GREAT THINKERS IN ECONOMICS

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List of Abbreviations

AB	Arthur Benson
ACP	Arthur Cecil Pigou
CUA	Cambridge University Archives
CUR	*Cambridge University Reporter*
EJ	*Economic Journal*
HMSO	His Majesty's Stationary Office
JMK	John Maynard Keynes
JNK	John Neville Keynes
JTS	John Tresidder Sheppard
JVR	Joan Violet Robinson
KCAC	King's College Academic and Tutorial Records
LR	Lionel Robbins
LSE	London School of Economics
NBKR	Philip Noel-Baker
OB	Oscar Browning

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Pigou in the Foreground

Cambridge professor of political economy Soviet spy?

On 29 May 1979, *The Guardian* published excerpts from a forthcoming book by Richard Deacon, a pen name used by Donald McCormick. His most sensational revelation was the accusation that Arthur Cecil Pigou (18 November 1877–7 March 1959), Alfred Marshall's successor in the Chair of Political Economy at Cambridge University, was the mysterious 'Fourth Man' in the Cambridge spy ring operated by the KGB. The first three were Guy Burgess, Donald Maclean, and Kim Philby, all of whom had studied at Cambridge in the early 1930s. Working as agents at the same time that they held important posts in the Foreign Office or the intelligence services – for a time, Philby was a leading candidate for chief of MI6 – they passed secret British and American intelligence to the Soviets in the early years of the Cold War. Burgess and Maclean escaped to Moscow in 1951, when they realized they faced imminent exposure. Philby, although compromised and forced to resign from MI6, continued to flourish in the British journalistic and intelligence establishment, living by his considerable charm and wits. He finally made his way to Moscow in 1963. In McCormick's imagination, however, Pigou was the master spy of the KGB Cambridge stable. He had proven to be not only 'an astonishingly deceptive character', but, for some 50 years, 'the most secret and in many respects one of the most effective Russian agents in Britain' (Deacon 1979). The apparent recluse residing in his 'ivory tower' – his rooms at King's College – had established contacts with Soviet apparatchiks while mountaineering in Switzerland during the interwar years. With his uncanny memory and formidable powers of analysis, he was able to convey valuable information to the Soviets in brief dispatches, including critical advice on financial policy at a time when they desperately needed it. However, his crowning achievement was success in recruiting agents – 'Marxist plums' – targeting the Cambridge undergraduates he took on alpine mountaineering expeditions. His criteria for identifying promising candidates for espionage work were surprisingly simple: a commitment to 'universal socialism' and a talent for alpine climbing (ibid.).

McCormick's charges had a perverse a priori attractiveness. A professor of economics at Cambridge during the 1930s, when many bright students had become disenchanted with capitalism, a homoerotic don who had befriended undergraduates for years and maintained close and affectionate ties with some of his former students, Pigou seemed well-placed and disposed to play the part McCormick had written for him. However, the conception of Pigou as an agent of the KGB, working in secret for the cause of a Soviet revolution in Britain, is so preposterous that one hardly knows where to begin. Pigou devoted his professional career of more than 50 years to strengthening the British economy in order to improve the welfare of British citizens. In doing so, he regarded the economic institutions of his time and their sociopolitical underpinnings as given, embedded in traditions that formed a fragile civilizational structure. Subjecting that structure to arcane policies devised by clever intellectuals entailed immense risks of damage for the economy, with corresponding consequences for welfare. Although an Edwardian progressive – a political species that the Soviets regarded as more dangerous than apologists for capitalism – it is not credible to suppose that Pigou in a hypothetical secret life embraced any ideology, regardless of its location on the political spectrum. Aside from these larger considerations, there are also plain facts that McCormick either ignored or did not know. In the mid-1920s, for example, Pigou began to suffer heart fibrillations while climbing in Switzerland, a condition that caused him to abandon serious mountaineering. By 1930, he had given up alpine climbing, ending the expeditions on which, McCormick claimed, he recruited Cambridge students.[1]

Presumably, McCormick did not know that MI5 had already identified the Cambridge Fourth Man: Anthony Blunt, former director of the Courtauld Institute of Art in London and Surveyor of the Queen's Pictures. His accusations had a short life. A few months after they were published, Prime Minister Margaret Thatcher revealed the identity of the Fourth Man, ending speculations about Pigou's clandestine political life. He was less fortunate regarding misconceptions about his work, which have a long history and persist to the present. Their explanation does not seem to lie in the substance of his thought, which is not profound – profundity, he argued, should not be expected from economists – but in two other considerations: the obligations he expected his readers to meet and several contingencies in the development of academic economics that determined the reception of his work.

'An economist's invisible hand'

Shortly after his unexpected election to the Cambridge Chair of Political Economy (Pigou to Macmillan, circa 5 June 1908, Macmillan Archive), Pigou developed a framework for analysing policies that could improve the aggregate economic welfare achieved by market outcomes. In *Wealth and Welfare* (1912), his first systematic treatise, he stated three fundamental propositions governing the relationship between the national dividend, or income, and economic welfare. Holding all other variables constant, economic welfare is likely to increase if (1) the size of the national dividend increases; (2) the dividend is distributed more equally, increasing the share allocated to the poor; and (3) fluctuations in the magnitude of aggregate output are reduced. His investigation of these propositions as well as their premises and consequences became the basis of a life-long research programme. The 1920s were an especially fertile period. In *The Economics of Welfare* (1920c), he revised *Wealth and Welfare*, expanding it substantially – in the view of some critics, excessively (Cannan 1921). Two other influential books followed: *Industrial Fluctuations* (1927b) and *A Study in Public Finance* (1928c). In the 1930s, he published *The Theory of Unemployment* (1933h), which John Maynard Keynes subjected to merciless and sophistical criticism in *The General Theory of Employment, Interest, and Money* (1936a). He also wrote *The Economics of the Stationary State* (1935b) – celebrated by reviewers (Benham 1936; Hicks 1936), it has been largely ignored by historians of economics. *Employment and Equilibrium* (1941a), arguably the first textbook in macroeconomics, remained faithful to classical doctrines even as it employed an IS-LM version of *The General Theory*. In Pigouvian parlance, these books and his many articles in academic journals were 'high brow', or scientifically demanding. He also wrote for non-specialist periodicals and published less-technical books and pamphlets – *Unemployment* (1913h), *The Political Economy of War* (1921a), *Socialism versus Capitalism* (1937b), *Lapses from Full Employment* (1945a), *Income: An Introduction to Economics* (1946a), *The Veil of Money* (1949c), and *Income Revisited: Being a Sequel to Income* (1955), his last book.[2]

Pigou was the last generalist in a long line of British economists, conceiving his work as an open-ended series of analyses of the conditions that produce economic welfare. It is evident that such a programme cannot be confined within the limits of welfare economics in its contemporary sense. It encompasses the entire discipline of economics. If Pigou had a second master whose importance for his thinking rivalled that of Marshall, it was Henry Sidgwick, Marshall's colleague in the Cambridge Moral Sciences faculty in the years before the Economics Tripos was introduced. From Sidgwick, Pigou learned the strategy of fine-grained utilitarian analysis. If Pigou became an economist by studying the techniques of marginalism and partial-equilibrium analysis with Marshall, he became a logician of policy analysis by reading Book IV of *The Methods of Ethics* on utilitarianism and its extension into economics in his *Principles of Political Economy*. Sidgwick assessed economic policies on utilitarian grounds – the extent to which, after patient and careful reflection, it was reasonable to conclude that they produced pleasure for all sentient beings. However, he provided no criterion for pleasurable states that improved on common-sense reasoning, which he regarded as basically sound but often vague and sometimes fallacious.

Pigou solved this problem by concentrating on economic welfare, a component of total welfare or satisfaction 'arising in connection with the earning and spending of the national dividend, or, in other words, of those parts of the community's net income that enter easily into relation with the measuring rod of money' (Pigou 1912, 3). Armed with Marshallian technique, Sidwickian analysis, and the concept of the national dividend, he developed a remarkably fruitful programme of research, leading to original work in theories of value, market structure, distribution, business cycles, valuation of real national income, and public finance. His work on the theory of unemployment and labour economics demonstrates an acute understanding of a remarkable range of phenomena: implicit contracts, internal labour markets, labour market segmentation, wage rigidity, human capital theory, and collective bargaining.

Although much of what Pigou thought has become the common coin of economics, contemporary economists associate very little of this work with his name: the Pigou effect, Pigouvian taxes, and the Pigou-Dalton principle are of course commonplace. Occasionally, his work has been discussed by recent thinkers: for example, Robert Solow on unemployment (1980), Robert Shiller on business cycles (1987), Gregory Mankiw on environmental pollution (2006), and Tony Atkinson (1983) and John Rawls (1971) on distributive justice. As the Great Recession unfolded, Amartya Sen – whose work bears a distinctively Pigouvian mark – and *New Yorker* writer John Cassidy underlined the salience of

Pigou's analysis of the economics of welfare to modern policy challenges (Sen 2009; Cassidy 2009). Cassidy envisioned a prize to be awarded the resident of the 'Heavenly Models home for deceased economists' whose work provided the best explanation of financial crises, global climate change, and other issues of great moment. Although he named Keynes, Hyman Minsky, and Milton Friedman as leading candidates, he awarded the prize to Pigou, 'for a long time the forgotten man of economics'. In this respect, the title of his article, 'An Economist's Invisible Hand', is particularly revealing.

Pigou's modest profile in economics is easily understood. In the innumerable archival collections and memoirs of the Cambridge Keynesians, he appears as a latter-day Mr Casaubon in George Eliot's *Middlemarch:* an erudite but unimaginative pedant, a relic of the past unable to recognize genuine originality and plodding to an inevitable dead end. The history of economic thought has all but disappeared from graduate education in economics, and very few theorists study, much less recall, the giants on whose shoulders they stand. And what of Pigou's status among historians of economic thought? With the exception of a few scholars, workers in this minor vineyard have either passed over Pigou's work or misinterpreted it. Although more than a half-century has passed since his death, there is no book in English on Pigou's life and work. In the main, he has been represented as playing a subordinate role in the history of economics, a foil in a drama in which the heroes are more brilliant, exciting, or engaging thinkers: Marshall, Piero Sraffa, Keynes, Lionel Robbins, or Ronald Coase.[3]

Pigou's ideal readers

In some measure, Pigou was the artificer of the fate of his work due to the prodigious demands he made on readers. Key aspects of his thinking were often not articulated in his treatises but explained in articles and public lectures, buried in evidence and testimony given before government committees, or spelled out in his many letters to *The Times*. Thus his analyses sometimes have the character of sketches rather than full-scale explanations. Critical premises are unstated, creating lacunae in his arguments. Pieces of technique are left unclarified or simply not mentioned. These lapses were noted by contemporaries and became a cause for criticism (Edgeworth 1921). If his work often seems intended for the initiated, economists who would have no difficulty in seeing what he had left implicit, that is because he generally wrote in this fashion. Pigou's ideal readers had studied Marshall's *Principles of Economics* thoroughly, enjoyed an easy familiarity with his assumptions and a sound understanding of how to employ them, and possessed a solid grasp of his analytical technique. They had also mastered the principal works of Edgeworth and were conversant with the main arguments of Pigou's own publications, which is why he saw no reason to repeat them in subsequent writings. Thus he conceived his scientific readership as a relatively small epistemic community whose members were trained in common principles and methods and followed the same professional literature.[4]

In sum, he presupposed a substantial body of tacit knowledge on the part of his readers, although not in the sense of this multi-valent term introduced by Michael Polanyi (1966, 1969): knowledge as know-how that must remain implicit because it cannot be explicated. The implicit knowledge required of Pigou's readers had already been explicated, chiefly by Marshall, but also by Edgeworth and their successors, among whom Pigou included himself. However, he may have been unrealistic in what he expected of his readers. In a recent account of tacit knowledge, Harry Collins has considered 'mismatched saliences' between authors and readers. Authors make assumptions about the material they suppose their readers know. They do not make this material explicit, because they believe it would be gratuitous and tedious to do so. However, readers may not know all an author expects of them. Suppose that readers understand the author up to a point, but because certain matters with which they are unfamiliar have not been made explicit, there are also failures of understanding: considerations that are salient for the author and the readers do not coincide (Collins 2010, 95). Employing Collins' idea of mismatched saliences, it is not difficult to see why many readers lacked the tacit knowledge Pigou ascribed to them. For example, Marshall had been read but not studied with the requisite care and thoroughness; or he had been read but not understood; or he had been understood but dismissed, forgotten, or not treated with the seriousness on which Pigou insisted. The result was the specific kind of breakdown of presuppositions on which Pigou relied.

There are many cases of mismatched saliences that made comprehension of Pigou's work a challenge for his readers – including his Cambridge contemporaries. Consider Joan Robinson, a student at Cambridge in the early 1920s. She called *The Economics of Imperfect Competition* (1933) – the aggressively deductive, technically dense, and empirically empty work that made her reputation – her Pigouvian book. Her reasons: she saw Pigou as working at daunting levels of abstraction, remote from the realities of economic life, and determined to reduce economics to algebraic-like functional relations. Her impressions were mistaken, but it is not altogether difficult to see how she arrived at them. Nor is it surprising that the demands Pigou made on his readers created both confusion and incomprehension in the minds of economists who were neither the Cambridge insiders nor his contemporaries.

The judgement of Clio

Clio, the muse of history, did not smile on Pigou. Shortly after he published the long version of his analytical framework in *The Economics of Welfare,* all three of his fundamental propositions were attacked as logically defective, false, contaminated by normative premises, or simply naïve. The following episodes were critical in the reception of his work.

Sraffa challenged the analysis of Pigou's first proposition, which held that a reallocation of resources from diminishing returns to increasing returns industries could improve economic welfare. In an acute argument that quickly became influential, not least at Cambridge, Sraffa maintained that the Marshallian analysis adopted by Pigou – conducted in a partial-equilibrium framework and assuming competitive markets – was logically incoherent and inconsistent with economic realities. A coherent and empirically realistic economics would begin from the assumption of monopolistic, not competitive, markets. Following one of Sraffa's ideas, Richard Kahn and Joan Robinson developed the theory of imperfect competition at Cambridge. Working independently at Harvard, Edward Chamberlin elaborated a theory of monopolistic competition, establishing a foundation for investigating strategic interaction among firms. Much later, Ronald Coase, who was deeply sceptical of state intervention as a response to spillovers, hammered Pigou's position that a reallocation of resources could improve economic welfare when private and social costs were not equalized. Although Coase's critique was based on stunning misreadings, his meteoric success cast a shadow over Pigou's account of public goods and externalities.

In the 1930s, Robbins imported Viennese philosophical fashions to Britain: hard-core empiricism and a verificationist criterion of scientific meaning. The meaning of a proposition became its method of verification. The only grounds of verification that Robbins allowed were empirical data and – in reports by persons on their own states of mind – introspection. This austere doctrine seemed to damn Pigou's second fundamental proposition as meaningless. After all, it was based on the alleged benefits to economic welfare of redistributing income in favour of the poor, which Robbins and other economists understood as a normative position that had no place in economic science. Robbins' argument entailed two possibilities for the concept of economic welfare: either a value-free criterion of welfare would have to be found, or it would be necessary to abandon the concept as scientifically meaningless. The first possibility encouraged the search for a value-free welfare criterion, leading to a new welfare economics much more restrictive in scope than Pigou's economics of welfare.

Keynes characterized classical economic orthodoxy as a heavily fortified citadel. Heterodox economists, and he was among them, would remain powerless in their assaults on classicism as long as they accepted its premises (Keynes 1935, 36). As he argued in the preface to *The General Theory*, heterodox opponents of classicism could not succeed by attacking the superstructure of the fortress, built over generations by economists of great theoretical power and ingenuity. In order to mount a successful offensive against classicism, it was necessary to undermine its foundations (Keynes 1973a, 533). Although Keynes included David Ricardo, John Stuart Mill, and Marshall among classical economists, he aimed his weapons at his colleague Pigou, whose *Theory of Unemployment* he called 'the only detailed account of the classical theory of employment which exists' (Keynes 1936a, 7). Pigou's book, Keynes claimed, suffered from fundamental errors. Its explanatory power was limited to voluntary unemployment – reductions in money wages or increases in prices would reduce real wages, causing workers to withdraw their services from labour markets – and left the larger and more important question of involuntary unemployment untouched. In Keynes' view, an account that remained silent on changes in the rate of investment produced by variations in interest rates or expectations of economic actors was so radically misguided that it failed to qualify as a theory of unemployment (ibid., 275).

In January 1935, Keynes told George Bernard Shaw that his forthcoming book would 'largely revolutionise' economics within a decade of its publication (Keynes 1973a, 492). He proved to be right. By the end of World War II, a consensus had been reached in academic economics that a Keynesian revolution had indeed taken place: a profound shift in thinking that reoriented macroeconomics, redefining its basic questions and variables and creating new theoretical tools. Although Keynes had used Pigou's book as a straw man, *The General Theory* eclipsed Pigou's analyses of business cycles and unemployment, which constituted his third welfare proposition. In his Josiah Stamp Memorial Lecture, given at the University of London in 1949, Pigou (1952b, 29) admitted as much, seeming to embrace the general perception that he had been defeated and outshone by the glittering success of Keynes.

> Since 1943 [the year of his retirement] I have been "emeritus" – which should mean, I think, with any merit one may once have had drained out of one. Worst of all, I am a relic of "classical economics", "traditional economics", "the old economics", all of which, I am sure, it has been the pleasure of many of you to "debunk" and cast upon the everlasting fires! Why should you not? After all, a Cambridge don, who instructs our youth in English literature, has recently "debunked" Milton.

In the same year that he delivered his two retrospective lectures on Keynes – acknowledging that Keynes' 'fundamental conception' was 'a very important, original and valuable addition to the armoury of economic analysis' (Pigou 1950a, 66) – he (Pigou 1952b, 29) also expressed hope, albeit opaquely, that his own work might someday be given its due place in the history of economic thought.

> There is, of course, the consoling fact that what has been "debunked" one day is sometimes, like Tennyson and Queen Victoria, "rebunked" the next.

Sources

Students of the historiography of intellectual history from Wilhelm Dilthey to Quentin Skinner stress the importance of understanding the intentions of authors in arriving at a sound understanding of their work. An account of authorial intentions is not the entire story of a text. It is a truism that writers may misunderstand their own work, failing to consider its premises or missing its implications. And they may be confused about their intentions, having no clear idea of what they are. These caveats admitted, in order to understand a text in the history of ideas, it is indispensable to grasp what the author meant to achieve in writing it; and if authorial intentions are vague or muddled, it is important to understand that as well. In order to read Pigou intelligently, it is minimally necessary to identify the problems he intended to analyse, determine how he conceived them, and ascertain what he meant to establish. Thus the importance in understanding what a writer thought of the *Nachlass*: what the writer left behind in the way of preliminary drafts, exploratory fragments, sketches, notes, and letters. In this regard, students of the biography of Pigou's work are confronted by a dearth of his papers. John Whitaker and Austin Robinson claimed that Pigou destroyed them (Groenewegen 1995, 748 and n1). His personnel file at King's College included a note requesting that, on his death, any papers in or on his desk be destroyed because he did not regard them as fit for publication (Davies to Aslanbeigui, 7/7/1995). A few notes and some correspondence bearing on his work survive in the Marshall Library at Cambridge (ACP Papers). Otherwise, Pigou's correspondence is dispersed in the papers of various economists and friends. The difficulties this circumstance entails for the project of a biography of his work are evident.

On instructions left to the Provost and Scholars of King's College as well as the Westminster Bank (the executor of Pigou's will) the Marshall Library chose 250 books from his personal library. King's deposited an additional 100 books and numerous pamphlets in the College Library. On a petition from Bertrand Hallward – the first Vice-Chancellor of the University of Nottingham, who had been a Cambridge student and a member of Pigou's climbing parties in the early 1920s – the newly founded University was offered a choice of the remaining 2,000 volumes in Pigou's collection. The only stipulation was a label in each book identifying its source as Pigou's library (Munby to King's College, 13/4/1959). With some difficulty and expense, therefore, it is possible to read many books and miscellanies culled from Pigou's library. Although this is helpful, it does not fill the gap left by the destruction of the *Nachlass*. Even in cases where Pigou wrote marginalia, it is not possible without speculation to offer judgements about how these books entered his thinking, the conclusions he drew from them, and the uses he made of them.

However, there are other sources that shed light on Pigou's authorial intentions. In the years of his professorship, Britain experienced several crises that threatened the viability of the social order. In summer 1914, British statesmen and military strategists planned for a short war, comparable to the European conflicts of the long nineteenth century. Victory could be expected in a matter of weeks. Four years of total war followed, in which all the institutions of the nation were coordinated to meet the military objectives of the state. Because the government had done little financial planning for this prospect, immense fiscal problems centring on the question of how to pay for the war ensued. In 1919, new economic problems were created by the vast war debts the state had accumulated and the necessity of funding the transition to a peacetime economy. Demobilization, dislocation, structural change, a severe slump, and monetary disarray created massive unemployment and capital-labour conflict throughout the 1920s. These problems were magnified by the decision to return to the gold standard at the pre-war parity rate and the collapse of values on the New York Stock Exchange.

In all these crises, British governments responded by employing an institutional device favoured by their late Victorian predecessors: appointment of commissions, committees of experts who were given a relatively specific remit to investigate urgent issues of policy and report by a certain date. Pigou assumed positions of responsibility in many of these crises, generally as a committee member and occasionally as an expert witness summoned to give testimony. Acting in the capacity of an official public intellectual performing services for the nation in states of emergency, he drafted letters, memoranda, and reports that became government documents and thus were not lost to history. His work on these bodies oriented his own research in various respects. Service on government committees gave him a perspective on economic problems of national import that he did not have within the confines of King's College, providing problems to investigate, and a more astute and realistic sense of the institutional limits of policy analysis. Most important for our purposes, Pigou's public service between World War I and the early 1930s sheds light on his scientific intentions and how they were formed by changes in the political economy of Britain. The same considerations hold for his many letters to *The Times*, articles on current economic issues in periodicals such as *The Economist* and *The Contemporary Review*, and books for the lay public. Their topicality and specificity offer a wealth of detail that is generally missing in his theoretical works, providing insight into the thinking that entered his scientific publications. We mine these sources both for their intrinsic value in a biography of his work and as evidence of his authorial intentions.

The following account, which is an effort at demystifying Pigou's life and work, does not follow conventional readings of Pigou as a highly abstract and ahistorical thinker, a transcendent and disembodied mind hovering over the turbulence of the economic world. Nor does it employ methods of reading based on a modest selection of his books, even though they may be painfully long. At best, these readings capture variables Pigou regarded as important at the time of writing, missing points he emphasized elsewhere and dismissing his project of constructing a theory of economic policy analysis. Our account is a historical sketch of that project and in this sense a biography of Pigou's thought. A hermeneutic of the Pigouvian oeuvre, although somewhat fatiguing, is the only sure path to understanding his work as he conceived it.

Notes

1. Shortly after McCormick's excerpts appeared, several of Pigou's friends and former colleagues responded, variously characterizing the charges as 'grotesque and ridiculous' and 'richly comical' (Annan 1979; Kaldor 1979; Noel-Baker 1979).
2. For a survey of Pigou's contributions to economics, see Collard 1981.
3. A caveat to the above, somewhat dispiriting, account. For some years now, a small community of Pigou scholars – including Michael Ambrosi, Karen Knight, David Collard, Ryo Hongo, Michael McLure, Norikazu Takami, and Keith Tribe – has been working toward a critical assessment of Pigou's work. In 1999, Macmillan published a 14-volume collection of Pigou's major writings (Pigou 1999), followed by a two-volume collection of his journal articles (Pigou 2002), both edited by Collard. Ryo Hongo's *The Philosophy and Economics of A.C. Pigou* (2007), published in Japanese, received the Academic Prize of the Japanese Society for the History of Economic Thought in 2008. Collard's *Generations of Economists* (2011) is a compendium of his pioneering essays on Pigou. In November 2013, Michael Hayes organized a mini-conference on Pigou at Robinson College, University of Cambridge. Ambrosi's work on the genealogy of the Pigou family remains unpublished. Finally, the economics society at Harrow bears the name of its distinguished alumnus.
4. These qualifications were not expected of readers of his extensive non-specialist publications. On epistemic communities, see Knorr Cetina (1999).

2
'The Most Brilliant Young Man I Know'*

Imperial heritage

Arthur Cecil Pigou, generally remembered as the architect of welfare economics, was the scion of several families of military officers, minor aristocrats, privileged officeholders, and freebooters whose fortunes prospered with the increasing power and wealth of the British empire in the eighteenth and the nineteenth centuries. His forebears included a number of colourful figures, men who proved quite adept at exploiting opportunities created by the rapidly changing conditions for success in the British polity and economy.

John Lees, First Baronet of Blackrock, Ireland, was born around 1739 in Ayrshire, Scotland, and was educated for a public career.[1] After joining the British army, he served in Germany during the Seven Years' War, although in what capacity is not clear. He was noticed by John Manners, Marquis of Cranbury, through whom he met the Marquis of Townshend, a major general who fought in the Battle of Villinghausen. When the general was appointed the new Lord Lieutenant of Ireland, Lees accompanied him as privy secretary. In 1772, Lord Simon Harcourt replaced the Marquis of Townshend as the British Viceroy in Ireland, and Lees also served as his secretary.

The death of Lord Harcourt in 1777 did not spell the end of Lees' advancement. Three years earlier, he had established a foundation for a flourishing career by purchasing the office of Secretary of the Irish Post Office, paying his predecessor an undisclosed annuity and the next previous occupant of the office £812 annually. In 1781, he was appointed Under-Secretary of the War Department in Ireland. A comparable path opened in England when Prime Minister Lord North offered him the position of Under-Secretary of State in 1783. Lees demurred, and in 1784 was officially appointed Secretary of the Post Office in Ireland, the office he had bought ten years earlier. In 1801, Lees' fourth son, Edward Smith, began to assist his increasingly infirm father as joint Secretary at the age of 18. After his father's death in 1811, Edward became the sole Secretary, retaining the office until 1831.

By the standards of their time, John and Edward Lees were honourable men who managed the Irish Post Office with fidelity and industry. They renovated its infrastructure – post roads, mail coaches, and mail boats – and introduced express mail service across the Irish Sea. Under their management, the penny post system improved, deliveries increased, and new letter offices were established throughout the country. Acting as informants to the British government, they also reported to Whitehall on Irish reactions to political rumours and threats. Both father and son were knighted for their services to the crown.

John Lees and his wife, Mary, daughter of Robert Cathcart of Ayrshire, had six sons and one daughter. As Secretary, his annual salary was £423. Yet on his death, he bequeathed an estimated £100,000–£250,000 to three of his sons. He left an additional £20,000 to his first son, Harcourt, a graduate of Trinity College, Cambridge, and a political pamphleteer, to support his inheritance of the baronetcy. John Lees could hardly have achieved substantial wealth through his salary alone. How did he amass such a fortune?

Like many British political appointees in Ireland at the time, John and Edward Lees energetically conducted their offices for private gain. Free from the scrutiny of regular audits or close supervision by postmaster generals, they liberally dispensed jobs and contracts to friends and relatives, sold appointments to others, and embezzled property. They used the riches they acquired for the sumptuous appointment of their homes, built on prime real estate. John Anderson, a relative and friend of the family, was awarded a contract to operate the mail coach between Dublin and Limerick. The terms of his contract included special concessions and overcompensation worth £1638. Edward Lees hired his brother Thomas as senior clerk, promoting him to chief clerk within a year and paying him additional income to jointly superintend the port of Wexford. Thomas was also given control of a suspension fund created from fines imposed on post office contractors and officers. The balance of this fund, £200–£900, was neither deposited in a bank nor audited. Harcourt Lees treated the Irish post as his personal fiefdom, visiting it regularly for hours at a time and taking full advantage of its services. Post office clerks wrote and copied numerous letters and articles on his behalf, using office stationery and dispatching them by employing his brother Edward's franking rights. John and Edward appointed themselves clerks of the Leinster postal road, subcontracting its management to William Armit, John's brother-in-law. On a petition from post road clerks, including John, the postmaster general awarded them inflated annual profits of £850. In the event of a shortfall, they received the difference through incidental charges to the post office. John also sold appointments and rights to newspaper distribution, boosting his stipend by £1500 annually. These machinations did not pass unnoticed by British officialdom. Several commissions investigated 'the defective state of the arrangements, the accumulation of errors in the accounts, the frequent embezzlement of private property [e.g. jewellery sent through the post] and the delays and irregularities in the conveyance and delivery of the mails which have been so long and so loudly complained of'. Although father and son were both found guilty as charged, they received only gentle rebukes (Butler 1953, 142–3). In 1831, Edward was finally transferred from the Irish Post Office.

Sir James Lillyman Caldwell was born on 22 November 1770, son of Major General Arthur Caldwell of the Bengal Engineers and Elizabeth Weed of Greenwich, Kent. He joined the Madras Engineers of the East India Company in 1789. Later he enlisted in the company's army under Lord Cornwallis, taking part in the third Anglo-Mysore campaign of 1791–2 against Tipu Sultan. In 1794, he married Mademoiselle Malliard of the Franche Comté. The same year, he joined astronomer Michael Topping in a project to improve the infrastructure of the Northern Circars on the western side of the Bay of Bengal. Caldwell directed the construction of various public works until 1799. He then joined the army of General George Harris in the fourth and final Anglo-Mysore campaign, which led to the death of Tipu, the defeat of his army, and the capture of Seringapatam. Caldwell was awarded a gold medal and a pension for injuries he suffered in trenches he had probably helped excavate as an engineer as well as for gunshot wounds sustained as a member of an advance guard sent on an especially hazardous mission. Following the victorious campaign, he returned to public works construction for some ten years. In 1810, he joined the expedition to Mauritius against the French as commanding engineer. After the French defeat and the British capture of the island, he was recognized for his 'most able and assiduous exertions'. This was Caldwell's final military exploit. Returning to Madras in 1811, he devoted the next 20 years to surveying, reconstructing fortresses and settlements, and designing the famous Cathedral of St. George in Chennai, completed in 1815. On retiring in 1837, he was honoured by the crown, first as a Knight Commander of

Bath and 11 years later with a Knight Grand Cross. As the oldest officer in the army, he was promoted to general in 1854.

Sir James passed as a 'gallant and venerable knight' and a 'Fine Old English Gentleman'. On retiring to Beachlands, a country house in Ryde he had purchased in 1843 following the death of his wife, he became a principal founder of the Royal Isle of Wight Infirmary (1849). Celebrated for his liberality, Sir James contributed generously to the construction and furnishings of the infirmary and treated his servants in a princely fashion, giving his builder complete discretion in providing them comfortable housing. At Christmas, he held lavish balls and feasts for his domestic staff and tradesmen. The son of a father who had lived to the age of 100, he enjoyed a long and healthy life, dying a few months short of his 93rd birthday. His funeral was attended by a large family, veterans, all his domestics, and much of the Ryde citizenry. As the local newspaper reported, 'Flags ashore and in the offing, private houses, and shops gave token of respect and regret. The memory of Sir James will be green for many a year to come' (11/7/1863, *Isle of Wight Observer*).

In Wilkie Collins' famous novel, the British soldier and adventurer John Herncastle escaped the blood-stained Palace of Seringapatam with the crown jewel of Tipu's treasure, the priceless yellow diamond Moonstone. The extent to which Sir James profited from his military service and public offices remains a matter of speculation. However, successful British army officers routinely supplemented their incomes by sharing the plunder, just as officers of the Royal Navy profited handsomely from the treasure and ships they captured from French and Spanish fleets (Marshall 1976, 210–12). Sir James died a rich man, leaving his widowed daughter, Eliza-Maria Sullivan, a life interest of £50,000. On her death, it was divided amongst her granddaughter Maria-Charlotte Sullivan (£20,000) and her six children (£5000 each). The family also inherited Beachlands and its ample appointments.

How is this assortment of builders and beneficiaries of the British Empire related to Pigou – A.C. Pigou or Arthur Cecil Pigou, as he signed himself, but never Arthur Pigou? In 1839, Maria-Charlotte married John Lees (b. 1816), third Baronet of Blackrock, son of Sir Harcourt Lees, and grandson of his namesake, the Secretary of the Irish Post Office. Although Sir John inherited Blackrock House, the couple apparently did not live in Ireland. The British censuses of 1851–91 record the Lees residence as Ryde, where the family seems to have occupied Beachlands after Sir James' death. The couple had many children, including Nora Frances Sophia Lees (b. 1850). On Sir James' birthday, 22 November 1876, she married Clarence George Scott Pigou (1850–1905), a retired lieutenant of the 15th Regiment of Foot, in the parish church of the Holy Trinity in Ryde. The Pigous were descendants of affluent Huguenot tradesmen who had fled France in the late seventeenth century to escape religious persecution. Clarence's father, Arthur Pigou (1822–67), and his grandfather, Henry Minchin Pigou (1791–1874), were both in the Bengal Civil Service. Henry studied at the East India Company College – later Haileybury – where Thomas Malthus taught political economy. Pigou's great-great-grandfather, Frederick, also worked for the East India Company. In 1748, he was in Canton, buying tea, silk, and chinaware for Britain. Two years after returning to England in 1756, he became a director of the company, a position he held until 1774.

Clarence and Nora had three children: Arthur Cecil, Gerald Arthur (1878–1957), and Kathleen Marie (1881–1955). By the birth of their last child, the family had settled in the village of Pembury, Kent, where Pigou grew up.

Education

Pigou's parents seem to have enjoyed a comfortable middle-class life. Although Arthur Pigou may have accumulated a modest fortune from the emoluments of his office as a civil servant in Bengal, divided amongst his seven children, the inheritance of each would not have been substantial. After serving some seven years, Clarence Pigou retired from the military, too early to qualify for a large pension. Nora had inherited £5000 from her grandfather, sufficient for middle-class life in mid-Victorian England, but not more than that. When Pigou attended Harrow, the public school that had educated several members of the Pigou family, including his father, he was chiefly supported by a scholarship based on academic merit. In 1891, he began his education as an Entrance Scholar and boarded at Newlands. The headmaster of Harrow was the autocratic James Edward Cowell Welldon, fellow of King's College Cambridge and later Bishop of Calcutta, who displayed 'an undying interest in the careers of his pupils' (Tomlin and Curthoys 2004). The historian Ernest Bowen directed 'the Modern Side', the first history department in any British public school, which he had helped establish in 1869. A sports enthusiast, accomplished skater, and mountaineer, Bowen was Pigou's master beginning in his second form.

Pigou had a stellar record at Harrow. He won numerous academic prizes, including awards for modern studies, English essay, oration, mathematics, and modern languages. In his fourth form, he became a monitor, exercising considerable authority in disciplining students outside the classroom. In his final year, he was elevated to captain, or head monitor, the first boy on the Modern side to receive this honour. In this capacity, he served on the school football committee, enforcing rules for the sport that Bowen had brought to Harrow. Pigou also excelled as an athlete and was cricket captain in 1896. In *The Harrovian*, he reported on important school events such as honours, prizes, and games (Pigou 1896a). He had a facility for writing English verse, and one of his efforts eulogized a boy of 13 who had died of a heart attack following a diving accident (Pigou 1896b). He even displayed business acumen, maintaining the solvency of the debating society by charging four pence for coffee, to be paid on purchase in lieu of a subscription.

Unlike his later colleague Dennis Robertson, Pigou demonstrated no special aptitude for acting. However, he was an accomplished orator, rendering Benjamin Disraeli's address of April 1872 at Manchester on the principles of conservatism before Harrovian parents on speech day. The long and complex oration highlighted improvements in the condition of the working classes, presented a spirited defence of the British establishment—the monarchy, the Church of England, and the House of Lords – and indicted Liberal Prime Minister William Gladstone and his government for their conduct of both domestic and foreign policy (Disraeli 1872).

In Michaelmas 1895, Pigou sat for the Cambridge entrance examination, and the following February was awarded a Minor Scholarship to King's College in History and Modern Languages. He went up to Cambridge in Michaelmas 1896, reading history when the Historical Tripos was still undivided and an independent Economics Tripos had not yet been introduced. Goldsworthy Lowes Dickinson lectured on law and government. Oscar Browning, his supervisor, taught elementary political science and the history of the French Revolution. Returning to Cambridge in 1876 after his dismissal from Eton, Browning followed the standard historiography of the time: serious history was essentially political history, especially histories of statesmanship and the relations of the great powers.[2] He conceived the Historical Tripos as 'a machinery by which men could be trained for learning, reasoning, and perhaps acting in politics; that is, in public affairs connected with the welfare of the State' (Browning 1910, 234). In addition to the routine work of supervision – assigning pupils weekly essays and preparing them for Tripos questions, he promoted education in political history as debate through the Political Society, which he formed shortly after his return to Cambridge. Topics debated in the Monday night meetings of the Society, held in his spacious set of rooms at King's, included the political ties between Russia and England, the disestablishment of the Church of England, the role of government in education on temperance, colonial India, women's suffrage, free trade, and home rule. Browning's pedagogical methods seem to have served Pigou well in the Cambridge Union Society, which he joined immediately after matriculating. The *Cambridge Review* reported that he was a frequent speaker and took positions on an extensive range of issues, addressing the Concert of Europe, the Church establishment and the monarchy, British imperial policies in China and India, the Spanish-American War, free trade, the role of government in minimizing drunkenness, and the Dreyfus affair (*Cambridge Review* 1896–9). By December 1897, he was already speaking from the Union 'Committee benches', a position he held for two years. He became secretary in 1899 and president in Lent 1900.

Pigou routinely gave Browning reports of his progress on the reading programmes he generally planned for inter-term vacations. Books he read on several vacations included William J. Ashley, *Introduction to English Economic History and Theory*; Walter Bagehot, *Lombard Street*; Henry Hallam, *Constitutional History of England*; W.E.H. Lecky, *Democracy and Liberty*; Alfred Marshall, *Principles of Economics*; Erskin May, *A Treatise upon the Law, Privileges, Proceedings and Usage of Parliament*; Henry Sidgwick, *The Methods of Ethics*, and many plays by William Shakespeare. He also turned to Browning for advice. Could he recommend a good book on the Children's Crusade? Should Pigou employ blank verse or rhyming heroics in submitting a poem for the Chancellor's Medal for English Verse? Did Browning think he was capable of earning something by writing for a weekly newspaper? Following his penchant for collecting bright, physically attractive, and intellectually promising young men who were willing to learn by sitting at his feet, Browning showered Pigou with offers of entertainment and travel. Although appreciative, Pigou had his own agendas and was not eager to comply. Pleading a previous overriding engagement, he declined Browning's invitation to a play in London's West End. Nor could he accompany Browning to Florence; the two weeks necessary for the trip could not be spared. However, he was grateful for Browning's willingness to serve as his tour guide in London and promised to join him for lunch at the Athenaeum, although he felt obliged to apologize for not dressing in conformity with the standards of an elite London club (OB/1/A:Pigou, A.C.).

After placing in the First Class of the Historical Tripos in 1899, Pigou began formal study of economics, devoting the academic year 1899–1900 to reading for Part II of the Moral Sciences Tripos and specializing in advanced political economy, ethics, and political philosophy. In this regard, he was most fortunate. The faculty teaching in the moral sciences included two of the most formidable thinkers of the time. Marshall lectured on general and advanced political economy, covering under the latter heading foreign trade, taxation, and the economic functions of the state. Sidgwick taught both theoretical and practical philosophy – metaphysics as well as ethics and political philosophy. Students who took Part II of the Moral Sciences Tripos were expected to demonstrate a keen understanding of theories of consumption, production, market structure, factor markets, international trade, foreign exchange, banking, stock exchanges, labour markets, public finance, the functions of government, and socialism, as well as a general knowledge of statistical, diagrammatic, and mathematical applications in economic theory (Groenewegen 1995, 563–4).

Several economists who formed the core of the Marshallian guild at Cambridge in the 1920s had impressive records as undergraduates – Keynes, Robertson, and Gerald Shove come to mind. None matched the achievements of Pigou. In addition to his First in the Historical Tripos, he won the Chancellor's Gold Medal for English Verse with a long ode on the Saxon King Alfred the Great. In 1900, he placed in the First Class in Part II of the Moral Sciences Tripos and was the only candidate to earn a special distinction in advanced political economy. In the same year, he won the Burney Prize for his essay 'Robert Browning as a Religious Teacher'. Pigou's first and perhaps only academic setback at Cambridge occurred in 1901. Although the Burney Prize carried a cash award of £105 (*CUR*, 5/12/1899, 260), it failed to win him a fellowship at King's. He was not surprised, even forewarning Browning that he had little chance of a fellowship that year. His judgement on this point seems to have been sound—neither of the reports on his thesis was encouraging. Bishop Brooke Foss Wescott criticized it for failing to state a refutable hypothesis. In addition, Pigou had considered Robert Browning more as a philosopher or theologian than a religious teacher (Wescott to Provost of King's, 8/1/1901, KCAC/4/11/2/4). The other examiner, who bore the improbable name Sir Walter Raleigh, found the essay excessively expository and difficult to assess, although he noted that it demonstrated serious work, careful reasoning, and extraordinary intellectual power (Raleigh to Provost of King's, n.d., KCAC/4/11/2/4). This reversal had little effect on Pigou's progress. In 1901, he won the Cobden Prize for his essay 'The Causes and Effects of Change in Relative Values of Agricultural Produce in the United Kingdom during the Last Fifty Years', which included a monetary award of £20 as well as a silver medal. On submitting the essay for a fellowship at King's, he was elected in March 1902. In 1903, he won the Adam Smith Prize of £60, a triennial award funded by Marshall, for the monograph 'A Study in the Principles and Methods of Industrial Peace'.[3] This text formed the basis of his Jevons Memorial Lectures at the University of London in 1903–4 (Collet 1936, 619). In June 1904, he was appointed the first Girdlers' University Lecturer at Cambridge – and the first Cambridge University lecturer in economics – a position he held until his election as professor in 1908.

The election

Micropolitics at Cambridge, 1908

On Saturday afternoon, 30 May 1908, between 12:00 and 2:00, the University of Cambridge elected a new professor of political economy. Marshall, author of the monumental *Principles of Economics*, the most influential economist of his time, and occupant of the chair since 1885, had announced his retirement. As befitted the selection of his successor, the electors were men of distinction. A.J. Balfour was a former Conservative prime minister. Lord Courtney of Penwith had been a Member of Parliament for 24 years and served as financial secretary of the Treasury in Gladstone's government. Francis Y. Edgeworth, a highly original economist and prolific scholar, was the Drummond Professor of Political Economy at Oxford and editor of the *Economic Journal (EJ)*, the most prestigious British publication in economics. John Neville Keynes was a logician and economist, a fellow of King's, and, as the University Registrar, a powerful Cambridge administrator. Joseph S. Nicholson was Professor of Political Economy at the University of Edinburgh and author of more than ten books. R.H. Inglis Palgrave, an expert in banking and finance, was a former editor of the *Economist* and the editor of the original *Palgrave Dictionary of Economics*. Ernest Stewart Roberts, the University vice-chancellor, chaired the committee of electors. William R. Sorley succeeded Sidgwick as Knightbridge Professor of Moral Philosophy at Cambridge. V.H. Stanton, fellow of Trinity College, had been elected Ely Professor of Divinity in 1889 and was Regius Professor of Divinity.

There were four candidates. William Ashley was professor of commerce at Birmingham and had also been professor of economic history at Harvard. Edwin Cannan was professor of economics at the London School of Economics (LSE), and his publications included the authoritative edition of Smith's *The Wealth of Nations*. Herbert Foxwell had lectured in economics in Cambridge since the mid-1870s. He was the successor of William Stanley Jevons in the chair of political economy at University College, London. Ashley was 48, Cannan 47, and Foxwell 59. The electors selected Pigou, fellow of King's since 1902 and former student and protégé of Marshall. At the time of the election, he was a mere 30 years old. Marshall was determined that Pigou succeed him and was elated on learning the result of the election. As he relayed the news to another former student, his face 'beamed with delight' (Roderick K. Clark, quoted in Groenewegen 1995, 625). Later in the day, he celebrated the event at tea and dinner with the electors who were still in Cambridge, perhaps to fortify himself for the painful task he faced on Sunday: the burden of writing a letter of consolation to Foxwell, one of his early students, a friend of many years, a Cambridge colleague, and apparently the only other candidate to whom the electors gave serious consideration. In writing, Marshall was frank in acknowledging that Pigou, whom he believed would 'likely be recognised ere long as a man of quite extraordinary genius', had been his choice. Although convinced that the electors had acted conscientiously as trustees of the University and done their duty, he assured Foxwell that he shared with 'all of them to whom I have spoken a deep sorrow on your account and an affectionate gratitude towards you'. Even Pigou's strongest supporters were 'deeply pained by the thought that it has not been possible to crown your long and trusted work by a high reward' (31/5/1908, Marshall 1996b, 190–1).

In a brutally candid response written the next day, Foxwell did not conceal his bitterness. 'At critical times in one's life', he complained to Marshall, 'one looks to one's friends for deeds rather than words'. In light of this expectation, he regarded the result of the election as an 'unexpected blow dealt me by a majority of my friends, the Electors'. For 20 years, leadership of the Cambridge economics faculty had been his supreme ambition. University gossip had encouraged him to believe that he was on the brink of achieving it. Indeed, he had been so confident that he had already begun to write his lectures and otherwise prepare himself for the responsibilities of the professorship, work in which he had received support from members of the faculty. Foxwell saw himself as Marshall's legitimate successor because he supposed that 'experience and long service might count for something in an election to such a responsible post'. Had Ashley or Cannan been the choice, he would at least have found his rejection comprehensible. Pigou's candidacy he regarded as an empty formality. In another ten years, perhaps Pigou might be qualified to succeed him. But to lose to 'an untried man young enough to be my son' was humiliating, 'a stamp of incompetency so publicly branded upon me by a body of experts, of whom I am bound to believe that they decided on a strict view of the merits of the case' (1/6/1908, Marshall 1996b, 192). Shortly after writing Marshall, Foxwell notified the Special Board that he would no longer lecture at Cambridge (3/6/1908, CUA/Min. V. 114).

Only some days after the election did Foxwell conclude, as he wrote Clara Collet, that Marshall had been furiously engaged in moving 'heaven and earth to prevent my election, and raking up every conceivable thing that he thought might prejudice me' (8/6/1908, quoted in Coats 1972, 493). Although his judgement on this point may have been excessive, it is clear that Marshall was quite active in planning and executing the tactics of the election. On April 30 and May 27, he visited Neville Keynes, pressing his case for Pigou and against Foxwell. As Keynes noted in his diary, Marshall supported Pigou's candidacy in the strongest terms. He was intent on his election and irrevocably opposed to Foxwell (JNK/Add. 7858 1908). On the eve of the election, Edgeworth, who was spending the night at Marshall's house, visited Keynes and the two electors he was housing, Nicholson and Palgrave. Keynes' diary records that they regarded Edgeworth's visit as a manoeuver on Marshall's part to influence their vote. Nicholson's pronounced irritation at Marshall's treatment of Foxwell suggests that Edgeworth had made a case for Marshall's preference of Pigou (9/6/1908, JNK/Add. 7858 1908).

Trevor Jones (1978) has suggested that Marshall's tactics might have included a lectureship for Keynes' son, Maynard, whose dissertation for a fellowship at King's had been rejected only some two months prior to the election. Several King's fellowship electors – including Pigou, who was a friend of Maynard – had extended to both father and son the consolation that if Maynard revised his dissertation, he would almost certainly be elected to a fellowship in 1909. For the time, Maynard expected to remain a civil servant in the India Office, a position he did not fill with enthusiasm.

Shortly after the fellowship election, C.R. Fay, another Cambridge economist and also a fellow of King's, wrote Maynard a speculative letter on the possibilities that the professorial election might open up. At that time, there was only one University lectureship in economics, the position endowed by the Girdlers Company and held by Pigou. If Pigou were elected professor, this lectureship would become vacant. In addition, Marshall's successor might decide to continue his practice of paying additional lecturers £100 from his professorial stipend. Would it be feasible, he asked Keynes, for him to accept one of these positions? 'I mean on May 30, ought one to let the new man know that there is a chance of getting you?' In that case, if Maynard resigned from the India Office and moved to Cambridge, he would not create the impression of waiting in London anticipating his election. 'It seems to me, at any rate, that if you have the end of this year clear from office work, you can make certainty more certain' (Fay to Maynard Keynes, circa mid-late March 1908, JMK/PP/45/101).

News of Maynard Keynes' availability travelled fast. On April 3, he received a somewhat cryptic letter from Marshall, who had failed to persuade him to read for the Economics Tripos in his undergraduate years. In a 'round-about-way', Marshall had heard that Keynes might be willing to return to Cambridge if he were offered a job. As professor, Marshall would be ready to offer him a lectureship fee for teaching first-year and possibly second-year students, presumably because Keynes at that point knew little economics. Since he was retiring, Marshall was reluctant to dictate to the new Special Board of Economics and Politics, not yet constituted, which lecturers it should appoint. However, he was prepared to make a suggestion. Pending a specific outcome of the election, someone – presumably Pigou – would propose to the Board that Keynes be asked to lecture. If the Board agreed, Keynes would be paid a fee of £100, either by Marshall or by someone else, again, presumably Pigou (3/4/1908, Marshall 1996b, 186–7). When he wrote this letter, Marshall surely anticipated that Maynard would consult his father. He also knew that his offer would confront Neville Keynes as professorial elector with a conflict of interest by giving him a compelling reason to vote for Pigou. On April 21, Maynard sought his father's advice. If he received a fellowship in 1909, he would resign from the India Office in any event. Since he needed time to revise his dissertation, should he not accept Marshall's offer now? After all, the position might not be open the following year. 'I am still quite decided as before that I wish to leave the India Office. Nothing would suit me better than this [Marshall's proposal], and even taking into account the fact that I should have at once to begin learning a little economics I shall have more time for rewriting my dissertation, with which my mind is much absorbed though not my time' (Maynard to Neville Keynes, JMK/PP/45/168, quoted in Moggridge 1992, 178).

Neville Keynes discussed the 'Marshall scheme' with Lowes Dickinson, a Board member. His initial reaction was sceptical since the proposal assumed that Maynard's next attempt to gain a fellowship at King's would encounter no obstacles (Maynard Keynes to Lytton Strachey, 9/5/1908, JMK/PP/45/316). However, his view changed when a fellowship elector of King's assured him that Maynard would very likely be elected the following year. As Neville Keynes observed in his diary on 23 May, Lowes Dickinson now seemed convinced that a move to Cambridge by Maynard would make his election a virtual certainty (JNK/Add.7858 1908). It is noteworthy that Lowes Dickinson expressed no doubts about Pigou's elevation to the professorship. Nor did Maynard, who had already begun a self-administered crash course in economics, the point of which presupposed Pigou's election. 'I am coming to Cambridge to-morrow', he wrote his father eight days before the election, 'and will bring two volumes of Pigou with me; I can't find the "Riddle of [the] Tariff" [Pigou 1903e] and think it must be at Harvey Rd [the Keynes residence]' (22/5/1908, JMK/PP/45/168). In the first Board meeting he attended as professor, Pigou allocated £200 per year of his stipend for instruction in economics, recommending that it cover lectureships for Maynard and Walter Layton in the coming academic year (6/3/1908, CUA/Min. V. 114). Neville Keynes chaired the meeting.

In his letter to Foxwell, Marshall insisted that the deliberations of the electors had been kept 'absolutely secret' (31/5/1908, Marshall 1996b, 190–1). This secrecy has led historians of economics to speculate on how each elector voted (Coase 1972; Coats 1972; Jones 1978; Groenewegen 1995, 622–7). Although there is some disagreement, they all take the view that the vote was split. Foxwell had his own assessment, based on an account he claimed to have received from Nicholson, who visited him the day after the election, pacing 'up and down my garden for two hours abusing Marshall' (Foxwell to Collet, 8/6/1908, quoted in Coats 1972, 494). On this account, Courtney, Edgeworth, Sorley, and Stanton voted against him, and Nicholson, Palgrave, and Keynes for him. Balfour was absent and did not vote. Foxwell believed that he would have received Balfour's vote. In that case, it would have been necessary for the vice-chancellor to break the tie, which Foxwell thought would have decided the election in his favour. A University document prepared by the vice-chancellor settles a controversy of some 100 years. It reports that the electors unanimously agreed on Pigou's election (30/5/1908, CUA/O.XIV. 54). There is no doubt that some of the electors – Keynes and Nicholson among them – found Marshall's tactics distasteful. The unanimous vote, however, shows that they were able to divorce their personal irritation from a decision on the qualifications of the candidates. In fact, Marshall had powerful reasons for preferring Pigou over Foxwell, which he had conveyed to Keynes directly and to Nicholson and Palgrave through Edgeworth. His arguments were presumably discussed during the electors' deliberations.[4]

After Marshall announced his retirement, the Board expressed its gratitude 'for his services as Chairman of this board and for the generosity with which he has for so many years supported the School of Economics destined to be long identified with his great name' (20/5/1908, CUA/ Min. V. 114, quoted in Groenewegen 1995, 619). The 'School of Economics' to which the Board referred can be understood in two senses. Institutionally, it designated the independent Economics Tripos introduced in 1903, a system of academic socialization employing specialized texts, personal supervision of students, lecturers, and honours examination papers designed to produce professional economists. Theoretically, it referred to the economics developed and promoted by Marshall, the elements of which were published in his *Principles*. As professor of political economy, his chief objective was to create a school in both senses. He had struggled for more than 25 years to establish economics as an independent discipline at Cambridge, separate from the Historical and Moral Sciences Triposes.[5]

Marshall had argued for a formal curriculum at Cambridge in which students would be trained to master the challenges of economic science. In addition to meeting the needs of students in economics and ensuring the competitiveness of Cambridge, which was confronted by independent economics programmes at other universities, an autonomous tripos would produce graduates who could serve the British Empire in government, Parliament, the civil service, business, and industrial and labour relations (Groenewegen 1988, 643–4). The curriculum that Marshall envisioned would form Cambridge students into economists by instilling 'sound, analytical skills', acute powers of 'perception and observation', and 'scientific imagination' (quoted in Groenewegen 1988, 642; see also Marshall to Neville Keynes, 13/12/1908, Marshall 1996b, 214–15).

In 1908, the Economics Tripos had been in place only five years. The curriculum had been cobbled together in compromises made prior to 1903, and as students began to take the honours examinations – a total of 28 students had sat for Parts I and II – its defects were becoming clear. No serious attempts at curriculum revision had been made, and the financial resources for teaching in the Tripos were not on a sound footing. A year before the election, the Board explained its predicament to the General Board of Studies and the Sites Syndicate, which were surveying space requirements of University departments. It was obvious to the Board that it would ultimately need several lecture rooms as well as space for a library. For the present, however, funding for lecturers was the paramount requirement: the 'Department receives scarcely any support from the university or the colleges beyond the salary of the Professor of Political Economy. As a consequence an inadequate provision is made for the teaching especially in relation to Part II'. The Board stressed that 'any money that the university can spare for their department, at the present time, should be devoted to strengthening their teaching staff rather than to building' (8/5/1907, CUA/Min. V. 114). Thus at the time of the election, the finances of the Tripos were fragile, and its curricula, regulations, and procedures were not yet institutionally embedded. If the electors chose a candidate who proved unable or unwilling to invest considerable time, intellectual energy, and money in the nascent Tripos, it could easily unravel. If they selected a professor inadequately trained in Marshall's techniques of analysis or unsympathetic to his conception of economics, he could deploy all the necessary resources but take Cambridge economics in a non-Marshallian direction. From this standpoint, Marshall's efforts in lobbying the electors can be understood as an attempt to achieve several objectives. He wanted to secure his legacy. He hoped to improve the competitiveness of the University and the quality of its graduates. And he was intent on strengthening the scientific basis of British social and economic policy.

Following Pigou's election, Henry Higgs, a friend and former student of Foxwell, began to raise funds for a second Cambridge professorship in economics that would be offered to him. On 13 December 1908, Marshall wrote Neville Keynes that if Higgs succeeded, he would be compelled to support John Clapham over Foxwell for the new chair. Although Marshall was prepared to stretch his 'academic conscience' in the interests of an old friendship, he found that his conscience had a 'stiff neck' (Marshall 1996b, 215). In writing Keynes, he spelled out some of his expectations for a Cambridge professor of economics. Scientific distinction was paramount. In order to meet the standards of the 'Cambridge tradition', the professor should demonstrate unquestionable intellectual aptitude and possess a scholarly record of 'a very high order, full of individuality and strength'. Relative youth was also a significant factor. Marshall believed that professors should generally resign at the age of 60. A determination to 'get to the bottom of things' was important: a commitment to economic science as economic analysis – as opposed to an atheoretical account of economic facts – and facility in employing the analytical apparatus he had developed in his *Principles* in order to conceptualize and solve economic problems. Marshall also emphasized a strong sense of judgement exhibited in the capacity to adopt, at least provisionally, a multiplicity of perspectives in order to see the various facets of complex questions. Finally, institutional commitment was imperative. As noted above, the professor should be prepared to follow the course Marshall himself had taken by employing both intellectual and financial capital to ensure that the Economics Tripos would thrive (ibid., 214–15). To what extent did Foxwell meet Marshall's expectations?

Marshall on Foxwell

In a memorial article, Maynard Keynes described Foxwell as a 'precocious child', able to read French at the age of four and discuss current events at seven. In 1870, he placed as a senior moralist in the Moral Sciences Tripos. A Whewell Scholar in 1872, he was elected to a fellowship at St. John's, Marshall's College, in 1874. These achievements suggest that by the time of the election, he possessed the intellectual powers Marshall required. However, Marshall was convinced that he had passed his prime (Marshall to Neville Keynes, 13/12/1908, Marshall 1996b, 215). Moreover, his conception of economics was quite remote from Marshall's. An advocate of the historical school, he found theoretical economics distasteful. This disposition is expressed in his assessment of David Ricardo, who 'gave the whole course of English economics a wrong twist' by conceiving it as 'unhistorical and unrealistic' (quoted in Keynes 1936b, 600). As an examiner of Pigou's successful fellowship thesis, he made his objections to Ricardian economics clear in his critique of the candidate's 'general method of treatment'.[6]

> He goes to an extreme in the use of elaborate *a priori* reasoning, though, as he admits, the imperfection of the available data makes exact and quantitative deduction impossible. He even prefers to rest upon *a priori* argument where exclusive *a posteriori* evidence is admitted to exist (p. 58). Although he has made a wide survey of facts, they seem to interest him mainly as illustration of theory; & the paper is rather a study in conjecture than documented history. He is too much of a Ricardian; too much enamoured of his technical apparatus. (Foxwell to the Provost of King's, 1/2/1902, KCAC/4/11/2/4)[7]

Marshall insisted that Foxwell's strength was purely empirical – factual accuracy was his sole desideratum in economics. However, Marshall required economics to wrestle with challenging analytical problems. In failing to struggle with the difficulties of economic analysis, Foxwell neglected what was 'at once the most arduous, the least attractive and the most essential duty of the lecturer' (Marshall to Foxwell, 12/2/1906, Marshall 1996b, 126). Had the electors chosen Foxwell, economics at Cambridge would have taken a pronounced turn. Even months before the election, he began laying the groundwork for a reconfiguration of Cambridge economics along lines contrary to Marshallian principles. In his post-election letter of 8 June 1908 to Clara Collet, he confessed that 'ever since October I had been preparing for the reorganisation of the school here. I had got Fay [an economic historian not notable for his analytical powers] elected to a fellowship' (quoted in Coats 1972, p. 493).

Foxwell's preoccupation with the trivial ephemera of everyday life was well known to his family and friends. Every fact, it seemed, was significant merely because it existed. His daughter reminisced that 'he would never cut a piece of string on a parcel, he would unravel the knots and notice how they were done and the best way of untying them' (quoted in Keynes 1936b, 598–9 n. 3). As Keynes observed, this strange penchant left little time for the concentration required for scientific and scholarly work. But then Foxwell was not a strong advocate of academic publication. Quite to the contrary, he was 'altogether opposed to the idea that it was the duty of every academic person to be constantly occupied with pen-driving' (Keynes 1936b, 599). This view marked a radical departure from Marshall's expectations. Nor did it seem to conform to the statutory requirements of a Cambridge professor, which included 'research and the advancement of knowledge in his department' (see Groenewegen 1988, 634).

In 1875, Stanley Jevons, a devoted collector of literature on economics, persuaded Foxwell to buy an old book at a London bookstore. Shortly thereafter, Foxwell became an obsessive bibliophile, indulging an apparently insatiable appetite for collecting books and pamphlets on British history and economics published between 1750 and 1848, the year before his birth. In his lifetime, Foxwell amassed some 70,000 volumes, devoting enormous time and energy to book catalogues and acquiring, reading, cataloguing, and arranging his treasure trove. In his enthusiasm, he bought not only individual books but entire libraries without bargaining over price. This habit imposed an insupportable strain on his modest income.[8] In 1897, Marshall urged self-control and the resolution of his financial difficulties. His advice: Foxwell should place the collection in the name of his future wife, reduce his rate of accumulation, and repay his overdrafts by writing economic journalism (Groenewegen 2003, 84 n.12). By 1901, his overdrafts had become unsustainable, and he could no longer afford his magnificent collection. He finally sold it to the Goldsmith's Company, which donated it to the University of London. Remarkably, Foxwell used the proceeds of this sale to begin a second collection (ibid., 80–1). Had he become the

Cambridge professor of political economy in 1908, his stipend would have been £700, of which £200 would have been deducted because he was a fellow of St. John's. With this income, he could not have maintained both his book collection and Marshall's practice of financial support of the Tripos. It was reasonable for Marshall to suppose that Foxwell, compelled to choose, would favour expenditures on books over stipends for lecturers in economics. If financial ruin could not end his bibliomania, a professorship at Cambridge could hardly be expected to achieve the same result.

Although Foxwell was apparently a competent lecturer (B., 1936, p. 839), Marshall had little confidence in his judgement. His views, while boldly stated, were 'apt to turn in opposite direction at six months notice'. Moreover, he seemed unable to 'see more than one side of any complex issue'. Marshall did not hold Foxwell's field, the history of economic thought, in high esteem (Marshall to Neville Keynes, 13/12/1908, Marshall 1996, 214–15). However, the aspect of Foxwell's academic persona that Marshall found most objectionable was his indifference to the education of Cambridge economics students, a fact that emerges clearly from Marshall's correspondence in 1900–1.

When Marshall returned to Cambridge in 1885, he planned to lecture exclusively to students with a solid foundation in economic analysis: those who knew 'how to go to the root of the matter', either because they had studied mathematics or because they had attended Foxwell's lectures. To his dismay, he learned that Foxwell failed to cover the essentials of a general course. Nor did he set papers in his lectures, which meant that his students would be unable to discover their weaknesses and correct them. Maynard Keynes described Foxwell as charming but 'most unreasonable' and 'exceedingly troublesome to anyone who wanted to smooth over personal difficulties and keep peace' (Keynes 1936b, 603). The latter qualities were fully in evidence when Marshall attempted to persuade him to cover the territory of a general course and set papers. Foxwell demurred. He was too busy compiling his library. He was also too old, lacking the stamina required to train students to the level required by Marshall's lectures. Marshall suggested an alternative: he and Foxwell might alternate teaching two systematic courses, one elementary and the other advanced. Foxwell would not be moved. Thus Marshall's view of his own predicament was most unhappy. He 'had for many years to do *the whole* of the drudgery side of economic teaching', at times reading student papers for days. As a result, he had become 'so sick in body and mind that I could hardly hold myself up'. After two further unsuccessful entreaties for Foxwell's cooperation, he resolved never to ask him again. Instead he hired the Cambridge philosopher J.E. McTaggart, and subsequently Clapham, to correct his papers. Although this arrangement eliminated the burden of evaluating student essays, it was unsatisfactory in other respects, raising 'a wall of division' between Marshall and his students that prevented him from getting 'inside their minds' (Marshall to Foxwell, 14/5/1901, Marshall 1996a, 319–21).

By 1900, Marshall believed that Foxwell was planning to relocate his books and household to London, where his library would be sold. This move would leave the general course unstaffed. To Marshall, the only option was to find an able replacement, which would allow him to concentrate on advanced teaching. F.W. Lawrence, a possible replacement, did not remain in Cambridge. Clapham was unsuitable because of his historical approach to economics. In Pigou, Marshall believed he had found his man. After receiving approval from the Moral Sciences Board in spring 1900, he contracted with Pigou to lecture in 1901–2 for £100, with the proviso that Pigou not 'undertake anything in the intervening year which would interfere with his preparing himself for his work' – at this point, Pigou was writing his second fellowship thesis for King's (ibid.).

In Marshall's account, Foxwell responded to Pigou's appointment with some asperity, calling it a 'direct attack' on his lectures. Because he received fees from the students enrolled in his courses, he understood Pigou's lectureship – which could attract students from his own lectures – as a 'bread and butter question' and was 'bound to fight it out'. Marshall reminded Foxwell that in making the appointment, he had done no more than arrange for Pigou to undertake work that on three occasions he had 'implored' Foxwell to do. In October 1900, he had been surprised to learn that Foxwell had begun to set papers in his lectures. Had he known that Foxwell would decide to remain in Cambridge and set papers, he might have eliminated the general course altogether instead of searching for a substitute lecturer. This solution would have left Pigou free to prepare a course on international trade and government, material outside the purview of Foxwell's lectures (ibid., 320).

Marshall saw Pigou as an 'under-study' who could fill vacancies created by exiting faculty, including Foxwell, who was considering a move to London or Birmingham. 'When you have been speaking of going to London, or Birmingham, you have seemed to me to be, quite naturally, wrapped up in your own troubles and never to have had a thought for the University that you were to leave desolate. I don't blame you in the least; but to me, the absence of any under-study in so big a subject seems to have the gravity of a national calamity' (ibid., 321). In a letter to Neville Keynes, Marshall was more unbuttoned in expressing his frustrations. 'Time does not diminish my feeling of soreness'. For 15 years, Foxwell had refused to help Marshall raise the standards of training in economics. On hearing the news of Pigou's appointment, 'he instantly cuts in before Pigou & duplicates in anticipation' part of the course Pigou was preparing after the Moral Sciences Board had approved it. In view of Foxwell's opportunistic behaviour, Marshall concluded that he and Pigou 'care for the men, & I think I may truly say for the men only. Foxwell does not seem to be able to understand this sort of aim, & hunts for some other' (22/5/1901, Marshall 1996a, 323–4)

Marshall on Pigou

On 11 December 1899, Neville Keynes recorded in his diary that he and his wife had dined with the Marshalls, where they met Pigou (JNK/Add.7849 1899). The first evidence documenting Marshall's recognition of his pupil's intellectual powers is from February 1900, when he wrote a testimonial on Pigou's behalf to R.D. Roberts, secretary of the Syndicate for Local Lecturers: 'Mr. Pigou shows in some reports exceptional genius' (23/2/1900, CUA/BEMS/55/24).[9] At that point, Marshall had not read any of Pigou's papers. If he had attended Marshall's general course in Michaelmas 1899, his papers would have been marked by Clapham. It is likely that he attended Marshall's advanced lectures on foreign trade, taxation, and the economic functions of government in Lent 1900. Between 23 February and 3 March, little more than one week, Marshall became convinced of Pigou's gifts. After reading several of his papers, he asked Pigou to teach his general course the following academic year. He discussed this arrangement with the Moral Sciences Board and wrote the following encomium to the Provost of King's, identifying Pigou as the analytical economist who could rescue him from the travails of the general course from which Foxwell was unwilling to relieve him.

> In answer to your letter, I have great pleasure in saying that I have a very high opinion of the ability and character of A.C. Pigou.[10] He seems to me to combine in a rare degree a patient and careful study of facts with vigorous constructive thought as to their mutual relations. He has a hearty, but well-balanced zeal for humanity. And this, combined with eagerness and power in attacking hard problems, gives promise of exceptional energy and success in that realistic but thoughtful examination of the past and present, by which alone we can get good guidance for the future in great matters. In economics the work of youth is so different in character from that of the mature

> age, that one cannot securely predict the future: but my hopes as to what he will achieve for economics and for social well-being are as high as they well can be. Perhaps it is not improper to add that I have asked him to give my usual "General Course" for me in the coming year. So that I may give more time to advanced instruction. I have informed the Moral Science Board of this arrangement.
>
> With perhaps one exception, I have never wished so strongly to see any student retained in Cambridge, as Pigou (8/3/1901, KCAC/4/11/2/4).

The opposing views on economics taken by Marshall and Foxwell are clearly exposed in the reports they wrote on Pigou's successful fellowship dissertation. Foxwell found the thesis defective in numerous respects. As noted above, he regarded Pigou's analytical framework unacceptably Ricardian. The dissertation was an intellectual exercise, not a 'substantial piece of Economic history'. Pigou reached no general conclusion, and he seemed to write without any definite objective in mind. Moreover, the thesis lacked 'dramatic unity', leaving the reader with 'a certain impression of sketchiness'. Foxwell's sense of Pigou's approach to evidence and detailed empirical argument – asserting too many 'disputable and disputed' propositions on the same page – reinforced this impression. However, he could not gainsay Pigou's intellectual powers.

> The style is a model of what a scientific style should be. It is direct, clear, terse, & strong; leaves the reader a sense of power in reserve. I have not met with any writing of the sort in which so much is conveyed, & so much more suggested in so few words, & with such perfect precision. The author says that he makes no claim to originality, & there is nothing in the paper that strikes me as strictly original. But it shows an ingenuity in the search for possible causes, & an alertness to the avoidance of plausible but unfounded conclusions, that seems to me quite exceptional, & to amount to a kind of genius.

Foxwell concluded that Pigou's work was 'fully up to Fellowship standard'. His powers of analysis could not be questioned, and if he strengthened the empirical tendencies Foxwell saw in the thesis, he anticipated that shortly Pigou would produce outstanding results (Foxwell to Provost of King's, 1/2/1902, KCAC/4/11/2/4).

Marshall wrote a glittering endorsement of the dissertation, celebrating aspects of Pigou's work that Foxwell had found objectionable and generally passing over the 'realistic' or empirical strengths of the thesis that had impressed Foxwell. The dissertation was 'of exceptional excellence', giving Marshall 'a strong confirmation of the hope which I had formed before I saw this thesis, that Pigou will be one of the leading economists of the world in his generation'. Pigou explored a challenging set of issues differing widely in detail but, as he showed, governed by the same causal principles. Although he demonstrated striking originality in discovering and analysing these principles, the genuinely distinctive feature of the dissertation lay in how he applied them 'in unravelling the intricately interwoven effects of the numerous causes affecting the values of agricultural products'. As a result, he had discovered the economic complexity of phenomena that, on superficial consideration, appear to be simple. 'I know of only two or three cases in which a difficult task of this kind has been performed thoroughly by an economic student at the beginning of his career in England: and I do not know of many cases in other countries' (Marshall to Provost of King's, Marshall 1996a, 341–2).

Contemplating Pigou on 27 July 1910, The Cambridge flâneur Arthur Benson observed that he was 'incredibly young for a professor' (AB/Vol. 113). Foxwell believed that Pigou's youth was an affront to the professorship and obviously disqualified him. Marshall, on the other hand, regarded it as a decided advantage, a view he seems to have held for two reasons. He expected original work of high quality from Cambridge professors and believed that there was a close connection between relative youth and scientific creativity and productivity. When he resigned his chair, he wrote the vice-chancellor that, although he still enjoyed 'vigorous economy of my strength', he could see that his powers of concentration were dwindling as the years passed: 'the number of hours in each year, during which my mind is of any considerable use, steadily diminishes' (4/10/1907, CUA/O.XIV.54). Perhaps equally important to Marshall was a successor with a full career ahead of him that would be devoted to the consolidation and revision of the new Tripos.

Between 1903 and 1908, the young lecturer published extensively. His first book in economics was *The Riddle of the Tariff* (1903e). Although its theme was a controversial set of reforms, Edgeworth praised its theoretical sophistication in unqualified terms. Pigou's deployment of the 'organon of economic theory' in analysing the complexities of the tariff question was of 'the highest promise'.

> One who had observed the early work of Clerk Maxwell remarked: "it is impossible for that man to go wrong in physics." For "physics"

> substitute what Jevons called the "mechanics" of industry and trade, and the dictum might be applied without extravagance to the author of the analysis that we have mentioned. (Edgeworth 1904, 67)

Marshall recommended Pigou's next book, a substantially revised text of his Adam Smith Prize essay, to his own publisher, Macmillan. In his estimation, Pigou was 'the ablest economist of his age (about 27) in England, & perhaps anywhere. I have no doubt that he will be amongst the leading economists of the coming generation; and I should like him to be connected from the first with the chief Publishers of economic books' (16/11/1904, Marshall 1996b, 96–7).[11] Macmillan accepted the essay, publishing it under a slightly revised title: *Principles and Methods of Industrial Peace* (Pigou 1905a). In his review, Price criticized what he regarded as an excessive dependence on mathematical and theoretical analysis, making the book inaccessible to businessmen and other non-economists. However, he had no reservations about Pigou's analytical prowess: 'Of the possession in full measure of this rare quality no careful reader of his present book can entertain a doubt' (Price 1905, 383).

When Edgeworth entrusted Pigou with the review of the fifth edition of Marshall's *Principles* for the *Economic Journal*, Pigou understood that, as a disciple of Marshall, readers might be sceptical of his impartiality. Mixing metaphors somewhat, he made a case for his selection.

> One thing a pupil of Prof. Marshall may be able to do which could not be done so easily by anyone occupying a more detached position. In a work at once covering so wide a range of detail, and delving so deeply into principles – more particularly when that work consists of "foundations" only, upon which the superstructure has still to be reared – it is easy to misconceive the central idea and to miss the organic unity of the whole. From this kind of misinterpretation, and the consequent misapplication of his doctrines, one who has been taught by Prof. Marshall himself as well as by his writings *ought* at least to be free. (Pigou 1907f, 532)

Pigou's articles, notes, and reviews of the period 1902–8 demonstrate his mastery of Marshall's conceptual and analytical apparatus (see, for example, Pigou, 1902a, c, 1903f, 1904c, e, 1905b, 1906a, 1907d, 1908b). He had a subtle grasp of the unity of Marshall's thought as well as the strength and limitations of its foundations. Perhaps most important, he had the scientific imagination required to construct a superstructure on these foundations. His sophistication in economic analysis and his commitment to advancing the research programme of the *Principles* are especially clear in two areas of his work from the years1902–8: his articles on consumers' surplus and his intervention in the national controversy over tariff reform.

In 'Some Remarks on Utility' (Pigou 1903f), Pigou demonstrated the limitations of Marshall's concept of consumers' surplus. In a partial-equilibrium framework, the market demand curve for a specific product can be obtained by summing up individual demand curves. On a ceteris paribus assumption, it can also be used to assess changes in consumers' surplus for the product. Pigou argued that if utilities are interdependent, it would be implausible to assume that all other variables remain constant, a position that suggested the analytical weakness of a partial-equilibrium model. Consider products such as diamond rings and top hats. As more consumers own diamond rings, the marginal utility of a diamond ring for any given consumer decreases. This is because a consumer's demand for a diamond ring depends in part on his preference for what is scarce and exclusive. Consumer demand for top hats also depends on how many top hats other people own, but in a quite different way. In this case, the consumer wants to exhibit his social status and conform to the fashions of his class. The higher the number of people who own top hats in a consumer's reference group, the greater his desire to own one (Pigou 1903f, 60–2). Unless we assume the insignificance of status and bandwagon effects – as christened decades later by Harvey Leibenstein (1950) – we cannot, Pigou claimed, 'obtain a curve for the whole market by compounding those of the individuals in it' (Pigou 1903f, 64). Without this assumption, therefore, consumers' surplus is not a valid aggregate measure of consumer well-being. Pigou believed that his argument entailed that it was impossible to arrive at a 'legitimate representation of total consumers' rent afforded by any commodity'. In 1903, however, consumer statistics were available only for small fluctuations in price. In these cases it was uncontroversial to assume that interdependent utilities were negligible. Because many of the issues investigated by economists concerned price changes of only small magnitude, he concluded that Marshall's engine of discovery, although limited in the scope of its application, could often prove useful (ibid., 66).

On 19 March 1903, Marshall wrote Pigou that he had read his article, accepted its main point, and agreed that he should have introduced qualifications along the lines Pigou suggested. In his defence, he claimed that he had always assumed that the demand price of a group serves as an approximate measure of satisfaction only if consumers with different incomes and sensibilities are uniformly distributed throughout the group. It was also necessary to assume that effects of changes in fashion include changes in the capacity of articles of consumption to mark distinctions significant to consumers (Marshall 1996b, 7).

In 'Monopoly and Consumers' Surplus', Pigou held that in the absence of interdependent utilities, consumers' surplus could serve as a powerful method for analysing price policies of monopolies. At the time, the tool favoured for capturing consumers' surplus was price discrimination. Monopolists could charge a different price for each unit of their product – in Pigou's later language, first-degree price discrimination – according to the 'degree of intensity with which it is "effectively demanded".' Or they could employ third-degree price discrimination – again employing his later terminology – by charging different prices to different groups of consumers, assuming that products could not be transferred amongst consumers and over time. Pigou suggested a third method. Monopolies could sell their products only in batches of a minimum size. In this way, the monopolistic price per unit of a product would be set at a higher level than would be profitable if consumers could freely choose the quantities of their purchases (Pigou 1904c, 388). Suppose that consumers are willing to buy X units of a product at price P, and the consumer surplus at P is M. The monopolist could refuse to sell the product in units smaller than Y (Y>X), thereby pushing consumers to operate outside their demand curves. In that case, consumers would pay a higher price for Y–X units than they would otherwise be willing to do. Suppose that the loss of consumers' surplus due to buying Y–X is N. Pigou maintained that it is in principle possible to choose P and Y in a way that would equalize M and N, leaving buyers with no consumers' surplus. He identified four conditions that were individually necessary and together sufficient to achieve this equality: (1) consumers are unable to collude; (2) the good or service in question is imperfectly transferable amongst consumers and over time; (3) the product is perishable; and (4) consumers are differentiated into a small number of homogeneous groups whose members prefer to purchase a larger quantity of a product over foregoing its consumption altogether (ibid., 392). Although all four conditions could be met simultaneously, this possibility was remote. For example, given only a few groups of homogeneous consumers, their members could collude against monopolists relatively easily.

Pigou used the same analysis to specify conditions under which a monopolist could exclude potential competitors from what is today termed a contestable market. The monopolist could set prices lower than potential competitors could afford to charge, ensuring that the consumers' surplus produced by buying from the monopolist would be higher than that created by buying from potential competing firms. The ability to exercise monopolistic power of this sort also depended on four conditions: conditions (1)–(3) above and the further requirement that no potential competitor can supply 'the *whole* needs of *some* consumers'. These conditions may obtain whenever, in Pigou's later language, producers are monopolistically competitive. Consumers may be loyal to larger firms not because of an insufficiency in goods produced by smaller firms, but on other grounds. Although large and small shipping companies may provide the same shipping securities, the larger firm may transport more often. The area served by a large telephone company may cover more customers than that of a smaller company. Finally, a company that leases patented equipment may require customers to lease it in bundles that include other items (ibid., 393–4).

A.W. Bob Coats claimed that Marshall's preference for Pigou as his successor was in large measure a consequence of his disciple's fierce support of free trade in the 1903 tariff reform controversy (Coats 1968, 1972). Foxwell's letter to Collet shortly after the election seems to support this position. On Foxwell's view, Marshall abandoned him in order to take a 'rather savage revenge for a letter I wrote in "The Times" a propos of the ridiculous professorial manifesto' (8/6/1908, quoted in Coats 1972, 494). The professors' manifesto, as it was immediately christened, was a letter to *The Times* signed by 14 academic economists, Marshall among them, attacking the economics of tariff reform. In 1903–6, tariff reformers challenged the Cobdenite doctrine of the Manchester school, deeply ingrained in late-Victorian political rhetoric and economic thought if not always implemented in practice, and maintained that British prosperity required the imposition of protective and retaliatory tariffs on various goods produced in countries outside the British Empire. In Chapter 3, we consider in some detail the significance of Pigou's engagement in the tariff reform controversy to the development and systematization of his conception of economics. A case can be made that Pigou's engagement influenced Marshall's decision. However, it turns less on Pigou's position in the controversy than the quality of his analysis in disentangling the complex of issues that defined the debate and the judgement he demonstrated in examining them. Both conformed to Marshall's stance on how an economist should conduct himself in handling problems of economic policy.

Pigou's book *Protective and Preferential Import Duties* (1906b) met Marshall's requirements for the economic analysis of policy questions. A vociferous opponent of tariff reform, Pigou nevertheless regarded the demarcation between economic and political reasoning a matter of scientific integrity. Moreover, assessment of policies should be made on the basis of probable, not merely possible, results, which included both economic and non-economic variables. On broad economic matters, economists had reached a consensus on 'the *questions* which it is right to ask and the general form appropriate to an inquiry of this kind'. Disagreements persisted in two areas: the answers to these questions, which depended not only on quantitative analysis but also on 'judgement of relative importance', and inquiries into non-economic dimensions of policy, a sphere in which economists had no special competence (ibid., 4). As he developed his position, Pigou considered the full range of arguments both for and against tariff reform, investigating direct and indirect consequences of policies. In exposing fallacies in the judgements of Chamberlain and his supporters, he was cautious in making quantitative judgements and acknowledged the speculative character of such an enterprise. In venturing political judgements, he warned readers that he was entering territory outside his field of expertise. C.F. Bickerdike, who reviewed the book, called it 'one of the most brilliant contributions to the discussion of the Fiscal Question' – high praise from an advocate of tariffs. Bickerdike applauded Pigou's 'singular impartiality and power of clear analysis', the lucidity of his arguments, and his mathematical contributions to theories of taxation. Although he observed that Pigou's attempt to estimate the effects of preferential import duties was inevitability speculative, he judged it 'the best of its kind that has yet been made' (Bickerdike 1907, 102).

Alfred Marshall II?

At his retirement, Marshall could claim two great achievements at Cambridge: publication of his *Principles* and its successive editions, in which he developed a new framework for economics as an analytical, causal science based on moral foundations – a project that promised to be more comprehensive and rigorous than the work of his predecessors; and establishment of the Economics Tripos, based on the theoretical programme of the *Principles*. Both accomplishments were schematic and required elaboration. The *Principles* assembled only the elements and methods of a new orthodoxy. Who would undertake its amplification and applications? The Economics Tripos was new at Cambridge with uncertain prospects, largely due to underfunding. Although Marshall was a giant in the field and Pigou a young man of great promise, there were no other salaried lecturers – thus Marshall's practice of paying stipends for lecturers out of his pocket. There was also no economics library, the core resource of the German seminar system of specialized scientific education that seems to have been Marshall's model in planning the Tripos. Who would take responsibility for overseeing the development of the Tripos into an academically and financially sound component of the University curriculum? Pigou was Marshall's ideal solution to both problems.

Foxwell was an older man with a fully formed career, a reputation to defend, and an investment in an academic agenda that had been in place before Marshall published the *Principles*. As a young fellow of King's, Pigou did not have these professional investments. His academic socialization was grounded in Marshallian economics, which defined the premises and methods of his research. Perhaps it could be said that in Marshall's thinking about a lecturer who would secure his legacy, he had three chief desiderata: theoretical, institutional, and ethical. The theoretical criterion required an economist who would develop the analytical programme of the *Principles*, a man with a superior intellect, a comprehensive perspective and sound scientific judgement, and a determination to 'get to the bottom of things'. The institutional criterion required a young man who could look forward to a career needed to strengthen the Tripos and ensure that it would represent economics education at the most advanced level. The ethical criterion required a man committed to Cambridge and the highest pedagogical standards – a professor with a liberal cast of mind who would give fair consideration to arguments that opposed his own positions. In 1908, Marshall had compelling grounds for his conclusion that Pigou, and only Pigou, met all these imperatives.

Notes

* The source of this title is a playful letter from Pigou to Philip Noel-Baker – an old friend, Kingsman, MP, and junior minister in the Atlee Labour government. Noel-Baker had asked Pigou's advice in finding a 'most competent economic advisor' and speech-writer who would be willing to work without pay. 'A brilliant young man two or three years out of the economics tripos is what I want' (Noel-Baker to Pigou, 19/6/48, NBKR/9/58/1). Pigou first suggested a young fellow Kingsman, the Marxist historian Eric Hobsbawm, who had submitted an unsuccessful fellowship dissertation the previous year. Then the retired Cambridge professor of political economy offered the following droll self-assessment of himself as a candidate for the position: winsome, a friend of the fine arts and music, full of witty conversation, and attractive to women but thus far unclaimed (Pigou to Noel-Baker, 24/6/1948, NBKR/9/58/1).

1. Our account of John Lees and his descendants is based on Butler (1953), Reynolds (1983), and the Ryde Social Heritage Group (n.d.). The discussion of Sir John Lillyman and his family is pieced together from the *Isle of Wight Observer* (1863a, b, c, 1892), the Ryde Social Heritage Group (n.d.), and Stephen and Lee (1901). The material on the Pigou family and Pigou's early education is drawn from Sherwood and Chater (2005), Piggin (n.d.), the Harrow School Archive, and various issues of *The Harrovian* (1895–96), the school newspaper.
2. Browning, a graduate of King's, was one of the most popular Eton housemasters of his day. He was dismissed due to conflicts with the headmaster, one of which was an extreme displeasure with Browning's unrestrained public displays of affection towards favoured pupils, which perhaps transgressed the current limits of schoolmasterly moral prudence. Browning's homosexual proclivities seem to have been an open secret at Cambridge. As his biographer notes, he enjoyed 'a permanent court of admiring students' (Anstruther 1983, 9). For a time, this group included Pigou, whom Browning entertained at his London club, the Athenaeum.
3. Marshall also paid each prize examiner £10. The adjudicators of Pigou's award were Marshall himself and L.L. Price (*CUR,* 16/1/1903).
4. Based on information he received from Foxwell, who had been an elector in 1884 when Marshall was the successful candidate for the professorship, Neville Keynes noted in his diary how electors proceeded: in their deliberations, each elector offered his assessment of each candidate (JNK/Add. 7834 1884). Although procedures may have changed by 1908, the comparative strengths and weaknesses of the candidates would certainly have been considered.
5. On the state of economics education at Cambridge before 1903 and Marshall's long struggle to establish an independent Economics Tripos, see Maloney (1985) and Groenewegen (1988). See also Marshall (1903).
6. The reports on Pigou's fellowship thesis by Foxwell and Marshall are housed in the King's College archives. They are largely reproduced in McLure (2013b).
7. In this book, all italicized expressions in quotations are in the original text.
8. By the late 1880s, Foxwell's annual expenditures on books were often more than twice his income; thus, the necessity of bank overdrafts.
9. The Syndicate, established on 27 February 1873, was chiefly due to the efforts of James Stuart. It offered lectures in various parts of the country, providing higher education to men and women of predominantly working class backgrounds (Welch 1973, 43). Marshall's letter recommended Pigou as a lecturer for the Syndicate.
10. We have no knowledge of the letter to which Marshall refers. In light of the two evaluations of Pigou's fellowship thesis on Robert Browning, the Provost was perhaps seeking a third opinion.
11. Marshall also wrote Macmillan that Pigou had published articles in monthly and quarterly magazines and other journalism as well. Publications for which Pigou wrote during these years include the *Pilot*, the *Edinburgh Review,* and the *Speaker.* Because these periodicals gave the educated middle classes access to the views of politicians, academics, and free-lance intellectuals, they were important media of public debate in late Victorian and Edwardian Britain.

3
Developing A Framework

Intervention in the tariff reform controversy

The Chamberlin–Hewins collaboration

On Friday afternoon, 12 June 1903, William Hewins met Joseph Chamberlain for the first time in the latter's private room in the British House of Commons to discuss the burning fiscal issue of the time: tariff reform. Chamberlain – committed imperialist, anti-Little Englander, and self-anointed leader of the reform movement – was Colonial Secretary in the Conservative cabinet of Balfour. Hewins was the founding director of LSE, a conservative imperialist and critic of free trade, and a member of the international community of historical economists. The tariff reform controversy of 1903–6 was the most contentious British political dispute in the decade before the Great War. It split the Establishment, inflamed the public, created a disastrous rift in the Conservative Party, and ended in a Liberal landslide victory in the general election of 1906, beginning the long Liberal ascendancy that set the foundations of the British welfare state. Although this may seem improbable in the extreme, the genesis of Pigou's research programme for economics, first set out in *Wealth and Welfare*, is linked to the controversy and Chamberlain's collaboration with Hewins.[1]

The debate over British fiscal policy, a mélange of inflammatory economic and political issues, captured attention when Chamberlain delivered a fiery speech on his home ground of Birmingham on 15 May 1903. He argued that protective and preferential tariffs would redound to the benefit of British consumers, taxpayers, farmers, and industries. They would increase the revenue of the Exchequer and achieve commercial consolidation of the British Empire, which was indispensable to its political unification as a United States of Albion. Otherwise, he saw impending doom for the 'British race': collapse of the Empire, the end of Britain as a world power, and its vulnerability to defeat in war (Chamberlain to Hewins, 5/9/1900, Hewins/45/35). In his estimation, unification would increase the political and economic power of the Empire under the aegis of London, neutralizing dangers posed by growing competition from the United States (US) and Germany. An essential first step toward union was commercial alignment through tariff reform: Britain would impose protective and retaliatory tariffs on various agricultural and manufactured goods produced by 'foreign' countries, defined as nations outside the imperial family. Bilateral negotiations within the Empire would decide questions of tariff exemption and imperial preference (15/5/1903, Chamberlain 1914, 125–40).[2]

Chamberlain understood that in order to make a compelling case for his position, it was necessary to convince diverse interest groups – business owners, workers, farmers, and political leaders – that pursuit of free trade was detrimental to the welfare of Britain. He was also sufficiently acute to see that he was not capable of producing the requisite arguments. As he confessed to Hewins, he had read John Stuart Mill and attempted Marshall, but the results were less than successful (recorded in Hewins' diary, 17/1/1904, Hewins/MS/74/178).

Chamberlain and Hewins met some four weeks after Chamberlain's Birmingham speech. The occasion was an invitation to Hewins from *The Times* to write a series of articles on imperial fiscal policy that would enkindle controversy. Publishing under the pseudonym 'An Economist', he worked confidentially and in tandem with Chamberlain. In Hewins' hands, tariff reform became a fiscal policy that would increase British exports and employment, unite the British Empire economically, and preserve the international hegemony of Britain for the indefinite future. All this would be achieved at the middling cost of short-term and moderate increases in food prices produced by a tax on foreign corn (grain). This cost would be cheerfully borne by the British working class, which Hewins celebrated for its phlegmatic patience, equanimity, and loyalty in supporting the greater national good.

The twilight of laissez-faire?

Chamberlain and Hewins confronted the British public and its leaders with an existential choice. The nation was at an historic crossroads with only two options: either free trade or imperialism – the union of the mother country with its dominions. In light of the circumstances under which they worked – Hewins claimed that his articles were first drafts composed under great pressure and generally not read in proof (ibid.) – it is hardly astonishing that tariff reformers did not arrive at a cogent set of arguments. That said, certain observations can be made about their conception of free trade and the conditions under which British national prosperity could be maximized.

In arguing their case, tariff reformers claimed that Little Englanders were motivated by an obsession to minimize consumer prices and maximize the wealth of British citizens. Hewins and Chamberlain had a more capacious objective: to achieve the '*maximum* prosperity possible in the circumstances of the time, both for the Empire as a whole and for its several parts' (21/8/1903, An Economist).[3] They employed four desiderata for British welfare, happiness, or prosperity, terms they used interchangeably: first, unification of the British race across continents, which would enormously increase the political and economic power of the Empire (15/5/1903, Chamberlain 1914, 131); second, political security: the ability of the Empire to defend itself in war (ibid., 137–8; 7/8/1903, An Economist); third, the psychological and physical health of the workforce, without which it would be impossible to maintain national industrial and military efficiency. The third consideration rested on two premises: secure supplies of food in both peace and war (14/8/1903 and 3/7/1903, An Economist) and '[c]ontinuous and remunerative employment' (1/2/1905, Chamberlain 1914, 300), the basis of stable income and consumption; and finally, public education, which would improve knowledge of foreign conditions, production and communication technologies, and management techniques (14/8/1903, An Economist).

Tariff reformers were convinced that a flourishing international trade was indispensable to the prosperity of the United Kingdom (UK) and the Empire. However, competition from the US and Germany had eroded the relative position of British trade. Not wedded to Cobdenite notions of free trade, competitors protected their industries behind tariff walls and reduced British access to world markets (6/10/1903, Chamberlain 1914, 148–9). Many were expanding industrially, cutting the demand for British products. In addition, raw materials that Britain imported were no longer readily or cheaply available, increasing the cost of UK production. Unlike its competitors, the British government had refused to employ financial and institutional instruments to manage its commercial policy intelligently. The result: laissez-faire would soon sink the UK to 'the rank of a fifth-rate Power' (31/7/1903 and 10/7/1903, An Economist).

Tariff reformers also held that laissez-faire had failed British workers. Several factors came into play here. Chamberlain contended that British wages did not rise as rapidly as wages in protectionist countries. This was due to an unreasonably permissive immigration policy and unstable employment caused by unrestricted imports. He darkly warned workers of the consequences of unrestricted immigration: increased crime, disease, and 'hopeless poverty' (28/10/1903 and 15/12/1904, Chamberlain 1914, 219–20, 263). Hewins' forecasts were also unremittingly bleak. Free trade would cause the contraction of 'every branch of our trade and manufactures, a fall in profits, a fall in wages, constant disputes between masters and men', and an expansion of the 'submerged class' – the bottom third of the British populace that was threatened by starvation. If Hewins was correct, his predication of permanently higher food prices would create a 'national disaster' (3/7/1903, An Economist).

Chamberlain repeatedly claimed that laissez-faire had failed to ensure stable employment and income for British workers, without which discussions of high wages or cheap food were pointless. When British manufacturers moved operations to protectionist countries, they reduced British employment (27/10/1903 and 15/12/1904, Chamberlain 1914, 201, 268). In depressions, protectionist countries managed employment by dumping surplus goods into free British markets below production costs (27/10/1903 and 28/10/1903, ibid., 199–200, 222). Free trade also exacerbated the damage produced by business cycles. 'The trade of this country', Chamberlain declared in a speech on 28 October 1903, 'always runs in cycles'. He predicted that in the next depression, 'the evils which I dread and fear will be accentuated in their influence upon the working classes of this country'. How would this happen? Under laissez-faire, many British industries had either curtailed their business or were threatened by collapse. In later economic parlance, the result was significant structural unemployment. Proponents of laissez-faire assumed that displaced factors of production would be reabsorbed by expanding industries. Tariff reformers questioned this assumption. In reality, lucky workers would find employment in low-grade jobs such as sweeping or dock work. The less fortunate would move to casual employment and live on the edge of hunger. The truly wretched would either be forced into workhouses or sink into destitution (28/10/1903, ibid., 221–2, 225).

The protectionist regime

Chamberlain and Hewins believed that national prosperity depended on the growth rate of net exports. Because they were convinced that a rate sufficient to sustain prosperity could no longer be achieved under laissez-faire, they concentrated on the British capacity to extract resources from the colonies and access their markets for manufactured goods. Such an arrangement would require comprehensive management of production and trade, both within the Empire and with foreign countries. Chamberlain maintained that if his protective and preferential tariffs were adopted, the commercial union of the Empire would become 'self-sustaining and self-sufficient, able to maintain itself against the competition of all its rivals' (15/5/1903, ibid., 140). Imperial commerce would be regulated by a systematic and carefully calibrated set of regulations that would discriminate in favour of the dominions and retaliate against foreign nations that adopted protective measures.

Fiscal reform included a set of escalating tariffs on manufactured products that would protect a wide variety of domestic industries, averaging 10 per cent but varying directly with the labour embodied in the product (6/10/1903, ibid., 162). Protection would stabilize employment for common workers and prevent the drain of displaced 'young men of brains and ambition' (7/8/1903, An Economist). A wide range of tariffs would be imposed on agricultural products, including a 'modest' tax on foreign corn, the most controversial of Chamberlain's proposals.[4] A corresponding tax would be imposed on flour, protecting the dying British industry of milling. Foreign meat (excluding bacon), dairy, wine, and fruit would also be taxed. In return, Chamberlain proposed to reduce duties on tea, sugar, cocoa, and coffee. The colonies would receive preference on the taxed items, the extent of which would be determined in bilateral negotiations (6/10/03, Chamberlain 1914, 158–9). Chamberlain argued that the fall in some food taxes would more than offset the increase in others, leaving British consumers better off. Hewins took a different view, admitting that the cost of living could increase somewhat, albeit temporarily. Higher foreign food prices would increase the demand for Canadian corn. Increased production in Canada, which benefited from increasing returns, would lower food costs in short order. In the interim, British workers and manufacturers knew how to contend with the increase in food prices: 'We save a little here and there, take cheaper holidays, do without this or that luxury for a time, and no great harm is done' (26/6/1903 and 3/7/1903, An Economist).

Hewins argued that unlike the Corn Laws of the early nineteenth century, Chamberlain's food taxes would have numerous benefits. British manufacturing was beset by child mortality and disease. Protection of agriculture would support more people in the salubrious British countryside, strengthening industrial and military efficiency. It would increase wealth, improve the fertility of land, and preserve 'all the machinery of administration and management, which also is the creation of centuries of civilized effort'. Hewins proposed an ambitious programme of educational reform for the agricultural sector, better access to scientific literature, and improvements in communication and transportation. He was convinced that his agricultural programme would make Britain 'the home of a flourishing country life, which will maintain unimpaired the vigour of the race' (19/8/1903, ibid.).

Unlike the German Zollverein states, British colonies were non-contiguous entities, scattered across several continents. Tariff reformers did not find this obstacle formidable. Control of sea lanes was the key to British world domination. 'If we retain command of the sea, the British Empire is invulnerable' (17/7/1903, ibid.). Foreign nations depended on heavy subsidies of their shipping industries, pricing the British merchant marine out of international markets. The UK further weakened its position by imposing differential regulations on the size and weight of ships, penalizing its own vessels. Preferential agreements between foreign nations and their colonies substantially reduced demand for British shipping. Several countries had even excluded British ships from their 'coasting trade' – for example, they could not navigate along American or Russian coastlines. However, dogmatic commitment to free trade left the British powerless to navigate (27/10/1903, Chamberlain 1914, 212–17).

As conceived by Chamberlain and Hewins, fiscal reform entailed an unprecedented increase in the scope and responsibilities of the state, massive changes in fiscal policy, and expansion of public finance on a scale that had never been envisioned in peacetime. Would projected revenues from the proposed tariffs cover the costs of fiscal reform? Although they addressed this question, their calculations did not include costs of instituting and enforcing policies. Moreover, they did not consider the possibility that the costs of waging commercial warfare against an indefinite number of foreign nations might outweigh the burden of prosecuting a conventional war – such as the recent Boer War, the expenses of which had imposed unanticipated demands on the Exchequer.

The manifesto

In an effort to oppose tariff reformers, Edgeworth, consulting with Nicholson and C.F. Bastable – Professor of Political Economy at the University of Dublin – drafted a letter to *The Times* in the form of a manifesto on the economics of British fiscal policy. On learning that Chamberlain and the Tariff Reform League had embraced 'the most glaring economic falsities', Marshall also decided to participate but found several points unacceptable. After gaining consent of the other signatories, Edgeworth made the changes on which Marshall insisted, and Cannan completed the letter. As Marshall wrote his colleague

Lujo Brentano, a German economist and professor at Munich, 'now I think that on the whole we may be proud of it' (18/8/1903, Marshall 1996b, 53).

On 15 August 1903, roughly midpoint in Hewins' series of articles, *The Times* published the manifesto signed by 14 academic economists, including a young fellow of King's College, Cambridge: Pigou (Bastable et al. 1903). Although firmly committed to maintaining amicable relations amongst members of the Empire, the signatories were convinced that preferential duties would defeat this purpose, requiring instead an 'immense and permanent sacrifice not only of material but also of higher goods'. Tariff reformers had committed various sins of economic fact and logic. Their claim that higher imports increased unemployment was refuted by evidence. Higher taxes on food would probably reduce real wages by increasing prices. In the long run, only a small share of the burden of duties would be borne by foreign suppliers. It would be impossible to increase production in the colonies and protect agriculture in Britain without punishing British consumers. Moreover, if proceeds of taxes on grain were redistributed as old-age pensions, the British public would not be fully compensated, as tariff reformers confidently predicted. Although consumers would pay higher prices on both foreign and domestic wheat, the state would collect tariffs only on foreign wheat. Finally, the professors intimated that other, more ominous, consequences would follow: 'loss of purity in politics, the unfair advantage given to those who wield the power of jobbery and corruption, unjust distribution of wealth, and the growth of "sinister interests"' (ibid.).

As an attempt to mobilize the public against tariff reform, the manifesto was a miserable failure. A deluge of hostile letters and editorials followed its publication. Price published his letter to Edgeworth, in which he had refused to sign the manifesto. His colleagues had committed a foolish error in condemning tariff reform proposals that had not yet been circulated to the public (Price 1903). Under the pseudonym Tariff Reformer, Leo Amery, a prominent *Times* journalist and opponent of free trade, ridiculed the document and its 'platitudes' as 'perhaps the most egregious production that has ever owned such distinguished parentage' (Tariff Reformer 1903). Sir Vincent Caillard, later chairman of the anti-free trade Tariff Commission, found the professors innocent of knowledge of affairs. In business, practical knowledge was much more important than theory (Caillard 1903). Foxwell thundered that as long as he was a member of the department of economics at University College, London, he and his colleagues would never 'pronounce or appear to pronounce, upon any economic proposal coming from responsible persons until the details of that proposal are before us'. The signatories of the manifesto were either confused or disingenuous. Making illegitimate use of their scientific credentials, they produced pseudo-justifications of their positions on public issues that did not lie within the province of science (Foxwell 1903). An editorial on the manifesto in *The Times* of 18 August was devastating, raising doubts about the professors' authority and competence (*The Times*, 1903).

Summing up the contretemps for Brentano, Marshall observed that the manifesto had been 'furiously attacked by *The Times*, by Foxwell & by one or two other persons' – a remarkable understatement. Although he was satisfied that the main arguments of its critics were 'quite invalid', Marshall was unhappy with the entire affair: 'Chamberlain (who organizes the cleverest appeals to selfish ignorance *all around*) needs to be combated by rough & – to speak frankly – more crude and unscientific arguments & methods than I have either the taste or the faculty for' (29/9/1903, Marshall 1996b, 59–60). Marshall was especially contemptuous of Hewins' pretentious dogmatism and facile conflation of economic and political problems. His arguments were purely sophistical, designed to provide rhetorical support for conclusions that he had arrived at independent of argument. Marshall regarded reasoning of this sort as more appropriate to parliamentary debate and the 'better class of newspapers' than to 'economists of the chair'. As scientists, academic economists had an obligation to consider all pertinent arguments, regardless of whether they supported or countered their favoured positions, a professional standard that Hewins had conspicuously failed to meet (Marshall to Brentano, 17/7/1903, ibid., 36–8).

Marshall's Olympian stance notwithstanding, most correspondents sided with Chamberlain, accusing the 14 economists of abusing their status as academic experts (Coats 1964). Week after week, Hewins, an accomplished and lucid stylist, had pummelled free traders. Compared to his articles, the manifesto had the appearance of a pretentious list of allegations, notable chiefly for their assertive tone, contorted syntax, academic diction, and deficiency in argument and evidence. Five days after its publication, Hewins, using his own name, challenged the signatories to prove that tariff reform proposals were 'inconsistent with sound economics' (Hewins 1903). The following day, employing his pseudonym, he maintained that 'no scientific case for economic Little Englandism has ever been stated' (21/8/1903, An Economist). And on 4 September: 'I am not aware that any great economist, in England or any other country, has ever even tried to make out a case for a general policy of free importation for a country situated as the United Kingdom is at the present time' (4/9/1903, ibid.). Hewins had thrown down the gauntlet. Pigou was quick to pick it up.

Pigou's engagement

Critique

Pigou's efforts to advance the cause of free trade began in July and August 1903 when he published a series of articles for the *Pilot*, a weekly political and literary review, and the *Westminster Gazette*, a Liberal newspaper regarded as essential reading for the London political class.[5] The main arguments of these pieces were reproduced in a small pamphlet (Pigou 1903b) and a short book, *The Riddle of the Tariff* (1903e). In November, Leopold Maxse, a former president of the Cambridge Union and the Conservative editor of the *National Review*, was the target of the 'fiery intensity and bitter sarcasm' on display in a speech by Pigou (5/11/1903, *Cambridge Review*, 55–6). A few weeks later, Pigou, McTaggart, and H.O. Meredith, fellow of King's, announced a series of lectures supporting free trade. They followed lectures delivered by the economic historian William Cunningham, a Chamberlain supporter (26/11/1903, ibid., 98). On 27 January 1904, Pigou spoke again at Cambridge in a small room at the Guildhall 'overflowing' with enthusiasts (25/1/1904 and 4/2/1904, ibid., 131, 163). On 4 December 1905, he lectured under the auspices of the Cambridge University Free Trade Association, of which he was a founding member. Speaking on 'Protection and the Unemployed', he dwelt 'at considerable length on Mr Chamberlain's arguments', giving 'an admirably lucid account of the consequences which Protection, in its several senses, would naturally entail' (7/12/1905, ibid., 140).[6]

Between 1903 and 1906, Pigou fought tariff reformers on their own ground in articles, pamphlets, and lectures. His method was the technique of the aggressive pugilist, engaging adversaries toe-to-toe and attempting to hammer them into submission. He confounded tariff reformers with counterarguments, convicted them of facile and fallacious reasoning, and charged them with ignoring or obscuring crucial facts, deftly employing the logical and rhetorical skills of the Cambridge Union debater he had been as an undergraduate only a few years earlier.

The only protective tariff Pigou was prepared to countenance covered infant industries, and it was of very little practical importance for the mature British economy. Chamberlain's protective tariffs would increase prices, reduce incentives to innovate, and increase inefficiency by reallocating resources from unprotected to sheltered industries (Pigou 1903e, 6, 11, 32; see also Pigou 1904d, 455). Pigou also rejected the analysis of dumping employed by tariff reformers. In some cases, what appeared to be dumping was merely price discrimination (Pigou 1903e, 38–9). He was not impressed by real cases of intermittent dumping, designed to rid trusts of surplus goods; there was no evidence that trusts had a significant impact on 'the normal instability of industry' (ibid., 41; see also Pigou, 1904d, 451; 7/12/1905, *Cambridge Review*, 140). Ashley's 1902 case of German companies dumping steel in the UK, for example, was inconsequential. Steel imports from Germany were a small fraction of total supply. Much of British industry operated on long-term contracts that were unaffected by dumping. Large firms comfortably weathered lean years. Employment data in the iron and steel industries indicated no abnormal fluctuations for 1902, although the number of shifts worked per person had actually increased compared to previous years. Pigou acknowledged that predatory dumping was more pernicious but discounted its relevance. If predators faced international competition, in which case monopoly prices were ruled out, they would not benefit from driving British businesses into bankruptcy. Global trusts were a rarity. Thus the conditions that would call for protective tariffs on this ground were seldom realized (Pigou 1903e, 41–3).

Pigou took a similarly sceptical view of imperial preference, which benefited neither the UK nor its dominions. Preference would require protection of agriculture, an unwise policy since reallocation of resources in its favour would promote an industry suffering from diminishing returns. Increased production could be achieved only at higher costs and prices. The result would reduce the nation's real annual income and redistribute it to the advantage of affluent landowners. Although he considered the possibility that agricultural protection might reduce rural-urban migration and the population of cities, it seemed implausible that urban conditions would improve as a result. Instead of fewer overcrowded towns, he anticipated more small overcrowded towns, contending with higher food prices (ibid., 69–72). He also contested the view that food taxes were necessary to expand corn production in Canada. Expansion had already begun 'under the operation of purely natural causes' (ibid., 75). As a result of increasing population density in New England, New York, and Pennsylvania and the extension of railway service west and north, tens of thousands of Americans had crossed the Canadian border in search of arable land. Pigou reminded his readers that British consumers were heavily dependent on foreign grain – 80 per cent of imported wheat was grown in countries outside the Empire. Increases in wheat production in the UK and Canada would not be sufficient to reduce domestic and international prices. On the contrary, he expected higher food prices. The demand for wheat was inelastic, which meant that a corn tax would punish British consumers (ibid., 80–2).[7]

The imperial conference of 1902 demonstrated some of the most serious weaknesses of tariff reform. Movements in the colonies for self-government made the vision of imperial union an illusion (Pigou 1904a, 267). The dominions were developing their own infant industries, which would require protection from even British goods. Moreover, they had no realistic alternative for public finance except indirect taxation or revenue tariffs. Thus any preference that favoured Britain could be achieved only by increasing tariffs on foreign goods, not reducing taxes on British products. Reprisals from foreign trade partners were a probable consequence of such measures. Germany had already threatened that any large-scale imperial preference awarded to the UK could cost the British their most favoured nation status, entangling it in 'continued tariff discussions, occasional tariff wars, and, in view of the present temper of the nation, in the permanent upkeep of a clumsy and expensive "big revolver"'. Finally, the volume of trade that would be shifted from foreign countries to the UK would be insignificant. Sir Robert Giffen had shown that colonial imports consisted mainly of food and raw material that Britain lacked the capacity to produce (Pigou 1903e, 83–93). As to the argument favouring preference and food security in the event of a European war, Pigou countered that British food imports from the US – which would most likely declare neutrality – would be less vulnerable to enemy attacks than imports from the colonies, which would enter the war on the side of Britain (ibid., 95).

Would imperial preference justify its costs if it strengthened consolidation of the Empire? Pigou's answer was a 'decisive and clear-cut negative' (ibid., 96). Colonial preference would most likely be achieved by increased duties on foreign goods in the UK and the dominions. Both sides would pay more for food and manufactures. 'Each party to the bargain is to inflict a considerable injury upon himself, in order to confer a small benefit upon the other. Both parties taken together are deliberately to cut themselves off from some of the advantages of international trade, and the imperial unit is to become more protective against the rest of the world, without the compensating advantage, obtained in a true Zollverein, of becoming more free-trading within its own borders' (ibid., 97–8). Pigou anticipated inevitable 'irritation and friction', both inter-colonial and between each colony and London (ibid., 99–100). His conclusion: if adopted, imperial preference would damage the UK, the colonies, and the Empire.

The institutional and administrative costs of intervening in markets did not escape Pigou. Several considerations were important. Because of ingrained sentiments in favour of free trade, any change in British fiscal policy would take the form of a complex and imponderable scheme of compromises, with more injurious consequences for commerce than any single policy component. A mix of general protective tariffs and preferential duties, for example, would be more pernicious than either a single policy of general protection or imperial preference.

> [F]or every bargain with a foreign country, and every resort to retaliation, would mean a modification in the amount of the protection which some or all of them received. The result would be an unstable and incalculable situation, bad for enterprise, conducive to crises, and proffering great inducements to dishonest political wire-pulling. (ibid., 105)

The costs of countering dumping by tariffs would also be unacceptably high. In the case of intermittent dumping, it would be necessary to implement a sliding scale: tariffs would increase when products were dumped and decrease when there was no evidence of dumping. The result: 'an extremely elaborate, mobile and inquisitorial tariff system would be required' (ibid., 42). In the unlikely event that the UK became a victim of predatory dumping, the argument for tariff manipulation was fraught with difficulties.

> For we should still have to consider the grave disadvantages which are bound to arise when ordinary human beings endeavour in practice to select the proper cases for intervention, the right time for beginning it, and, above all, the moment at which the temporary duty ought to be removed. Can we seriously suppose that a democratic Government, pressed upon all hands by interested suitors, bewildered by conflicting evidence, nervous of offending political adherents, would prove itself equal to that Herculean task? (ibid., 44)

The question was rhetorical. Even if a protective tariff were introduced as a temporary measure, the obstacles in the path of repeal would be enormous. Businesses that benefited would be reluctant to sacrifice their profits. 'While the theory is that Protection is needed for the weak, in practice it is those who can shout loudest, lobby best, and pull wires most effectively to whom that boon is prolonged' (ibid., 45). It would also be difficult for the state to restrict protection to the industries intended; other producer groups would vie for preferential treatment. And if a protected industry produced inputs for other industries, downstream firms could be expected to demand protection (ibid., 45–6).

Pigou held that in the previous 25 years, the tariff policy of the British government was anchored in two principles: it did not engage in retaliation or concession, regardless of the policies of other countries; and it raised revenue not through protective tariffs, but by taxing products that were not produced domestically. Although he conceded that retaliation might occasionally be necessary, he questioned its wisdom. These principles had generally secured the country most favoured nation status. A foreign tariff imposed on textiles would punish all countries in that industry, not only the UK. When foreign countries had discriminated against British colonies, their actions had been motivated by preference issued by a colony to the home country. The colonies were better advised to abstain from preferential treatment of the UK; the privilege was insignificant and the ensuing disputes expensive. In Pigou's assessment, tariff wars were the most likely outcome of retaliation. Foreign ministers did not possess 'superhuman genius' (ibid., 50–9). As a polity, the UK was in an especially weak negotiating position since the government was subject to parliamentary interference. He concluded that the net gain of retaliatory tariffs would be quite modest, even if negotiations were conducted by 'a Cabinet of Solomons'. They would be non-existent when 'the coefficients of human ignorance and frailty are introduced' (ibid., 61).

Analytical breakthrough

Neither Pigou, who wrote *The Riddle of the Tariff*, nor Edgeworth, who reviewed it (Edgeworth 1904), believed the book made novel theoretical contributions. Its objective was modest: to assess the proposals of tariff reformers for the general public (Pigou 1903e, v). Nonetheless, it sketched the fundamentals of Pigou's later framework for analysing economic policy. Tariff reformers argued that free trade was an obstacle to national prosperity because it failed to maximize British net exports. Pigou countered that this exclusive focus on trade as an index of British well-being – his fundamental unit of analysis – was deeply flawed. Following a natural disaster, both exports and imports could increase, hardly evidence of prosperity. Moreover, as Britain became more prosperous, trade would decline as a proportion of total income because the public would increase its consumption of domestically produced services such as education, sanitation, sports, and holidays. Pigou presented no criteria for assessing the 'advance of national well-being' (Pigou 1903e, 2–5). However, the national income and its size, distribution, and stability were imbedded in his critique of tariff reform. Between 1861 and 1901, British national well-being had improved because real per capita income had increased without damage to the distribution of income or increases in the rate of unemployment (ibid., 6–9).

The Riddle was an exercise in unsparing criticism. However, in his article 'The Known and the Unknown in Mr. Chamberlain's Policy', Pigou (1904b) began to distance himself from the minutiae of the controversy, his stance as a proponent of free trade, and his status as signatory of the manifesto. Instead of persevering in his polemics, he posed a general problem: what was the appropriate method for evaluating Chamberlain's tariff proposals systematically? By way of an answer, he suggested a 'balance-sheet' representing both gains and losses likely to be produced if Chamberlain's programme were implemented. As a first step, it would be useful to specify the several headings – some obvious, others not – under which estimates could be distinguished. This was the method he used in analysing policies for the rest of his life: disposing of red herrings, identifying issues of true significance for the problem at hand, and assessing their costs and benefits. He repeatedly warned that perplexities and uncertainties due to defective statistical methods, inadequate data, and unpredictable contingencies represented significant challenges to cost-benefit calculations (ibid., 36–7, 41–2, 44). It followed that the economist's conclusions were inevitably probabilistic, tentative, and contingent, not definitive. This warning became a leitmotif of his work.

As the tariff reform campaign continued undiminished, Chamberlain and his supporters increasingly emphasized the importance of stable employment for British workers. In his latest book, Ashley (1904) argued that German protectionist policies had improved the condition of workers. Chamberlain claimed that Canada's preferential treatment of British manufacturing had created 32,000 jobs, supporting 160,000 people. This figure did not include secondary employment. 'The shopkeeper benefits if the working man has more to spend. The man who supplies him with clothes or with food or anything else – all are benefited when the working man gets employment' (1/2/1904, Chamberlain 1914, 305). Warming to this theme and ratcheting up his rhetoric in May 1905, he spoke to the organized labour branch of the Tariff Reform

League, claiming that the 'question of employment, believe me, has now become the most important question of our time. It never was so important before. It underlies everything; it underlies the position of the working man as a class; it underlies all trade unionism' (17/5/1905, ibid., 317).

Pigou's article 'Protection and the Working Classes' (1906a), written in part to counter arguments by Ashley and Chamberlain on the putative benefits of tariff reform for workers, is a critical artefact in tracing the genesis of his conception of economic analysis. He found their statistical arguments fallacious and their popular economic analysis spurious. A sound analysis of welfare would employ the Marshallian concept of the national dividend, which Pigou had previously called material wealth. The national dividend represented both the totality of the goods and services a nation produced as well as the aggregate pool of resources available for distribution amongst factors of production. From this 'general principle', Pigou claimed, 'it is easy to deduce the correct method of estimating the effect of Protection upon Labour' (ibid., 12). The correct method required three steps. First, the economist determines the impact of tariff reform on the size of the national dividend. Pigou suggested that there is a prima facie case for the view that any policy that enlarges the size of the national dividend is likely to improve the well-being of all factors of production, including labour. Second, the effect of protection on the distribution of the national dividend is established. An increase in the size of the national dividend does not qualify as improvement if it reduces the labour share of the total product. Third, the change in the 'manner in which Labour receives its share' is assessed. Because the character and morale of the workforce are at stake, it is necessary to determine the consequences of protection for the following variables: the stability of employment; working conditions – the question of whether a higher proportion of workers is engaged in the 'sweated industries'; and hours of work and leisure (ibid., 12–13, 27; see also Pigou 1904d, 451–4).

In late August 1906, Pigou notified his publisher that he was writing *Protective and Preferential Import Duties*. He described it as a 'scientific' work that would consider 'popular arguments' only incidentally (25/8/1908, Macmillan Archive). In this book, he generalized his new method of analysis to assess the impact of tariff reform on the entire British economy, not simply British workers. In addition, he made an explicit distinction between economic and non-economic welfare: 'To determine the goodness or the badness of a legislative proposal we need to balance the whole of its effects. Some of these will probably be economic; others will not. Of the others, the economist, as such, has no peculiar knowledge' (Pigou 1906b, 1–3). The consequences of a policy for economic well-being were assessed by identifying the changes it produced in the size, distribution, and stability of the national dividend (ibid., 36–79).

While on Christmas vacation in December 1907, Pigou drafted his Memorandum for the Royal Commission on the Poor Laws and Relief of Distress (Pigou to Browning, circa Christmas 1907, OB/1/A:Pigou, A.C.). In considering the welfare impact of various modes of administering relief, he stressed the importance of a detailed and comprehensive utilitarian analysis of all policy options – their effects on the well-being of the British public. The Memorandum employed his new framework, which now included the concept of the good. Examining not tariff reform but the welfare implications of the Poor Laws, he distinguished three chief elements on which national well-being depended: people conceived as moral beings; social and other relations and satisfactions that are derived from them; and the satisfactions produced by economic conditions. All three elements could be affected by Poor Law policy. Because the two non-economic components of national well-being could not be quantified, he limited his account to the third. Here, perhaps for the first time, he called it economic welfare, introducing the assumption that policies proven to be superior in delivering economic benefits were likely to be superior in improving welfare generally. An assessment of the impact of Poor Law relief on economic welfare depended on two considerations: the magnitude of the national dividend and its distribution (Pigou 1910a, 981–90).[8]

Denouement

The year 1906 marked a sea change in the development of Pigou's thinking. The critical text was his January essay in the *Edinburgh Review*, 'Protection and the Working Class', in which he abandoned his earlier polemical stance against tariff reformers and his defence of free trade. Instead of adding yet another chapter to the tariff reform controversy, he raised a question that, at the time, qualified as innovative: what mode of economic analysis was required, on theoretical grounds, to address the principal issue in the controversy? In considering this problem, he developed an analytical apparatus, the main desiderata of which were drawn from the armoury of his enemies of 1903. There is, of course, a delicious irony in this historical conjunction. Pigou's reconceptualization of economics as a theory of the conditions under which economic policy could advance economic welfare had its birth in a controversy in which he took the position of a relatively full-throated advocate of laissez-faire.

What resources did he find in the speeches and writings of the tariff reformers? Their arguments were informal, occasionally tacit, and often labile – changing, especially in Chamberlain's speeches, in substance as well as rhetoric. However, in their attacks on laissez-faire, four key premises can be identified without difficulty: (1) Purely material wealth should not be confused with genuine welfare, prosperity, or happiness. The object of economic policy was to achieve the latter for the 'British race'. (2) The welfare of the British people depended on the productivity of the British economy. This is why tariff reformers were troubled by the relative decline they saw in British net exports. Unless this process were reversed, prosperity was impossible. (3) Welfare also depended on an economy that achieved relative prosperity for the working class, protecting workers from pauperism by responsible economic policy. (4) Finally, welfare required economic stability. Sound economic policy reduced fluctuations in the demand for labour, ensuring regular and predictable sources of employment and income.

By 1906, Pigou was no longer a policy advocate. He was committed to achieving conceptual clarity, methodological rigour, consistency, empirical validity, and pragmatic effectiveness in economic analysis. In *Protective and Preferential Import Duties*, he appropriated and recast the four principles of the tariff reformers. The idea of British prosperity was reconceptualized as economic welfare. The three conditions for prosperity, implicit in tariff reform arguments, were made explicit and reconfigured as the fundamental causes of economic welfare – in essence a Pigouvian welfare function: economic welfare varied with the size, distribution, and stability of the national dividend. Thus Pigou abstracted the ideas of the tariff reformers from the controversy, transposing them into an implicit analytical framework. He translated their vocabulary from a politicized language designed to defeat opponents and convince sceptics into a theoretical discourse in which he elucidated the main problem at stake in the controversy and investigated the conditions under which it could become a legitimate object of economic policy. In 1906, he applied his framework to the consequences of tariff reform for the British economy. In his 1907 Memorandum, he used the same framework to explore the economic impact of the Poor Laws. In the following decade, he generalized and systematized these early ideas as a theoretical programme for economics. What path did he take?

From the inaugural lecture to *The Economics of Welfare*

The address

In his professorial inaugural address, Pigou sketched some of the main premises and objectives of his nascent conception of economics. Its logical structure, however, was not exposed, perhaps because he had not yet fully developed it – four years lay between the inaugural address and publication of *Wealth and Welfare,* his first systematic work. Highlighting the continuity he envisioned from the Marshallian era at Cambridge to a new Pigouvian era, he paid homage to his old teacher and promised to advance his legacy at Cambridge. Like Marshall, he saw little value in the study of economics for its own sake. Pure economics did not investigate actual human experience but an ideal world, 'the commercial doings of a community of angels' (Pigou 1908a, 15). Pigou embraced economic realism, the inquiry that Marshall characterized as 'a study of mankind in the ordinary business of life'. This enterprise was not only uninspiring, but inherently uninteresting. Because the springs of action that govern human life are generally 'mean and dismal and ignoble', if economics did no more than to discover facts or theoretical knowledge about the operations of the economy, substantiating no results that could be expected to elevate the human condition, its pursuit would be a crushing waste of time (ibid., 11). Thus economics was a dismal science in a sense more fundamental than Thomas Carlyle supposed. 'By their fruit ye shall know them.' This was the ultimate axiom of Pigouvian economics. Borrowing Francis Bacon's metaphor of experiments of light and experiments of fruit – scientific investigations that produce either theoretically significant conclusions or practically useful results – Pigou maintained that if economics has any value, it must lie in the fruits of the knowledge it bears, its contribution to human well-being (ibid., 11–13). However, he did not conclude that policymaking is the vocation of economists. In the sphere of policymaking, economists are under-labourers, called to the subaltern but indispensable task of producing analyses of policies and their consequences that will prove useful to political leaders – 'not necessarily directly or immediately, but at some time and in some way, to practical results in social improvement' (ibid., 11).

Pigou regarded policy analysis as the fundamental contribution of economic science to human knowledge. It exposes fallacies that often lie at the basis of policy proposals made by opportunistic politicians, ignorant or misguided citizens, and economic charlatans. It specifies the questions that economists should ask and clarifies how causes and effects are linked. Ideally, it leads to quantitative knowledge of the operation of economic causes – the species of knowledge most useful to policymakers. Pigou held that this ideal had not been realized: given the state of economic knowledge in 1908, no economic law could be stated with quantitative precision (ibid., 22, 30).

Wealth and Welfare

Pigou's conception of policy analysis framed the programme for all his work in economics, articulating an informal Pigouvian philosophy of economic science. Four years after the inaugural lecture, the year he turned 35, he published *Wealth and Welfare*, a systematic analysis of the economic conditions for human welfare. With characteristic self-deprecation, he summed up the 491-page volume as a 'page' in the 'book of statesmanship' (Pigou 1912, 488).[9] In analysing organizational forms and structures of economic life, he targeted areas where statesmen could intervene to improve welfare, and weighed costs and benefits of these interventions. Where possible, he developed tentative or hypothetical generalizations based on data collections, academic literature, and official reports drawn from Britain, Europe, the US, Canada, and Australia and written in several languages – all in an attempt to approximate quantitative estimates of general causal relations. Where reliable studies were not at hand, which was most often the case, he followed his intuitions and common sense reasoning, a provisional and unsatisfactory method but a compromise he regarded as indispensable until economists achieved a higher level of statistical sophistication.

Pigou's treatise was reviewed in the major English-language economics journals and by leading thinkers in the field. Edgeworth praised its 'unmistakable mark' of originality and Pigou's virtuosity in mathematical reasoning (Edgeworth 1913b, 62–3). Although Allyn Young had the impression that the book had been composed in undue haste, marred as it was by typographical errors and other slips not to be expected in a work of 'dignity and importance', he marvelled at Pigou's mastery of 'an unusual range of modern economic literature', writing that some of his analyses of labour issues were 'beyond question the best discussion to be found anywhere of the economic principles involved in this new social program' (Young 1913, 685–6). However, even Maynard Keynes' meticulous efforts in vetting the manuscript had apparently not succeeded in tempering its formidable 'severity and abstrusiveness' (Parry 1915, 628).[10] J.M. Clark also found Pigou's exacting method of deductive reasoning 'benumbing' (Clark 1913, 623).[11]

In a 7 November 1915 letter to Macmillan, Pigou suggested that he too was unhappy with the book: 'During the last two years, I have gone through *Wealth and Welfare* and have rewritten it, partly with the objective of making it less difficult to understand and partly with that of including a number of topics not originally discussed in it' (Macmillan Archive). In 1920, he completed this revision, doubled in length by the addition of some 500 pages, and published under a new title: *The Economics of Welfare* (1920c). What assumptions and methods did he favour in building a renovated structure of economic analysis that would provide a solid foundation for intelligent policy?

The Economics of Welfare

Economics and ethics: welfare and the good

In the opening pages of *Wealth and Welfare*, Pigou had made it clear that he understood economics as a moral science in a more exacting sense than that suggested in the Cambridge Moral Sciences Tripos: economics was grounded in ethical premises. 'Welfare' in the Pigouvian sense is equivalent to the ethical concept of 'the good' (Pigou 1912, 3). Following G.E. Moore in *Principia Ethica* (1903), he claimed that although the good can neither be defined nor analysed, its elements can be specified by moral philosophy. Pigou's remarks in *Wealth and Welfare* on the good and the relationship between economics and ethics are arresting but brief in the extreme. They are based on two other texts that explore these matters in more detail: his inaugural address and his essay 'The Problem of the Good', which he included in *The Problem of Theism and Other Essays* (Pigou 1908d), published shortly after his election.[12]

Because economics is a 'hand-maid' of ethics, the study of ethics is indispensable for economists (Pigou 1908a, 14). In his inaugural lecture, Pigou offered an apologia for economics by considering its ultimate rationale. What is the point of studying economics? 'What is its value and what is its meaning?'(ibid., 7) These questions cannot be answered by economic analysis. They lie in the province of moral philosophy and its distinction between intrinsic and instrumental goods. Economic knowledge is either worth pursuing for its own sake or valuable because of its uses in achieving some intrinsic good. Otherwise it is worthless. The conception of economics as a handmaid of ethics and the equivalence between welfare and the good tie economics to ethics. Because practical results are the *raison d'être* of economics – its contribution to the lives of 'the suffering and degraded, who have been worsted in the industrial struggle' – it is not an autonomous science (ibid., 12). Its normative principles, which state what should be done to improve human welfare, are supplied by ethics. Given these principles, economics investigates the factors that make improvements in welfare probable. Thus, Pigou conceived economics as a moral science, not in the sense that it can establish moral positions or that economists are qualified to reach moral conclusions by virtue of their training. His point is epistemological. In order to arrive at scientific conclusions concerning economic welfare, economists require knowledge of human welfare generally – the good – which is the objective of moral philosophy.

Presumably in an effort to simplify his revision of *Wealth and Welfare*, Pigou deleted the introductory discussion of economics and ethics from *The Economics of Welfare*. However, he did not abandon his views on economics as a moral science, the sense in which ethics lies at its foundation, or the metaphor of economics as a handmaid of ethics. In his eulogy on Marshall, delivered at Cambridge on 24 October 1924, he reasserted his views of 1908 and 1912, also attributing them to his master. It was through ethics, Pigou claimed, that Marshall arrived at his professional commitment to economics.

> Because, when you have decided what things, or, if you will, what states of consciousness, are ultimately good, it becomes your duty to try and bring about these things, and, in order to bring them about, you need, above all, ability to trace the interworking of causes and effects in the economic sphere. So economics for him was a handmaid to ethics not an end in itself, but a means to a further end: an instrument by the perfecting of which it might be possible to better the conditions of human life. Things, organisation, technique were incidents: what mattered was the quality of man. (Pigou 1925a, 82)

Pigou's conception of what is intrinsically good – 'good absolutely and in itself', independent of consequences – was spelled out in 'The Problem of the Good' (Pigou 1908d, 80). In considering the proper method of inquiry for reaching conclusions in ethics, he drew on Sidgwick, who had distinguished two methods of ethical reasoning in his essay 'Public Morality'. One method proceeds from basic principles of 'abstract or ideal morality', deducing from them moral rules or conceptions of the good. The other begins with morality as a fact of social life – the views concerning what is right, wrong, good, and bad in the social order in which we are situated. On the basis of this sociology of the ethics of common sense, moral philosophy eliminates vagueness, ambiguity, and apparent contradictions, corrects lapses and omissions, and attempts to reduce morality as a complex social fact to a 'rational and coherent system' (Sidgwick 1889, 52–3).[13]

Following Sidgwick, Pigou distinguished an '*a priori* method of deduction from the nature of things' from 'the method of direct perception' (Pigou 1908d, 81). He regarded the first method futile and based his view of the good on perception: 'the only way to know whether anything is good is by looking at it.' 'Looking' in this context has a largely introspective sense. The Pigouvian moral philosopher turns 'the eye of the soul' on the world and perceives some things to be good and others bad – in quite the same way, he claimed, that we perceive some things to be yellow and others red. When he turned the eye of his soul on the world, the only good things he perceived were 'states of conscious life' (ibid., 82–3). Perception also shows that the goodness of a state of consciousness is a function of several variables. In this sense, Pigou was committed to ethical pluralism. The elements of the good include pleasure, good will or good intentions, love, the character of a person's ideals, a person's attitude toward other persons or things, and the passion or enthusiasm with which ideals are pursued.[14] What was the basis of Pigou's perceptions of the good? It seems that he had none. He called his perceptions 'opinions' for which neither justifications nor refutations are possible. Although they can be compared with moral perceptions that may be at odds with his, they cannot be invalidated by alternatives (ibid., 68–87).

In the preface to *The Problem of Theism and Other Essays*, Pigou claimed that his 'general philosophical standpoint' was derived chiefly from the writings of Sidgwick (ibid., viii). This holds true for 'The Problem of the Good', only within modest limits. Although Pigou's theme and some of his conclusions were Sidgwickian, he departed from Sidgwick's seminal treatise on moral philosophy, *The Methods of Ethics*, on several important points of substance and method. Pigou's view that perception is our source of knowledge of the good seems to correspond to the method that Sidgwick called 'perceptual intuition', in which specific acts or objects are immediately seen as intuitively right or good. Sidgwick regarded this method as unreliable not only on philosophical grounds, but also from the perspective of common sense moral reasoning. In everyday life, we are often unable to see whether specific things are good. When this is the case, we appeal to general rules embedded in conventional moral standards (Sidgwick 1907, 100). Sidgwick did not regard judgements of the good as purely personal or subjective opinions. They are dictates of reason in the sense that grounds for accepting or rejecting them can be given. They are objective in the sense that truth or falsity can be ascribed to them. If my judgements of the good are correct, they are generally valid (ibid., 33–4, 345). They do not state incorrigible facts about me, but claims to universal moral truth that can be substantiated by passing tests of rationality or reasonableness that Sidgwick specified: clarity and precision, ascertainability by careful reflection, logical consistency, and conformity with the judgements of others (ibid., 338–41). As these tests suggest, Sidgwick conceived ethics not as a subjective sphere surveyed by the eye of the soul, but a science that follows the method of the natural sciences of the nineteenth century as he understood it.

Although Sidgwick held that the good is a state of consciousness, it is constituted by what it is reasonable to desire. Pleasure is what is reasonable to desire: the feeling that 'when experienced by intelligent beings, is at least implicitly apprehended as desirable or – in cases of comparison – preferable' (ibid., 127). Contrary to Pigou, Sidgwick did not think that virtues such as the quality of a person's ideals are an element of the good. The same holds for character or its expressions, such as the seriousness with which persons follow their ideals or act on deeply held convictions. Although they may have instrumental value, they are not intrinsically good. He dismissed the Kantian position embraced by Pigou that good will is inherently good (ibid., 392–5). Reflective states of mind, such as Pigou's 1907 idea on attitudes toward beautiful persons or things, were also ruled out (ibid., 398–401). Pigou was, at best, an eclectic utilitarian. Sidgwick's utilitarianism was systematic: 'the only true basis for morality is a utilitarian basis', grounded in 'the happiness or well-being of humanity at large – or rather, of the whole universe of living things' (Sidgwick 1889, 63). Yet he also called himself a 'mere empirical utilitarian' (Sidgwick 1904, 211). There seem to be two senses in which this self-characterization is apropos. Sidgwick attempted to base ethics on common sense morality as clarified, corrected, and systematized by philosophical analysis. However, in the famous dualism of practical reason with which he concluded *The Methods of Ethics*, he despaired of devising a proof that utilitarianism was rationally preferable to moral hedonism – the doctrine that my pleasure is the ultimate good. Therefore, his commitment to utilitarianism remained, in his estimate, empirical – based on his analysis of the facts of moral life and not on an argument that he regarded as logically compelling. Pigou, on the other hand, finessed the problem of the dualism of practical reason by refusing to recognize hedonism as a legitimate moral position.[15]

Economic and total welfare

Although Pigou regarded welfare as an unanalysable state of consciousness, he believed that quantitative comparisons of welfare were possible. Because an investigation of all the variables on which welfare depends is a hopeless undertaking, he limited the scope of his analysis to economic welfare. This restriction had a distinct advantage. Since economic welfare comprises satisfactions and dissatisfactions to which monetary value can be ascribed, measurement of its size, distribution, and variations is possible, albeit not directly. Following Sidgwick, he distinguished desires from their satisfaction. In principle, the intensity of a desire should not be conflated with the intensity of its satisfaction. Money measures the demand or the intensity of desire for a good, not the satisfaction produced by its consumption. This distinction frequently has no practical importance because the intensity of a desire and the intensity of its satisfaction generally coincide. As a general rule, therefore, money can be understood as a measure of both the satisfaction of desires and the desires themselves. This correlation breaks down only when economic actors compare present and future consumption – especially consumption of goods that lie in the remote future. Suppose that a sum of present satisfactions and another sum of future satisfactions are equal and equally certain. Because economic actors have a defective 'telescopic faculty' that disposes them to discount the future, they prefer the present sum (Pigou 1920c, 24–5). As a result, inter-temporal allocations of resources are skewed by a fundamental irrationality that has troubling economic consequences. For example, the level of savings is inevitably inadequate since saving presupposes deferred consumption. For the same reason, investment in forests and tunnels is insufficient, natural resources are wasted through overconsumption, and critical animal species become susceptible to extinction due to overhunting and overfishing.[16]

Pigou contended that there are two reasons why economic welfare cannot qualify as a valid index of total welfare. Non-economic welfare, which cannot be measured by money, is influenced not only by income, but also the conditions under which it is earned. Monotonous labour, hostile work environments, and long hours may impoverish the lives of workers and diminish their total welfare. In addition, non-economic welfare depends on how income is spent. Expenditures on public baths and museums elevate the quality of life. Consumption of liquor debases it (ibid., 14–17). Thus there is no one-to-one correspondence between changes in economic and total welfare. This conclusion notwithstanding, Pigou made the theoretically optimistic assumption that unless there is evidence to the contrary, changes in economic and total welfare probably vary in the same direction, although not in size (ibid., 20).

The national dividend

The national dividend, one of many ideas that Pigou drew from Marshall, is arguably the keystone of the Pigouvian system. Economic causes affect welfare through 'the earning and spending of that objective counterpart of economic welfare which economists call the national dividend or national income' (ibid., 30). The Pigouvian national dividend is the annual flow of goods and services that the economy produces. In his review of the fifth edition of the *Principles*, he claimed that Marshall's work on the concept was perhaps even more important than his treatment of time. '*The conception of the National Dividend is not an academic toy, but a practical instrument of great power designed for service in the concrete solution of social problems*' (Pigou 1907f, 533–4). Marshall's 'unavoidable and regrettable' failure to write the promised second volume of the *Principles* obscured the significance of the national dividend. However, there were intimations of its analytical power in the new chapter of the fifth edition, on 'Progress in Relation to Standards of Life'. Without this concept, Pigou asked rhetorically, how could economists estimate the impact of trade union activity, state relief of poverty, collectivism, or philanthropy? The Pigouvian conception of the national dividend is a protean phenomenon and an idea with many uses. It is an essential instrument in achieving the end of economic welfare but also a composite of ends – better nutrition, health, housing, and social stability. An indispensable tool of economic analysis, it is the basis for investigating a wide range of economic problems (ibid., 534–5). Thus it does not seem excessive to suggest that in placing the national dividend at the foundation of economics, Pigou was undertaking work left unfinished in Marshall's edifice.

Pigou insisted that in so far as possible, measures of the national dividend should include the value of final products of economic activity, covering such social losses as the agricultural demineralization of soil and depletion of natural resources by mining. They should also encompass depreciation of capital, the subtleties of which he explored in investigating the conditions under which capital is maintained intact.[17] But even under ideal conditions, measures of the national dividend are bedevilled by imperfections, especially in failing to include the value of non-monetary transactions. These imperfections produce a host of paradoxes. A farmer's produce qualifies as part of the national dividend if it is sold to customers; consumed by his family, it does not. The wages a man pays his newly hired housekeeper increase the national dividend; if she continues to perform the same work after marrying him, the national dividend decreases. Extraction of gold and silver from mines increases the size of the national dividend, but the concomitant destruction of natural beauty does not decrease it. And when factory regulations divert paid labour of women to unpaid domestic work as wives and mothers, the national dividend declines (Pigou 1920c, 30–4).

Pigou tied variations in economic welfare to shifts in the national dividend by developing a criterion for interpreting changes in its size.[18] Under what conditions can the national dividend of period II be judged higher than that of an earlier period I? If the national dividend were a homogeneous entity, the dividends of I and II could be ranked without ambiguity. Because it is a heterogeneous and variable composite, an unambiguous ranking of the national dividends of I and II is possible only on the assumption that tastes and distribution of income remain unchanged from I to II. Given this assumption, the national dividend of II can be judged higher if economic actors in II are willing to pay more for goods that have been added to the national dividend than they are willing to pay for those that have been subtracted from it. Without this assumption, a paradox may result: the dividend of I could be validly assessed as both higher and lower than that of II. In considering what is likely to occur if the assumption is violated, Pigou found it reasonable to suppose that, as a general rule, a change in the dividend that is regarded as an increase from the standpoint of the tastes and income distribution in I will also be considered an increase from the perspective of the tastes and income distribution in II (Pigou 1932b, 52–4).[19]

The basic principles of economic welfare

In the early pages of *The Economics of Welfare*, Pigou stated three general propositions that he proposed to substantiate. In the literature, they are often called the Pigouvian 'welfare axioms', on the supposition that they are bedrock presuppositions that lie beyond verification rather than basic hypotheses that call for verification. All other conditions remaining the same, economic welfare is likely to increase if (1) the size of the national dividend increases, (2) the dividend is distributed more equally, raising the share allocated to the poor, and (3) fluctuations in the magnitude of aggregate output are reduced (Pigou 1920c, 47–67).[20] Much of the book is devoted to analyses of growth, redistribution, and stabilization of the national dividend and examination of a wide range of policies addressing these objectives.

Before beginning his ambitious inquiry, Pigou disposed of two objections to his analytical programme, both derived from the genetics of his time and defended by advocates of eugenics, an influential contemporary scientific and social trend.[21] Writing in an age when genetic speculation on the causes of human behaviour had become fashionable, Pigou, like many of his academic contemporaries, embraced the premise that some congenital defects are inherited. Although not a member of the Eugenics Society, he joined the Cambridge branch of the National Association for the Care of the Feeble Minded, established in 1896 (Mambro 2003). In 1908, the Royal Commission for the Care and Control of the Feeble Minded published a massive report based on four years of inquiry. The following year, he contributed to a book compiled by a joint committee of the Eugenics Education Society and the National Association, summarizing the results of the report for the general reader (Pigou 1909a).[22] Although the feeble-minded exposed their fellow citizens to many dangers, the most serious social cost of feeble-mindedness was its reproduction: mental illness was passed from one generation to another, permanently degrading the quality of the population. In Pigou's judgement, the benefits of confining the feeble-minded to institutions or isolating them in colonies outweighed the economic and emotional costs of such programmes (ibid., 141–5). In *The Economics of Welfare,* he even entertained the possibility of 'surgical' solutions (Pigou 1920c, 95). In his Galton lecture to the Eugenics Society three years later, however, he took a less draconian position, emphasizing the complexities of managing the birth rate scientifically, and reasons for taking a guarded stance on eugenic explanations and policies for population planning. It was often difficult to distinguish effects of inborn qualities from environmental effects. Breeding experiments, critical in substantiating results on inherited characteristics in animals, were out of the question in controlling human reproduction. The same genetic 'unit character' could carry desirable and undesirable traits, as exemplified by the Russian writer and epileptic Fyodor Dostoevsky. Genetic material could mutate. Finally, two genetically deficient parents could produce a normal child, perhaps even a genius (Pigou 1923b, 82–3).

Pigou rejected the position that the potential benefit of economic policies targeting the size, distribution, and stability of the national dividend were limited to a single generation (Pigou 1920c, 97–8). Environments, like people, have progeny. Although education may have no effect on innate qualities, it exercises a profound influence on the world of ideas. Each generation inherits a stock of knowledge from its predecessor, forming a basis for continuous progress (ibid., 98–9).

Pigou also dismissed the view that economic growth would cause a population to degenerate by providing material incentives to its weaker members for higher birth rates. Although conceding that redistribution of income in favour of the poor could, in theory, increase the reproduction rate of inferior stock, he found this possibility unlikely. Employing Brentano's results on the relationship between the material welfare of social classes and declines in their birth rates, he argued that as the poor become more prosperous, they advance culturally and ethically (see Brentano 1910). Couples devote more forethought to childbearing, and satisfactions of a higher standard of living rival those of parenthood. As parents' prosperity increases, their feelings toward their children become more refined, also encouraging smaller families. The consequence: as the national dividend grows and the economic welfare of the poor improves, they are likely to have fewer children (Pigou 1920c, 61, 106).

The size of the national dividend and the allocation of resources

Pigou rejected the standard mid-Victorian laissez-faire conception of the Smithian system of natural liberty. In his view, an economy of buyers and sellers operating in a free market and attempting to maximize their interests does not invariably achieve an allocation of resources that maximizes economic welfare. Following Sidgwick (1901, Book III), and to a lesser extent Marshall, he identified numerous areas in which private interests do not conform to social interests.[23] When such conflicts arise, the free play of self-interest favours private objectives, resulting in a national dividend and a level of economic welfare that deviate from the ideal.

Marshall had defined marginal net product as the output achieved by employing an incremental unit of a factor of production, allowing for 'any extra expenses that may be indirectly caused by the change, and adding for any incidental savings' (Marshall 1920, 337). Pigou distinguished two types of marginal net product. Marginal social net product – hereafter marginal social product – is the whole net output resulting from an incremental resource investment, regardless of how it is distributed. Marginal private net product – hereafter marginal private product – is the part of net output created by the same investment that is received by the party undertaking it (Pigou 1920c, 114–15, 149).[24] The national dividend is maximized only if the marginal social products of resources are equalized in all their uses. However, pursuit of self-interest in a market economy – assuming perfect divisibility, knowledge, and mobility – equalizes only private products across investments; industrialists are interested only in private returns of their productive activities. If private and social products differ, the national dividend and economic welfare are not maximized. Thus Pigou inferred that 'certain specific acts of interference with normal economic processes may be expected, not to diminish, but to increase the national dividend' (ibid., 149).[25] He qualified this conclusion in several important respects. Production techniques that require lumpy resources or fixed factor proportions may prevent the equalization of returns in all their uses. Reallocation of resources imposes relocation – 'movement' – costs; for example, costs of retraining and relocating workers, psychological burdens of moving a home, and job losses suffered by workers' family members. When economic actors make decisions on imperfect knowledge, measures that promote mobility may prove self-defeating, shifting capital and labour to less productive sectors. Finally, state subsidies designed to increase mobility and information impose costs on taxpayers that can be justified only if the private sector fails to take such initiatives (ibid., 128–9, 449–77).

Marginal private and social products of an incremental resource investment diverge when a portion of the marginal product either benefits or damages parties who do not invest in that resource. The character of the divergence depends on the type of market structure.

Misallocation of resources under simple competition

Pigou defined simple competition as a market structure in which two conditions are satisfied: each producer sells only a small portion of aggregate output; and the interest of each producer is best served by accepting the market price as given (ibid., 190, 218). In such a market, he argued, there are three chief classes of divergence between marginal social and private products.

The first class of divergence occurs when investors and owners of durable instruments of production are not the same. The extent of divergence depends on technological conditions of industry, customary practices, and relative wealth of contracting parties. Pigou's principal example is the economic relationship between owners and tenants of land. In some cases, the marginal social product exceeds the marginal private product because tenants do not capture all the benefits of their investments before leases expire. In others, the marginal private product is higher than the marginal social product as tenants exhaust the land under cultivation to the extent that productivity is significantly reduced for lengthy periods after lease expiration. From the perspective of economic welfare, these arrangements are obviously unsatisfactory. According to Pigou, such divergences can be reduced by altering the terms of contracts. Lessors and lessees can specify conditions of durable instruments at the expiration of the lease or devise compensation schemes for uncaptured costs and benefits. Under certain conditions, legal protection of the rights of contracting parties may also be advisable (ibid., 150–9).

Although Pigou did not coin the terms 'public goods' and 'externalities', he discussed them as constituents of a second class of divergence. They arise because it is exceedingly difficult, sometimes even impossible, to exact payment from parties who capture incidental benefits or extract compensation on behalf of those burdened by incidental costs. Marginal private products of investments in lighthouses, parks, roads, forests, street lamps, pollution prevention, and scientific research fall below their social products. Marginal private products of harmful externalities, on the other hand, exceed their social products. Pigou considered an extensive range of cases: rabbits that damage a neighbour's land, factories located in crowded residential areas, automobiles that wear down the surface of roads, crimes induced by the sale of alcoholic drinks, wars waged to protect foreign investments, and factory work of pregnant women. It was clear to him that, unlike the first class of divergence, this class cannot be mitigated by voluntary revisions in terms of contracts. His reasons varied with the circumstances governing each case. In some instances, for example, voluntary contractual arrangements are impossible due to an excessive number of participants (ibid., 159–71).

Since the problems posed by this class of divergence cannot be resolved by contractual revisions, Pigou considered state intervention as an alternative. It is possible, although not always advisable, for the state to try to equalize private and social products by 'extraordinary encouragements' – most obviously subsidies – and 'extraordinary restraints' – most obviously taxes (ibid., 168). He also considered other measures: urban planning and zoning laws, slum clearance, worker retraining, paid maternity leaves, patents, and liability for health-care costs imposed on companies when it can be shown that high disease rates are a consequence of their operations (ibid., 160–3, 168–71).

The third class of divergence occurs when a marginal resource investment by a producer affects other producers in the industry. In increasing returns industries – where 'certain external economies are common to all the suppliers jointly' (ibid., 192) – increased investment in resources by one firm enhances the productivity of all other producers. In diminishing returns industries, increased investment in resources by one firm creates external diseconomies for all other producers by changing 'the proportionate combination of different factors' (ibid., 936). Output in diminishing returns industries exceeds the social ideal. A tax on such industries, or a system of taxes if firms are sufficiently diverse, might equalize social and private products and promote economic welfare by reducing output. In increasing returns industries, output falls below the social ideal. It is possible to design subsidies that could increase output if the taxes that fund them do not reduce the size of the national dividend (ibid., 189–94).

Misallocation of resources under monopoly power

Under simple competition, the free rein of self-interest tends to equalize the marginal private products of resources across productive activities. In general, monopolistic market structures – which include simple and discriminating monopoly, duopoly, monopolistic competition, and bilateral monopoly – fail to produce this result. As a result, such structures are not likely to maximize economic welfare (ibid., 218).

Before analysing different types of monopolistic structure, Pigou enumerated conditions that favour the formation of monopoly power. Some industries create customized products that vary in quality. Individual establishments, although not large in absolute size, may each produce a large share of the output of their own small markets. In other industries – railway transportation, water, gas, electricity, or tramway services – the number of firms is small because of substantial fixed costs. If an industry includes many firms, each is plagued by excess capacity. In addition, public authorities are reluctant to invoke eminent domain rights beyond absolute necessity. In some industries, it may be economically efficient – though not necessary – for one firm to control several plants, each of which specializes in a particular product or process. In others, larger firms may have a financial advantage in research and development. They may also have the ability to access a wider range of markets, diversifying the risk of fluctuating demand (ibid., 219–23). Non-structural factors may also contribute to monopolization of industries. Amalgamation is easier if demand has low price elasticity or firms are interested in reducing marketing expenditures. Firms are more likely to combine if mergers are not traditionally exceptional or speculators place a premium on stocks of large firms. And all other considerations remaining constant, cartels are more likely in industries where products are homogeneous, the number of firms is small, and the distance between sites of production is insignificant. However, Pigou noted that monopolization does not necessarily occur when 'the gain from unification exceeds the cost and trouble involved'. The reason: mutual jealousy may induce firms to 'leave the melon of common gain uncut' (ibid., 228–30).

Monopolistic competition – a term Pigou used long before Edward Chamberlin (Pigou 1912, 192) – exists when two or more sellers produce significant proportions of aggregate industry output. Monopolistic markets are dominated by one firm that sets the market price – or prices if it exercises discrimination of first, second, or third degree – regardless of whether other sellers in the market accept this price. Welfare implications of monopoly power depend on whether an industry exhibits increasing, constant, or diminishing returns. They also vary according to barriers to entry, interdependence amongst firms, and pricing behaviour – simple, discriminating, or predatory (1920c, 232–55). Pigouvian prudence dictated that remedies, if any, be decided case by case. He developed detailed analyses of public utilities and railways, where monopolies may be inevitable, and offered a lengthy discussion of two policy options: public regulation and public operation. Here too, the welfare implications are nebulous. A decision on policy requires a thorough study of the industry in question and the governmental body that would assume public regulation or management (ibid., 257–82; 293–359).

Exercise of monopoly power may cause social and private products to diverge for reasons immaterial to the level of output. Instead of attempting to achieve managerial efficiency, firms may engage in wasteful advertising, exploit their workers, or deceive their customers. Trusts may crush small and medium-size enterprises, preventing capable working class entrepreneurs from acquiring apprenticeship relationships and managerial skills that lead to higher levels of responsibility. Standardization of production, which has the immediate effect of increasing productivity, may impede innovation, thereby reducing the productivity of future generations. Scientific management may compromise productivity by failing to take advantage of the diverse abilities and skills available in the work force. The rationalization of management also poses a more serious risk: if opportunities for the exercise of independent thinking and initiative disappear, the capacity for initiative may be lost, resulting in a work force incapable of innovation (ibid., 171–88).

Pigou suggested that voluntary arrangements such as consensual agreements amongst firms and involuntary measures such as taxes or prohibitions can restrict or eliminate competitive advertising. The same holds for state action on exploitation and deception (ibid., 175–6). Aside from vague observations on the role of the state and philanthropic organizations in encouraging formation of small businesses and fugitive remarks on the importance of limiting detrimental consequences of scientific management, he did not assess policy solutions to problems posed by trusts or Taylorism (ibid., 181–2, 188).

The redistribution of income

In a cost-benefit analysis of food taxes proposed by tariff reformers, Pigou included the indirect but significant loss in satisfaction to British citizens (Pigou 1904b, 36–7). He claimed that if income required to meet basic necessities were exempted, every 1 per cent addition to people's income would produce comparable increases in their satisfaction, irrespective of discrepancies in economic status. This claim entailed that the satisfaction produced by an addition of £1 of income would be worth more to the poor than to the rich: as incomes increase, the same level of incremental satisfaction can be achieved only by spending larger amounts of absolute income.[26]

As a basis of his argument, Pigou mentioned quantitative estimates made by the eighteenth-century polymath Daniel Bernoulli in a note that was finally translated into English in 1954 (Bernoulli 1954).[27] In Pigou's reading of Bernoulli, satisfaction derived from income did not begin until people had spent a minimum amount of their annual income on basic needs, which he assumed to be £30 for British citizens. Using Giffen's calculations, he also assumed that the annual income of the average British citizen was £44. Lacking adequate data, he conjectured that the income of the average landlord was £100, a figure that he believed was too low. These estimations and suppositions implied that the income left for satisfaction – in Pigou's parlance, 'surplus income' – was £14 for the average consumer and £70 for the average landlord. If £1 were subtracted from the average consumer's income to cover Chamberlain's food taxes, his surplus income would fall by 7.14 per cent. If £1 were added to the income of the average landlord – the true beneficiary of tariffs on food – he would receive 1.43 per cent gain in income. The loss of satisfaction for the average consumer, therefore, was almost five times as great as the gain in satisfaction of the average landlord. Pigou concluded that if Chamberlain's tariffs were imposed, British citizens would experience a substantial net loss in aggregate satisfaction (ibid., 47–8).

In *Protective and Preferential Import Duties*, Pigou introduced an early sketch of his three welfare propositions and assessed Chamberlain's policies in light of their consequences for the distribution of income. He did not mention Bernoulli, nor did he provide quantitative estimates of probable changes in satisfactions of landlords and general consumers.[28] Instead, he considered the benefits gained or lost by 'rich men' and the 'labouring population'. For example, a policy that increased the income of the rich by £1 million would not make the British people more prosperous if it reduced the income of workers by as much as £500,000 (Pigou 1906b, 38). In *The Economics of Welfare*, he simplified and generalized this position.

In the Pigouvian world, the 'law of diminishing utility' entails two main propositions, both of which assume ceteris paribus conditions.[29] First, an increase in the magnitude of the national dividend is likely to elevate economic welfare less than proportionately; increased consumption reduces the satisfaction of incremental units. Second, 'it is evident that any transference of income from a relatively rich man to a relatively poor man of similar temperament, since it enables more intense wants to be satisfied at the expense of less intense wants, must increase the aggregate sum of satisfaction' (Pigou 1920c, 48, 52). Why was the second proposition evident to Pigou? He based this claim on three considerations.

(1) Widespread poverty is endemic to modernity. (2) Even if the rich save much of their incomes, they still outspend the poor by multiple factors. Assuming similar temperaments, it follows from diminishing marginal utility that additional consumption expenditures by the rich result in less economic welfare than additional consumption expenditures by the poor. Pigou also emphasized that affluent groups concentrate their extra income on 'less intense wants' such as luxuries. (3) The satisfaction of an ordinary person depends on both absolute and relative income. Absolute income is far more important to the poor than to the rich, who value the prestige of their relative social status. Satisfaction linked to prestige will remain intact as long as redistributive measures maintain the relative positions of the wealthy in the income structure (ibid., 48, 53). Conclusion: redistributions that increase the income share of the poor are likely to increase economic welfare.

What consequences would follow if the mentalities of the rich and the poor differ? Pigou considered the objection that if the rich are capable of achieving higher levels of satisfaction from a given income than the poor, then the possibility of improving economic welfare by redistributing income from the rich to the poor would be 'seriously doubtful'. He conceded that 'at any given moment the tastes and temperament of persons who have long been poor are more or less adjusted to their environment'. Thus the poor might waste unexpected increases in their income by drinking or gambling. However, he considered it more likely that higher incomes, especially if sustained for more than one generation, would elevate tastes and temperaments (ibid., 53–4). On this view, there is no reason to suppose that people's preferences are fully formed at birth. Infant demands are just as likely to exist as infant industries. 'People may be given a taste for a particular thing, or the keenness of their desire for it may be permanently increased, through the temporary use of, or acquaintance with, it.' If increased incomes and expenditures of the poor were properly channelled – if, for example, libraries, theatres, and opera houses became easily accessible to the poor – they could be expected to abandon gambling and drinking for high culture. At least some of their newly formed tastes and capacities would be irreversible (ibid., 50–1).

Pigou anticipated the argument that increased economic welfare due to formation of new tastes and capacities might have a limit. A progressive rise in incomes results in ever increasing consumption of luxuries. If people are conceived as vessels, with a limited capacity for economic satisfaction, they will eventually reach that limit. Beyond that point, 'further new satisfactions can only be admitted at the cost of driving out an equivalent volume of other satisfactions'. Pigou saw the merit of this argument for populations that advanced from affluence to greater wealth. However, it was irrelevant to the relatively poor economies of his time (ibid., 51–2).

Pigou considered his position on income redistribution to be inconsistent with Vilfredo Pareto's inductively based law covering the circumstances under which poverty can be alleviated. On Pigou's reading, this law comprised two sets of claims: Pareto's analysis of Western European data, purportedly showing that patterns of income distribution had remained essentially constant across time and geography; and the inference Pareto drew from this analysis – that the lot of the poor could be improved only through economic growth. He found Pareto's law wanting on several counts. Pareto's own data exhibited some variation in patterns of income distribution. Moreover, A.L. Bowley had demonstrated that in the important case of Prussia, income distribution had become more equal over a long period. Inherited property as a source of income was also important. If European inheritance laws were rewritten, if socio-economic institutions changed substantially – if, for example, private property were abolished – then, as Pareto himself acknowledged, changes in patterns of distribution would follow. The same result could be achieved by much less radical measures that altered the balance between earned income and income from property. If more people owned property, their access to higher levels of education would improve, giving them more opportunities to enter the economically privileged professional classes (ibid., 693–700).[30]

Pigou held that income can be redistributed in favour of the poor – a term he understood as roughly synonymous with the class of manual wage earners (Pigou 1912, 79) – in two ways: indirectly through increasing wages by extra-market interventions such as state regulation and public opinion; and directly by transferring income to the poor from the rich – by which he meant owners of capital.

Indirect methods of redistribution

The Pigouvian 'natural' wage is determined by workers and employers – regardless of whether they are organized – but independent of public opinion or the state (Pigou 1920c, 488). He saw no reason in principle why the natural wage would qualify as fair and distinguished two types of unfair wages. Under the first type, although workers in occupation A receive a wage equal to the value of the marginal product of their labour, it is less than what they could earn in other industries. Under the second, workers in occupation A receive a wage less than the value of the marginal product of their labour. He regarded the second type of unfairness as exploitative (ibid., 506–7). What are the consequences of an increase in wages for unemployment, the national dividend, and economic welfare? A general answer to this question is not possible. The impact of wage increases varies with the existence and type of unfairness.

Given unfairness of the first type, the effects of increasing the wage rate in occupation A depend on the method of labour engagement. Pigou argued that if firms retain certain workers based on a preference list because they are regarded as irreplaceable, the mathematical expectation of earnings for those who are laid off is zero. Because they know that their release is permanent, terminated workers will be compelled to move into spheres of the economy where they believe productivity is higher and jobs are accessible. Based on the same mathematical expectation, a wage increase will also fail to attract other workers to A. Thus it will improve the distribution of labour and increase the national dividend. Suppose, on the other hand, that labour is engaged by employing the casual method, based on the assumption that workers are perfectly substitutable. If the elasticity of the demand for labour is less than one, a wage increase in A will reduce the size of the national dividend. Why is this the case? Pigou held that a wage increase raises the mathematical expectation of earnings for laid-off workers – the percentage increase in the wage is higher than the percentage reduction in employment – as well as workers in other industries. Laid-off workers will not move, and some workers with jobs elsewhere will relocate to A. As a result, unemployment will increase and the national dividend will fall. If the elasticity of demand for labour exceeds one, a prima facie case can be made for increases in employment and the national dividend. In practice, however, results depend on the extent to which workers prefer part-time employment in A over emigration to other occupations where they can expect full-time employment (ibid., 510–11).

The second type of unfairness, exploitation, occurs when workers are uninformed, immobile, unorganized, poor, or geographically dispersed. Under these circumstances, unscrupulous employers have a considerable strategic advantage over workers. They are better financed, better trained, more adept at bargaining, and better situated to withstand adverse conditions. A wage increase would conclusively increase the size of the national dividend. With the possibility of exploiting labour excluded, firms could increase profits by innovating. Monopolistic firms – the term 'monopsony' had not yet been coined – unable to survive the wage increase would be replaced by more efficient businesses (ibid., 511–19).

Although there are conditions under which wage increases may elevate short-term unemployment, Pigou argued that such increases could achieve long-term benefits by improving the capacities, skills, and efficiency of workers. Common sense suggested to him that such benefits will be more pronounced for workers who are exploited and very poor – women and children especially – trapped in a vicious cycle of exploitation, low capacity, and inferior bargaining power. He also believed that a long-term net gain in the dividend produced by higher worker capacity could, in theory, be achieved by improvements in the lives of workers who are not exploited. However, he was reluctant to ascribe empirical significance to this possibility without adequate data; effects of higher wages on both the short-term and long-term demand for labour can be reliably determined only by thorough empirical investigation (ibid., 547–51).

Pigou did not support proposals to increase wages by passing a minimum wage law. Because workers confront diverse circumstances and have different needs, a mandatory minimum wage would fail to provide most workers with a 'living income'. Moreover, there is a risk that a minimum wage might increase unemployment rates for the elderly, the unskilled, and women. He saw more merit in a proposal made by Beatrice and Sidney Webb: a 'national minimum' that would secure for all families, 'an adequate minimum standard in every department of life', including employment, education, housing, health, and childcare. On this view, the state is obligated to compel all citizens to live according to certain standards of decency as determined by public policy experts. A national minimum standard of life complemented by flexible wages would provide a better economic outcome than a minimum wage law – less poverty and more efficient labour markets (ibid., 558).

Direct methods of redistribution

Pigou maintained that certain redistribution schemes that improved the economic welfare of the poor would also improve economic welfare generally if they did not reduce the size of the national dividend. Under this heading, he considered direct income transfers from the rich to the poor. The rich would pay income or inheritance taxes, and the poor would receive a variety of amenities ranging from direct cash transfers, maternity leave, and old-age pensions to public parks. However, both the expectation and the delivery of transfers can alter the size of the national dividend. If the interests of capital and labour conflict, it is impossible to arrive at reliable generalizations about the net consequences of redistributive measures for economic welfare (ibid., 743).

The expectation of income transfers is likely to change the dividend of any given year in two ways: by influencing both the amount of work performed during that year and the funds invested in previous years to cover the needs of the year in question. The rich may work less, capital may leave the country, savings may fall, and the poor may become 'idle and thriftless'. Although all these contingencies were possible, Pigou believed that they could easily be exaggerated. The danger of capital flight was not serious since money sent abroad would be taxed, at least in Pigou's time, by both foreign and home governments. The rich are motivated by relative, as well as absolute, levels of income. If the wealth of the rich is reduced by an income tax increase, their loss will be much smaller than the benefits the poor achieve by the same measure. Pigou had little confidence in the common belief that inheritance taxes encourage saving. Most people envision a level of savings that will provide a secure future for their families. Once that target is reached, the rich continue to engage in business as a game-like enterprise, motivated by 'a love of action and a love of power'. Capital becomes a chip in the game. As long as the capitalist continues to play and succeeds in accumulating chips, he cannot be expected to give up the game merely because he believes that eventually the state, and not his heirs, will collect most of the chips (ibid., 624–44, 589–99).

Pigou rejected the argument that the poor become lazy and prodigal when they expect to benefit from a redistribution of income. Decisions by the poor depend on how transfer schemes structure incentives.

Payments that discourage idleness and thriftlessness tie productivity to relief: the more productive workers are, the more relief they receive. Neutral transfers are configured by the state in such a way that workers have no control over whether they meet their terms. Pigou's examples include sanitation improvements, public education, and medical care for children, public parks, and vacations in the countryside for boys. Transfers that encourage idleness increase as workers fall further below a defined poverty line. Voluntary leave pay discourages work. Thus the state may reasonably expect transfer recipients to work for the relief they receive. Refusal to do so could justify punitive measures, including detention (ibid., 752–68).

The actual delivery of transfers can produce its own effects by reducing the share of the national dividend that can be used to accumulate capital. However, Pigou conceived redistributive transfers as investments in the labour force. They would increase the national dividend if their return at least equalled the return on investment in capital, which he regarded as roughly equivalent to the interest rate. Returns on investment in labour could be high if monetary transfers targeted specific objectives such as training for low-wage workers with uncommon abilities, medical care and food for workers at risk of becoming permanently ill, or nutrition and education for 'normal' children of the poor. State oversight could ensure that the poor made the proper high-return investments in the requisite areas (ibid., 773–86).

Industrial Fluctuations

In Pigou's analytical framework, the productive potential of the economy trends upward due to improvements in resources, technology, and the organizational skills of managers. The extent to which this potential is realized – the national dividend that is actually produced – moves in a wave-like fashion around this trend. According to Pigou's third principle, reducing variations in the national dividend and controlling their principal consequence, changes in employment, can increase economic welfare (ibid., 799–801). In a depression (Pigou's term for what is now called a recession) labour demand drops, leading to reduced hours of work or increased layoffs, both of which are involuntary from the standpoint of workers and conditions of the time (Pigou 1913h, 14). Unemployment reduces the income and consumption of the poor with damaging consequences. Unlike the rich, they lack the foresight and resources, such as access to credit, to smooth consumption over time. Unemployment also reduces productivity – sometimes temporarily, in other cases permanently (Pigou 1920c, 68). In his early writings, Pigou detailed the injurious effects of unemployment: from losses in income, skills, self-respect, self-confidence, and regular habits of work to a 'haunting sense of insecurity and danger' (Pigou 1913h, 32–4). Vacillation between work and indolence may gradually weaken physical capacities and corrupt morals. Because effects of depressions may be irreversible in booms, the unemployed may become unemployable (Pigou 1912, 404–5).

Causes

Pigou identified three causes of periodic movements in the national dividend. Although agricultural yields are wave-like, improvements in irrigation technology and innovations in buffer stocks and futures markets reduce their severity. The effects of variations in harvests on farm incomes depend on the price elasticity of demand for agricultural products. Lacking reliable data, Pigou accepted Dennis Robertson's conjecture of elasticity slightly higher than one. As a result, farmers earn higher incomes during good harvests, increasing their demand for products of other sectors, aggregate output, and employment. Following the same reasoning, crop failures reduce agricultural incomes, demand of the agricultural sector for other products, total output, and employment. Although the data at Pigou's disposal were shaky, he regarded variations in harvests as an autonomous cause of changes in the national dividend. Operating independent of other casual factors, they produced a periodic or rhythmic pattern of industrial fluctuations (Pigou 1920c, 817–26).

Although not wave-like, inventions set forces in motion that create changes in the national dividend. When an invention is introduced, output of producer goods increases as different sectors adopt the new technology. Not seeing that this increase could precipitate a Schumpeterian process of creative destruction, Pigou believed that aggregate output would increase as a result. This phase would diminish over a period that varies from industry to industry. In a second phase of 'comparative quiescence', total output would stabilize as new equipment exhausts its life cycle. In a third phase, the demand for producer goods and total output would increase as businesses replace depreciated equipment. Therefore, rhythmic industrial fluctuations caused by the introduction of inventions have the shape of a staircase (ibid., 827–30).

The most consequential cause of periodic fluctuations in economic activity is the psychology of business, which vacillates between errors of optimism and pessimism. Pigou identified several grounds for these errors. (1) Production is not an instantaneous process but invariably 'prospective', above all in the producer goods sector. Prospectiveness together with a lack of perfect foresight create misjudgements of optimism or pessimism. Errors are particularly significant in modern markets, where specialization and exchange link industries. Businesses base their predictions on the prospects of other industries, about which they have little information. In periods of expansion, the sanguine entrepreneurial mentality magnifies misjudgements (ibid., 831–4). (2) Firms do not fully understand that by taking advantage of increases in current profit, they inevitably reduce their future profit rate. When demand for products increases, so do profits. Although new equipment may be ordered to meet demand, it will not be on line immediately, so profits will remain high. As a result, industrialists continue to invest in machinery without restraint. The mistake lies in business forecasts of future profits, which are erroneously based on current facts. The fallacy is to assume that the future will reproduce the present. The longer the interval between the point at which demand increases and the point at which new equipment becomes operational, the larger the error of optimism. (3) Firms operate independently of one another. A firm ordering new equipment is unaware of similar orders placed by other firms. Errors are magnified because actors ignore the aggregate effects of individual firm expansion (ibid., 834–6). (4) Entrepreneurs engage in 'forward buying' – employing contracts to order inputs from other firms. Because the terms of such contracts cannot be fully specified, a firm's decisions on sales of its products are based on guesswork concerning its costs. If execution of contracts were synchronous or if firms acted in collusion, optimism would not be excessive. In reality, neither condition holds. Firms ignore the fact that when contracts are executed, factor prices will change. Since future increases in production costs are discounted, errors of optimism increase (ibid., 837). (5) A series of creditor-debtor relationships links producers of raw materials, final goods and services, and wholesalers and retailers. As a result, the effects of advantages or disadvantages experienced by any actor in this series are likely to be experienced by others. In a prolonged boom, the size and duration of loans increase. Some collaterals increase in value, commanding a more substantial advance. In transactions without collateral, the importance ascribed to risk assessment diminishes. The result: a coupling of production, business psychology, and finance exacerbates errors of optimism as they spread from one sector to another (ibid., 840–1).

How does this dynamic end without destroying the economy? When new equipment ordered to meet demand is delivered and new and larger output reaches markets, it becomes evident that too many products are in search of too few markets. Exaggerated expectations of profits also come to light. Although it would be rational to curb economic activity at this point, reason does not prevail. On the contrary, businesses in difficulty are tempted to borrow even more, making 'a desperate throw to restore their fortunes'. Eventually, however, they are compelled to acknowledge errors, sell products at lower prices, and absorb losses (ibid., p. 841). Coupling transmits the misfortunes that befall some economic actors to others. As some firms begin to reduce prices, others follow. The general liquidation of bad business expands rapidly and weakens business confidence. As the optimistic mood evaporates, the 'dying error of optimism gives birth to an error of pessimism'. Inventories accumulate, and a period of inactivity ensues as every industry expects reduced demand for its products by other industries. This pessimistic temperament also eventually exhausts itself. As inventories are depleted, shortages of important commodities appear and increase profits. Because industrialists are generally unwilling to buy, labour and raw material are cheap. Given adequate security, capital can be obtained at low rates, and 'new pioneers' increase production. Observing their success, other businesses follow their lead. The new economic growth renews optimism, which encourages excessive confidence. In this manner, the cycle is reproduced (ibid., 843–4).

In a stationary state, or in non-stationary state conditions in which economic actors have perfect foresight, monetary factors do not affect periodicity. Because the real world is not static and actors do not foresee events accurately, monetary factors exaggerate errors in business sentiment. As a general rule, businesses hold a certain balance of funds in the banking system. Its size depends on the importance ascribed to liquidity. A large balance is convenient and provides security against sudden calls. However, large balances entail costs. Interest is lost when resources are not put to productive uses. The state of expectations determines how entrepreneurs view the costs and benefits of liquidity. When confidence in the economy rises, the preference for liquidity falls and entrepreneurs use their funds to expand production. As fear of bad debts and sudden loan calls abates, they reduce their balances, withdrawing funds from banks and increasing 'effective demand' by purchasing goods and services (ibid., 851).

When confidence is strong, interest rates rise and banks are willing to extend the duration of loans, increasing the ratio of their liabilities to reserves (ibid.). Higher levels of credit followed by an increase in the quantity of money raise prices. The Pigouvian world exhibits two sets of information deficits. No one – entrepreneurs, workers, or 'sleeping capitalists', whose savings are deposited in the banking system – has perfect information. However, because entrepreneurs are better informed than workers or savers, there are information asymmetries. In times of prosperity, entrepreneurs realize that they benefit from windfalls at the expense of workers and savers, who fail to make allowances for price movements in contracts. As a result, economic activity expands even more, contributing to higher levels of optimism (ibid., 855). When confidence is shattered, economic activity contracts, and firms reduce their indebtedness. Entrepreneurs increasingly prefer bank balances as protection from calamities, which seem more probable. Banks call in loans. Reductions in credit levels and the quantity of money lower prices. Cognizant that real wages and interest rates have increased at their expense, entrepreneurs become more pessimistic and restrict production even further.

Financial crises

As the above account indicates, Pigou did not neglect the phenomenon of financial crises. The magnitude of errors of pessimism is affected by the number and scale of legal bankruptcies, which he called 'detonation': the noisier the blast, the more excessive the pessimistic mood of entrepreneurs. However, bankruptcies or business failures have no intrinsic importance. More savvy entrepreneurs buy failed businesses or take them into receivership. Every destruction of capital is due to earlier decisions taken by incompetent entrepreneurs. Business failures are significant only because they inevitably lead industrialists to fear that their debtors may also fail. Detonation is especially deafening in the 'highly developed credit arrangements of the modern world', where businesses rely on loans that may not be renewed. Circumstances are more difficult for firms that depend on extremely risky short-term loans instead of long-term capital and bond markets. In times of distress, ill-advised creditors may increase lending to troubled businesses, raising their indebtedness and hastening their eventual collapse (ibid., 865–6).

To what extent is it reasonable to expect that threats of bankruptcies will actually materialize? The answer to this question depends on the capacity and willingness of the banking system to rescue firms that are solvent but face a short-term credit crunch. The depth of a crisis, therefore, depends on whether bank loans can be quickly secured to meet short-term liabilities (ibid., 867). Under what conditions are banks willing to make such loans? On the one hand, they are pressed to call in loans for self-protection; in crises, the ratio of bank liabilities to cash reserves increases as a result of excessive exposure to industries that invest in illiquid assets. On the other hand, public interest requires that banks lend freely. How can these apparently conflicting requirements be reconciled? Pigou believed that if the banking system is not tightly coupled, narrow private interests will prevail. However, if banks are closely interconnected, bankers will see that their own interests can be protected only if they act in the public interest: 'a selfish policy is dangerous to the banks that practice it, as well as highly injurious to the community as a whole. If loans are withheld and sound houses fall, their fall will drag down others. Panic will grow wilder and wilder and will eventually lead to distrust of the banks themselves.' Depositors will demand currency, and the system, including solvent banks, will collapse (ibid., 868).

Stabilization policies

The primary responsibility for long-term stabilization of the national dividend lies with the state and charitable organizations. In Pigou's view, private industry lacks incentives to address this responsibility. Three sets of policies can reduce the variability of the national dividend, diminish layoffs, and protect the unemployed. The first is preventative. Since price movements can amplify errors of optimism and pessimism, he favoured the type of monetary policy advocated by Irving Fisher (1911): monetary authorities increase the quantity of money during depressions – preventing prices from falling dramatically – and reduce it during booms – halting excessive increases in prices (Pigou 1920c, 859–61).

The other two policies – unemployment insurance and aggregate demand management – are palliative. Pigou recognized that all unemployment insurance schemes entail problems of moral hazard. In order to become eligible for benefits, workers can simulate unemployment by pretending to be involuntarily unemployed even though their idleness is voluntary; or they can 'create' unemployment by quitting their jobs. These problems are easily overcome. Benefits can be set at a fraction of income earned from employment, deferred until a reasonable period has elapsed following job loss, and terminated after a reasonable period. Other problems are not so easily redressed. Certain occupations such as the engineering trade and certain categories of workers such as the aged are uncommonly susceptible to unemployment. There are limits within which insurance premia can be adjusted to the actuarial value of different risks; if premia become too high, many workers will be driven out of the insurance market. In addition, the poor suffer most acutely from the defective telescopic faculty that Pigou ascribed to human beings generally. They discount the importance of a stable long-term consumption pattern, wasting potential savings in good times (ibid., 894–900).

Because the 'ordinary poor man' fails to insure himself in conformity with his economic interests, it is, as Pigou put it, 'open to the State to increase economic welfare by applying some spur to him in this direction' (ibid., 902). In this regard, the state has two options: voluntary or compulsory unemployment insurance. Voluntary insurance schemes can be subsidized in a variety of ways. To make premium calculation more accurate, the state can provide statistical data and actuarial tables to insurance companies or associations. To prevent fraud and insolvency, it can operate an insurance company. To encourage purchase of insurance, it can offer small subsidies such as exempting premium payments from income taxes. A much more expensive subsidy could be introduced by adopting a programme employed experimentally in Europe at the time and pioneered in Ghent: workers were insured by labour unions, with the state providing liberal funding (ibid., 902–3).

In Pigou's view, even a subsidized voluntary scheme will direct sizeable resources toward persuading workers to purchase insurance. This is because only workers with a high risk of unemployment are likely to find the cost of insurance acceptable. A compulsory system avoids this adverse selection problem by including workers with various risk profiles. And unlike voluntary schemes, it has the advantage of insuring the poor, who need it most. If a compulsory system is funded through premia, it will be necessary to set rates that closely approximate actuarial values of the risk of unemployment. Otherwise workers who believe they are overcharged will resent the system, rendering it unsustainable. Given the limits within which premia can range, a system of uniform rates might be more effective: certain categories of workers, such as the young, would pay rates higher than the actuarial value of their annual risk. A compulsory system could also be funded through general taxes, in which case, workers might consider themselves insured without cost. However, such an arrangement entails the important disadvantage that workers engaged in more dangerous, unhealthy, or irregular employment would qualify for benefits more frequently than others. That might encourage a detrimental reallocation of workers into these jobs, diminishing the value of the marginal net product below the national average and reducing the size of the national dividend. Because of differential occupational risks, Pigou suggested that gratis insurance might be limited to the minimum risk common to all occupations (ibid., 905–10). Although he offered no details, presumably higher-risk workers would be responsible for funding premia above that minimum.

The second palliative remedy for stabilizing the national dividend and reducing unemployment – the countercyclical management of demand for labour – rests on a simple premise: in depressions, private charities – and more importantly the state – could increase their expenditures by providing jobs for the unemployed, and in booms they could reduce their outlays. Employment could be offered based on common-sense, utilitarian calculations. It would be quite costly to engage the unemployed to produce perishable or fashionable goods; the former decay quickly, and the latter lose value as tastes change (ibid., 878). However, employment in areas of 'actual and substantial utility' – ships, ammunitions, elementary schools, universities, training, forests, office furniture, or even publications – incurs relatively small costs (ibid., 886–7).

In light of the foregoing considerations, it is unsurprising that Pigou rejected the argument later called the Treasury View: the position that aggregate demand for labour cannot be increased because the volume of resources that can be allocated to labour at any given time – the wage fund of John Stuart Mill's political economy – is fixed. Precisely because the wage fund is not fixed, increases in demand for labour in one part of the economy do not reduce demand in other sectors. Entrepreneurs can draw on inventories – 'storage' in Pigou's terminology – as well as goods set aside for their own consumption. Moreover, the state can easily introduce deficit financing, borrowing resources from the private sector in depressions and returning them with interest in booms (ibid., 879–80).

Presuppositions

Pigou's inquiry into the national dividend and the conditions under which economic policies can be expected to improve economic welfare rests on several institutional presuppositions. Two of paramount importance merit consideration here.

The institutional structure of labour markets

Joseph A. Schumpeter claimed that Pigou's work – as embodied in *Principles and Methods of Industrial Peace*, *Wealth and Welfare*, and *The Economics of Welfare* – represented the 'greatest venture in labour economics ever undertaken by a man who was primarily a theorist' (Schumpeter 1954, 948). Employing the theories of Marshall and Edgeworth, Pigou based his analyses of labour on a thorough study of the research published on international labour markets as well as his experience on the Board of

Trade during World War I (1916–17). As a member of the Board, together with Ashley, Clapham, Beveridge, and Cannan, he investigated the prospects of post-war employment in British industries (Pigou 1905a, vii; Ashley Papers, 166–291).

Pigou regarded the 'machinery of industrial peace' – the formal organization of labour relations – as a critical component of the institutional structure of labour markets. Designed to reduce the frequency and intensity of 'industrial wars', it governs operations of labour markets and includes employer associations, unions, and voluntary and state bodies for conciliation, mediation and arbitration. Strikes and lockouts reduce output in the industries directly affected. Spillovers damage other industries, limiting or cutting off sources of raw material and equipment. The same considerations hold for the demand for products, as unemployed workers reduce their consumption of goods and services. Losses to the unemployed may be significant and enduring: 'industrial careers interrupted, a load of debt contracted to meet a temporary emergency, and permanent damage to their children's health through the enforced period of insufficient nourishment' (Pigou 1920c, 363–5). Building and maintaining an effective machinery of industrial peace, therefore, can be expected to increase economic welfare.

The most important components of the Pigouvian machinery are organizations representing workers and employers (Pigou 1905a, 17). He saw both trade unions and employer associations as products of the industrial revolution. The emergence of a distinct and class-conscious working class, 'divorced from ownership of the means of production' and with an 'infinitesimal chance' of upward mobility (ibid., 6–7), was indispensable to the development of the powerful labour movement that gave rise to unions. To counterbalance their power, employers formed their own associations (ibid., 13).

As a means of achieving and sustaining industrial peace, Pigou suggested standing conciliation boards. Composed of worker and employer representatives, they would meet regularly to consider working conditions, methods of compensation, technical education, industrial research, and settlement of disputes between labour and capital, as well as improvement of their own processes. Ad hoc appointment of negotiators in the heat of conflict could cause delays. Standing boards would reduce the probability of obstruction and friction by fostering mutual trust, the glue that binds social networks. Pigou proposed that lawyers be excluded from negotiations because they would waste time and money, sharpening an adversarial spirit of opposition between the principals. He also favoured private meetings – which would encourage forthright debate and acceptance of compromise resolutions – and decisions based on a more substantial consensus than a simple majority (Pigou 1920c, 372–6).

In conflict resolution, the function of boards could be limited to conciliation, or their brief might also include arbitration of last resort. Without arbitration, strikes, lockouts, and their destructive consequences are strong possibilities. However, arbitration clauses also have disadvantages. Serious attempts to agree might not be forthcoming; opponents might be reluctant to offer concessions that could be used against them in subsequent arbitration cases; and although strikes might be avoided, conflicts could increase, leading to the collapse of conciliation boards. Accordingly, Pigou warned against a definitive choice between these alternatives (ibid., 377–8).

Pigou argued that in an arbitration clause, the composition of arbitration panels is critical. He stressed two criteria for membership: a reputation for competence and impartiality. Competent arbitrators were usually recruited from the industry under consideration. Employers mistrusted the impartiality of arbitrators who had been allied with workers, and workers returned the favour. If it was impracticable to identify arbitrators who satisfied both criteria – which was more often than not the case – he favoured impartiality. The best candidates for arbitration panels were eminent outsiders who would take advice from non-voting expert staff. Since several qualified prominent individuals were unlikely to be available on the same occasion, the responsibilities of arbitration could be assigned to one person instead of a panel; Pigou suggested the elected neutral chairman of the conciliation board. Alternatively, the state could train professional arbitrators or institute 'industrial courts' (ibid., 380–2).

If conciliation or arbitration proved unworkable, Pigou considered voluntary mediation prior to strikes or lockouts. A distinguished outsider or a national board could mediate. Although each of the above modes of conflict diffusion and resolution has its own weaknesses, each can be effective in certain circumstances. Finally, if all efforts at reconciliation fail, the state may impose a resolution. Pigou considered four coercive options: sanctions on labour and capital; a more general implementation of local best practices; legislation forestalling work stoppages by requiring submission of all disputes to a fact-finding tribunal that mandates negotiations; and prohibition of strikes, imposing binding agreements through compulsory arbitration (ibid., 386–400).

Based on British and American data, Pigou concluded that disagreements over labour compensation and working conditions are the occasion for most industrial disputes (Pigou 1905a, 38–9). In a highly competitive market, wages are determinate at a single rate. Under collective bargaining, they are indeterminate within a certain range. Although unions prefer to push wages above the competitive level, they understand that wage increases reduce employment opportunities; thus it is not in their interest to press for wages above a maximum rate. Employer associations prefer wages below the competitive rate; however, they too recognize that hiring labour below a minimum wage rate is difficult. Will labour and capital agree to settle wages peacefully within this range? The answer to this question is not clear. Based on a cost-benefit analysis, unions will determine a minimum wage below which they are willing to strike. Using the same reasoning, employer associations will determine a maximum wage above which they are willing to tolerate a strike. Pigou called wages between these two sticking points the 'range of practicable bargains' (Pigou 1920c, 402–3). Outside this range – which lies within the range of indeterminateness – a peaceful and consensual resolution of capital-labour conflicts is not possible. However, it would be a mistake to suppose that formation of a range of practicable bargains guarantees a peaceful outcome.

Excessive hours of work are a less frequent but nevertheless significant cause of industrial disputes that diminish the national dividend. They reduce physical vigour and efficiency and contribute to absenteeism, tardiness, and alcoholism. Their consequences are especially harsh for women and children, who are powerless since they are not unionized (ibid., 412–13). Pigou argued on many grounds that self-interest fails to establish socially desirable hours of labour. Labour demand and supply are determined without adequate consideration of the damage long work hours inflict on society. Everyone discounts future events due to lack of foresight. Even with perfect foresight, workers have a good reason – poverty – to do so at an especially high rate (Pigou 1912, 417). Moreover, they miscalculate, considering only satisfactions they might derive from further income and ignoring the fact that working longer hours will leave them fewer hours of leisure. Employers fail to grasp that shorter work hours are in their interest because they promote efficiency. If labour is unskilled and casually employed, lack of a 'durable connection' between an employer and his workforce leads him to employ workers for excessive hours inconsistent with the long-term interest of production. If firms have monopoly power over hiring, their exploitative wage rates force employees to work longer hours. Finally, employers are often reluctant to reduce hours of work because the reduction will be interpreted as a concession expected by all workers (Pigou 1920c, 417–18).

If bargainers cannot settle on socially optimal hours of work, the workday can be shortened by legislation in an industry-specific fashion. This mode of state intervention does not create as much unemployment as increasing wages above competitive levels. A business will be compelled to employ a workforce of a certain size until it develops more capital-intensive technology. However, the productive capacity of workers may improve significantly during the interval required for the introduction of new technology, reducing the employer's incentives to fire them. The case for state intervention, Pigou stressed, remained contingent and prima facie. 'It is still necessary to consider how far governmental authorities are competent to frame the delicately adjusted regulations which analysis shows to be desirable' (ibid., 418–19).

Other elements of the institutional structure of labour markets include methods of compensating workers and distributing labour and unemployment. Pigou regarded piece-rates as the best method of compensating labour since they provide the most accurate link between wages and productivity. However, the measurement of workers' marginal product poses several problems: it is difficult to separate labour and capital productivity; worker productivity can vary in quality; and in service or supervisory occupations, the marginal product is intangible. Although these problems may not be intrinsic to piece-rates, their introduction may entail other difficulties. Workers who are paid the value of their marginal product have an incentive to increase productivity and expect higher wages. Employers who believe that workers are overpaid may attempt to lower wages. Workers may anticipate the probable reduction and deliberately curb their output. In sum: although piece-rates may be the ideal method of compensation, they may also prove useless in increasing the national dividend (ibid., 424–45).

The national dividend can be increased by eliminating inefficiencies in the distribution of labour. Distributive inefficiencies have several causes. Imperfect knowledge leaves workers ignorant of vacancies or better job opportunities elsewhere. It also leads parents to miscalculate future needs of labour markets and their children's capacities. Costs of mobility may prevent a more satisfactory allocation of labour. Unions may create obstacles to movement of labour by restricting jobs to union members. Finally, cultural norms may restrict certain occupations to workers of a specific race, colour, or gender. Ignorance, costs of mobility, and arbitrary or traditional restrictions can be remedied by state action. Pigou believed that social and economic progress makes information more accessible, diminishes transportation costs, and breaks down traditional attitudes. At taxpayer expense, the state can actively promote employment exchanges, the voluntary and compulsory reallocation of labour, and a more comprehensive distribution of information – measures that are advisable only if their benefits outweigh costs to taxpayers (ibid., 447–77).

The distribution of unemployment, like the distribution of labour, influences the size of the national dividend. During depressions, demand for output is diminished. Employers can achieve the requisite reduction in output either by employing a fraction of their workforce full time and dismissing the remainder or by maintaining the entire workforce for shorter work periods.[31] The choice is dictated by many factors: costs of suspending production for part of the day; sophistication of worker skills such as the ability to handle expensive equipment; possession by workers of firm-specific human capital and knowledge of the firm's manufacturing secrets; and the accuracy with which wages are tied to worker efficiency – if a time-rate method is used, layoffs of less productive workers are more likely (ibid., 478–80). Pigou argued that a prima facie case can be made for shorter work periods. A long spell of unemployment targeting a specific group of workers is much more injurious to the national dividend than unemployment of short duration shared by everyone. Prolonged deprivation of basic needs may produce irreparable damage to the health of workers and their families. Vagrancy and dependence on charity or state subsidies may cause a 'permanent weakening of the moral fibre' (ibid., 482–5). However, Pigou warned against shortening the workweek prior to careful analysis. If workers are mobile and costs of movement low, layoffs may reduce the national dividend less than shorter work periods (ibid., 486–7).

The rationalization of state intervention

Pigou argued that the capacity of the state to increase the national dividend by intervening in markets rests on assumptions concerning political organization, expertise, and ethics. Various obstacles make effective intervention, either by regulating businesses or by operating them, a hazardous undertaking. Personnel, above all elected officials, pose the most perplexing problems. Pigou was troubled by their mode of recruitment, competence, incentives, interests, corruptibility, and limited authority. Like Marshall, however, he was convinced that improvements in public education and standards of living during the Victorian era had democratized and modernized the state, strengthening its resources, competence, and moral responsibility (Marshall [1907], printed in Pigou 1925a, 334–7). This conviction led him to conclude that the obstacles he had identified no longer constituted insuperable objections to effective state intervention.

Pigou suggested several impediments to state regulation or management of business by elected officials. Criteria for recruiting elected officials are largely independent of economic expertise. The composition of governmental organizations such as legislative bodies or municipal councils changes with election cycles and terms of office, making it difficult to achieve policy continuity. The geographic limits of political jurisdiction are determined by factors such as boundaries of municipalities or electoral districts, not commercial relevance. The scope and configuration of spheres of political authority are not likely to conform to the larger scale of operations indispensable to the effective management or regulation of modern business. Finally, elected officials are subject to continuous lobbying, the need to raise campaign funds, competing interests, and patronage, all of which compromise moral probity and efficiency.

Although Pigou regarded these as serious impediments, he maintained that they could, on the whole, be eliminated by the Victorian institution of special royal commissions or parliamentary committees: bodies of experts appointed to investigate specific problems of economic welfare and propose solutions. Selection of commissions solely on the basis of expertise would solve the problem of recruitment. Their economic expendability – private incomes and freedom from the exigencies of gainful employment – would make extended appointments possible, solving the problem of policy continuity. The scope of their jurisdiction could be determined by Parliament, which would solve the problem of the economic scale of their brief. And the terms and duration of their appointment could, in the main, immunize them against the forces of corruption to which elected officials are vulnerable. Pigou's conclusion: in comparison with earlier British experiments with state intervention, the more democratized and enlightened British state of his time could be expected to increase the size of the national dividend by appointing expert commissioners who are not susceptible to political pressures and specifying their powers and responsibilities in carefully defined briefs (Pigou 1912, 247–50).

Notes

1. Unless otherwise noted, our account of the association between Chamberlain and Hewins is based on Hewins' diary, written on 17 January and 31 January 1904. Passages from the diary were later included in Hewins' memoir (1929). We employ the original text, housed at the University of Sheffield Library.
2. In this and all subsequent references to Chamberlain's speeches, the first date refers to the date of the speech, the second to the date of its publication.

3. In this and all subsequent references to An Economist, the date refers to the date of publication of Hewins' article in *The Times*.
4. Maize – consumed by the destitute and used by farmers as feed for stock – would be exempted.
5. The prehistory of tariff reform began in the 1880s with the fair trade movement (Zebel 1940). There is no evidence that Pigou was influenced by this prehistory. On the various dimensions of the tariff reform controversy, see Cain (1996), Coats (1968), Irwin (1994), Sykes (1979), and Thompson (1997).
6. There is no indication that Marshall collaborated with Pigou in his work on tariff reform. However, he followed Pigou's engagement in the controversy and judged it favourably. In a letter to an unknown recipient, written on 6 June 1907, he lamented that there was no systematic analysis of free trade policies but suggested that his correspondent would 'find good answers' to some tariff reform criticisms in Pigou's *Protective and Preferential Import Duties* and *The Riddle of the Tariff* (Marshall 1996b, 160–1).
7. Tariff reform proposals were based on several theoretical propositions. Pigou analysed them algebraically and published the results (Pigou 1904e).
8. Pigou did not consider the effects of Poor Law relief on industrial fluctuations and the stability of the national dividend, perhaps because he thought there were none.
9. It does not seem possible to date with any precision when Pigou decided to write *Wealth and Welfare*. A passage in his essay 'The Problem of Involuntary Idleness', written for the Conférence Internationale du Chomâge in September 1910, suggests that the project began with his work on unemployment 'some years before'. In the course of these early investigations, he concluded that unemployment was inextricably entangled with so many other economic issues that an independent investigation had no prospect of success. The 'gradual growth and more extended scope' of *Wealth and Welfare* was a consequence of this insight (Pigou 1912, vii).
10. Between March and August 1912, Keynes had been remarkably helpful in suggesting revisions. Pigou relied on Keynes' judgement in revising successive drafts of the manuscript as well as page proofs. See letters from Pigou to Keynes, late March–early April 1912, JMK/PP/45/254/10–11 and JMK/PP/45/254/12–13; 13/6/12, JMK/PP/45/254/14–15; and13/8/12, JMK/PP/45/254/16–17.
11. For centenary assessments of *Wealth and Welfare*, see Collard (2014) and McLure (2012).
12. An earlier version of this essay was published as 'Some Points of Ethical Controversy' in the *International Journal of Ethics* (Pigou 1907h).
13. Sidgwick called the second method 'dogmatic intuitionism', a term that made sense in the discourse of Victorian moral philosophy. In *The Methods of Ethics*, his major philosophical work, he analysed it in detail. See Sidgwick 1907, 217–361.
14. In the 1907 version of the essay, the good includes a person's 'attitude towards beautiful persons or things', a position that resonates with Moore's view of the relationship between ethics and aesthetics in *Principia Ethica* (Pigou 1907h, 103).
15. If there is a single indispensable work on Sidgwick's ethics, it is Schneewind (1977), which sets new standards in the analytical historiography of Victorian moral philosophy. See also Schultz (1992, 2004).

16. Because of these considerations, Pigou saw that state regulation of non-renewable natural resources would constrain the choices of the present generation, with a corresponding reduction in current economic welfare (Pigou 1920c, 25–30). Pigou's concern with the fundamental irrationality of economic agents in inter-temporal decision-making inspired Frank Ramsey's classic articles on theories of optimal taxation and saving (see Ramsey 1927, 1928). On Pigou and future generations, see Collard (1996a).
17. See Pigou 1912, 17; 1920c, 33–9; 1932b, 43–9; 1935c; 1941b; Hayek 1935, 1941; Hicks 1942.
18. Pigou's analysis of this set of issues changed significantly from the first edition of *The Economics of Welfare* (1920c, 69–90) to the last (1932b, 56–81), which is why we employ the 1932 edition to explain his treatment.
19. As measures of change in the size of the national dividend, Pigou used two index number ratios: Paasche (P) and Laspeyre (L). If both P and L are greater than 1, Pigou argued, the national dividend of II is higher. If they are both less than 1, the dividend of I is higher. Years later, Paul Samuelson demonstrated that $P>1$ is sufficient to show that the dividend of II is higher; $L<1$ shows that the dividend of I is higher. $P<1$ and $L>1$ do not prove either proposition (Samuelson 1950b, 21–9). Pigou's work in this area was the touchstone of debates on the valuation of social income. See Hicks 1940, 1948; Little 1949a, 1949b; Kuznets 1948a, 1948b; and Samuelson 1950a, 1950b. For Pigou's later contributions to the subject, see Pigou 1940b, 1943c, 1951c.
20. We used the first edition in our account of Pigou's analysis of the economics of welfare because it includes all of his three basic propositions. He eliminated the third proposition from later editions, dealing with it in *Industrial Fluctuations* (1927b) and *The Theory of Unemployment* (1933h).
21. These arguments remained prominent tenets of the British eugenics movement into the 1920s. See Overy 2009, 93–135. The British Eugenics Society was founded in 1907 as the Eugenics Education Society. The Society launched an offensive against pauperism, criminality, and disease in addition to mental and moral deficiencies as understood by late Victorian reformers – from prostitution, sexual promiscuity, and masturbation to alcoholism, laziness, and feeble-mindedness. By postulating that they were effects of hereditary disorders, it mobilized national anxieties over the decline of the British 'race' and promoted legislation to reverse this tendency. These aims meshed with contemporary enthusiasm for social and moral reform, attracting such luminaries as Francis Galton and J.B.S. Haldane, as well as the young Maynard Keynes and Neville Chamberlain (Farrall 1985; Mazumdar 1992).
22. Florence Keynes, who had been asked by the organization to find a competent economist willing to help, asked her son Maynard to speak with Pigou about a contribution (22/1/1908, JMK/PP/45/168).
23. Although Marshall had recognized the possibility of divergences between private and public interests, his discussion of this point was cursory. See Marshall 1920, 415–17. On Sidgwick, Marshall, and Pigou see O'Donnell (1979) and Backhouse (2006).
24. In the first edition of *The Economics of Welfare*, Pigou used marginal trade net product to signify what he had called marginal private net product in *Wealth and Welfare*. In subsequent editions, he restored his earlier terminology. Hence our use of marginal private net product.

25. Pigou noted that equalizing marginal social products across all resources does not entail that the highest possible national dividend will be achieved. Resources may be allocated by employing a variety of methods, each of which could result in local or relative maxima. Only one of these allocations can produce a global maximum. For this reason, reallocating resources in order to approximate the global maximum may be preferable to attempting to produce local maxima by equalizing marginal net social products (Pigou 1920c, 120–1).
26. Pigou assumed that the income distributions of different economic classes had equal standard deviations.
27. Although Pigou read scholarly literature in Italian, it is not clear whether his understanding of Bernoulli was based on his reading of this seminal work or derived from Marshall's discussion of the same text (see, for example, Marshall 1920, 111 and n.2).
28. Bernoulli's name and Pigou's interpretation of his work reappeared in an article by Hugh Dalton, a former student of Pigou (Dalton 1920).
29. Pigou preferred the term 'ophelimity' because he thought it was 'free from certain ambiguities involved in the Common English term utility' (Pigou 1910d, 359, n.1). However, it is not clear that he remained faithful to Pareto's usage (see McLure 2010).
30. On Pigou's misreading of Pareto's Law see McLure (2013a).
31. Pigou dismissed a third method – worker rotation by engaging only a fraction of employees at a given time – on the ground that it was organizationally impracticable (Pigou 1920c, 478, 481).

4
The Theory of Policy Analysis

Preliminaries

Pigou's economics is generally understood as a body of policies, particularly 'Pigouvian' taxes and subsidies, designed to maximize economic welfare. This view is embedded in leading economics textbooks, the basis of the early socialization of economists and the principal artefacts in which ideas are institutionally certified as economic truths. Older books identify presumptively Pigouvian policies by attaching his name to them. Newer texts retain the policies but drop his name, indicating the extent to which the received view is woven into the conventional wisdom of the field. One notable result of this reading of Pigou is the 'Pigou Club' founded by Gregory Mankiw. Numerous economists have been inducted as members, amongst them Gary Becker, Robert Frank, Paul Krugman, Nouriel Roubini, and Lawrence Summers.[1] Pigou's place in the disciplinary consciousness of contemporary economics is nicely documented in a remark by William D. Nordhaus in an essay on the economics of energy use. Taxes on negative externalities, Nordhaus observes, are 'sometimes called Pigouvian taxes after their first important advocate, English economist Alfred [sic] Pigou' (Nordhaus 2011, 30). So much for the conventional view of Pigou's thinking.

Although Pigou assessed the economic policies of his time, his judgements were invariably prima facie, guarded, and hedged and qualified by a formidable array of restrictive and contingent variables: the significance of the problem at stake; the conditions under which it could be addressed given existing circumstances; the analytical tools, data, and competent personnel – economists, civil servants, and political leaders – available for handling the problem; and the potentially damaging consequences, both economic and extra-economic, of adopting policy proposals. In other words, there are no definitively Pigouvian economic policies. Pigou was a logician of policy analysis, not a proponent of specific economic policies. Nor was he the architect of a general system of policy analysis – for the compelling reason, as we shall show, that he believed such a system is impossible.

In the ensuing, we explore Pigou's theory of policy analysis and some of its more significant implications. Pigou developed what he called a 'machinery' of thought, favouring, as he often did, Marshall's mechanical metaphors. The Pigouvian machinery constituted a blueprint for a metatheory of economics, specifying the conditions an analysis of economic policy should satisfy in order to qualify as scientifically legitimate. Employing his metaphor, he was an artificer of the tools that comprise the economist's toolbox as well as an artisan who employed them to investigate the conditions under which specific economic policies can be expected to succeed in solving concrete problems of economic wellbeing.[2]

Policy and policy analysis

Pigou's theory of policy analysis is defined by several premises. Some he stated explicitly and stressed repeatedly. Others are tacit assumptions. He arrived at these principles in early manhood and adhered to them with remarkable consistency. There is a strong sense in which his conception of the aims of economic analysis and what it means to be an economist had their source in the reformist social thought of late Victorian progressives, the Edwardian New Liberals who became prominent in the early years of the twentieth century, and his engagement in the tariff reform controversy.[3]

Economists do not make economic policy, which lies in the province of politics. Economic policy is a responsibility of political leaders, whom Pigou, borrowing language from Plato's *Republic*, occasionally called 'philosopher kings', with what sense of gravity, levity, or irony it is difficult to judge (Pigou 1939, 220). Economists analyse effects of alternative policies, spelling out their consequences for the size, distribution, and stability of the national dividend. The choice amongst these alternatives is not a legitimate question for economics, which is a purely 'positive' science. It can substantiate no judgements about what measures should be taken or what ought to be done, because its conclusions are restricted to propositions that can be established by logic and empirical investigation. In Weberian language, economic policy analysis is value-neutral. It cannot validate norms and is limited to clarifying the substance of economic solutions to problems of policy and examining the consequences of acting on them (Pigou 1906b, 1–2). Thus economics cannot be the sole basis for economic policy. Nor should economic welfare be conflated with human welfare generally. Under ideal conditions, economists generate well-confirmed generalizations bearing on policy problems for the consideration of statesmen, who treat them as premises that are indispensable to their decisions. Together with premises essential to the achievement of extra-economic ends such as ethical, eudaemonistic, aesthetic, and political values, 'philosopher kings build up policies directed to the common good' (Pigou 1939, 220).

It follows that economists should not be political partisans – advocates of political doctrines, programmes, or ideologies (Pigou 1906b, 1–2). They investigate policy proposals supported by revolutionaries, reformers, conservatives, reactionaries, and revanchists – actors who span the entire political spectrum. They also consider policies enacted by diverse polities in the full range of national and historical settings. Economic reasoning may provide fodder for political partisans, who employ it not as a basis for arriving at truths, but as a 'kind of brickbat useful on occasions for inflicting injury on their opponents' (Pigou 1935a, 9). This prospect may tempt younger economists to tailor their results to the requirements of political programmes in hope of positioning themselves 'near the centre of action'. Pigou claimed it was an 'intellectual crime' to succumb to such temptation. In his biblical metaphor, economists who compromise their scientific integrity in this fashion sell their 'birthright in the household of truth for a mess of political pottage' (ibid., 10).

Pigou did not think that his austere distinction between economic science and economic policy committed him to a scientific asceticism, restricting him to writing only for professional economists. He was also, in the parlance of our time, a public intellectual who wrote for non-specialist readers. When he entered the public domain, he did not – barring the exceptional circumstances considered below – abandon or compromise his commitment to scientific economics in favour of policy advocacy. The differences between his more strictly academic and popular works were determined by their level of technical sophistication. In writing specialized treatises and academic articles for students of economics and in publishing for the general reader, he employed the same mode of analysis. In the latter case, he simplified or elided complexities of technique that might be confusing, or even unintelligible, to the non-specialist. From the standpoint of logic, however, there were no differences between his contributions to these spheres of discourse.

Philip Noel-Baker, one of Pigou's oldest and most intimate friends, recalled that Pigou 'carefully refrained from membership or other affiliation to any political party' (Noel-Baker 1979). Above the fray of party struggles, he was able to draw on the works of a diverse group of British social reformers: from New Liberals such as Charles Masterman and Seebohm Rowntree to Fabians such as Beatrice and Sidney Webb and more conservative philanthropists such as Charles Booth, Helen Bosanquet, and Octavia Hill. Like the Webbs, he saw considerable value in a national minimum for housing and other necessities of life. He also found merit in the position on housing for the poor taken by Hill, who strenuously opposed both state provision and management of shelter (Pigou 1914b, 36, 47).[4] Although he believed that Rowntree's reforms at the family's chocolate factory promised to bear fruit, he did not take his stance on the minimum wage. This aspect of Pigou's thought is a mark of his intellectual circumspection and conservatism. The policies that he regarded as legitimate candidates for economic analysis were not logical possibilities that he conceptualized in his rooms at King's, but actual programmes that had been proposed or implemented by polities, parties, or interest groups, many in his own time.

Methodological pragmatism

There are no definitively Pigouvian analytical methods. He treated methodology as a practical and provisional matter, not a question of doctrine. It is sensible to employ a technique if it proves useful in discovering causal relations. The more extensive the range of economic problems to which a technique can be successfully applied, the greater its analytical power. However, there are two reasons why no great confidence can be placed in the durability of a technique. Economic phenomena and the problems they pose are subject to change, which may spell an end to the efficacy of techniques successfully employed before the change. In that case, alternative methods will be needed. In addition, new techniques may achieve better results – more precise or comprehensive knowledge of causal relations – than current methods. In both cases, there are good grounds to discard elements of the current analytical apparatus.

Pigou's methodological pragmatism is clear in the remarks on economic analysis in his Sydney Ball Lecture at Oxford in 1929. Here, he attempted to shed light on the concept of economic analysis by juxtaposing it to economic description. Descriptive economics provides a narrative account of economic affairs. Analysis is an investigation of their causes and effects. Description addresses the question of what is the case, analysis the question of how and why events transpired as they did. Description gives a phenomenological account of events as they are experienced and observed. Analysis penetrates beneath the surface to discover the underlying mechanisms that produce events. However, economic analysis is not a methodologically uniform process. 'With different problems and with different sets of data, different detailed methods are appropriate' (Pigou 1929c, 4). Economic analysis is performed in a 'workshop'. The methods suited to different problems are tools, comparable to those employed in Alpine mountaineering. Although every analysis requires tools, just as every mountaineering expedition requires ice axes, no given tool is inherently and invariably indispensable. A tool that fails to demonstrate its analytical value should be 'scrapped', for the same reason that an ice axe that does not prove serviceable should be repaired, redesigned, or replaced (ibid., 10). In characterizing techniques of economic analysis, Pigou's main concern was to stress their purely instrumental and transient value. Because the terrain of economics changes, the same holds for the scope and character of economic problems. As new problems engage economists and old problems are reconceptualized from new perspectives, new tools can be expected to supersede, piece by piece, older techniques. In this manner, the instrumentarium of the economist's workshop is endlessly renovated.

Pigouvian methodological pragmatism does not conflict with his legendary devotion – 'idolatrous' in the view of some (E.A.G.R. Robinson 1967, 91) – to Marshall's economics. It was notoriously difficult to persuade him that the Marshallian engine of analysis was deficient in any respect. In addition, he believed that there was 'much to be urged against the employment of novel terminology' and tools. However, he was ready to refine or innovate if the results promised to strengthen economic analysis (Pigou 1910d, 358). He betrayed no hesitation in making a case for defects in consumers' and producers' surplus – tools Marshall had developed to assess changes in welfare – when externalities were present. Nor was he reluctant to propose new tools, such as the now famous curves of marginal social costs and benefits, when he was convinced that circumstances called for technical innovation (Pigou 1903f, 1910d). When Piero Sraffa's critique of Marshallian partial-equilibrium appeared in the *EJ*, Keynes wrote him that Pigou 'feels he must, in light of it, reconsider his whole position' (in Potier 1987, 20). Although Pigou did not follow Sraffa's suggestion to abandon a competitive market analytical framework for an apparatus based on monopolistic assumptions, he revised his analysis in order to refine its logical consistency (Sraffa 1926; Pigou 1927c, 1928a). His flexibility in adopting new techniques is perhaps most evident in his employment of an IS-LM version of Keynes' model in 1938 (Pigou 1938; see also Pigou 1941a), only two years after his scathing review of the *General Theory* (Pigou 1936b). Years later, Pigou made a case for the unprecedented explanatory power of Keynes' macroeconomic formulation. The core of Keynes' contribution to economics, Pigou argued, lay in the development of a 'single formal scheme' by means of which all significant economic factors, real and monetary, could be methodically investigated (Pigou 1950a, 65).

Pigou's conception of economic methodology should be understood in light of a basic principle of his philosophy of science: economics progresses not by wiping the slate clean and destroying or demeaning the work of others, but by building on the past. In this regard, he urged economists to follow the scientific etiquette of Einstein, who 'did not, in announcing his discovery, insinuate, through carefully barbed sentences, that Newton and those who had hitherto followed his lead were a gang of bunglers' (Pigou 1936b, 115). On this point, there is a fundamental conflict between Pigou and the post-*Treatise* Keynes, who believed in the revolutionary promise of eradicating the past and beginning *de novo* – a strategy that Pigou regarded as professionally bad form, politically hazardous, and logically impossible.

Successful policy analysis depends on the sophistication of statistical methods. The quantitative estimates at the disposal of economists were paramount in Pigou's thinking on this point. Notwithstanding improvements in statistical techniques during his lifetime, he habitually lamented various sources of methodological and quantitative negligence that limited the powers of policy analysis. Economists seemed unwilling to tackle the problem of omitted variables. They often conflated correlation and causation. And they failed to conduct careful quantitative analyses of disequilibrium processes, cumulative causation, and the short period (Pigou 1908a, 31; 1910a, 984–5; 1935a, 21–2). However, even in a perfected regime of statistical refinement, serious methodological difficulties would remain. Some variables, for example, resist quantification. In his memorandum for the Royal Commission on the Poor Laws and Relief of Distress, he addressed one such variable: the competence of the agency that administers relief to the poor. '[O]n the really debatable question whether carefully administered out-relief would be better or worse in this respect [reducing pauperism] than carefully administered in-relief, refinements of statistical reasoning can throw no light' (Pigou 1910a, 986). Because of this insurmountable problem, economics 'must almost always speak with an uncertain voice' (Pigou 1908a, 31).

Historicity

In view of the above considerations, Pigou concluded that economists should abandon the illusion of a general theory of policy analysis and resign themselves to a much less grandiose programme of inquiry: a methodology of painstaking, case-by-case investigations, each of which is limited by the irreducible complexity and variability of historical circumstances.[5] A strong case can be made that the historicity of policy analysis is an important aspect of Pigou's thought that has been neglected, or occasionally denied, in the secondary literature. The realistic possibilities of Pigouvian policy analysis are determined by the historical conditions under which the analysis is performed. Two respects in which this is the case can be distinguished. The range of possible economic policies, while not infinite, is very large. Pigou's selection of policies for analysis was a function of the priorities of his political culture. He took up and dropped economic policies as candidates for analysis depending upon their salience in the agendas of Parliament, the government, and the leading political parties in Britain. He also held that the validity of policy analysis is tied to current political and economic conditions and limited by changes in their complexion. As a result, the generalizations or 'laws' of economic science that hold true today may prove to be false tomorrow.

In targeting, rejecting, or discarding policies for analysis, Pigou was opportunistic. His analytical choices were decided chiefly by his sense of the shifting distribution and balance of interests, axiological priorities, and power that would determine which policies were likely to be enacted and which would disappear from the public agenda. His conception of the validity of policy analysis was based on the same considerations. As a result, Pigouvian economic generalizations were empirically fragile propositions, vulnerable to shifts in the polity and the economy. As these shifts occur, it is impossible for economists, embedded in history, to make scientifically reliable estimates concerning their scope and implications. An economic analysis is an historical artefact, constrained by the same contingencies that define all historical phenomena. This is the ultimate reason why Pigouvian policy analyses are restricted to case-by-case investigations. Because the conditions for their validity are historically determined, reliable inferences from current to hypothetical future cases are out of the question. Here we part company with T.W.

Hutchison, who maintained that Pigou, ‘though he came to economics from history, did not share Marshall’s intense concern with the historical dimension of economic processes, which, in fact, largely faded from the Cambridge scene with Marshall’s departure’ (Hutchison 1981, 65; see also Groenewegen 1995, 755).

Pigou ruled out a universally valid theory of policy analysis due to the intractable diversity and flux of individual lives, local histories, and institutional spheres. Consider the problem of poverty, which he regarded as a daunting challenge because of immense differences in the lives of poor people as well as the factors responsible for their poverty. ‘The poor’ did not constitute a homogeneous class defined by common conditions of existence. People could be transiently or chronically poor. The transiently poor were otherwise independent families who had experienced a ‘sudden misfortune’. Chronic poverty might be a result of numerous causes: old age; frailty, which could be physical, intellectual, or moral; an inability to master crises and a consequent dependence on indiscriminate handouts; or the accident of being born to chronically poor parents (Pigou 1901h, 240–7). Diversity in local conditions and variation in the competence of public agencies made the problem of caring for the poor even more complex. It was unrealistic to develop regulations for charitable organizations without investigating local cultures where poor relief was administered. If the rich generally provided liberal and indiscriminate grants to the poor, it would be pointless for a local charitable organization to introduce strict regulations governing poor relief; they would be ignored (ibid., 257). Finally, even if a need for government intervention could be demonstrated, it did not follow that public assistance should be forthcoming. The judgement and competence of public officials were crucial variables. It was essential to consider ‘how far, in the particular country in which we are interested and the particular time that concerns us, the government is qualified to select the right form and degree of State action to carry it through effectively’ (Pigou 1935a, 124). Pigou’s view of the futility of a systematic theory of policy analysis is nicely documented in his testimony on 23 April 1919 before the Coal Industry (Sankey) Commission. Here he contested the ideal of a uniform policy of nationalization.

> Nationalisation in any sense cannot be judged on grounds of general principle. What would work well under one kind of Government would work badly under another: and what, under any given Government[,] would work well for one industry would work badly for another. The desirability or otherwise of the nationalisation in

any sense of any industry can only be determined after a detailed study of the characteristics of the industry in relation to the qualities of the country's Governmental machinery. (HMSO, 1919a, 416)

Public finance

Pigou's conception of the historicity of policy analysis can perhaps be demonstrated best by considering his writings on public finance. This sphere of his work offers thorough and comprehensive documentation of the substance and intentions of his thinking: academic publications, pamphlets written for a general readership, letters to editors of magazines and newspapers, memberships on government committees and testimony before such bodies, and archival sources.

Land value taxation

At the turn of the century, the British government was under immense pressure to increase revenues. The Boer War was the most expensive British military initiative since the Crimean War of 1853–6, imposing costs of £35,750,000 between April and July 1902 (*The New York Times* 1901). In the five-year period beginning 1895–6, normal government expenditure rose by 40 per cent (Daunton 2001, 303–4). Central grants to local governments did not keep pace with their responsibilities, resulting in tax increases of 141 per cent on building occupants between 1875 and 1900 (Packer 2001, 55). The campaign against free trade had important ramifications for public finance, supporters of tariff reform promising that protective duties would be an effective source of revenue for both local and central governments. This was not to be.

When the Liberal Party returned to power in the general election of 1906 it reduced dependence on indirect taxation by introducing the modern system of resource extraction via income taxes, adopting both differentiation and graduation. Land reform was also an important item on the Liberal agenda. Lloyd George, Chancellor of the Exchequer (1908–15), included taxation of land values – targeting the unimproved value of land – as a prominent component of his 'People's Budget' of 1909.[6]

Before World War I, ownership of land in both rural and urban Britain was concentrated in families of considerable wealth. A comprehensive national survey conducted in 1873 showed that in that year 7,000 people owned 80 per cent of the land in the country (Horn 2002, 104). The skewed distribution had not changed markedly by 1900. In rural areas, agricultural workers lived in substandard cottages owned by landlords, reducing their bargaining power in wage negotiations and their mobility to pursue better opportunities elsewhere. Liberals argued that taxation of the unimproved – or socially created – value of land could fund many initiatives. Ownership of smallholdings by agricultural labourers could be increased. The housing–employment connection could be broken, ending the serf-like dependence that bound agricultural workers by holding them in thrall as vassals of the landlord. Finally, minimum wages for agricultural labourers could be introduced, giving them access to housing of higher quality. In urban areas, traditional ownership, lease, and tax regimes discouraged construction. Landowners leased large parcels to developers, retaining ownership rights to the site and claiming improvements as their own. Despite dramatic increases in land values in congested cities such as London, landowners contributed little to local government finances. Rates were imposed on occupants based on rental values that failed to distinguish the value of the land and the value of its improvement. The principle of land taxation was use value, which reduced owner incentives to improve or build (Packer 2001, 28, 54–5). Between 1906 and 1915, the Liberal government considered various measures of land taxation, the most creative of which were suggested by Lloyd George and the unofficial land inquiries he commissioned. Under the umbrella of land reform and site value taxation, other policies were also considered: smallholdings, a minimum wage, tenure security, and the extent and quality of housing available to the poor.[7]

Although discussions of land value taxation had begun in 1906 when Asquith was Chancellor of the Exchequer, it quickly became clear that Britain had no coherent method for valuing landed property. How could improved and unimproved values be distinguished? Perhaps the most difficult problem was how to replace archaic methods of valuation. Outside London, 648 parishes valued property on the basis of outdated lists. Even more worrisome, the boundaries of parishes and counties did not coincide – a foundation for administrative chaos (ibid., 60). It was in this confused setting that Pigou published *Policy of Land Taxation*, an amplification of his July 1907 article in the *Edinburgh Review*. He urged policymakers to consider his analysis carefully before introducing legislation (Pigou 1909b, 32).

In generating revenues, Pigou argued, the Liberal Party had two options: increase existing taxes on incomes, inheritance, commodities, and imported goods, or identify untapped sources of revenue. In considering land taxes, he noted that they could be based on either the unimproved value of land or increments in its value. Once available, revenues could be used to adjust national and local finances. In his view, unimproved land values formed the basis of a very effective and relatively equitable form of taxation, chiefly because they were a consequence of unearned spillover benefits generated by the efforts of neighbours, the government, or general economic progress (ibid., 5–6, 11). Thus taxes on unimproved land values would not damage productivity. Although they were unfair in targeting a specific economic group, they confiscated only socially generated unearned incomes. From the standpoint of distributive justice, therefore, they were unobjectionable, especially in comparison with alternatives. Pigou held that all taxes were unfair to some extent. Taxes on commodities such as tea or tobacco, for example, compelled consumers either to pay more in order to purchase the item or to forego consumption altogether. In either case, the consumer was burdened. He suggested that the distributive injustice of land value taxation could be mitigated by maintaining moderate and stable rates (ibid., 12–13). If the cost of valuing land proved to be low, land value taxes would qualify as an ideal source of revenue.[8] They could also preempt new and more burdensome taxes. Revenues raised from land taxes could relieve local rates on improvements to land and buildings, reduce migration from the countryside to congested cities, and improve urban sanitation as well as the availability and quality of housing. Because of inadequate data, he was not prepared to draw confident conclusions about how funds might be allocated (ibid., 31–2).

Taxation of the incremental value of land was a much more complex matter. In general, Pigou saw merit in imposing very high taxes on all genuine windfalls when two conditions were met: they could be differentiated from other increments, and the costs incurred in taxing them were not prohibitive (ibid., 22). However, it was not clear how these conditions could be employed to craft a workable policy. How could pure windfalls be distinguished from those caused by changes in the price level or interest rates? Should taxes be imposed only on increments, or should decrements be taken into account as well? Although Pigou could envision solutions to these problems, he regarded them as excessively complicated for policymaking. Pragmatism suggested taxing extravagant windfalls – for example, land values that tripled over a 15-year period. Although this simplification would generate little revenue, it would reduce administrative costs substantially.

The war and the national debt

On 4 August 1914, Britain declared war on Germany. World War I made food production a national security requirement, and taxing land quickly gave way to more pressing issues. Pigou's theoretical priorities changed with the dramatic political and economic exigencies of the war.

The Asquith government had underestimated the scope and aggressiveness of Germany's expansionist ambitions and misjudged the threat, both financial and military, posed by German war preparations. Like the other chief belligerents, the British anticipated a short war. In the vision of Asquith's strategic planners, British military commitments would not extend beyond a naval blockade of Germany, deployment of its small professional army to support much larger French forces in the West, and non-military assistance to allies. This vision was shattered in autumn. Following the September failure of the German army to achieve a decisive breakthrough to Paris in the Battle of the Marne, the inconclusive results of Allied counterattacks, the inability of either army to outflank the other, and shocking casualties in Flanders – especially in the first Battle of Ypres in October–November – a grim template was set for a conflict of indeterminate duration on the Western Front: industrialized carnage, massive casualty rates, immobility of forces as armies mounted grand offensives that produced gains measured in metres – taking, losing, and retaking the same devastated terrain – and the stalemate of trench warfare. Fighting a war with no end in sight, even as the Imperial General Staff promised victory with each successive new offensive, Parliament passed legislation in the early months of 1916 mandating general conscription and imposing an enormous financial burden on the state. The government had increased its revenues by raising income tax rates, lowering the income threshold for taxation, and introducing excess profit duties. However, the expenses of the war resulted in significant budgetary deficits (Horn 2002, 26, 76–94).

In 1915, the socialist trade union leader Benjamin Tillett called for conscription of wealth to pay for the war, a position that the War Emergency Workers' National Committee and the Trade Union Congress adopted following the introduction of military conscription. On this view, it was unconscionable, and also politically unwise, for the country to expect its men to risk their lives only to return home facing income insecurity and massive debt service to rentiers. The Labour Party adopted this position in its election campaigns of 1919 and 1923: outdoor relief to capitalists would have to end. Labour proposed to solve the budgetary problem with a one-time capital levy that would dramatically reduce the national debt and interest payments, lower income tax rates on work and saving, and diminish the concentration of wealth. Imposition of a capital levy during wartime was considered as economically dangerous and politically impossible. It was seriously contemplated after the war but encountered numerous objections. How should capital be defined? What consequences would the levy entail for capital and credit markets, consumption, saving, and investment? In settling the national debt, was it politically prudent to favour rentiers over the poor and the middle classes, whose income taxes had increased markedly during the war? Would a levy encourage tax avoidance and evasion? These difficulties seemed intractable, making a capital levy an unattractive fiscal policy even to its earlier supporters. When Labour came to power in 1924, the government formed the Colwyn Committee on the National Debt and Taxation with a view to ascertaining the most effective way to retire the war debt. In 1927, a year before Pigou published *A Study in Public Finance* (1928c), the levy was rejected as unsound on both political and economic grounds (Daunton 2002, 49–74).

Pigou believed that it was critical to analyse the problems posed by financing the war, which had never been systematically investigated. Shortly after war was declared, he delivered two public lectures at Cambridge on these issues (Pigou 1916b, 5). They were followed by a series of works that considered the merits of large increases in the income tax (Pigou, 1916b, e, f, g, 1918c). He understood that the principle guiding peacetime taxation – extracting equal fractions of well-being from everyone – could not apply in wartime, when both weak and strong were required to make equal sacrifices of life and limb. It was just to expect generous monetary contributions from non-combatants. Extreme progressive income tax rates that would leave non-combatants – rich or poor – with equal after-tax incomes were morally justifiable but politically unimaginable. However, tax rates for citizens exempted from military service on grounds of health, age, gender, or conscientious objection could be substantially increased. Because Pigou expected Britain's peacetime tax structure to be reinstated after the war, he rejected arguments that a wartime increase in income tax rates would reduce incentives to work and save.

> On the contrary, heavy temporary taxes now are likely, on the whole, to hinder production much less than the heavy continuing taxes which we shall otherwise be compelled to impose for an indefinite period to provide the money for war loan interest. In many economic problems considerations about what is just and considerations about what is best for production join in opposite direction. In this problem they point in the same direction. (Pigou 1916f; see also Pigou 1916g)

As war costs mounted, the British government increasingly relied on loans to finance its deepening budget deficits. On Pigou's analysis, Britain had two options for settling its £6 to £6.5 billion post-war internal debt – he did not believe that the British external debt was a matter of great consequence (Pigou 1920a, 8). It could employ a conventional strategy of raising annual taxes to finance interest charges on the debt and establish a sinking fund that would retire the principal over several decades. Or it could impose a one-time capital levy on real and financial assets that would quickly pay off much of the debt. In his thinking on this choice, the relative advantages and burdens of the capital levy championed by Labour leaders had a prominent place. Although steep, the capital levy would diminish subsequent tax rates. It would also render a sinking fund unnecessary, and interest payments would be minimal. His immediate post-war analysis suggested that this option, if properly crafted, was the preferable course: a carefully structured capital levy complemented by taxes on windfall wartime profits and moderately progressive income tax rates. Unlike the first option, a capital levy would also reduce disincentives to work and save over the coming decades (ibid., 17).[9]

When enthusiasm for a capital levy waned in the mid-1920s, Pigou's thinking on the two options for repaying the national debt also changed. In his testimony before the Colwyn Committee, he no longer regarded a large capital levy as feasible, and for several reasons. It would encounter powerful organized resistance from various quarters. It would encourage fears that reliance on such a levy might become a routine tactic in the fiscal armoury of the state and exacerbate existing pessimism caused by post-war British industrial depression. Finally, his initial assessment of the advantages of a capital levy assumed that future revenues from income, super, and death taxes would not be appreciably diminished. However, new research, including Josiah Stamp's work on the economic effects of a capital levy, persuaded him that this assumption was mistaken: 'I have not, until within last year, realised how very large a proportion of a levy at steeply progressive rates – and the rates would have to be steeply progressive – would be used in repairing ravages in the future revenue consequent upon the levy itself' (HMSO 1927, 436–7).[10]

Peacetime public finance

Pigou's thinking on public finance was powerfully affected by the transformation in British financial planning occasioned by the scope and duration of World War I. The war convinced him that financing government expenditures had become a critical field of economic analysis. In revolutionizing the fiscal challenges of the great powers, the war had changed state extraction of resources so radically that 'the problems it presents are different, not merely in degree, but in kind from what they were before the war' (Pigou 1920a, 7). If Britain could count on a post-Versailles era of peace – comparable to the relative pacification of Europe following the Congress of Vienna – he would have been prepared to take a benign view of debt repayment as a matter of no great urgency. However, he held a much darker vision of the future of Britain – 'obsessed', as he expressed it, by the prospect of another general war in 20 years. In that event, a large outstanding debt would reduce the credit rating of the state, making it difficult to borrow at low interest rates. Pursuing this line of reasoning, he suggested that the existing sinking fund be doubled to £100 million annually. Although this policy would entail higher tax rates and diminished productivity, the security of the country required severe measures (HMSO 1927, 444).

It would be necessary to finance the sinking fund through general taxes in peacetime. Sound fiscal planning required that debt be assumed only to cover extraordinary expenditures. Recurrent borrowing would increase debt levels and interest obligations, damaging the legitimacy of the state and, in the extreme case, threatening bankruptcy. By financing standard operations of the state through tax revenues on various sources of income, expenditure, saving, and inheritance, it would be possible to escape these consequences (Pigou 1920c, 589). When Pigou gave evidence before the Colwyn Committee, its members were interested only in certain aspects of these taxes. Neither their questions nor Pigou's answers addressed problems of peacetime public finance systematically. However, it is clear that in his appearances before the Committee, Pigou drew heavily on Part IV of the first edition of *The Economics of Welfare*.[11] Part IV – 'Public Finance' – employed the analyses of tariffs, land value taxation, and wartime taxes that he had developed in 1903–18. He wrote its treatment of income taxes after his membership on the Royal Commission on the Income Tax, also chaired by Lord Colwyn (Frederick Henry Smith), in 1919–20.

The brief of the Royal Commission was to examine the British income tax system and recommend measures to improve its fairness, working on the assumption that tax revenues would be maintained at their immediate post-war levels. The Commission began meetings on 7 May 1919, and issued its report on 11 March 1920. In the interim, it held 50 sessions and examined 187 witnesses, representing the government, a broad spectrum of industries and occupations, and various other organizations. As the signatories of the report observed, the 'evidence we have heard and the information put at our disposal have been voluminous and fairly exhaustive, for we believe that we have been in touch with most of the important sources of knowledge and of informed criticism on the subject with which we were called upon to deal'.[12] Pigou's service on the Commission gave him a more sophisticated understanding of the British tax system as well as an appreciation of the principles of peacetime taxation. By the time he wrote *The Economics of Welfare*, he was able to devote some 100 pages to public finance (Pigou 1920c, 587–688).

Pigou argued that a sound system of taxation was grounded in two principles. First, its impact on employment, consumption, saving, and investment would vary across income groups. The poor, living near subsistence and with little or no savings or other assets, would very likely meet their tax obligations by increased effort – the value of their marginal dollar increasing markedly in comparison with the disutility of additional labour. The rich, on the other hand, had several options. They could reduce their consumption, draw on their savings, or liquidate assets. Second, the chief consideration in assessing a tax was its impact on the national dividend. The consequences of a tax for the national dividend depended on several factors: expected revenue; administrative costs; the perception on the part of taxpayers that the distribution of tax burdens was fair; and predictability, conceived as minimal interference with the ability of taxpayers to manage their economic affairs in an instrumentally rational fashion (ibid., 593–9).

A windfall tax, levied on unforeseen and unearned increases in property values, was efficient and relatively equitable. In a peacetime economy, however, it might not be feasible to identify windfalls. As a pragmatic solution to this problem, Pigou suggested that windfall taxes be limited to very large incremental changes in property values. Because of their efficiency, taxes on the unimproved public value of land compared favourably with windfall taxes. As noted above, they singled out landowners invidiously and thus were defective on grounds of fairness. Nevertheless, states were compelled to raise revenue, and the public value of land was a most attractive source, at least within reasonable limits (ibid., 601–15).

Taxes on expenditures could take different forms, targeting specific commodities or all consumer goods and services. Uniformity was not a requirement of taxes on specific products. Although taxes on articles of mass consumption were objectionable because they were regressive, their administrative costs were low. Because they were imposed at differential rates, they changed the relative volume of the consumption of goods, the marginal products of resources invested in their production, and the national dividend – which would increase or decrease depending on whether the product taxed was produced under conditions of diminishing or increasing returns (ibid., 618–21). A uniform and modest ad valorem tax on all consumer goods and services – essentially a 'general unregulated tax on expenditure' – would have little effect on the national dividend (ibid., 616). Although it might marginally reduce saving and on-the-job-diligence, it left the relative magnitude of the marginal product of resources intact. The drawbacks of an ad valorem tax were due to other factors. It was blind to product quality, consumer income, and family size. Moreover, the difficulty and cost of collecting revenues from shopkeepers and providers of professional services were enormous. Such a tax was 'an open invitation to fraud', prevention of which would require 'an army of inspectors' (ibid., 617–18).

A progressive income tax that exempted saving would eliminate disincentives to save and invest. Because it was derived from income, it could exempt consumption for basic needs, differentiate income levels, and accommodate family size. Because it exempted saving, it affected the national dividend only by dampening incentives to work. Pigou considered the possibility that intellectual workers or the propertied class might seek refuge in other countries from such a tax. Even workers without means to emigrate might relax their efforts. However, he discounted the weight of these possibilities. Relocating was inconvenient and costly, and countries that hosted expatriates also had income tax systems. Moreover, the rich preferred to live in their own countries due to the emulative social advantages conferred by wealth. Domestic entrepreneurs were not likely to work less energetically because of a tax on expenditures. They were motivated by a passion to succeed, which should not be conflated with profitability. Finally, the poor would respond to the tax by attempting to increase their hours of employment (ibid., 625–9).

The disadvantages of an income tax that did not exempt saving varied with several factors: the percentage of total income collected in taxes, the normal saving rate of the economy, and the motivations for saving. If savers accumulated a certain sum to educate their children or set aside their post-consumption income, taxes would not seriously reduce saving. However, insignificant changes in saving and capital might be magnified over time, translating into a lower national dividend in the long term. In addition, the choice between an income tax that did and one that did not penalize saving depended on fairness as well as efficiency. Even if income taxes did not exempt saving, they could differentiate earned and unearned income. A moderate tax on unearned income limited to the affluent would improve the fairness of the tax system. However, it might entail a cost in efficiency if it reduced the national dividend. Beyond certain thresholds, earned incomes could be progressively taxed and equal incomes earned by people of differing circumstances taxed differently. Fairness dictated that bachelors be taxed more heavily than heads of families, with relief to family men diminishing as family income increased. Pigou devoted little attention to flat taxes, believing that there was a general consensus supporting non-uniform taxation based on ability to pay (ibid., 631–7).

For a variety of reasons, Pigou believed that property taxes were more effective than taxes on unearned income: they could be defined more easily and precisely; they did not penalize business incomes; and unlike income taxes, they captured capital gains. Nevertheless, property taxes were objectionable in several respects. Because income from property was volatile, taxing it in lean years could impose an undue burden on property owners. If property ownership promised potential future income, property values might change. However, it was unfair to tax potential, as opposed to actual, income. It might also be difficult to graduate taxes on property. More importantly, property taxes, unlike income taxes, were not amenable to a simple assessment and were more easily evaded. Property could be taxed annually or over longer intervals. In Pigou's view, the latter was a more productive fiscal tool than annual taxes on property or unearned income. Taxpayers discounted the burden of taxation at longer intervals since it occurred in a remote future. One variant of such a tax, death duties, had the advantage of a remarkably heavy discount, since it was charged at an unknown future date after the death of the taxpayer. Taxes on inheritance could not be expected to discourage saving or reduce the national dividend significantly. They fell chiefly on the very rich, who would continue to accumulate regardless of taxes because of their love of the 'power and prestige that riches confer' (ibid., 640–2).

In sum, the evolution of Pigou's work in public finance was tied to changes in the political and economic conditions of Britain. The exigencies of 1903 were not those of 1914. Policies that were politically possible in one year might have no prospects for success in the next. Because of shifts in the economic priorities of the state or civil society, policies once regarded as critical were replaced by new imperatives. What Pigou wrote and when he wrote it mapped these changes. *A Study in Public Finance* incorporated the results of the analyses discussed above, following his case-by-case mode of investigation. In this book, the specifics of cases and the historical conditions that formed them were elided. However, our reconstruction of his research programme in public finance documents the extent to which it was anchored in the politics and economics of his time.

Normality and crisis

The principle of value neutrality in economics is a metascientific norm. In Pigou's thought, it rests on a critical assumption: normality, the institutional conditions under which it is sensible and responsible to act on the norm. Normality in this sense presupposes a stable social structure in which economists can safely limit themselves to the analysis of policy. This assumption is warranted only if they have no reason to believe that the institutional bases of scientific research, democratic politics, and capitalist markets are threatened. In the event of such a threat, the premises of normality must give way to the exigencies of crisis, at the same time nullifying the default norm of value neutrality. If economists have scientifically valid reasons to think that policies implemented by the state or under consideration by political leaders will jeopardize the world of normality and precipitate a crisis, a state of exception exists in which the restrictions on economic reasoning dictated by value neutrality are not only scientifically irresponsible but incoherent. The norm is suspended because the circumstances under which it makes sense – the institutional conditions of normality – are not satisfied. In the fact of a crisis, the professional obligations of economists shift markedly. It becomes their duty not only to analyse but also to advocate in order to save the economy and the polity from decisions made by political leaders following destructive policies. In a crisis, therefore, economists have an obligation to attempt to make policy. This obligation is not merely a public responsibility of citizenship but an ethical imperative entailed by the vocation of economics – it follows from the conditions for the possibility of economic science. If the economy and the polity fall, the sociopolitical infrastructure of economics as a career and a scientific pursuit break down. Confronted by an imminent risk that places the normal institutional order in grave danger, economics becomes a science of crisis resolution. In such a crisis, economists should publicly defend policies designed to forestall or end the crisis and return the polity and the economy to a state of normality – the world in which the value neutrality of economics again reigns.

Quite early in his work, Pigou considered the radically different requirements that normality and crisis impose on economists. On 31 May 1902, an unsigned article in *The Speaker: The Liberal Review* chastised British professors of political economy for failing to enlighten the public on the damaging consequences of the corn tax, which the Chancellor of the Exchequer Michael Hicks Beach had imposed that same year. The tax had already increased the price of bread, filling the coffers of 'agricultural landlords'. The fact that 'so many clever and learned men should deliberately relinquish their profession and forget that it is their duty to teach *Political Economy*, is at this moment almost disastrous' (N.A. 1902, 240).

Pigou responded on 14 June with an article of his own, defending the relative silence of economists on two grounds: the political role of economists in developing a body of scientific expertise and the principle of value neutrality. Political economy, he claimed, is a science that 'provides necessary ground work' for politics in the classical sense of statesmanship or state-crafting, polity or policymaking, which Pigou understood as 'the supremely important art of improving, so far as may be, the general condition of the people'. Because of the differences between politics and economics and the correspondingly different functions of economists and political leaders, it was not the duty of distinguished professors of economics to 'descend into the arena of politics and 'give counsel' to the government through the public Press'. Although it may be tempting to argue that scientific experts should enter the public domain whenever their field is under discussion, this temptation should be resisted. If academic scientists became journalists, they would quickly lose the expertise that qualified them as scientific specialists. Professors serve the public interest best by limiting themselves to 'the difficult task of developing their science' (Pigou 1902d).

In crises, however, the conventional normative order governing the relationship between economics and politics is rescinded. Suppose that economists, working on the basis of their professional expertise, are convinced that the state is undertaking measures that are not merely imprudent or mistaken, but likely to be economically catastrophic. In such a circumstance, the danger to institutional normality imposes a quite different imperative on economists: 'the work of advancing theory would have to stop in favour of rescuing the nation.' Pigou maintained that if political leaders were 'fathering some scheme which, in light of the existing economic knowledge, ought to be condemned as a grave and undoubted evil to the nation, then our economic experts should leave their special work, and throw the whole weight of their authority into the scale against the scheme'. The corn tax, he argued, did not reach the threshold of a crisis and thus called for no extraordinary measures on the part of economists. It was imposed to raise revenue for the Boer War and could be repealed when peace returned. The tax was not of great economic impact. By voicing their views on this question in a public forum, economists would cast doubt on their legitimate scientific authority. Moreover, if they discussed the tax in a public arena, it would be necessary to consider the possibility that the corn tax might be a first step taken to introduce a general policy of imperial preference. However, the cabinet had not yet adopted a position on this larger question. 'For a professor of economics to indulge in political prophecy and gravely to indict the Government upon the grounds that it intends to do what Mr. Balfour [the Prime Minister] implied very clearly it did not intend to do, would turn him at once into a partisan and ruin that reputation for impartiality upon which his influence in large part rests' (ibid.)

Pigou amended his article with a postscript after the Chancellor of the Exchequer gave a speech that clarified the government's preference for imperial tariffs. Writing that when the Chancellor delivered this speech, 'it may reasonably be held that the silence of academic economists has ceased to be justifiable upon the grounds that I have argued above', Pigou clarified his own position that in supporting a system of tariff reform and imperial preference the government had suspended the norm of economic value neutrality by creating a crisis that required academic economists to become public intellectuals (ibid.).

For most of his career, Pigou was prepared to suspend his academic research and enter the arena of partisanship if he was convinced that the integrity and viability of British institutions were at stake. In his non-specialist articles, books, pamphlets, and many letters to *The Times* on tariff reform, war finance, and massive unemployment, he became an economist as public intellectual. However, it was the controversy over the British return to the gold standard following World War I that illuminates most fully his conception of the responsibilities of economists and the limitations they should respect in entering the sphere of policy.

The return to gold

The setting

Before World War I, the British currency consisted of gold coins and Bank of England notes, largely convertible to gold at a parity rate of \$4.86. On entering the war, the government did not abandon the gold standard but pegged the sterling at a parity rate of \$4.76, some 2 per cent below its long held sacrosanct pre-war rate. With a ban on melting gold and sovereigns that were out of circulation, the Treasury was allowed to issue as legal tender a new and primarily inconvertible paper money called currency notes. The government funded its wartime expenditures through taxes, loans, and credit from the Bank of England based on promissory notes. Credit and currency policy, however, were linked (Hawtrey 1922, 292). As the government paid workers and contractors through central bank credit, balances in commercial bank accounts swelled, leading to more loans and higher prices. The Bank Act of 1844 had authorized but strictly limited fiduciary note issues. No limit was set on currency note issue.[13] Without the so-called adjustment mechanism of the gold standard, British and world prices could not be coordinated. Because of the threat posed by German submarines, higher prices did not result in gold exports. The peg stabilized the nominal exchange rate. Nevertheless, it was obvious that the sterling had depreciated, although it was difficult to estimate the extent (HMSO 1918, 4–5).

In January 1918, the Treasury and the Ministry of Reconstruction formed the Committee on Currency and Foreign Exchanges after the War under the Chairmanship of Lord Walter Cunliffe, then Governor of Bank of England. Committee members were executives in banking and finance, Treasury officials, central bank governors, and Pigou, the sole academic. Their remit included the charge to consider 'the various problems which will arise in connection with currency and foreign exchanges during the period of reconstruction and report upon the steps required to bring about the restoration of normal conditions in due course' (ibid., 2). On 15 August 1918, they released an interim report, concluding: 'nothing can contribute more to a speedy recovery from the effects of the war, and to the rehabilitation of the foreign exchanges, than the re-establishment of the currency upon a sound basis' (ibid., 3). In order to achieve this objective, the Committee recommended that the government begin by returning to fiscal discipline: terminating seemingly endless borrowing and credit expansion and repaying its debt, a challenging undertaking in view of the extreme pressure to fund post-war reconstruction. Fiscal responsibility depended on strictly limiting the fiduciary note issue. However, these limits could not be specified with precision due to various contingencies, including uncertainty over post-war prices. In consequence, the Committee recommended that the Treasury gradually reduce currency notes in circulation to a level consistent with £150 million in gold reserves, the estimate sufficient to maintain stable exchange rates on the gold standard. This level would be maintained for one year, at which time remaining currency notes would be replaced with bank notes (ibid., 8–10; Pigou 1919d).

In March 1919, the government ended its currency peg. Between 1915–16 and 1918–19, the peg had been sustained by loans at a cost of more than $2 billion (Moggridge 1969, 12). Some ten days after the currency peg was suspended, the gold standard was abandoned and the sterling floated. To prevent a gold flight, gold exports were banned until the end of 1925. These measures did not change the position of the

Committee, which issued its final report on 3 December 1919. It held that an inconvertible currency spelled disaster: interminable issues of currency, inflation, and depreciation in the foreign exchange markets. Because the economy was in the final stage of demobilization, it was time to reduce the volume of currency notes in circulation. The actual volume of fiduciary notes circulated in one year became the maximum legal limit for the following year. The Committee reiterated its view of the importance of restoring 'the pre-war methods of controlling the currency and credit system of the country for the purpose of re-establishing at an early date a free market for gold in London' (HMSO 1919b, 3). There was broad consensus amongst committee members and expert witnesses that a return to gold was the best policy for the country, to be achieved as expeditiously as possible. The Committee report made the tacit assumption that on the occasion of the return, the country would re-establish the pre-war parity rate (hereafter, par).

The return to gold proved to be a hazardous policy. A period of demobilization and planning for post-war exigencies was followed by a vigorous one-year boom that peaked in April 1920. Several factors, including elimination of wartime controls and deficit financing that increased liquidity in the banking system, created high rates of inflation – 10.1 per cent in 1919 and 15.4 per cent in 1920 (Historical UK Inflation and Price Conversion). The pound depreciated, reaching its lowest level of $3.20 in February 1920 (Dimsdale 1981, 308). Inflationary expectations and uncertainty over whether the government could continue to raise funds through short-term securities compelled the Bank of England to increase its discount rate to 7 per cent in April 1920. This rate was maintained through the first year of the Great Slump – the worst the country had experienced – even though unemployment had risen by some 10 per cent (Social Democracy for the 21st Century n.d.).[14] Thereafter, the rate was gradually lowered to 3 per cent. Beginning in 1921, severe deflation – 8.6 per cent in 1921 and 14 per cent in 1922 – reduced British prices relative to American prices (Historical UK Inflation and Price Conversion n.d.; Historical Inflation Rates: 1914–2013 n.d.). While the economy suffered from the slump, the pound gradually recovered some of its lost value. However, it seemed politically unwise to return to gold. Elevating a severely depreciated currency would require steep increases in interest rates and further reductions in prices. Wage reductions would follow, aggravating labour strife dramatically.

In July 1923, some six months after the slump ended, the Bank of England increased its discount rate from 3 per cent to 4 per cent, taking a serious step toward restoring the gold standard. The Federal Reserve

Bank of New York complemented the move the year after by reducing its rate to 3 per cent, creating a differential rate of 1 per cent in favour of London (Dimsdale 1981, 311). The increase in the value of the sterling encouraged policymakers to believe that a return to gold was possible in the near future. Accordingly, the Treasury Minute of 10 June 1924 appointed the Committee on the Currency and Bank of England Note Issue to 'consider whether the time had come to amalgamate the Treasury note issue with the Bank of England note issue, and, if so, on what terms and conditions the amalgamation should be carried out' (HMSO 1925b, 372). The Committee was composed of five members. Again, with the exception of Pigou, they represented the Treasury, banking and finance, and the Exchequer. Austen Chamberlain, Joseph Chamberlain's son, chaired the Committee until he was appointed Foreign Secretary, after which Lord John Bradbury assumed chairmanship.[15] The Committee held nine meetings in June, July, and September 1924 and heard 13 witnesses – including Sir Montague Norman, Governor of the Bank of England; Reginald McKenna, Chairman of the Midland Bank; Sir Robert Horne, former Chancellor of the Exchequer; Cannan; Sir George Paish, advisor to Lloyd George; Maynard Keynes; and representatives from the clearing banks, the Association of British Chambers of Commerce, and the Federation of British Industries (ibid., 372). As the Committee worked on a draft of its report, the Labour government that had appointed it was defeated in the general election of October 1924.

The Chamberlain–Bradbury Committee began its work with the Cunliffe Committee recommendation to amalgamate the Bank–Treasury paper currencies following a return to the gold standard. Thus consideration of notes amalgamation called for a decision on whether and when to restore the gold standard. Expiration of the gold exports embargo at the end of 1925 also made a decision on the return imperative. As committee members understood their brief, they were expected to consider three options: (1) returning to the gold standard at par; (2) returning to gold at a new, devalued parity; or (3) recommending a currency system that was independent of gold. They declared that devaluation 'was never in our opinion, a policy which the United Kingdom could have adopted' but offered no explanation for this position (ibid., 373). However, suppose the Committee had regarded devaluation as politically possible in September 1924, when the exchange rate against the dollar – the only currency the Committee apparently considered – was 10–12 per cent below pre-war parity. This possibility had become a dead issue by January 1925, when the difference between the current rate and par was less than 2 per cent. A return to par would have required minor adjustments – 'inconveniences', a euphemism for deflation, unemployment, and labour unrest.[16] An alternative currency system was ruled out as impracticable at the time. Hence the conclusion of the Committee that there was no acceptable alternative to a return to pre-war parity: a view 'supported by the overwhelming majority of opinion, both financial and industrial, represented in evidence before us' (ibid., 373).[17] Thus the only serious question concerned the mechanics and timing of the return to gold.

The report of the Committee was drafted by its secretary and revised by Pigou, following which other members strengthened its language (Moggridge 1969, 33–4). It took into account the post-war international malaise in trade, the fact that Britain could not collect war debts from its economically weaker European allies, and the country's need to create a sinking fund to settle its own war debt. However, the Committee was optimistic about the ability of the country to restore and maintain a free gold market at par if it made the necessary domestic price and wage adjustments and restricted its foreign investments to match its export surplus (HMSO 1925b, 373–4). In September 1924, the difference between the actual exchange rate and pre-war parity was large enough to tip the balance of cost-benefit calculations in favour of a 'waiting policy in the hope that the disparity would disappear through a rise in American prices (of the probability of which there appeared to be indications)'. At that time, a return to par would have required a contractionary credit policy to slash domestic prices. The Committee entertained hopes that essentially the same result could be achieved 'within a very few months' by a policy that would maintain stable domestic prices against the anticipated rise in American prices (ibid., 375). In October 1924, the Committee submitted its recommendation to the governor of the Bank of England: the country should curtail foreign lending and maintain the sterling at its current value, re-evaluating the situation within a year (Moggridge 1969, 34).

Brian Reddaway has speculated that if the Labour government had not been defeated in the general election of autumn 1924, the Committee would have reassessed the situation one year later, finding the pound weak and recommending further delays. Reddaway's counterfactuals were mooted by the election of a Conservative government, which encouraged the perception that a return to gold was imminent. The sterling appreciated to \$4.79 at the beginning of 1925, when the Committee heard evidence from Governor Norman. He reported on his discussions with the governor of the Federal Reserve Bank of New York, and an American line of credit that would support the return. The economic adjustments required for pre-war parity would not be significantly different from those needed to maintain the current exchange rate of $4.79. The Committee recommended an immediate return to gold and amalgamation of the two paper currencies in a not too remote future – they were in fact amalgamated in 1928. On 28 April 1925, Winston Churchill, the new Chancellor, announced the return in his budget speech (Reddaway 1970, 16–21).

The decision to reintroduce the gold standard has been analysed at length and lies beyond the scope of this book (see Moggridge 1969, 1972; Dimsdale 1981; Eichengreen 1992). With a few exceptions (e.g. Moggridge 1969), the decision has been assessed from the point of view of costs of the return: deflation, labour strife, unemployment, and damage to the competitiveness of British exports (Keynes 1925; Stamp 1925; Barkai 1993). Pigou's views have been ignored, misconceived, or otherwise misunderstood.

In 1931, the Macmillan Committee on Finance and Industry examined the predicament of British export industries. It maintained that the difficulties encountered in this area were, in the main, a consequence of two factors: the rigidity of domestic costs in the face of deflation that followed the 1925 return to par and the American stock market crash of 1929 (Stamp 1931, 426). In his evidence before the Committee given on 28 May 1930, Pigou was asked to explain his position. He was 'not particularly inclined' to apologize. 'It seems to me', he observed, 'the argument is put rather unfairly against the return to gold' (HMSO 1931, 54). Here, as in his writings prior to April 1925, he constructed his argument by weighing the costs of the return to par with the costs that would ensue if the country maintained the status quo. In what follows, we examine Pigou's thinking on this matter, which was reflected in committee reports, summarized in a memorandum for the League of Nations International Financial Conference in Brussels in September–October 1920, given in evidence before various committees, and published in magazines, newspapers, and books for the general reader between 1918 and 1930. We offer an analysis of his views, exploring his reasoning and its basis.[18]

Costs: maintaining the status quo

The wartime currency peg weakened the tight connection between currency and gold. The post-war currency float severed it altogether. The resulting inconvertible currency system lacked the adjustment mechanism of the gold standard that, many including Pigou, believed automatically corrected currency, credit, trade, and price imbalances (HMSO 1918, 3–4).[19] Unlimited credit issues enabled the banking system to make funds available to the public at low interest rates. Pigou argued that low interest rates created two problems. First, they encouraged borrowing at the expense of saving, impoverishing real capital markets where savings – funded through household choices to sacrifice current consumption – were made available to borrowers. Capital markets provided the only reliable source of funds for post-war reconstruction (ibid., 6; Pigou 1920f, 9). Second, unlimited credit issues reduced British interest rates below those in other countries, leading to increased foreign lending when the economy required funds for reconstruction (HMSO 1919b, 3).

The most troubling defect of a monetary system not anchored in gold was its inability to correct the unsustainable rates of inflation it was prone to create. British policy of funding government expenses through credit and unlimited issues of notes had created historically high inflation rates. A decision to maintain an inconvertible currency system threatened to create the hyperinflationary economies that Germany and Austria experienced following the war. Inflation was dangerous because it redistributed income unfairly in three ways. First, it was an implicit income tax, a forced levy that transferred funds from the public to the government. There was a limit to this method of public finance: 'so long as notes have any value at all, a government can always raise *some* real revenue by issuing new notes, it may soon become impossible for it to raise a substantial real revenue without issuing so large a mass of them as practically to annihilate their value' (Pigou 1923b, 197). Second, inflation redistributed income from holders of debenture stocks – equities that paid fixed dividend payments – to investors who received ordinary dividends. Third, inflation eroded the purchasing power of wages and salaries, driving workers to demand cost of living adjustments and generating 'great friction' (Pigou's 1920f, 8; 1921a, 161). In the British post-war political economy, this concern was acute. In 1919–20, 4.6 million workers had been on strike, resulting in a loss of 61 million workdays. The three-month coal stoppage of April–June 1921 had raised the unemployment rate to 22–23 per cent (Pigou 1947a, 164–5, 40).

Continuous inflation could severely depreciate the currency, catastrophically eroding trust in its soundness. Currency depreciation could be very large – Pigou's examples included not just Germany and Austria but also Italy and France (Pigou 1920d, 8). Domestically, citizens would be reluctant to use the currency as a medium of exchange, diminishing production and exchange. Pigou envisioned a vicious cycle, causing higher domestic inflation and wild fluctuations in the exchanges that would damage border trade and credit transactions (Pigou 1920f, 12;

1921a, 161). For instance, uncertainty about future exchange rates would weigh heavily on merchants who purchased raw materials. If they planned to conduct transactions using currency, they faced the uncertainty that competitors could obtain the same goods at more favourable exchange rates at a later date. Purchasing materials on credit was bedevilled by its own uncertainties. The exchange rate at the time of contracting could be much lower than the rate at payoff (Pigou 1920f, 12; 1921a, 167–8). In Pigou's view, the prospect of such an economy was truly abysmal. In the worst case, which was not an unrealistic possibility, continued 'debasement' of the currency and a collapse of trust in its soundness could render it worthless, irreparably damaging international trade and causing the industrial fabric of the nation to unravel (Pigou 1921a, 161–2).

Following Pigou's logic, therefore, currency depreciation could create an immanent, self-perpetuating dynamic that would continue to operate even after the government decided to adopt more responsible instruments of public finance. National solvency could be threatened if the government that issued the currency were deemed untrustworthy (HMSO 1918, 2; Pigou 1921a, 163). Under these circumstances, the ability of the state to raise funds through loans would be gravely compromised. The permanent danger was floating, or short-term, debt. If holders of Treasury bills refused to renew them at maturity, the government would confront a dilemma: significantly higher rates on securities or creation of further credit (Pigou 1920f, 9).

Costs: the return to gold at the pre-war parity rate

The Chamberlain–Bradbury Committee members, including Pigou, have been criticized for discounting costs of the return to gold. In the case of Pigou, this criticism misses its mark. He regarded it as evident that overvaluation of the sterling would require painful adjustments. A return to par would require reductions in British relative prices. Although such a reduction could be achieved by increasing British productivity relative to American productivity, this scenario was extremely improbable. The war had created much higher levels of financial and real dislocation in the British economy. Alternatively, American prices could increase relative to British prices, requiring no further action by London. Obviously, this possibility depended on American monetary policy as well as contingencies that neither country could control. Stable or falling American prices would require deflation to restore pre-war relative prices. Deflation would favour neither industry, which would be compelled to accept lower profit margins, nor workers, who would be asked to reduce nominal wages. Moreover, the state would be forced to service its war debt using a more expensive currency. This prospect would be unfair as well as fiscally damaging, necessitating either budget deficits or extremely high tax rates (Pigou 1921a, 176–7).

The cost of the transition to the gold standard also depended on the monetary policy of the British government. In a letter of 12 February 1920 to the editor of *The Times*, Pigou lamented the depreciation of the exchange rate – at the time $3.30 – which he thought was caused by a policy of expanded credit and low bank rates. Pointing out the broad national consensus on the merits of returning to par, he questioned an easy monetary policy that, at the height of the post-war boom, had reduced the bank rate below rates prevailing in the much stronger economies of Japan and the United States. Failure to increase the bank rate would cause higher prices, trade imbalances, and foreign lending – a dynamic that had no foreseeable end. Although a moderate rise in the rate to 8 per cent would damage wage and salary earners, businesses, and the highly indebted government, it would not create financial havoc. However, costs would soar if interest rates did not increase, requiring much more drastic subsequent hikes in the bank rate (Pigou 1920d). In another letter, of 1 May 1920, to *The Times*, Pigou reiterated the need to elevate the bank rate, even though the slump had already begun. If the ban on gold exports were lifted, low interest rates would lead to a gold flight. Massive gold exports could be forestalled only by astronomical bank rates. The result: further financial crises that would produce unforeseeable consequences. Failure to act, Pigou argued, would increase the risk of shattering the creditworthiness of the country and its financial standing (Pigou 1920e).

In his publications, Pigou specified conditions necessary to minimize costs of the return to par. Responsible credit and currency policies would be required to end high rates of inflation, reducing domestic and international fears of further inflation and depreciation (Pigou 1920f, 12). In his view, restoration of the gold standard would succeed only if the gap between par and the exchange rate at the time of the return was below 20 per cent. It followed that British–American relative prices could not deviate significantly from their pre-war levels. Moreover: 'industry and the general export trade of the country must be already so far restored, and the loans we are making to foreigners so far stopped, that the gap between immediate obligations to make payments and immediate claims to obtain payment elsewhere is reduced to more manageable dimensions' (Pigou 1920g, 173).

In September 1924, Pigou was working on a draft of the Chamberlain–Bradbury Committee report. Costs of not returning to gold at this point seemed decisively higher than costs of returning. Relative prices had moved in favour of Britain (Dimsdale 1981, 308). The country had experienced deflation for every year of the period 1921–4. With the exception of 1922, American prices had stagnated or increased over the same period.[20] The British financial position was still weak due to war debts European allies owed Britain as well as corresponding payments Britain owed the United States. However, the British current account balance offered grounds for optimism. Although some industries had lost their international prominence, considered collectively, export, insurance, shipping, and foreign investment revenues generated adequate funds to support British debt obligations and imports (HMSO 1925b, 373–4). The difference between the actual exchange rate and par was 10–12 per cent. Although the gap was below the 20 per cent Pigou had specified as the maximum limit in 1920, it was still significant enough to justify a 'waiting policy in the hope that the disparity would disappear through a rise in American prices (of the probability of which there appeared to be indications)'. Transient but severe deflation could impose high economic and social costs on the economy. It was prudent to wait a few more months to determine whether the gap would disappear as the result of an expected rise in American prices. It 'could not be regarded as a matter of such extreme urgency as to justify a credit policy calculated to bring down domestic prices if the same practical results could reasonably be expected to be attained within a very few months by a policy designed merely to prevent them from rising concurrently with a rise elsewhere' (ibid., 375). By January 1925, the actual–par exchange rate gap had contracted to less than 2 per cent. In addition, the country could maintain its limitations on the fiduciary note issues proposed by the Cunliffe Committee. In consequence, costs of the return to gold seemed much lower than costs of not returning.

Devaluation and alternative currency systems

In his testimony before the Macmillan Committee, Pigou was asked to explain why the Chamberlain–Bradbury Committee had recommended a return to par. Why were other options – devaluation or a currency system not anchored in gold – not taken seriously? Keynes, a member of the Committee, posed the following pointed question to Pigou: 'Did the Terms of Reference of the Committee rule out one or the other of the alternatives?' In responding to Keynes, Pigou emphasized the impracticability of alternative options at the time. 'The real practical alternative in my view was, to go back now or later' (28/5/1930, HMSO 1931, 54). Examination of Pigou's writings shows that his thinking on this matter was grounded in post-war economic and institutional constraints on both international and domestic sectors.

In autumn 1920 (24 September–8 October), the newly established League of Nations organized an international financial conference in Brussels. Thirty-nine countries answered the call to assess the post-war international financial disarray and devise measures to restore economic stability. As national governments responded to questionnaires on budget and debt, trade, money supply, and official reserves, five leading economists – Gijsbrecht Weijer Ian Bruins (Holland), Gustave Cassel (Sweden), Charles Gide (France), Maffeo Pantaleoni (Italy), and Pigou – prepared memoranda on credit, currency, and exchange rate fluctuations.[21] In addition to individual memoranda, the five experts issued a joint statement, emphasizing the need to end runaway inflation, stabilize exchange rates, revive international trade, and develop a policy for allocating international credit (Decorzant 2009). There was remarkable consensus amongst the conference delegates as well. They urged governments to return to the pre-war principles that had guided their domestic policies, balance their budgets, end inflation, and restore currency trustworthiness (Pauly 1996, 8). Although they recommended that each country determine its own rate of recovery in re-establishing a sound currency, return to a gold-based standard was emphasized as the foundation for a world currency policy. The international economy required a common standard for determining exchange rates. Gold was the only generally acknowledged standard (Pauly 1996, 8; Decorzant 2009).

The question of establishing a stable basis for determining exchange rates was also discussed at the Genoa Conference, held between 10 April 1922 and 19 May 1922. Although the Conference failed to achieve its political agenda of promoting European reconstruction and restoring economic relations with the Soviets (Fink 1986, 41), it passed a resolution on an international convention for a gold-exchange currency regime. The report of the Financial Commission of the Conference – drafted by Hawtrey, Keynes, and Sir Robert Horne (Chancellor of the Exchequer) – recommended what can fairly be described as a precursor of the Bretton Woods system. Most world currencies would maintain stable exchange rates relative to a few major currencies such as the US dollar or the British pound. Only hard currencies would maintain direct convertibility to gold. This proposal begged the question of the exact magnitude of exchange rates. Should countries return to gold at pre-war parity rates, or should they devalue? The proposed solution to this problem was arbitrary. It was conceivable that currencies that had lost less than 50 per cent of their pre-war value could still return to pre-war parity. Currencies with a 60 to 90 per cent loss of value could return to a rate that fell between their current and pre-war exchange rates. Entirely new rates consistent with current prices were recommended for hyperinflationary economies (Eichengreen 1992, 157–63). As Hawtrey later explained, effective operation of a gold-exchange system required cooperation of independent central banks willing to manage their credit and currency policies on a regular basis (Hawtrey 1922, 292). In a world where many countries had not yet established central banks – Chile, Argentina, Mexico, Canada, and Australia were examples – this was a formidable requirement. In sum, the international community was not yet prepared to adopt either a modified version of the gold standard or a system completely divorced from it.

In his memorandum written for the League of Nations and in other writings as well, Pigou considered three alternative international systems – essentially, three possible options for currency reform. The first was to follow the current course, provided that governments returned to fiscal responsibility in financing their expenditures and taming runaway inflation. Maintaining the status quo would require one of the following two policies: deregulating gold markets and facing a drain on gold reserves, which would lead to an inconvertible currency, or a permanent ban on the export of gold. In either case, the result would be the same: a permanent breach between currency and prices on the one hand, and gold, on the other. Broad fluctuations in prices and exchange rates would ensue, with concomitant effects for trade and industry (Pigou 1920f, 10). In his testimony before the Macmillan Committee, Pigou warned advocates of this course of action that their position was naïve and unrealistic. A currency policy based on the status quo would probably have further depreciated the pound and increased the price of imported staples. A higher cost of living would also have increased wages in industries that used sliding scales. In other industries, British workers would have fought for wage increases. In short, a failure to return to gold would have ended in unstable prices and exchange rates (28/5/30, HMSO 1931, 54–5).

A second, 'theoretically attractive' currency regime was to abandon the gold standard altogether (Pigou 1920f, 11). In principle, such a system would not necessarily create volatile exchange rates. As Pigou explained in 1921, a 'whole world of nations each with separate inconvertible currencies, could, if their governments were sufficiently firm and able, maintain a system of approximately stable foreign exchanges'.

In fact, however, this possibility was illusory: 'in the present state of the world, governments are not strong enough, nor yet sufficiently trusted, for a system of this kind to be likely to work. Something less directly dependent upon the conduct of politicians is needed' (Pigou 1921a, 168).

Another impracticable monetary regime would tolerate foreign exchange volatility but attempt to establish domestic price stability (Pigou 1920f, 11). This solution, inspired by Irving Fisher, would require governments to maintain purchasing power stability by buying and selling currency (Pigou 1912, 437; 1924a, 119–20). The British banking system had shown that it was capable of stabilizing prices, at least temporarily. It created more money during holiday or tax seasons when the demand for money rose, assuming that the increased supply would soon return to its coffers (Pigou 1912, 435). There was no reason why control of price variations could not be placed in the hands of 'intelligent forces', even on a permanent basis. Under a Fisherian currency system, where token gold coins or paper money of one country would always have a fixed purchasing power, a board of officials would buy and sell that currency with the objective of maintaining a fixed purchasing power for gold. In this gold-exchange system, all other currencies could be anchored to the first currency. Because all economies would benefit from the resulting price stability, it would be preferable to establish and finance the official board through an international body. Pigou believed that 'a very considerable net benefit' would result (ibid, 437–8).

However, operationalization of Fisher's scheme faced impressive obstacles. In testimony before the Committee on the National Debt in March 1924, Pigou argued that an unconventional approach to settling the war debt, such as a capital levy, would fail unless there were 'general assent' on its practicability. Solidification of current opinion against the policy made it very difficult to implement (HMSO 1927, 443). For the same reason, a broad consensus was necessary to operate a non-gold currency standard. Pigou reminded the Macmillan Committee that before Britain decided to return to gold, there was an international consensus that the gold standard was the only viable currency regime. In an oblique reference to the results of the Brussels and Genoa conferences, he pointed out that, before 1925, 'it had been the decided policy of all governments to go back to gold and, as a matter of practice, it was felt that nothing else could be done' (ibid., 54). This general sentiment was confirmed by events. In the British Empire, Australia, New Zealand, and South Africa returned to gold in 1925, Canada in 1926, and India in 1927. In 1923–7, many European countries – Austria, Belgium, Denmark, France, Germany, Holland, and Switzerland – made the same decision. Outside Europe, Japan reintroduced gold in 1927 (Eichengreen 1992, 188). Pigou told the Macmillan Committee that he did not think 'you can work a non-gold currency unless it is generally agreed, and at that time [1925] it seemed to me it was quite impossible' (HMSO 1931, 54). The year before Britain returned to the gold standard, Pigou explained why a Fisherian system would not work:

> In practical affairs, to introduce large changes the meaning of which most people cannot understand is dangerous. So far as the United Kingdom is concerned, until the gold standard has been re-established, more elaborate improvements in our monetary system are not practical politics. When it has been re-established public opinion is unlikely, for some time, to sanction any formal departure from it. If this is so, both the Fisher plan and any thorough-going attempts at stabilization by discount policy are ruled out of court. (Pigou 1924a, 121–2)

In light of the above constraints, Pigou concluded that restoring the gold standard was the only realistic policy (Pigou 1921a, 168). A return to gold did not necessarily signify a return to pre-war parity. However, he argued that devaluation was 'just as impracticable as the other [non-convertible currency], perhaps even more so' (HMSO 1931, 54). A lower parity could create more inflation, which would be extremely unpopular in the post-inflationary economy of the time (ibid.). It would, for example, impose hardship on lenders who had extended loans when the currency was stronger. For this reason, the government might be expected to increase the nominal amount of loans in order to reduce burdens on lenders. However, the frequent exchange of securities on open markets would make such compensation schemes excessively complicated (Pigou 1920f, 12). For Britain, the most devastating impact of devaluation would be a loss of trust in the government that introduced the policy and a decline in the international prestige of London as a centre of finance (Eichengreen 1992, 163). A government that devalued the currency once could perhaps be expected to do so repeatedly. As Eichengreen (1992, 163) put it: 'Credibility and 4.86 dollars were not just linked. They were regarded as synonymous.' This was Pigou's position. Deliberate devaluation would 'reduce general confidence in the financial probity of the devaluating country' (Pigou 1921a, 174; see also Pigou 1920f, 11; and Pigou in HMSO 1931, 54).

The consequences of this loss of confidence and Britain's capacity to fight another major war were intimately connected. In the years following World War I, Pigou regarded the European peace as fragile and was preoccupied with the likelihood of another war. In 1924, he predicted that 'there might quite well be a war in 20 years' (HMSO 1927, 444). Breakthroughs in nuclear physics suggested the utter devastation of another general war. The following observations were written in 1926, 12 years before Otto Hahn and Fritz Strassmann discovered nuclear fission.

> It would be rash to set a limit to what may be possible here. No man, for example, can be certain that there will not some day be discovered a means of releasing and controlling the stupendous energies that are stored inside the atom. Should this be done mankind will become possessed of powers utterly beyond the reach of our present imaginings; powers which they may, indeed, devote in war to mutual annihilation, but which there is at least a hope may serve a better end. (Pigou in Pigou and Robertson 1931c, 25)

Pigou's experience of the Great War had taught him that a total war, which mobilized all the institutions of a nation, could not be funded exclusively through taxation. Its burdens would cause public animus against the war, the reason, he claimed, why the British did not attempt to fund World War I by means of taxes. Like the 1914–18 war, a subsequent European conflagration could be funded only through prodigious borrowing (HMSO 1927, 38). The national credit – in Pigou's understanding, the terms under which a government would be able to borrow – depended on public confidence 'in the ability and willingness of the Government to honour any obligations that it may incur' (ibid., 39). Devaluation, 'manipulation of the currency' (ibid., 42), would shatter this confidence: the public would be convinced that the government did not intend to honour its commitments or secure the sanctity of contracts (ibid., 57).

Economic analysis and economic policy: the dynamics of normality and crisis

Several observations. Pigou's position on the problems surrounding the return to gold was based primarily on utilitarian reasoning: weighing the costs of returning to gold against the costs of other policies, primarily maintaining the status quo. He seems to have disposed of other options – for example, a non-gold system, his personal preference (Pigou

1912, 437; HMSO 1931, 54), or a devalued currency based on gold – in some measure because he was committed to a theory of economic policy quite different from that taken by a most active member of the Cambridge economics faculty, Keynes. Pigou believed that novel policies, unfamiliar to the political class and the public because they represented a departure from convention or were not legitimated by tradition, would not succeed. Stated in the academic discourse of our time, a policy that represented a paradigm shift would fail unless measures were taken to embed it in the public consciousness, establishing a consensus in its support and developing an effective framework for its implementation. Unlike Keynes, Pigou was profoundly suspicious of intellectually clever policy innovations. In this respect, it was Pigou rather than Keynes who was the authentic Burkean political economist, reserving a more modest role for economists in the social order than Keynes was prepared to accept. His differences from Keynes on this point are clear in the cover letter to the draft of the report he sent to the secretary of the Chamberlain–Bradbury Committee in October 1924. On the question of the return to gold, he marginally favoured what he called a 'wait and see' policy. However, he added the following caveat: 'It would be very inappropriate for me as an academic person to *press* for heroism; but if the rest of the Committee had been in favour of it, I doubt if I should have opposed' (quoted in Moggridge 1969, 34). Pigou seems to have been confident of his powers in policy analysis. However, he had more respect for the policy judgements of officials and business executives – the bourgeoisie in an era in which this term still had a clear sense, the British upper class of power and wealth – than many other economists, then and now, would allow.

In Pigou's early philosophy of economic science articulated in his inaugural lecture, economists were handmaidens who sat at the feet of the moral philosopher and took their lead from his pronouncements. Pigou's actual scientific habitus under conditions of normality was quite different. He was the scientific expert who whispered into the ear of the prince, his judgements based solely on empirical and logical analysis. When the prince decided, the course of history changed, altering the scientific agenda of the economist. Thus the Pigouvian economist reconfigured, on a much more modest plane, the role of the great chancellors of the Renaissance such as Machiavelli and Francis Bacon, whose advice to the prince was based on intuition and practical wisdom schooled by decades of exercising power. In an economic crisis, the task of the Pigouvian economist changed dramatically. Collaboration with the prince and the political class in crafting a policy to resolve it was called for. Once normality was restored, he could return to his rooms and his own research. In a crisis, however, he was compelled to contend with the paradoxes of unintended consequences and the indeterminacy of the relationship between analysis and policy. In the end, he was forced, as Max Weber put it, to 'contract with diabolical powers', for in the sphere of policy 'it is *not* true that good can follow only from good and evil only from evil' (Weber 1958, 123).

Pigou made policy on the question of the return to gold, believing that doubts about the soundness of the sterling could become an existential threat to the nation. Suppose that the members of the Chamberlain–Bradbury Committee had been unable to reach agreement. Or suppose that their report had been rejected by the government and its own officials had proved incapable of devising alternative solutions. In that event, crisis would become normality with the result that, empirically at least, the distinction would break down. These counterfactual conditions were theoretically possible and not utterly implausible on historical grounds, as the various crises and eventual collapse of the Weimar Republic suggest. However, they were not possibilities that Pigou considered. Although this observation is somewhat speculative, the reason seems to lie in his faith in the essential solidity and, at least in the long run, effective performance of British institutions as well as the character, albeit flawed, of the political-economic class these institutions formed. In a crisis, the scientific ethic of the economist moved him to lay aside his research and turn to policy. The scientific expertise and judgement of the economist ensured that, once he was engaged, a resolution could be expected. Or so Pigou supposed, a child of the late Victorian and Edwardian progressive ethos and its faith in science.

Notes

1. A professor at Harvard University, Mankiw served as chairman of the US Council of Economic advisors (2003–5) during the presidency of George W. Bush. For the 'manifesto' of the Pigou Club, see Mankiw (2006).
2. This chapter is based in part on Aslanbeigui and Oakes 2012.
3. Some three months before taking the Moral Sciences Tripos at Cambridge in 1900, Pigou applied for an appointment to the lecturing staff of the Cambridge University Local Lectures, citing as experience his presidency of the Cambridge Union and his occasional lectures to workingmen. The Local Lectures offered instruction to the working classes in various parts of Britain (Welch 1973, 43). With letters of recommendation from Browning and Marshall, Pigou proposed two sets of lectures. The first would survey general trends in English history – including the integration of the public and the state; advances in freedom of religion; the state, trade, and industry; and

indications of resistance to the doctrine of laissez-faire. The second set would cover the history and causes of the growth of towns in Britain. Following Marshall's advice, he modified the latter topic to include the causes and consequences of urbanization (see letters from Marshall, 23/2/1900, Browning, 28/2/1900, and Pigou, circa February 1900, to R.D. Roberts, Board of Extra Mural Studies, CUA/BEMS/55/24). Although it is not clear whether Pigou actually delivered these lectures, the damaging consequences of urbanization in Britain during the nineteenth century became leitmotifs of his work: overcrowded homes and neighbourhoods, unhealthy working conditions and punishing working hours, inadequate sanitation, elimination of urban green spaces due to inadequately regulated building construction, pollution of air and water, unemployment, abject poverty, and extreme inequality.

4. On Pigou's formative years, see Hongo (2013) and Takami (2014b).
5. On Pigou's commitment to a case-by-case method of analysis, see Aslanbeigui and Medema (1998) and Medema (2009).
6. When the House of Lords – overwhelmingly dominated by landowners – vetoed Lloyd George's budget, Prime Minister Herbert Asquith dissolved Parliament and called a general election in 1910, precipitating a constitutional crisis over the distribution of legislative authority between the Commons and the Lords. The Liberals succeeded in forming a new government and, with the cooperation of the new king, George V, severely restricted the power of the Lords to veto legislation originating in the Commons.
7. For Pigou's views on these and related issues, see Pigou (1913e; 1923b [1913e], 92–102). On Pigou and the minimum wage, see Flatau (1997) and Takami (2009).
8. As an academic economist, Pigou did not regard himself competent to make accurate estimates of this cost. However, reliance on expertise was not a satisfactory alternative, since experts could not arrive at a consensus on how the estimates should be calculated. In considering American and Australian experiments in valuation, he supposed that the first round of valuations would be very costly and then fall dramatically.
9. A capital levy was endorsed by the Trades Union Congress in a resolution of September 1916 and received the support of the Labour Party. On the debate over the levy in the government, Parliament, and the Conservative and Labour parties between 1916 and 1919 and the grounds on which the measure was finally rejected, see Daunton (1996, 90–6). For Pigou's views concerning financing the war, see Barber (1991).
10. Stamp's contributions to the debate, made in a series of lectures and magazine articles in 1923–4, were reproduced in *Studies in Current Problems in Finance and Government* (Stamp 1924, 227–70).
11. Pigou eliminated Part IV from subsequent editions, since much of it was duplicated in his *Political Economy of War* (1921a; see Pigou 1924b, v). On 29 September 1925, shortly after giving evidence to the Colwyn Commission, he wrote Macmillan that he was 'revising the *Political Economy of War* for a second edition' (Macmillan Archive). However, he abandoned this project in favour of the more comprehensive work, *A Study in Public Finance* (1928c). As he wrote Macmillan, this book would complement his *Economics of Welfare* and *Industrial Fluctuations* (circa 1 September 1927, Macmillan Archive). Macmillan published a revised edition of the *Political Economy of War* in

1941, when Pigou's fears of a second general European war had been realized (Pigou 1941d).

12. See HMSO 1920, 1–3. For Pigou's summary of the findings of the Commission, see Pigou (1920b,h).
13. By December 1920, currency notes outstripped Bank notes by a factor of 3.22 (Federal Reserve Bank of St. Louis 1928).
14. On calculating the British unemployment rate, see Feinstein (1972) and Garside (1990).
15. On Pigou's membership of the Chamberlain–Bradbury Committee, see McLure (2014a, b).
16. Historians have criticized the Committee for employing this locution. However, its use in the present context does not seem to have been extraordinary. In notes Keynes wrote after an interview on 4 February 1920 with Austen Chamberlain, he referred to the effects of high inflation as 'social unrest and other inconvenient consequences which that will bring with it' (quoted in Howson 1973, 458).
17. Keynes and McKenna were against a British return to gold at that time. For theoretical positions of Pigou and Keynes on the return to gold, see Milgate (1983).
18. In his publications on the return to gold, Pigou reiterated the positions held by the committees he served on. In the absence of evidence to the contrary, it is reasonable to suppose that their official reports represented his views.
19. Garside argues that the success of the gold standard before World War I was due to 'a number of fortuitous circumstances unlikely to operate again as favourably as they had done in the past' (Garside 1990, 116).
20. See Historical UK Inflation and Price Conversion, n.d., and Historical Inflation Rates: 1914–2013, n.d.
21. Walter Layton, the first Director of the Economic and Financial Section of the League Secretariat, chose the economists based on their prominence. But he also hoped to improve the prospects for acceptance of their proposals by a selection along the lines of diversity in nationality and ideological disposition (Decorzant, 2009).

5
The Cost Controversies

Preliminaries

In the first three decades of the twentieth century the analysis of the laws of returns developed by Marshall and Pigou enkindled several controversies. Conceived most narrowly, they revolved around the functional relationship between costs and output and its implications for economic welfare.[1] Regarded more broadly, they entailed important consequences for Cambridge economics. At the time of his retirement, Marshall's *Principles* endowed his successors with several alternative profiles for the future of economics. In light of the unrivalled pre-eminence of this book – Joan Robinson called it the 'bible' of Cambridge economics in the 1920s (Robinson 1951, vii) – how Cambridge economics developed would depend on how his disciples interpreted it. On this point, the conception of time in Marshall's thought was critical. Should his followers adopt the framework of comparative statics elaborated in the *Principles*? Or should they attempt to develop an evolutionary theory, using as inspiration the organic metaphors with which Marshall embellished some of his arguments? For a number of reasons, Pigou took the former course, which rested on the concept he saw as the cornerstone of economics: the national dividend. In the ensuing, we consider the cost controversies of these years in so far as they bear upon Pigou's interventions.

In 1922, Clapham traced the genesis of the cost controversies to conversations amongst economists at Cambridge. For years, he complained, his colleagues had exercised undue restraint in abstaining from published debate over economic issues. In some measure, this was a consequence of 'a certain very natural piety'. As a result, things 'are said in conversation which never get into print' (Clapham 1922a, 563).

This was an allusion to Marshall's reluctance, following the tariff reform controversy, to further diminish the prestige of economics by indulging in public debate and the consequent acquiescence of his disciples in honouring the master's wishes. In the same year, Pigou also seemed to endorse the idea of a hermetic oral tradition at Cambridge, writing that discussions of 'difficulties' concerning the laws of returns were some 25 years old, tracing them to the time he had studied the fourth edition of the *Principles* as an undergraduate (Pigou 1922a, 458). In an exchange of letters with Edgeworth in 1910, Marshall took exception to Pigou's revisions of his treatment. In subsequent marginalia written in his personal copies of Pigou's publications (Pigou 1910d, 1912), he made the same objection. However, these observations were not circulated. Young (1913) published an incisive critical review of *Wealth and Welfare*. But of course he was not a Cambridge economist. Clapham finally broke the silence at Cambridge in 1922 with his article 'Of Empty Economic Boxes', and Robertson followed with a critique in 1924.

In questioning fundamentals in the work of Marshall and Pigou, Clapham's article marked a turn in Cambridge economics: public airing of dissent became a legitimate and institutionalized feature of its culture. Maynard Keynes' poignant memorial essay on Marshall in 1924 was an artefact of this new era. In a biographical appreciation of Marshall, he added the critical observation that the discussion of time, which was closely linked to the treatment of the laws of returns, was the 'least complete and satisfactory' aspect of his work, the area 'where there remains most to do' (reprinted in Pigou 1925a, 43). In 1925, Sraffa published (in Italian) a seminal critique of Marshall's account of the laws of returns, attacking the foundations of the competitive theory of value. Edgeworth, Keynes' co-editor at the *EJ*, was much impressed, and on his recommendation Keynes invited Sraffa to write a version of his paper in English. Sraffa's *EJ* article of 1926 radicalized the Cambridge critique of value theory. A remarkable debate ensued that included Lionel Robbins (1928), Young (1928), and Schumpeter (1928), as well as Cambridge insiders Pigou (1927c, 1928a), Robertson (1930), Shove (1930), and Sraffa (1930a, b) – for whom a position was established at Cambridge in 1927. The debate culminated in the theory of imperfect competition, developed by Kahn (1989 [1929]) and Joan Robinson (1933). Although Pigou had done foundational work on this theory – Robinson (1979, x) called her *Economics of Imperfect Competition* 'a complete restatement of the Pigovian system with various amendments' – he devoted his energies chiefly to tightening the logical coherence of long-run value theory under competitive conditions.

A few signposts may be useful. Between the introduction of the Economics Tripos in 1903 and the late 1920s, market structures were not as highly differentiated as they later became, nor were they as rigorously defined. Most participants in the debate recognized two market structures: 'simple', 'pure', or 'free' competition – not to be confused with the contemporary concept of perfect competition – and monopoly.[2] The term 'diminishing returns' – 'decreasing returns' had not yet been defined – was used liberally, referring to falling returns either to a variable factor of production while all others remained fixed, to all variable factors except one – generally land – or to all variable factors. There were three classes of increasing returns. Internal economies depended on investment of resources, the division of labour, and managerial efficiency in individual firms. Industry-specific external economies were endogenous, a consequence of 'general development of the industry'. Expansion of industry output could result in localization of skilled labour, specialization of firms producing different types of the same product, and further division of labour in subsidiary industries – local or international (Marshall 1920, 262–4; Chapman 1905). External economies in a period called 'the very long run' were created by the dynamics of economic progress. They affected costs of production in all industries by, for example, advancing communication and transportation technologies. Tendencies to diminishing and increasing returns might affect the same industry: 'the part which nature plays in production shows a tendency to diminishing returns, the part which man plays shows a tendency to increasing returns' (Marshall 1920, 265). If the two tendencies were in balance, constant returns would follow. Thus constant returns were not a function of the technology of production. Finally, the unit of analysis was the industry, not the firm. Firms constituting an industry were so heterogeneous that they were not amenable to general economic analysis. Hence the need for a 'representative firm', a 'particular average sort of firm, at which we need to look in order to see how far the economies, *internal and external*, of production on a large scale have extended generally in the industry and in country in question' (ibid., 265).

The wayward disciple?

In identifying cases where competitive equilibria are unlikely to maximize economic welfare, Pigou generally but not invariably followed Sidgwick. Pigou's suggestion that public and private interests diverge in increasing and diminishing returns industries was a modification of

Marshall's brief remarks on exceptions to the 'Doctrine of Maximum Satisfaction'. If industries operate with increasing returns, Marshall argued, increases in production beyond the level dictated by competitive equilibrium may reduce prices considerably. A subsidy that increases production substantially might increase total satisfaction, since 'the direct expense of a bounty sufficient to call forth a greatly increased supply at a much lower price, would be much less than the consequent increase of consumers' surplus'. As a way to pay for the bounty, he suggested taxes on industries producing with diminishing returns. However, he had reservations about his own suggestion: the administrative costs of such taxes, the problem of an equitable distribution of tax and bounty benefits and costs, fraud and corruption, and distortions in the decisions made by landowners (ibid., 391).

In 1910, Pigou built on Marshall's analysis, at the same time highlighting his own argument that, given consumption and production externalities, consumers' and producers' surplus could not provide a valid assessment of the welfare impact of economic policies (Pigou 1910d). In 1903, he had used the examples of diamond rings and top hats to show that utilities are interdependent, violating the ceteris paribus conditions underpinning the analysis of consumers' surplus. In 1910, he extended his argument to producers' surplus, which did not accurately measure welfare impact if one firm's output expansion affected the efficiency or cost parameters of other producers. In place of consumers' and producers' surplus, he introduced new concepts, which remain standard tools of policy analysis: marginal private and social benefit and cost curves – although, as we will see below, he did not use precisely this terminology.

Pigou's discussion of his new tools was quite abstract and included no detailed explanations or concrete examples. On the demand side, he distinguished the private marginal demand price – the difference made to the satisfaction, measured in money, of a person who consumes an incremental unit of a product (Δx) – and the collective marginal demand price – the difference made to the satisfaction of all consumers, again measured in money, by the consumption of Δx. Diagrammatically, the vertical distance between the two curves represents consumption externalities. The collective marginal demand price curve lies below the private demand price curve if increased consumption of rare products reduces the satisfaction of other consumers. Increased consumption of fashionable goods may elevate the satisfaction of other consumers, which means that the curve of the collective marginal demand price lies above the private demand curve (ibid., 361). On the supply side, Pigou made a similar distinction: the private marginal supply price – the difference that producing Δx makes to the costs of the firm producing the increment – and the collective marginal supply price – the difference made to aggregate industry costs resulting from the production of Δx. In a diagrammatic depiction of these concepts, the vertical distance between the two curves measures incidental costs or benefits to other producers. If the production of Δx by one producer increases the expenses of other producers – for example, by raising the price of a certain raw material that they all use – the curve of private marginal supply price lies above that of the collective marginal supply price. If increased output by one producer reduces other producers' cost of production – by creating industry-specific '*external economies* of improved general organisation' – the curve of marginal supply price lies below its collective counterpart (ibid., 360).

Conventional thought of his time, Pigou believed, assumed that Marshall's producers' and consumers' surplus was maximized at the output level corresponding to the intersection of private demand and supply price curves. Pigou argued that this assumption holds true only if individual utilities and costs are mutually independent. Given consumption and production spillovers, the intersection of collective marginal demand and supply price curves determines which output maximizes total satisfaction. Depending on whether actual output is below or above ideal output, subsidies and taxes may improve on market outcomes (ibid., 365–6).

The origin of the cost controversies can be traced to an exchange of letters between Edgeworth and Marshall in summer 1910, shortly before publication of Pigou's 'Producers' and Consumers' Surplus'. In a letter of 22 August to Marshall, Edgeworth, editor of the *EJ* at the time, wrote that Marshall's 'general impressions' about Pigou's work on increasing returns were interesting and useful.[3] Although Marshall's comments are not extant, their substance can be inferred from undated marginalia on his copy of Pigou's article of 1910. Marshall complained that Pigou 'excludes short periods but treats all long periods, say 10 to 50 years, as having the same effect' (quoted in Bharadwaj 1972, 41). In the *Principles*, Marshall had distinguished two long periods. The first designated a period of 'several years' in which changes in the quality of factors of production, tastes, and technology can all be bracketed with negligible consequences for the realism of economic analysis. The second designated very long, intergenerational periods in which such changes can be bracketed only at great cost to the correspondence between theory and reality. In the latter case, Marshall warned, 'the uses of the statical method in problems relating to very long period are dangerous; care and forethought and self-restraint are needed at every step' (Marshall 1920, 315, n.1).[4] He argued that static analysis was especially defective in investigating increasing returns, to which he dedicated Appendix H. Among other considerations, he stressed the importance of the irreversibility of change under increasing returns. The 'extensive economies' generated through increased production during very long periods 'are not really lost'. In other words, a contraction of output following a long period of expansion would not return the economy to previous price levels: 'the supply price would not move back by the course by which it had come, but would take a lower course' (ibid., 666).[5]

In the preface to the fifth edition of the *Principles*, Marshall made the now famous statement that the 'Mecca of the economist lies in economic biology rather than in economic dynamics' (quoted in Guillebaud 1942, 338). In his article of 1910, Pigou assumed that his system of curves described only long-period tendencies, excluding Marshall's very long period, in which historical time could not be ignored (Pigou 1910d, 360).[6] Ten years after publication of Pigou's article and four years before Marshall's death, Marshall lamented that biological conceptions were too complex for economics, an immature discipline that had not yet developed the tools necessary for analysis of time. Nor was he sanguine about the prospects of an early resolution of this problem (Marshall 1920, xii, 667). The consequences for economics? The eighth and final edition of the *Principles*, with its proliferation of mechanistic analogies and the crucial status Marshall assigned to the static concept of equilibrium. Nevertheless, he insisted that the book was 'concerned throughout with the forces that cause movement', and its 'key-note' was 'dynamics, rather than statics' (ibid., xii–xiii).

Between 1890, when he published the first volume of the *Principles*, and 1908, when he retired from his professorship, Marshall considered the following subjects for the second volume: foreign trade; money, credit, and banking; trade and credit fluctuations; business combinations and monopolies; transportation; distribution of national income; public finance; collectivism; and aims for the future (Whitaker 1990, 195–201). In 1910, when he published the sixth edition of the *Principles*, he abandoned plans for a second volume. Notwithstanding his intentions for the promised book, he could not have covered this vast territory in a thorough and comprehensive fashion. Thus his followers were left with an abundance of potential lines of research. In his preface to the sixth edition, Marshall announced plans for two independent books: *National Industry and Trade* and *Money, Credit, and Employment*.

He also proposed a third book that would consider ‘the ideal and the practicable in social and economic structure, with some account of taxation and administration’ (Guillebaud 1942, 339). This unwritten third book provided the main themes of the Pigouvian research programme. Its ‘key-note’ was the national dividend, not economic biology. If Pigou had undertaken an investigation of secular economic change along Marshallian lines, it is improbable that he could have pursued his major objective as an economist: developing an analytical framework valuable to policymakers in improving the economic welfare of British citizens. Even if he had been inclined to seek the Mecca of economic biology, he did not possess the mathematical expertise necessary for such a project. That said, the choices he made and the course he followed lay squarely within the larger Marshallian research tradition.

In *Wealth and Welfare*, Pigou simplified the conceptual apparatus that underpinned his earlier analysis of increasing and diminishing returns industries. He abandoned the distinction between the marginal private and collective supply price. In its place, he paired an ordinary long-run industry supply curve with a long-run marginal supply price diagram. The former exhibited the private cost of producing an increment of output, Δx; the latter, which depicted ‘the aggregate expenses of the industry’, included the unintended incidental consequences of Δx for the same industry (Pigou 1912, 173). His policy analysis remained unchanged: under simple competition, the vertical distance between the two curves determines both the extent to which actual and ideal industry output diverge and the amount of tax or subsidy that may be appropriate for diminishing and increasing returns industries (ibid., 174, 178). In view of the controversies Pigou’s analysis generated, a few comments are in place.

A cursory reading of *Wealth and Welfare* might suggest that Pigou supported a tax on ‘*every* industry subject to decreasing returns *and* a bounty to *every* industry subject to increasing returns’, casting the net of economic policy ‘very widely indeed’. Interpreted in this fashion, his supposed policy proposals contrast sharply with the position of Marshall – ever mindful of the costs of state intervention, the scope of his policy recommendations was quite modest (Bharadwaj 1972, 39, 45). The compass of Pigou’s tax and subsidy analysis might seem to be remarkably broad, especially since he did not specify diminishing returns industries as the primary source of subsidies to increasing returns industries. Moreover, he held that there is a prima facie case for state intervention whenever private and social interests diverge, regardless of whether diminishing or increasing returns industries are at stake. However, the expansive range of possibilities for state intervention in Pigou's thought is more apparent than real. Although it is not clear how he reached this conclusion, he excluded agriculture and mining – standard instances of diminishing returns – from the pool of diminishing returns industries that could be taxed (Pigou 1913c, 19; see also Pigou 1910d, 360). In principle, it seems that every increasing returns industry could conceivably qualify for subsidies. However, he made it clear that they actually qualify only if they exceed a certain threshold of output: 'a considerable change in aggregate output would have to come about before the general organisation and external economies of an industry were appreciably affected' (Pigou 1913c, 20). In light of Chapter 4, it should be evident that he would not countenance taxes or bounties if the costs of administering them exceeded their benefits. Finally, although he targeted possible areas of state action, he did not advocate taxes or subsidies. Regarding production spillovers, he wrote that it was 'possible to conceive' taxes on every diminishing returns industry or subsidies to every increasing returns industry (Pigou 1912, 178). Logical possibility is not advocacy.

In *Wealth and Welfare*, Pigou's analysis of the laws of returns and their implications for policy was brief and fragmented. However, it can be reconstructed more systematically on the basis of two of his articles (Pigou 1910d, 1913c). Because aggregate industry output can create economies or diseconomies shared by all producers, an industry is not necessarily the sum of its individual firms. Following this line of reasoning, he formulated the industry supply curve as dependent on two components: the horizontal sum of individual supply functions and the external economies or diseconomies created by the aggregate output of the industry. An industry falls under the heading of diminishing or increasing returns depending on the nature and magnitude of both elements.

In Marshall's thought, a competitive industry comprised of diverse firms could be represented by a firm with 'normal access' to the economies, external and internal, that are consistent with the aggregate volume of production in the industry (Marshall 1920, 265). Unexhausted internal economies can be reconciled with competition in a number of ways, one of which is the life-cycle theory of the firm. Although a forest may live indefinitely, its individual trees wither and die. Similarly, an industry may endure even as its firms falter and collapse following periods of growth and maturation (ibid., 263). Pigou took note of Marshall's discussion of this point but did not fully subscribe to it. Theoretically, a Marshallian system of firms is 'necessarily' in unstable equilibrium. 'Apart from obstruction due to the time element, to which Dr. Marshall has called attention, it would seem that one of the suppliers must drive all the others out of the market.' On Pigou's view, a logically coherent analysis of a competitive industry is not consistent with internal economies in individual firms (Pigou 1913c, 22; also see Pigou 1912, 177).[7]

What causes the diminishing returns that vex all firms? Pigou ruled out diminishing returns to individual factors of production, which he distinguished from falling returns to the application of successive units of 'resources in general' (Pigou 1912, 81). Under 'resources in general', he included labour, capital or 'waiting', the 'original and indestructible properties of the soil', 'uncertainty bearing' or entrepreneurship, and managerial competence (ibid., 79, 174). Although he did not state the point explicitly, it is reasonable to conclude that fixity of factors of production is not responsible for diminishing returns. Were there other possible causes? He hinted at changing factor proportions (ibid., 81).

The question of whether an industry obeys the law of diminishing returns depends on the economies or diseconomies its aggregate output creates for member firms. An industry falls under the category of diminishing returns if expanding its aggregate output results in diseconomies such as increases in prices of raw material. An industry falls under the category of increasing returns if it generates external economies large enough to offset diminishing returns due to the internal operations of its individual firms (ibid., 176–7). Pigou offered no details concerning these economies, instead endorsing the views of Sydney Chapman, a professor at Manchester with expertise in industry and trade. Like Adam Smith, he maintained that increasing returns are linked to specialization and division of labour, which depend on the scope of the market (Chapman 1905, 191). For example, when the market for cotton fabric is weak, a small Bulgarian cotton manufacturer can produce only a modest range of textiles easily spun for its local market. However, the growth and internationalization of textile markets create subsidiary industries producing specialized machinery that the Bulgarian manufacturer can import, enabling the company to improve the quality of its products and reduce its costs (ibid., 191, n.3). Following Chapman's reasoning, Pigou concluded that 'when the commodity is one whose production requires the help of subsidiary industries – a need attaching to all increasing returns commodities – the separate sources [the firms] are not really independent, and the presence of increasing returns in the market as a whole does not really imply its presence in the parts' (Pigou 1913c, 22).

Between 1910 and 1913, Pigou attempted to strengthen the logical consistency and rigour of Marshallian static theory, efforts that had important consequences for his later thought. Instead of trying to reconcile the static idea of the industry with the dynamic and historical firm by employing biological analogies (Moss 1984, 309), he excluded from his analysis considerations that could not be accommodated by Marshall's static theory. This tactic enabled him to treat diminishing and increasing returns symmetrically. He also introduced theoretical tools that reconciled, at least to some extent, a partial-equilibrium analysis with consumption and production spillovers.

Young's critique of Pigou: the nominalism-realism controversy

Shortly after publication of *Wealth and Welfare*, Young questioned the validity of some of Pigou's conclusions, especially those based on the 'new and powerful instrument of economic analysis' – the curve of marginal supply price (Young 1913, 676). Although he regarded it as 'a powerful aid in the analysis of the tendencies of monopoly' as well as 'certain problems relating to the *distribution* of the national dividend', he had doubts about its usefulness in analysing 'the extent to which competition tends to secure the maximum national dividend'. Young rejected the view that increasing returns under simple competition are due to external economies, arguing that such cases are rare to non-existent (ibid, 678). 'The economies of large scale production affect industry at large (if competitive) only by reducing the expense per unit in individual establishments.' In a competitive industry this is possible only through internal economies achieved by expanding the size of the typical firm (ibid., 678 and n.1). Without external economies, the curves of supply price and marginal supply price would coincide. In Young's reconstruction of Pigou's logic, diminishing returns occur in agriculture. In the wheat industry, for example, producers can satisfy increased demand by applying to land larger quantities of labour and capital per unit of output. He maintained that this decision leads to an increase in the 'annual price for the land (and, under some conditions, for other resources) used in production'. However, the higher price of land, and perhaps other factors of production, does not represent increased '*using up* of resources in the work of production' but rather mere '*transferences* of purchasing power' from entrepreneurs to factor owners (ibid., 683).[8]

On 10 October 1914, Marshall, who apparently had not read Young's review, raised similar objections in marginalia on his copy of Pigou's *Wealth and Welfare*. His dissatisfaction with Pigou's analysis of increasing returns followed the line of the comments he had made in 1910: Pigou overrated 'the possibilities of the statical method'. His analysis of diminishing returns was also wanting. The marginal supply curve had 'no reality' under simple competition. Increased production under diminishing returns was not a 'a real expense but an extra charge wh[ich] landlords will be able to put on producers, in consequence of the increased value of land' (quoted in Bharadwaj 1972, 33, 35).[9]

Both Young and Marshall seem to have assumed that the quantity of land under wheat cultivation is fixed. In that case, increased output of wheat would drive up rents. However, if the quantity of land is fixed, it follows, as Young (1913, 677) put it, that

> if an aggregate annual product of x units of wheat is increased to an annual product of x + Δx units, more capital and labour per unit of product must be "applied to the land" to produce the Δx units than were required to produce the final increments of the original x units.

In other words, increased production of wheat is achieved at the expense of deteriorating factor proportions – capital to land as well as labour to land. Thus there are two, not one, logical consequences of assuming a fixed quantity of land. All other conditions remaining constant – 'neglecting influences on the technical economies of farming caused by increased production' (Marshall, quoted in Bharadwaj 1972, 35) – increased production of wheat increases the price of land as well as the '*using up* of resources in the work of production' (Young 1913, 683). Increased output in diminishing returns industries entails both nominal and real costs.[10]

Marshall left his book collection to the economics library at Cambridge. On discovering the marginalia in his copy of *Wealth and Welfare*, Sraffa, the librarian, showed them to Marshall's wife, Mary Paley Marshall, who withdrew the volume. After her death in 1944, it was restored to the library but quarantined until Pigou's death in 1959 (Bharadwaj 1972, 32, n.5). Hence, Pigou had no opportunity to take a position on Marshall's comments. However, Young's critique drew a response in Appendix III of the first edition of *The Economics of Welfare* (1920c, 934–6). Pigou claimed that Young's objection is valid only if the entire economy is constituted by a single industry, in which case 'the land available for all the industries collectively in a country is fixed'. Under this condition, it could be argued that the increased costs of production are largely monetary. However, Pigou's assumption of simple competition required diverse industries and occupations, each of which uses only a small fraction of aggregate resources. This means that increased production in one industry will not drive up the price of factors of production. He emphasized that he did not assume a perfectly elastic factor supply curve. Prices of factors could increase to a small degree. In exceptional cases – such as the production of dominant crops in the agricultural sector – much of the excess cost could be due to increased rents (ibid., 935–6). This exception aside, he insisted that in his analysis, differences between supply price and marginal supply price were due to real factors.

> The reason why diminishing returns in terms of money appear when they do appear is, in general, not that the money price of the factors employed is increased, but that that proportionate combination of different factors, which it is most economical to employ when ($x + \Delta x$) units of commodities are being produced, is a less efficient proportionate combination than that which it is most economical to employ when x units are being produced; and the extra cost involved in this fact is real, not merely nominal. (ibid., 936)

Pigou's argument on this issue is vulnerable to a simple but damaging objection. Suppose that under simple competition, producers of crop x can rent as much land as they need without increasing its price. In that case, the supply of land to the industry is unlimited, and there is no reason why firms should experience diminishing returns. When the demand for x increases, farmers can rent additional pieces of land and replicate existing factor proportions. Factor proportions will not deteriorate unless additional pieces of land are of inferior quality. However, heterogeneity of factors of production entails that the supply of better quality land is fixed, in which case increased production of x will lead to both increased rents and deteriorating factor proportions. Thus the assumption that the quantity of land is unlimited eliminates the possibility of both higher rents and deteriorating factor proportions. If this argument is sound, both Young and Pigou were mistaken.

In 1924, Robertson seems to have grasped the above point even though he did not make it explicit. He could not understand why increased production under Pigouvian assumptions would become less efficient. Bewildered, he returned to the traditional explanation of increasing costs – his preferred terminology for diminishing returns – namely, limits on the quantity of land. Increasing applications of labour and capital to a fixed quantity of land had two consequences: higher rents and changed factor proportions, neither of which represented incidental costs to other producers. Robertson was convinced by Young's argument that rents were purely nominal costs. Concerning deteriorating factor proportions, he argued that the logical rod of cost–benefit analysis forced producers to carry the employment of all factors of production 'up to, but not beyond, the point at which any further application would be less advantageous to the individuals concerned than application in some other field' (Robertson 1924, 27).[11]

The shelf life of the curves of marginal supply and demand price in Pigou's work was short. Appearing in 1910, they were incorporated into the arguments of *Wealth and Welfare* (1912) and the first edition of *The Economics of Welfare* (1920c). However, he eliminated them from the second edition (1924b). His reason: some students were confused by the curves, and he had discovered a way to conduct his analysis without them (Pigou 1924b, v). The new analysis was indeed much simpler. In increasing returns industries, a higher scale of output achieves economies that reduce average industry costs and prices, leaving the position of producers intact.[12] Independent of producers, however, consumers capture real gains that are not offset by losses elsewhere in the economy. Could the same reasoning be applied to diminishing returns industries? Pigou claimed that he had actually been 'entrapped by this appearance', even after reading Young's careful criticisms. However, in a final reconsideration of Young's arguments prior to publication of the second edition of *The Economics of Welfare*, he concluded that Young was correct. Thus Pigou embraced the position that in agriculture, which is generally understood as following the law of diminishing returns, there are no incidental costs in a closed economy. Although average industry costs increase as the rising scale of output forces producers to pay higher rents, producers are compensated by charging higher prices. Nor is there a net aggregate loss to society at large. The loss to consumers in paying higher prices for agricultural products is balanced by increased rents received by landlords. Such an analysis may not hold for an open economy. The flour and sugar refinement industries, Pigou claimed, rely on other nations for their raw materials. International expansion of demand for bread or sugar increases the price of raw materials used by British industries. Although consumers pay higher prices, the landowners who benefit from rent increases are located in other countries. In such cases, the marginal private product of resources invested in making bread or refining sugar is higher than their marginal social net product (ibid., 195).

By this point, Pigou's agreement with Young was close to complete. Inexplicably, he no longer contended that increased production in diminishing returns industries affected factor proportions, conceding that increased average costs caused by a larger output in diminishing returns industries are entirely nominal. More importantly, he revised the scope of the welfare impact of scale economies and diseconomies of the industry on society at large. In identifying areas in which production by individual actors created spillovers that could not be easily rectified by Marshall's producers' surplus concepts, he assumed that his marginal supply price curve would solve this problem. However, Young had demonstrated the fallacy of limiting the assessment of welfare consequences of production interdependence to the industry. An analysis of these consequences was acceptable only if it included the well-being of the whole 'community', by which Pigou generally meant the nation.

Boxing the laws of returns: Clapham's critique

In his article 'Of Empty Economic Boxes', Clapham began by imagining a Cambridge economist in a hat factory. On the shelves of the first room he visits, there are boxes labelled as containing concrete items such as hats and socks. He also takes note of the theoretical boxes on the shelves of his mind labelled as increasing, constant, and diminishing returns by the master of theory – Marshall – and 'handled with beautiful ingenuity by his friends', presumably including Pigou. He tries to place the products of the hat factory in his empty mental boxes but fails. Returning home, he seeks wisdom in Marshall's *Industry and Trade* (1919), finding only a handful of general references. Turning to Pigou's *The Economics of Welfare*, he has even less success – 'not even one illustration of what industries are in which boxes' (Clapham 1922b, 305). In nearly 2,000 pages of text, neither Marshall nor Pigou provided criteria for identifying and distinguishing industries that obey different laws of returns.

Clapham warned that a practical science such as economics cannot rest content with ideas of purely conceptual and pedagogical significance. Pigou in particular had inflicted considerable damage on the discipline by disguising the fact that the boxes were empty, instead 'elaborating hypothetical conclusions about, say, human welfare and taxes in relation to industries which cannot be specified' (ibid., 312). Clapham also took two important further steps, arguing that the task of filling the boxes was impossible and, even if it could be performed, useless.

In making his case that the laws of returns could not be boxed, Clapham employed a two-step strategy. First, he confronted the imaginary Cambridge economist with a series of taxing puzzles. Then he argued that they could not be solved on the basis of Cambridge reasoning, which he regarded as philosophically naïve and lax. How should a top hat be defined? As a 'standard hat or a standard quantity of hat stuff?' What were the geographic boundaries of an 'industry'? National or international? What of industries that provided raw materials for the hat industry – from coal, rabbit fur, and shellac to hat boxes? Was coal, mined in several nations and exchanged on international markets, produced under diminishing returns? Was coal not also mined in new nations such as Australia and the United States, where forces causing diminishing returns had not yet been set in motion? Was rabbit fur a by-product of another production process? In that case, the conditions of returns in several processes would require investigation. Was it reasonable to assume that shellac, primarily scraped from the bark of trees in Indian and Thai forests, was subject to diminishing returns if it could also be cultured in plantations that presumably operated under increasing returns? What of hat boxes? They were fabricated from raw material such as wood pulp, recycled rope, or worn railway wagon covers, all produced in industries where diminishing returns due to nature battled increasing returns due to improvements in the organization of production. How were economists expected to disentangle increasing returns achieved by inventions, which the long-run equilibrium framework excluded, from increasing returns resulting from scale economies, which were consistent with that framework? Finally, the box of constant returns, a mathematical point requiring that increasing and diminishing returns were exactly in balance (Marshall 1920, 265–6), will always remain empty. 'It is inconceivable that a method can ever be devised for measuring these real but subtle and imponderable tendencies towards diminishing and increasing returns that someone will be able to say, Lo, here a perfect balance' (Clapham 1922b, 306–10).

Clapham argued that even if the laws of returns could be boxed – if, for example, economists could establish that top hats were produced under conditions of diminishing returns – this knowledge would be relatively useless. The theoretical conclusions of Cambridge economics were based on ceteris paribus assumptions. Thus Cambridge economists were not competent to advise political leaders. Could their conclusions be useful to industrialists or social reformers? Clapham could not conceive of any such use. Long before it could be established that specific industries operated under diminishing returns, price increases would lead to inventions or organizational changes that would neutralize them. 'In all these matters the economist is, willy-nilly, an historian. The world has moved before his conclusions are ripe' (ibid., 312–13).

If Clapham intended to provoke Pigou, he succeeded. In his response, Pigou acknowledged the difficulties occasioned by the '*conception* of a rate of return in industry, particularly of a rate of increasing returns'. These problems had been familiar to economists for some 25 years (Pigou 1922a, 458). However, he showed no inclination to dispose of the laws of returns. The real point of contention between his position and Clapham's, Pigou thought, was not practical utility but epistemological realism. Even if Clapham were correct in assuming that the analysis of the laws of returns had no practical utility, it did not follow that its pursuit was worthless. Clapham's expertise was in economic history, which established facts such as the following: in the year 1600, the East India Company was granted a royal charter. Pigou, however, characterized himself as a 'logician' who was interested in knowledge of the implications of facts. For example: if increasing doses of factors of production are applied to an acre of land, the quantity of wheat produced on it will increase less than proportionately (ibid., 459–60). If Clapham believed in the value of the economic history of the seventeenth century, which was irrelevant to economic policy in 1922, on what grounds could he dismiss the importance of Pigou's analysis of implications? Clapham insisted that economists answer the question of whether the concepts of increasing and diminishing returns contributed to the development of 'a realistic economic science'. He seemed to think that they had no answer to this question, but only because his understanding of economics was flawed (ibid., 406). Beginning with Adam Smith, the theory of value had been fundamental to economics. In its Marshallian variant – the supply–demand framework – it had developed a powerful mode of analysis. However, it was impossible to arrive at a satisfactory account of supply without knowing the relationship between output and average costs in an industry, which was dictated by the laws of returns. Thus the laws of returns were not mere metaphorical boxes but indispensable components of the theoretical machinery of the discipline. 'To take the categories of increasing and diminishing returns out of their setting and to speak of them as though they were a thing that could be swept away without injury to the whole *corpus* of economics is a very perverse proceeding' (ibid., 461).

However, Pigou was also prepared to debate the issue of realism and practical utility on Clapham's grounds. In this regard, he was more exacting than Clapham, who would have been satisfied if some industries could be labelled increasing returns and others diminishing returns. Pigou maintained that this result could not be expected to make a significant contribution to practical results for policy. Such labels might enable economists to make general inferences about the effects of taxes or subsidies on prices. For precise conclusions – for example, to determine by how many pounds, shillings, and pence a price would change – detailed study of the exact shape of the relevant portions of demand and supply curves as well as the relevant elasticities, short run and long run, were necessary. Clapham wrote 'as though increasing returns is one definite thing and diminishing returns another, whereas, in fact, each of these terms covers an infinite number of different things'. Each of Clapham's mental boxes contained 'an infinite collection of little cases'. The needs of policy could be served only by filling these little cases. He understood that in making policy, extra-economic considerations that might override economic values would come into play. However, this fact did not release economists from their scientific obligation to fill the cases for policymakers (ibid., 463).

Was Clapham on the right track in emphasizing the difficulties of boxing the laws of returns? As Pigou had already observed in the opening pages of *The Economics of Welfare*, the difficulties were much more severe than Clapham supposed. Economists had contrived an analytical scheme that was far from ideal. Applied economics required quantitative analysis, which barely existed (Pigou 1920c, 8). However, it was excessive and premature to damn as impossible a sphere of investigation still in its infancy (Pigou 1922a, 464). Several options were open to economists. They could attempt to obtain data on output and costs from industry leaders, tap into available statistical material that could be expected to improve in quality and quantity, and train more economists of the calibre of Jevons, who comfortably navigated both analytical and statistical problems. Until economics became a quantitative science, Pigou suggested that theoreticians and statisticians work in tandem rather than exhaust themselves in futile methodological disputes (ibid., 456).

Clapham, who had demanded precision and realism in the analysis of the laws of returns, was not satisfied with this response. Pigou's suggestions on filling the boxes were insubstantial, and the 'cheque drawn on the bank of an unborn Jevons' did not solve the real problem of how to fill the boxes. Above all, he rejected the argument that methodological arguments were futile. His self-deprecating reproof of Pigou on this point was trenchant.

> Public discussion elucidates the methods and improves the understanding ... Mounted on the smoothly running machine which he handles with such incomparable skill, Professor Pigou may be a trifle impatient of suggestions that a rather differently constructed model might have a longer and more useful life; but that is no reason why

the suggestion should not be made, even by a much less expert driver. (Clapham 1922a, 563)

Robertson's critique: a 'grotesque misunderstanding'?

Inspired by Clapham's article, Robertson entered the debate, attempting to demonstrate that Pigou's analytical apparatus made it difficult to fill the boxes of laws of returns; at the same time it encouraged economists to use the boxes, once they were filled, in ways that could be 'positively misleading and dangerous' (Robertson 1924, 16). Robertson identified two types of decreasing cost industries – his preferred term for increasing returns. In type (1) industries, average costs decrease because of scale economies. As output expands in industries with large and lumpy fixed costs – newspapers and railways, for example – fixed costs are lower per unit of output. These internal economies are caused by changes in demand, not economic progress. In type (2) industries – such as electrical engineering and movie production – the passage of time improves technology and organizational methods, creating both internal and external economies (ibid., 18). Robertson chided Pigou for excluding internal economies from his analysis, irrespective of whether they were due to spreading fixed costs or improving managerial efficiency. How could Pigou have forgotten Marshall's representative firm, which enjoyed normal levels of internal and external economies and played a 'commanding part in the theory of normal competitive price' (ibid., 19, 23)? If Robertson was correct and internal economies were important in decreasing costs, it was a mistake to suppose that individual firms did not internalize improvements that these economies achieved. Hence Pigou's prima facie case for subsidizing increasing returns industries seemed to collapse. Robertson could contemplate temporary state intervention for infant industries. But this was a temporary measure, not to be confused with Pigou's seemingly permanent subsidies. Robertson also contended that his proposals would simplify the analysis of increasing returns by eliminating the duplex Pigouvian curves of supply and marginal supply price (ibid., 24).

In his response, Pigou was uncharacteristically terse and pre-emptory, limiting himself to what he regarded as Robertson's most serious errors. A judgement on the usefulness of his duplex curves depended on the methodological taste of economists. Analysts could employ his curves, Marshall's differential calculus, or, for the clever economist, 'no apparatus at all'. He declared that he had no 'affection' for the duplex curve apparatus. For mathematicians, it was superfluous. For those 'innocent of mathematics' – perhaps a thinly veiled allusion to Robertson's modest mathematical competence – it seemed to be unintelligible. For these reasons, he had deleted the curves from the second edition of *The Economics of Welfare*, which was in press at the time. On increasing returns, Robertson had apparently failed to grasp the fundamental issues. In addition, he had grotesquely misunderstood Pigou's work (Pigou 1924e, 30–1). Pigou was exasperated by the charge that his conclusions were 'new and revolutionary', insisting that they were 'identical with those established thirty-years ago by Dr. Marshall'. Robertson was also confused about long-period conditions in which there were no fixed costs and firms operated at their minimum efficient scale. Finally, he had made a grave error in assuming that Pigou had denied the reality of internal economies: 'it is obvious', Pigou instructed, that 'no economist, who is not an imbecile, *could* deny' their existence (ibid., 31).

The differences between Pigou and Robertson are not reducible to misunderstandings. Two conflicts between their positions are especially significant. First, they disagreed over how long-period conditions should be understood. Robertson defined the long period 'in the sense that we are not concerned with the effects of cyclical or other temporary fluctuations of demand' (Robertson 1924, 17). Thus his definition was quite expansive, including industries in which heavy fixed costs were routine. It departed from the norm of the time, which restricted fixed costs to the short period. His definition also encompassed what Marshall defined as the very long period, when inventions and economic progress could not be bracketed. Pigou's definition was a closer approximation to Marshall's, excluding fixed costs – lumpy or otherwise. In *The Economics of Welfare*, he took note of general economic progress, which changes technology, tastes, the economic environment, and the 'quality' or character of human beings. However, he excluded these considerations from his long-run analysis of value. Second, there are inconsistencies between their concepts of competition. Robertson understood competition as an outcome of the operation of the market structure, but not the structure itself. In his critique of Pigou's laws of returns, he proposed his own definition of competition: although firms that do not exercise monopoly powers are unable to make monopoly profits, they '*are* free, and determined, in the long run' to lower their average total costs (ibid., 20). Robertson's reasoning on this point seems peculiar. If firms are free and determined to cover their costs, surely they are able to influence prices. In view of the examples Robertson considered in his article, the Robertsonian box labelled competition includes the railway, newspaper, and cinema industries as well as small producers of wheat and clothing.

Unaccountably, Robertson derided Pigou's theory of simple competition as mathematical. It was not. Pigou categorized different types of competition by reference to differences in market structures. Thus Robertson seems to have conflated Pigou's attempt to achieve logical rigour and mathematics. Under Pigouvian simple competition, the size of the firm relative to the market in general is so small that individual producers are powerless to influence prices. If producers earn a normal return by covering their average costs, it is not because they are determined to do so. Their conduct is a response to the exigencies of market dynamics. In a Pigouvian framework, it is a contradiction to hold that actors are both free and determined to cover their average costs. It is also a mistake to suppose that firms in a competitive market structure could experience internal economies at equilibrium. Such equilibria are unstable, resulting in a different market structure. Does this mean that Pigou did not believe in internal economies? If internal economies operated at equilibrium, he would not categorize the market as simple competition. He discussed such cases, including the railway and newspaper industries, under the headings of monopoly or monopolistic competition (Pigou 1927c, 194–5).

Both Pigou and Robertson were steadfast disciples of Marshall, convinced that their respective extensions of his analytical framework were faithful to the original. How can their differences be explained? The answer to this question lies in the open texture of Marshall's research programme. The studied imprecision of the *Principles* encouraged exegetical exercises on the part of his followers, whose alternative interpretations were arguably consistent with Marshall but inconsistent with one another. Robertson was faithful to the economic historian in Marshall, at least as regards the laws of returns. Within limits, he seems to have attempted to describe the British economy of his time. Pigou's master was the analytical Marshall. In order to improve economic welfare, it was necessary for economists to identify areas where private and social interests diverged and assess policies that addressed these divergences. In this analysis, descriptions of economic facts alone were relatively useless. A conceptual framework that distinguished pertinent logical possibilities was indispensable. The question of whether it included theoretical components that did not correspond to current facts was irrelevant to its analytical value. Robertson's philosophy of economic science was a version of Baconian empiricism, deriving solutions to economic problems from factual knowledge. He described economic processes in a detailed and comprehensive fashion, made common-sense distinctions, and developed policy proposals on their basis. Pigou examined economic facts in order to abstract categories and typologies of cause and effect, deriving consequences for economic welfare by considering a wide range of possibilities, irrespective of whether they could be found in the contemporary economy. In Pigou's thought, economics was impossible without theory. His philosophy of economic science rested on a basic Kantian dictum. Liberally translated: concepts without facts are empty, facts without concepts are blind.

Sraffa: radicalization of the critique of the laws of returns

In his article of 1926, Sraffa considered the dominion of Marshallian economics, immense but somnolent. The sceptic in Sraffa ascribed the quiescent hegemony of Marshallian theory not to a universal consensus amongst economists but to their apathy, a lapse of interest in a doctrine that had 'lost much of its direct bearing upon practical politics' (Sraffa 1926, 535). What accounted for the degradation of the theory of value, which in the hands of Ricardo and Marx had inspired epochal social change? How had it been reduced to a banal technical apparatus, employed largely for pedagogical purposes? Sraffa blamed the neoclassical reconfiguration of the laws of returns.

In classical economics, the laws of returns fulfilled purposes for which they had been designed. Diminishing returns were linked to the problem of distribution. Although increases in rent influenced costs, they affected all producers without exception, which is why they were irrelevant in determining relative prices. The law of increasing returns had a less prominent role. It was perceived as 'an aspect of the division of labour' and thus a consequence of general economic progress, not a result of increased scale of operations. Although Sraffa did not mention Marshall, he criticized the theoretical gambit Marshall had introduced in extricating the laws of returns from their classical context and grafting them onto a theoretical structure developed to explain 'exchange-value'. Marshall used a new artifice – the single 'law of non-proportional returns' – to derive a supply curve, sloping upward or downward depending on whether returns were diminishing or increasing. This curve, together with its symmetrical counterpart, the demand curve, formed the Marshallian theory of value.

Sraffa contended that Marshall's innovation in imbedding the classical laws of returns in a neoclassical theory of value was a failure, producing irreparable internal inconsistencies. In analysing the equilibrium price of a single commodity, Marshall assumed ceteris paribus premises: the demand for a commodity and its supply were mutually independent and also independent of the demand and supply conditions for all other commodities. In the 'great majority of cases', Sraffa maintained, use of the laws of returns violated the Marshallian independence rule (ibid., 539). The most serious problems arose when the following question was considered: to what extent do supply curves based on the laws of returns satisfy the requirements indispensable for their use in analysing the equilibrium value of single commodities produced under competition (ibid., 538)? In answering this question, Sraffa dissected the analysis of diminishing returns. Suppose an industry produces an output Q using a considerable amount of factor T, the quantity of which is either fixed or can be increased only at a cost that is higher than proportionate. A small increase in Q will require an increase in the application of variable factors to T, which in turn will affect the cost of producing Q. But if T is used by other industries – which normally produce substitutes for Q – a modification of their costs and prices will have a substantial effect on the demand for Q, violating the independence rule. Alternatively, if the industry producing Q uses only small amounts of T, it does so by attracting marginal doses of T from rival industries. This alternative has two possible consequences. In the first, costs are not affected, in which case diminishing returns are not produced. In the second, more than one industry is affected by increasing costs, in which case the independence rule is again violated. A logically consistent theory must exclude these possibilities, limiting its field to what Sraffa called a 'minute' set of cases in which the industry producing Q uses all of the fixed factor T (ibid., 539–40).

A parallel argument applies to increasing returns, even though they differ fundamentally from diminishing returns. Internal economies due to the expanding firm size or spreading fixed costs must be ruled out as incompatible with long-run equilibrium. Because of their incompatibility with a partial-equilibrium framework, the same holds for economies due to general economic progress. The only permissible economies are internal to the industry but external to the firm. In this intermediate position, Sraffa claimed, 'nothing, or almost nothing, is to be found'. External economies are generally shared by groups of industries. Regardless, it is unlikely that a small increase in industry output could create external economies of this type.

If both diminishing and increasing returns are rare, Sraffa suggested that the cost of production be considered constant in the long run. The consequence for Marshallian value theory is devastating: demand plays no role in determining the equilibrium value of a particular commodity. What are the alternatives? Sraffa considered three. A simple method of analysing the problem of competitive value was to use the 'old and now obsolete' classical theory, which neglected the role of demand in price determination. As a first approximation to reality, this was 'as important as it is useful'. However, Sraffa seemed uninterested in first approximations. Further approximation could be achieved by relaxing the assumption of partial equilibrium and capturing interdependence amongst industries with a system of simultaneous equations. This strategy had at least two weaknesses. The complexity of a general equilibrium theory made it barren, 'at least in the present state of our knowledge'. In addition, it was not clear that the dynamic character of external economies was conducive to such an analysis. There was a third, more attractive alternative for rescuing the partial equilibrium theory of value: economists could 'abandon the path of free competition' in favour of monopoly (ibid., 541–5). Sraffa offered a rough outline of such an alternative, which led to the development of the theory of imperfect competition at Cambridge.[13]

Pigou's response: recasting the competitive theory of value

On 25 January 1927, Keynes wrote Sraffa that his article was a success at Cambridge. 'Pigou is extremely interested, and has been looking up your Italian article. You may be interested to know that he feels he must, in light of it, reconsider his whole position' (quoted in Potier 1987, 20). Did Pigou 'reconsider his whole position'? Reduced to its essence, Sraffa's criticism made two claims: the competitive theory of value was both unrealistic and logically incoherent. Scrapping the framework of simple competition would solve both problems. As we noted in Chapter 3, Pigou had considered the type of market structure that Sraffa regarded as dominant at the time and had developed a partial framework for analysing it. He did not, of course, jettison the competitive theory of value. The fact that an imperfectly or monopolistically competitive analysis corresponded more closely to the realities of Western economies of the early twentieth century was not, he thought, a compelling argument for abandoning the competitive model. Given the contingencies of historical change, investigation of a manifold of structures and policies might prove much more useful to policymakers than further work on the contemporary economy. In light of this consideration, it is not surprising that he persisted with his work on strengthening the logical coherence of the competitive theory of value. In response to Sraffa's articles of 1925 and 1926, he recast his account of the laws of returns and their welfare implications, producing a more systematic analysis by clarifying ambiguities, making tacit assumptions explicit, and eliminating contradictions. In developing this revised model, which he published in two articles, he heeded the following Sraffian maxim: in investigating the equilibrium of the individual firm, it is necessary to explore three variables – 'cost, quantity produced by the single firm, and quantity produced by the industry as a whole' (Sraffa 1925, 27). Pigou's first article examined costs. The second considered the shape of the supply curve for the firm as well as the industry (Pigou 1927c, 1928a).

In 'The Laws of Diminishing and Increasing Cost', Pigou noted the importance of Sraffa's work: in writing his own article, he was influenced by 'reading Professor Sraffa's very interesting paper with a similar title'. In examining the relationship between the quantity of output and the cost of production for individual commodities, Pigou's unit of analysis was the industry and he employed a 'cost function'. His purpose was not to defend his own framework or that of Marshall. In many respects, he had already identified the qualifying assumptions required to nest the laws of returns in a neoclassical framework. However, it was necessary to address two of Sraffa's criticisms: the logical inconsistency of diminishing returns in a competitive theory and the empirical irrelevance of the type of external economies to which Pigou had limited his analysis.

Pigou began by stating the primary problem: the functional relationship between long-run industry output (Q) and total cost (TC). He ruled out exogenous developments in technology but allowed for endogenous technological change that followed from a change in Q. Although the two types of change were difficult to distinguish empirically, he insisted that they were logically independent. Assuming a general cost function of the form F(Q), he posed the question: 'what precisely, for the purposes of a cost function, costs should be taken to mean' (Pigou 1927c, 189). If the production process employs only one factor, a cost function could be unambiguously derived. Introduction of several factors of production need not introduce difficulties if their relative prices remain constant as Q changes. Variable relative values introduce irresolvable difficulties: the cost function expressed in terms of one factor could indicate increasing returns while the same function expressed in terms of another factor could exhibit diminishing returns. Hence it was necessary to assume that the industry employs 'so small a proportion of each of several factors of production that no practicable change in the scale of their output could sensibly affect the relative values of these factors' (ibid., 192). Pigou had made this assumption explicit in 1920.

From a total cost function TC=F(Q), Pigou derived two more functions: average (AC) and marginal (MC) cost – F(Q)/Q and dF(Q)/dQ respectively. These functions could be used to define returns to scale. In the case of constant costs (returns), AC remains constant irrespective of Q, which implies that MC is also constant and has the same value. Constant costs no longer describe situations in which increasing and diminishing returns perfectly balance each other; they are a property of the technology of production. If the slope of AC is negative irrespective of Q, the result is the law of decreasing costs – Pigou's new and preferred term for increasing returns. In that case, MC would be negatively sloped and lower in magnitude compared to AC. Conversely, if the slope of AC is positive irrespective of Q, the law of increasing costs – or diminishing returns – would result, in which case MC would slope upward and be greater in magnitude than AC. If the slope of AC is negative for some ranges of Q and positive for other ranges, AC and MC curves would become U-shaped and intersect.

As the above discussion shows, Pigou demonstrated that a general cost function could define cases in which an industry operates under increasing costs. Was this result consistent with the assumptions of his model? His answer was a resounding no. If the relative values of factors remain fixed as Q expands, there is no reason why producers should not increase 'the quantities of all the factors employed (including, of course, managing ability) in exactly equal proportions'. Thus it is '*impossible* for production anywhere to take place under conditions of increasing costs. In this matter my conclusion agrees with that reached by Professor Sraffa in his recent article' (ibid., 193).

Pigou acknowledged that decreasing costs could result from internal and external economies. He did not need to be persuaded that internal economies are incompatible with long-run equilibrium conditions under simple competition, having reached that conclusion long before Sraffa wrote his articles. In agreeing with Sraffa, however, he rejected a key concept of Marshall's *Principles*: the 'representative firm must be conceived as one for which, under competitive conditions, there is at each scale of aggregate output, a certain minimum size, trespass beyond which yields no further internal economies' (ibid., 195).[14] Consider the position on which he and Sraffa agreed – that a partial-equilibrium framework could accommodate only external economies that were created endogenously by the expansion of industry. Did this position leave Pigou with an empirically empty box? Not so, he argued. Industry expansion could lead to 'inventions, improved technique, increased specialisation amongst the makers of the machines used in the industry and so on' (ibid., 195). Admittedly, a small change in Q could create only small per cent changes in the costs of all firms. If sustained over time, however, they could result in significant cumulative improvements. This result was sufficient for an examination of logical possibilities, and economic analysis alone could not be expected to arrive at more satisfying conclusions. 'To determine the actual content of any part of the cost function for any commodity would necessitate a very difficult combination of statistical research and intelligent guess-work, which might, indeed, even in skilful hands, fail to achieve success' (ibid., 196).

Pigou next addressed the relationship between AC and MC and the long-run supply function of a competitive industry. Since increasing costs are ruled out on logical grounds, the supply curve must coincide with the industry AC curve. If costs drop with the expansion of output, price must be equal to AC in order for the industry to earn a normal rate of return. If costs are constant, price is equal to both AC and MC, since they are equal. Industry supply curve, therefore, is L-shaped. Pigou claimed that industry output can be regarded as socially optimal if price, considered as equal to marginal utility, is equal to marginal cost (see also Sraffa 1925, 34, n.1). Since this condition is not met when industry costs decline – price is equal to average, but not marginal, cost – output is below the optimal level and can be increased by subsidies (Pigou 1927c, 197).

In his article of 1928, Pigou modelled the cost and supply functions of an individual firm. Recalling Marshall's metaphor of trees in a forest, he noted that industries consist of heterogeneous firms, some expanding and others contracting. Industry equilibrium implies that 'tendencies to expand and contract on the part of the individual firms will cancel out'. It is obvious that not all firms are at equilibrium when the industry is at equilibrium (Pigou 1928a, 239). Since disequilibrium states – 'evidently a state of things the direct study of which would be highly complicated' – do not lend themselves to static modelling, Pigou developed the concept of the equilibrium firm, which he had identified but not named in his article of 1927. Under this theoretical construct, industry equilibrium is consistent with the possibility that one firm in the industry also operates at equilibrium (ibid., 239). 'The conditions of the industry are compatible with the existence of such a firm; and the implications about these conditions, which, whether it in fact exists or not, would hold good if it did exist, must be valid' (ibid., 240). It follows that the price of the industry at equilibrium and the price of the equilibrium firm are the same. In introducing this concept, Pigou changed the unit of analysis, switching to a mathematical and diagrammatic analysis of the cost and supply functions of individual firms. In this manner, he intended to offer a precise analysis of Marshall's thesis that these functions depended on firm (q) as well as industry (Q) output (ibid., 241).

Production costs of the equilibrium firm can take three forms. (1) In the simple case, f(q), they are independent of industry costs – there are no external economies or diseconomies. This conception of firm cost curves has survived in undergraduate textbooks: the shape of a firm's cost curves is determined by its own internal economies or diseconomies, irrespective of aggregate output of the industry. (2) The firm's costs may depend on industry output in an additively separable form, $f(q) + q/Q\ F(Q)$. A change in industry output may induce changes in markets for factors or raw materials purchased by the entire industry. (3) Firm and industry costs are no longer independent. 'These costs will undergo different variations in consequence of a given change in its output according to the level at which the output of the industry as a whole stands; and they will undergo different variations in consequence of a given change in the output of the industry as a whole according to the level at which the individual firm's own output stands' (ibid., 241). In case (1), absence of external economies and diseconomies implies that the industry operates under constant returns. In cases (2) and (3), industry costs may rise or fall.

Pigou spelled out equilibrium and stability conditions, which are independent of the functional form of costs. Both the industry and the equilibrium firm are in equilibrium at an output level allowing industry price (P) to equal the equilibrium firm's AC and MC. He distinguished unstable, neutral, and stable equilibria.[15] An unstable equilibrium is transient, leading to eventual monopolization of the industry. Neutral equilibrium occurs when the equilibrium firm's MC and AC are constant. Stable equilibrium requires a positive slope of the MC curve (ibid., 244). He also produced geometrical diagrams of his mathematical functions for case (1), in which the firm's cost function lends itself to two-dimensional representation. In a series of seven diagrams, he paired average and marginal cost curves of different shapes and slopes, reproducing equilibrium and stability conditions. Amongst these, only U-shaped marginal and average cost curves depicted a stable equilibrium position for the equilibrium firm in a competitive industry. In drawing his U-shaped cost curves, he replicated a diagram from Sraffa's article of 1925. Sraffa, interestingly, had attributed the general relationship between average and marginal cost curves to Pigou (Sraffa 1925, 31, n.1).[16]

An industry conforms to increasing, decreasing, or constant returns depending on whether an increase in its output causes the price charged by the equilibrium firm to decrease, increase, or remain constant (Pigou 1928a, 240). Pigou used the equilibrium firm's average cost function to specify conditions for classifying the returns under which the industry operates. Suppose that the equilibrium firm purchases two factors of production a and b at prices p_1 and p_2 respectively. In that case, the following condition holds true:

$$AC = (p_1a + p_2b)/q.$$

How does the average cost of the equilibrium firm change when industry output changes? As the following equation shows, the first derivative of the cost function includes two elements.

$$dAC/dQ=1/q\ [a\ dp_1/dQ + b\ dp_2/dQ] + [p_1\ d/dQ\ (a/q) + p_2\ d/dQ\ (b/q)]$$

If the first element has a positive value, the change in industry output changes the prices of factors of production. This result is a translation of Young's transfer of rents from producers to factor owners. The magnitude and sign of the second element, which embodies real changes in factor use and costs, determine whether an industry operates under non-proportional or constant returns. If industry expansion results in further specialization – either within the industry or in other industries that produce specialized equipment for it – the AC and equilibrium price of the equilibrium firm drops. If factor proportions deteriorate due to industry expansion, the AC and equilibrium price of the equilibrium firm increase. In 1928, Pigou reiterated his conclusion of 1927: there is no reason why factor proportions should deteriorate in a competitive industry.

Conventional wisdom traces the relationship between individual firm costs and output to Jacob Viner's classic article 'Cost Curves and Supply Curves' (Viner 1931). This view ignores the importance of the cost controversies that preceded the development of the theory of imperfect competition at Cambridge. It also disregards the part Pigou played in disputes from 1910 to 1928 in advancing and refining the neoclassical theory of the firm in a long-run, competitive framework. Pigou's work in the area improved the logical coherence of the Marshallian framework, providing important building blocks for constructing the modern theory of the firm as taught to undergraduates. Shifting the unit of analysis from the industry to individual firms, he offered diagrammatic and mathematical treatments of the firm's average and marginal cost functions, becoming the first economist engaged in the cost controversies to provide a systematic analysis of equilibrium and stability conditions of a competitive firm. Marginal private and social cost and benefit curves, which Pigou developed in 1910 but discarded in 1924, have remained powerful tools of welfare policy analysis.

Crossroad

As Marshall's successor, Pigou confronted a fundamental choice. Should he take the theoretical course of strengthening the logical rigour and consistency of the comparative statics framework he had inherited? Or should he pursue Marshall's vision of a 'biological economics'? As the above account demonstrates, he decided not to seek Marshall's biological Mecca. Marshall scholars habitually lament this choice, a complaint that poses the following question: how plausible is it to suppose that Pigou, or any other Cambridge economist of his time, could have fulfilled Marshall's dream of an organic theory of the industry or firm?

The ideal candidate for this task was Marshall himself. However, on retiring from the Cambridge chair to devote his remaining years to research and writing, he fought a protracted physical and intellectual battle to complete the two books that became the companion volumes of the *Principles* – Industry *and Trade* (1919) and *Money Credit & Commerce* (1923). Neither work matched the scope, analytical acuity, and mastery of the field that distinguished the earlier book. Moreover, even if the physical strength and intellectual powers of Marshall's maturity had remained intact in old age, his project of an evolutionary economics would have remained a vision. As he realized in revising the final edition of the *Principles*, such an enterprise could succeed only with a new and more sophisticated 'scientific machinery' that might be developed in a 'later age' (Marshall 1920, 667).

And what of Marshall's other disciples? Could they have been expected to realize his dream? This is improbable. Fay and Clapham were economic historians, not theoretical innovators. Keynes and Layton worked in macroeconomics, economic journalism, and policy development. Shove, who took the Economics Tripos in 1911, did not receive a fellowship at Cambridge until 1926, largely as a result of Keynes' efforts. Extremely slow to publish, he laboured for years on a study of the relations between cost and output that was never completed. Finally, Robertson, a participant in the cost controversies, was essentially a macroeconomist.[17]

Pigou's choice was a consequence of several considerations: the primitive state of economic theory in his youth, his own limitations as a theorist, and the scandal of widespread urban poverty in Britain. He judged that a sustained and rigorous analysis of the size, distribution, and stability of the national dividend in the static framework that Marshall had already conceptualized had greater promise in improving economic welfare than following Marshall to a biological Mecca that might prove to be imaginary.

Addendum: on Coase contra Pigou

Logic and hermeneutics

After the several phases of the cost controversies lapsed, the most influential criticism of Pigou's account of externalities was unquestionably the attack of R.H. Coase, launched with full force and some animus in 'The Problem of Social Cost', published within a year of Pigou's death. This is obviously not the place for a discussion of Coasian economics. However, a history of the cost controversies generated by Pigou's work would be deficient without considering Coase's critique. The damage he attempted to inflict on Pigou's programme can hardly be exaggerated. If his objections are sound, it is not clear that a single stone of the Pigouvian structure is left standing. Coase's inventory of Pigou's sins against sound economic reasoning is formidable, and a full assessment of his critique exceeds the limits of this book. Here we examine chief points of contention.

In considering spillovers – in Pigou's vocabulary, transactions in which 'there is reason to believe that the free play of self-interest will cause an amount of resources to be invested different from the amount that is required in the best interest of the national dividend' (Pigou 1932b, 331) – Coase claimed that Pigou advocated a policy that is naïve, more often than not inefficient or otherwise deficient, and often destructive. On Coase's reading, both in 'Social Cost' and in essays of the following three decades, Pigou held that it is the responsibility of the state to reset the misallocations and right the wrongs caused by spillovers, addressing the problems they create by some mode of governmental action. This policy was naïve, because it rested on a facile distinction between a laissez-faire economic order – the Pigouvian 'free play of self-interest' – and the imaginary ideal world of an optimal national dividend. The properties of the ideal world remained indeterminate and obscure in Pigou's thought. Crucial issues were 'shrouded in mystery and every man is free to draw whatever conclusions he likes'. It was inefficient and destructive, because Pigou was oblivious to the institutional underpinnings of the economy, failing to consider the legal and sociopolitical factors that determine the costs of state intervention and the prospect that they may exceed the costs of damages (Coase 1960, 43).

How much weight can these charges bear? Coase's critique draws on a remarkably selective reading of Pigou's work. He culled a few passages from the fourth edition of *The Economics of Welfare* for quotation, limiting himself to material taken from several chapters of Part II and ignoring the rest of the book. He also dismissed everything else of significance Pigou wrote or said about economic policy between 1902, when he began to think seriously about economic analysis, and 1951, when he published his last important essay. This hermeneutic violates a fundamental principle of textual interpretation: the meaning of a text depends on its context, including other works by the author that can be expected to shed light on the views under consideration. In parsing *The Economics of Welfare*, this context includes almost two decades of preliminary studies on which he based the book – especially empirical work that underpins Pigou's analyses but does not appear in the text – other canonical Pigouvian writings, and his membership on several parliamentary committees as well as his testimony before others. Although these materials illuminate Pigou's conception of the aims and limits of economic policy and policy analysis, Coase passed over them in silence. This atomistic hermeneutic, which seems to assume that the import of each statement in *The Economics of Welfare* should be transparent and self-interpreting independent of every other statement on economics that Pigou made, was surely an immense convenience as Coase developed his critique, sparing him the tedium of long hours devoted to studying Pigou's works. However, it resulted in grave errors that nullify his main criticisms. By casting Pigou as the confused champion of a radically defective policy, Coase mangled Pigou's texts to the point of distortion. The consequence: his fundamental objections miss their target, contesting positions that Pigou did not take and charging him with errors he did not commit. Coase also chastised Pigou for failing to embrace more enlightened analytical assumptions. They are, of course, Coase's own assumptions. In important respects, however, Coase's premises merely reproduce those of Pigou, ironically revealing him as an unwitting, albeit somewhat unsystematic, Pigouvian epigone.[18]

The 'perfect form of governmental organization': Pigou as state interventionist?

For some 30 years, Coase consistently maintained that Pigou's economic policy was grounded in the necessity and the efficacy of state intervention in markets. Departing from the lessons of the judicious Marshall, ever sceptical of routine state intervention, Pigou 'was in favour of an expanding governmental role' in the economy (Coase 1994, 56). The state stood on the watchtowers of markets, 'waiting beneficiently to put things right whenever the invisible hand pointed in the wrong direction' (Coase 1994, 30). This was the 'basic position' of Pigou's economics and 'the central tendency of his thought'. Whenever markets failed to maximize the value of total output, there was invariably a solution: 'the way to put things right was through some form of governmental action' (Coase 1988, 20). This 'basic position' was the hammer with which Coase pounded Pigou, producing apparent refutations of his economic doctrines and subjecting them to ridicule. However, it is a canard and can be dispatched without difficulty.

In Chapter 20 of Part II of *The Economics of Welfare*, Pigou warned readers that the capacity of the state to improve the performance of the national dividend was an unstable variable, not susceptible to general statements on the relative merits of government intervention in the economy. The structural properties of the state were a key consideration for Pigou. Public authorities were 'liable alike to ignorance, to sectional pressures and to personal corruption by private interest' (Pigou 1932b, 332). Thus the economic competence of the state depended in large measure on its institutions. How effectively did they correct or offset the ignorance of officials and the probability that their decisions would be prejudiced either by their constituencies or powerful lobbies? The answer to this question depended on historical conditions. Both the efficacy of state agencies and the political ethics of officials varied with what Pigou called 'the general tone of the time' (ibid.). As he listened to the general tone of his own time, Pigou heard signs that the state was becoming more effective in managing economic affairs. The democratization of the political order and improvements in public education during the nineteenth century had made elected officials more responsive to the needs of the British people. He also took note of improved forms of public administration: parliamentary commissions and ad hoc boards composed of dispassionate experts who had stronger commitments to the public interest than could be expected from elected officials. Due to the introduction of a system of economic policymaking by appointed committees of technocrats, the structural weaknesses of the state as well as the incompetence and ignorance of its personnel that had bedevilled British economic policy in earlier centuries could be, 'in great measure, obviated' (ibid., 333–40). The inference that he drew from these developments was not, of course, that the perfect state had descended on England's green and pleasant land, much less the preposterous idea that he had discovered such a polity. The perfection of the state is an idea that cannot be found in the conceptual vocabulary Pigou employed to analyse policy in the lapsarian world of political and economic reality. His conclusion was a characteristically Pigouvian judgement, tempered and relative: 'modern developments in the structure and methods of governmental agencies have fitted these agencies for beneficial intervention in industry under conditions which would not have justified intervention in earlier times' (ibid., 335). Thus Coase's understanding of what may be called Pigou's Victorian state formation argument is fallacious, and the inference he drew from it – the supposed Pigouvian thesis of a perfected British state – is false. The result: Pigou's political realism concerning the probable benefits of state intervention in markets remains untouched by Coase's objections.

> It is not sufficient to contrast the imperfect adjustments of unfettered private enterprise with the best adjustments that economists in their studies can imagine. For, we cannot expect that any State authority will attain, or will even whole-heartedly seek, that ideal. (ibid., 247–8)

Pigou's unvarnished scepticism concerning the value of economic policy made by the state in his time is fully spelled out in his collection of lectures *Economics in Practice: Six Lectures on Current Issues* (1935a). Four of the six lectures were delivered at LSE in the year Coase joined its faculty. Political partisans, Pigou claimed, first decide questions of policy. These questions would, of course, include the brief and the membership of parliamentary commissions. Economic argument enters their thinking only when the fundamental policy questions have been resolved. 'Economic reasoning is for them, not a means for arriving at the truth, but a kind of brickbat useful on occasions for inflicting injury on their opponents' (ibid., 8–9). State economic policy is often made on the basis of superficial or otherwise unacceptable grounds. However, state intervention in the economy can be justified only if there is reason to suppose that public servants are better fitted to anticipate consumers' wants than business executives. Such a reason requires the assumption that the expertise of public servants in economic forecasting exceeds the comparable expertise of private-sector actors. 'That assumption is at least a doubtful one' (ibid., 114–15). In view of these considerations, what is the most basic responsibility of the economist confronting 'a world in chaos, where blundering legislation strangles trade, where governments, misconceiving what progress means, cancel the benefit of technical advance by subsidies and quotas'? It is to persist in reiterating 'broad and elementary economic truths, which, commonplaces as they are to students, those set in authority above us perpetually disregard' (ibid., 13).

Pigou as blackboard economist?

On Coase's reading of *The Economics of Welfare*, Pigou, convinced of the perfection of the British state, saw no reason to inquire into the circumstances under which 'the defects of public intervention would mean that such intervention would tend to make matters worse' (Coase 1988, 22). Employing a more recent idiom, he did not see that government failures might prove more costly than market failures. In contemplating the wisdom of state intervention, Pigou did not compare real markets, with their various imperfections, to real state institutions and their defects. He compared market mechanisms, which sometimes malfunction, with an ideal state – the product of his speculative imagination, a state that has never existed and could never exist. Thus Pigou became yet another entry on Coase's list of proponents of 'blackboard' economics, 'an elegant but sterile' mode of theorizing employing 'a system which lives in the minds of economists but not on earth' (Coase 1994, 5, 13).

As the above chapters show, this complaint is a red herring. It was precisely because of his mistrust in abstract theories and grand systems that Pigou embraced an approach to policy based on detailed, case-by-case investigations, prudence, and pragmatism. His emphasis on the social structure and cultural setting in which successful policies are embedded document the institutionalist bent in his thinking, providing grounds for including him amongst institutional economists, albeit with a lower-case 'i'. The significance he ascribed to the larger framework of policy is clear in his observations on why an effective policy is generally the product of an interaction between the state and civil society.

It is mistaken to suppose that state actors are the exclusive artificers and enactors of policy. It may be most sensible for a government to legislate minimum standards for housing, inspect homes for overcrowding, condemn uninhabitable buildings, 'tackle the collective problem of beauty, of air and of light' through urban planning, and subsidize rents for families that do not earn a living wage (Pigou 1914b, 37–55). However, philanthropists may also improve the quality of life by managing friendship societies and brotherhoods that provide social security and housing (ibid., 46–47; 1901h, 254). In many cases, the policy spheres of the state, civil society, and even charitable individuals cannot be clearly delineated. Because 'it is impossible to say what any one of them ought to do, without knowing what the others are doing', public-private collaboration may be indispensable. In simple cases of destitution, the state may be most effective in allocating resources by a quasi-centralized system of distribution, such as the Poor Law. However, allocation by voluntary agencies may be the best course in more complex settings requiring careful discrimination amongst heterogeneous needs of individuals. And although Pigou himself was a religious agnostic, he believed that religious charities were well suited to assist the poor since they were decentralized and maintained close ties to their communities (Pigou 1901h, 259, 261).

Employers were often well qualified to partner with the state, and on several grounds. Because of the length of the working day on factory floors, employers were in a unique position to improve the lives of their workers by introducing better working conditions and hiring supervisors with strong organizational skills and high moral standards. Instances of best practices were not hard to find. In Bournville, England, the Cadbury family offered its younger workers gymnastics classes, subsidized education, and regular physical and dental examinations. Underperformers suffering from ill health were placed on a strict regimen of nutrition, exercise, and rest. In Rochester, New York, the Canadian entrepreneur Franck Brownell maintained comfortable year-round temperatures in his camera factory. And in York, England, Joseph and Seebohm Rowntree hired a social secretary to improve working conditions in their factory, organize social activities, and reduce employee-management conflicts (Pigou 1923b, 18–22). Although 'chivalrous' employers could not expect a full return on their philanthropic investments, there were undeniable economic benefits. They enjoyed reputational advantages as well as higher productivity – a result of reductions in labour strife, tardiness, absenteeism, and sloth as well as improvements in work discipline (ibid., 17–18).

Coase's charge of institutional myopia is also undermined by his own exposition of Pigou's account of parliamentary commissions. What was Pigou's project in explaining the relative effectiveness of commissions? To undertake precisely the sort of institutional analysis that, Coase claims, cannot be found in his work. From his early writings on tariff reform through the last edition of *The Economics of Welfare* that he corrected, the importance of institutional variables in framing economic policy was an essential premise of Pigou's reasoning. Thus Coase's claim that Pigou ignored this consideration seems incomprehensible. In *The Economics of Stationary States* (1935b), Pigou even stressed the component of the institutional infrastructure of the economy to which Coase ascribed paramount importance: the allocation of property rights by the legal system. He argued that modern commerce is 'built upon a foundation of legal rules about property and contracts' as interpreted by the appropriate courts of law. In most transactions, the legal machinery of the state does not lie in the foreground of the transaction, or so Pigou claimed. However, 'its presence in the background, alike in fact and in men's minds, is essential to the smooth conduct of affairs'. This is not an accident, nor is it inevitable. The predominance of voluntary and private transactions in the economy is 'largely the result of an elaborate system of laws and institutions deliberately devised to bring about that very result' (ibid., 64–5). These observations reveal Pigou as a Coasian *avant la lettre*. Or, rather, Pigou's analyses of the institutional bases of economic transactions unmask Coase – who apparently reserved for himself the role of Pigou's arch-critic in the drama of the history of economic thought – as a closet Pigouvian. Pigou's summary of his position on the fundamentals of economic policy analysis could easily have been written by the author of 'The Problem of Social Cost'.

> Each particular case must be considered on its merits in all the detail of its concrete circumstances. High-sounding generalizations on these matters are irrelevant fireworks. They may have a place in political perorations, but they have none in real life. Accumulation of evidence, judgement of men, by these alone practical problems in this region can be successfully attacked. (1935a, 127–8)

Coase possessed an acute facility for uncovering errors in *The Economics of Welfare* that were embarrassing and inexcusable but ultimately trivial and inconsequential. It was irresponsible for Pigou to refer to parliamentary commissions as 'recently created', even as late as the 1952 reprint of the book. He was not the most conscientious editor of his own work. And his use of Sidgwick's lighthouse case as an example of an externality in which third parties receive services for which payment cannot be easily extracted was careless at best. For these and other mistakes, Coase skewered Pigou. However, they left his theory of policy analysis intact and undamaged.

Notes

1. A substantial literature locates the origins of the Cambridge theory of imperfect competition in these controversies. However, it glosses over Pigou's role in advancing and refining the neoclassical theory of the firm, based on the assumptions of a long-run, perfectly competitive framework. See Aslanbeigui and Oakes (2009, Part 2), Harcourt and Kerr (2009, 15–22), and Marcuzzo (2011).
2. As early as 1906, Henry L. Moore objected to the bifurcation of markets into the polarities of competition and monopoly. For the most part, actual markets operated 'in a state intermediate between perfect monopoly and perfect competition' (Moore 1906, 215). As we have seen, Pigou identified a third type, monopolistic competition, for which the contemporary term is oligopoly.
3. Edgeworth recorded the day and the month he wrote the letter but not the year. John Whitaker, editor of Marshall's correspondence, dates the letter in 1910 (Marshall 1996b, 262).
4. In citing the eighth edition of the *Principles*, published ten years after Pigou's article appeared in 1910, we commit a sin of historiography. However, according to Marshall's nephew, the economist Claude Guillebaud, the book changed little between 1907 and 1920 (Guillebaud 1942, 337, 340).
5. The rich body of scholarship on Marshall and industrial economics is too extensive to survey here. For recent publications, see Quéré and Arena (2003), Raffaelli, Becattini and Dardi (2006, Part IV (d)), and Raffaelli, Nishizawa, and Cook (2011).
6. Roberto Marchionatti maintains that in doing so, Pigou repudiated 'an essential characteristic' of Marshall's work (Marchionatti 2006, 621; see also Marchionatti 2003, 52–3). Geoffrey Hodgson argues that notwithstanding Marshall's observations on the limitations of mechanistic reasoning, his pilgrimages to a biological Mecca were of little significance (Hodgson 1993). Peter Groenewegen claims that the conflict between mechanistic and historical analyses in Marshall's work was eventually settled in favour of the former (Groenewegen 1982, 13). Finally, John Whitaker has a fascinating account of the reasons why Marshall was unable to write the volume he intended on economic dynamics (Whitaker 1990, 220).
7. Pigou did not explain why Marshall's concept of the representative firm or his biological rhetoric held no attraction for him. Prudent speculation on this point does not seem out of order. By the time Pigou systematized his theory of economic policy analysis, the industrial landscape included many joint-stock companies, for which Marshall's Schopenhauerian life-cycle metaphors of growth, maturation, decadence, and collapse were irrelevant. Marshall himself saw that biological metaphors had little force if firms grew but did not expire (see Hart 1991, 1996; Martin 2006; Prendergast 1992). In *Wealth and Welfare*, discussions of the social costs of industries operating under simple competition covered fewer than ten pages; the comparable analysis of markets consisting of large firms with monopoly power – which were more likely to be publicly held companies – occupied more than 100.

8. Two months before publication of Young's article, Clark made a similar point but offered no argument to support it. The distance between the marginal supply price curve and the supply price curve amounted to 'increases in rental values of lands already under cultivation, and hence is a mere transference of income and not an outlay of labour or capital by society as a whole' (Clark 1913, 624).
9. Marshall thought that the theoretical point was implicit in Edgeworth's article, published some 16 months earlier, on Pigou's analysis of railway rates (Edgeworth 1913a). He made no attempt to 'controvert' Pigou, in part because he was unable to follow the analysis. 'When he translates his W[ealth] & W[elfare] into realism, then I may perhaps raise a question, if I still cannot follow him' (see Bharadwaj 1972, 35, 33). On the debate between Pigou and Frank Taussig concerning railway rates, see Pigou (1913f, g) and Taussig (1913a, b, c).
10. Our analysis, like Pigou's, brackets unemployment of resources, which is consistent with the neoclassical long-run framework. If land and other factors of production are left unemployed, increased production will not increase rents or create diminishing returns, thus invalidating the objections of Young and Marshall.
11. For a similar point, see Knight (1924, 596). Publication of Robertson's article predated Knight's by some four months. There is no evidence that Pigou read Knight's article before publishing the second edition of the *Economics of Welfare*.
12. In *Wealth and Welfare* and the first edition of *The Economics of Welfare*, Pigou had assumed that increasing returns were due solely to external economies shared by all firms in an industry. In the second edition, he acknowledged that some firms may benefit from internal economies: 'the presence of increasing returns in the market as a whole does not *imply*, though, of course, it is compatible with, its presence in the parts.' This revision notwithstanding, he seems to have assumed that such internal economies were incompatible with long-run equilibrium.
13. Publication of Sraffa's article of 1926 launched debates on several aspects of Marshallian value theory. Some economists questioned the theoretical value of the representative firm (Robbins 1928; Robertson 1930; Shove, 1928, 1930; Sraffa 1930a, b). Others reconsidered static economic analysis (Schumpeter 1928; Young 1928). And two economists followed the blueprint suggested by Sraffa, constructing the Cambridge theory of imperfect competition (Kahn 1989 [1929]; Robinson 1933). For more on these debates, which lie outside the scope of this book, see Aslanbeigui and Oakes (2009), Marcuzzo (2011), and the *Review of Political Economy* (2005).
14. Pigou did not regard this concept, which he later christened the 'equilibrium firm', as a repudiation of the Marshallian representative firm. Without offering any evidence, he claimed that Marshall conceived the representative firm as an equilibrium firm (Pigou 1928a, 240, n1).
15. Pigou assumed that the equilibrium firm changes its output based on the premise that industry output remains constant: an expansion in the firm's output is regarded as met by a contraction of output in other parts of the industry.

16. Jan Horst Keppler and Jérôme Lallement (2006, 736) maintain that Edgeworth developed the first U-shaped average cost curve as it is currently understood, albeit in an analysis of monopoly pricing. Sraffa was apparently the first economist to use U-shaped average and marginal cost curves in studying competitive conditions.
17. For details on Marshall's early disciples at Cambridge, see Collard 1990. The generation that studied at Cambridge during the 1920s and early 1930s – Austin and Joan Robinson and Kahn – was inspired by Sraffa and pioneered the theory of imperfect competition. However, this theory was also confined within the limits of a Marshallian partial-equilibrium framework (see Kahn 1989[1929], Robinson 1931, and Robinson 1933). After discovering radical defects in Marshallian value theory, Sraffa quickly lost interest in it altogether. By late 1927, he was at work on a model inspired by classicism that later became *Production of Commodities by Means of Commodities* (1960).
18. The suggestion that Coase misunderstood or misrepresented Pigou's work, sometimes using Pigouvian ideas even as he undertook to refute them, is not new. See, for example, DeSerpa (1993), Simpson (1996), Aslanbeigui and Medema (1998), and Hovenkamp (2009).

6
The Robbins Critique

Robbins' attack

In 1932, some three years after Lionel Robbins was appointed Professor of Economics at LSE, he published his first book: *An Essay on the Nature and Significance of Economic Science*.[1] It was also the first methodological treatise by a British economist since John Neville Keynes' *The Scope and Method of Political Economy* in 1890. Unadorned by complex arguments or arcane technique, the *Essay* was lucid, tendentious, blunt, confident, and rhetorically somewhat disingenuous – Robbins presented his unorthodox ideas as if they were standard fare, drawn from the accumulated wisdom of economics. The rhetorical ploy had little effect, and the *Essay* stimulated considerable controversy. Much of the attention centred on his critique of the scientific legitimacy of welfare economics, one of the fields in the territory he called 'applied economics' (Robbins 1932, 121, 125).[2] Robbins would be satisfied by nothing less than a Carthaginian peace: welfare economics should be banished from the positive or empirical domain of economic science and relegated to the policy judgements of political economy. He advanced his arguments in an informal, discursive fashion, making no effort to distinguish various grounds on which he found it wanting. Examination of his last chapter shows that he regarded its scientific credentials as irredeemably defective in four respects.

The principle of equal capacities for satisfaction

Welfare economics is based on the principle that actors 'in similar circumstances are capable of equal satisfactions'. Robbins claimed that this principle rests on the shifting sands of convenience, convention, and value judgements. In public finance, for example, the assumption is conventionally made that all economic actors possess an 'equality of capacity for satisfaction from equal incomes in similar circumstances'. Why? For the purposes of both theory and policy, it is simpler to do so than to acknowledge what is actually the case: that 'there is no way of proving that the assumption rests on ascertainable fact' (ibid., 124). If people in a rigidly stratified society committed to a metaphysics of caste differences insist that members of their caste have a tenfold capacity for satisfaction from a given income over members of another caste, it is impossible to establish that they are mistaken. Although Robbins suggested no evidence for this sweeping assertion, he claimed that 'in our hearts', we do not actually believe in equal capacities for satisfaction. In that case, would it not be 'rather silly if we continued to pretend that the justification of our scheme of things was in any way *scientific*?' The principle can be justified only as a shrewd conceit, a matter of convenience, or a consequence of our commitment to specific 'ultimate standards of value' (ibid., 125). However, it falls outside the limits of scientific economics because it is not verifiable by the only two modes of proof he considered scientifically admissible: observation and introspection (ibid., 121, 123–4).

The normative interpretation of diminishing marginal utility

Welfare economics assumes that economic policies, such as achieving greater economic equality by distributive measures that do not affect production, can be derived from diminishing marginal utility of income. By parity of reasoning, the same principle rules out any policy that increases economic inequality. Robbins rejected this position, maintaining that these inferences are valid only if the principle of equal capacities for satisfaction is also admitted. On his view, a normative interpretation of diminishing marginal utility 'begs the great metaphysical question of the scientific comparability of different individual experiences' (ibid., 121). And this question, he claimed, has no satisfactory answer.

The principle of interpersonal comparisons of utility

Welfare economics assumes that magnitudes of satisfactions experienced by different economic actors can be compared. Independent of reliable interpersonal utility comparisons, proposals to increase economic welfare by redistributing the national dividend cannot be justified on scientific grounds. Consider two economic actors A and B. Robbins held that a verifiable scale of preferences can be constructed, exhibiting the order in which A prefers alternatives available on the market; for example, wine over beer and beer over mineral water. Further, A's order of preferences can be compared with B's order of preferences for the same items. Such comparisons are scientifically unproblematic because their results can be confirmed observationally or introspectively. However, it is impossible to compare how much satisfaction A receives from these items with the magnitude of B's satisfactions. All such comparisons 'necessarily' lie beyond the scope of science because they cannot be tested by employing Robbinsian criteria for scientific verifiability. Introspection is not a possible test because no one has access to the consciousness of another person. Observation is ruled out because satisfactions cannot be observed. It follows that '*there is no means of testing the magnitude of A's satisfaction as compared with B's*' (ibid., 124). All interpersonal utility comparisons include 'an element of conventional valuation'. Because they are 'essentially normative', they have no place in pure science (ibid., 123). This means that collective or aggregate economic welfare is a scientifically empty concept, even if the collectivity consists of only two persons.

The principle of value neutrality

Robbins noted that the conventional source of the principles of equal capacities for satisfaction and interpersonal comparisons of utility is a commonplace fact: we routinely make interpersonal comparisons of utility that presuppose equal capacities for satisfaction. However, he understood these routines as grounded not in scientific evidence but in value judgements. A long and illustrious philosophical tradition, articulated most famously in David Hume's *Treatise of Human Nature*, posits an absolute and unbridgeable dichotomy of facts and values. Following this tradition, Robbins insisted that 'propositions involving "ought" are in an entirely different plane from propositions involving "is"' (ibid., 126). The empirical claims of economic science can be sustained only if its investigations are limited to existential propositions concerning what is or what may be the case. Value judgements asserting what should be done or undertaken lie outside the sphere of economic science because they are not verifiable.

In criticizing normative assumptions and value judgements in economic science, Robbins' strategy was simple and utterly destructive of all axiological reasoning. Conflating norms with ethics, he maintained that ethical claims cannot be justified – not only on scientific evidence but on any grounds that approximate rational argument. In his review of Hawtrey's book *The Economic Problem* (1926), which championed a synthesis of economics and ethics, Robbins contended that ethics lies in 'the wilderness of velleity and dogma', the state of knowledge that prevailed in 'the irrationality of the pre-scientific era'. Ethics is the domain of 'dogmatizing' and 'pure *opinion*', not scientific argument, a sphere of 'speculations whose very nature no philosopher since the beginning of time has succeeded in making clear' (Robbins 1927, 176–7). Thus in the meta-ethics of the young Robbins, the moral philosophies of Aristotle, Kant, Bentham, and Sidgwick did not qualify as alternative arguments and theories of moral reasoning but exercises in futile dogmatizing and speculation.

Robbins' post-*Essay* position

In the face of criticism, Robbins reiterated the above views in the second edition of the *Essay*. Making no concessions, he offered somewhat more detailed explanations of his reasoning. The second edition removed any doubt as to whether he understood the principles of interpersonal comparisons of utility and equal capacities for satisfaction as unverifiable in principle, and thus scientifically meaningless, or merely unverifiable in light of the current state of knowledge: the principles could 'never' be verified (Robbins 1935, 137). Introducing arguments from his review of Hawtrey, he also attempted to clarify his remarks on the place of value judgements in economics. Although economic science can make no claims about the validity of value judgements, it does not follow that use of value judgements as hypothetical premises of economic arguments is ruled out altogether. Following Max Weber's analysis of the concept of value neutrality and the place of value judgements in economics, he suggested that such arguments might take the following form: given a certain value, the validity of which cannot be demonstrated scientifically, what are the most efficient economic measures for achieving it? If these measures are taken, what other economic means are excluded, and what other values are compromised or negated? Beyond this line of inquiry, economics has no scientific remit to draw conclusions about value judgements (Robbins 1938, 636).

Robbins never retracted the positions taken in the 'slender essay' of his 'salad days', as he characterized the *Essay* in his Richard T. Ely lecture of 1981. He even radicalized his criterion for verifying comparisons of interpersonal utility by stating it more restrictively. Observation or introspection of magnitudes of satisfaction was no longer sufficient. Measurement of these magnitudes was now required. Because there was 'no objective measurement conceivable' of interpersonal comparisons of value, welfare economics was left to languish in the sphere of

Robbinsian political economy: the domain of economic policy and 'assumptions of value essentially incapable of scientific proof', the field of economic reasoning in which conclusions 'clearly go beyond science' and no 'scientific authority' can be claimed (Robbins 1981, 4, 6, 9).

Was Pigou's work vulnerable to Robbins' arguments? Even as he planned the *Essay*, Robbins certainly seemed to have thought this was the case. In 1930, he and Pigou were both members of the Committee of Economists together with Keynes. During the 13 August meeting of the Committee, as Keynes discussed procedures and Robbins' mind drifted from the business at hand to reflections on his book, he wrote the following note.

> Of the redoubted names Pigou [,] Dalton, etc. especially the "axioms" of the Economics of Welfare. No one will wish these to be excluded from the books of Economists (though like Mr. Hawtrey [illegible] will think them rather thin). All that it is deserved to emphasise is that they do not spring from the same body of knowledge. They are not part of the unity of Economic generalisations. (attached to a letter from Keynes to Robbins, in LR/EAC/1/1)

Given a bit of background, Robbins' note can be deciphered without difficulty. Dalton was Hugh Dalton, Robbins' teacher in economics during his first year at LSE, sometime Member of Parliament for the Labour Party, future Chancellor of the Exchequer, and a graduate of Cambridge, where he studied with Pigou. The 'axioms' of *The Economics of Welfare* were the three main propositions that Pigou undertook to establish – his fundamental propositions concerning the relationship between economic welfare and the size, distribution, and stability of the national dividend. Robbins' main point was that Pigou's propositions do not qualify as scientific theses. Employing his demarcation criteria for distinguishing economic science and political economy, verifiability and value neutrality, they fall in the latter domain.

Pigou's silence

Following publication of the *Essay*, which was in some measure an attack on the scientific status of his work, Pigou made no response for some 20 years. Why? Several considerations bear on this question.

Pigou was reluctant to enter disputes over economics. This disposition may be traced to Marshall's aversion to public disputations in economics and to Pigou's experience as a young man in the tariff reform controversy.

He believed that the controversy had led the public to conclude that economists were hopelessly at odds with one another, casting doubt on the scientific validity and practical value of economics itself (Pigou 1906b, 2–3). In general, his preference was to remain above the fray, or oblivious to it. He placed the value of an economist's constructive work far above engagement in controversy. At best, it was a distraction. At worst, it was an embarrassment to the discipline and a waste of intellectual energy that could be expected only to entrench interlocutors more firmly in their convictions. The latter consideration was a point on which he chastised Robertson, whose obsessive efforts to persuade Keynes of the erroneous path he had taken in *The General Theory* were futile. For Pigou, there was little value for economics in John Stuart Mill's liberal arguments on the benefits of intellectual conflict. Perhaps because of his commitment to Victorian positivism – the view that science progresses conservatively and cumulatively, erecting a structure built from the best ideas, suitably revised and amplified, of many generations of thinkers – he did not embrace a scientific culture of robust criticism. His stance on controversy in economics was not motivated by dogmatism or a powerful conviction in the truth of his own ideas. Through the successive editions of *The Economics of Welfare*, he was responsive to shifts in economic theory, and his thinking never became frozen in doctrines that he regarded as beyond revision. In the 1952 printing of the fourth edition, he claimed that had he been younger and more agile intellectually, he would have taken the work of Chamberlin and Joan Robinson on imperfect and monopolistic competition into account (Pigou 1952a, 833). Finally, in understanding Pigou's responses, or non-responses, to the work of his contemporaries, it is important to consider not only ideas that he countered in print, but views on which he published little or nothing. Pigou's silences often signified implicit criticism, rejection, or his sense that some views were so banal or obviously mistaken that they did not merit comment on his part.

Pigou did not shun controversy when he believed that circumstances called for a rejoinder or even a reprimand. He was moved to criticism when convinced that an economic position was pernicious, irresponsible, or mistaken in an important respect. This was the case when he believed that a thesis was likely to damage the smooth operation of the 'engine' of economic investigation that supplied the tools for his theory of economic policy analysis. Notable occasions on which he thought it necessary either to demonstrate to critics that the machine was in good order or to repair or replace parts to improve its performance include his exchanges with Frank Taussig over railway rates (Pigou 1913f, g), his response to Sraffa's critique of Marshall's theory of value (1927c, 1928a), and, most dramatically, his exchange with Keynes on *The General Theory* (Pigou 1937a, 1938). However, he had no reason to think that Robbins' attack hampered the operation of his machinery. It was quite remote from the critiques of Sraffa and Keynes, which placed in jeopardy Pigou's tools of economic analysis. He made timely responses to both, believing that if they were allowed to stand, the analytical apparatus he employed would be seriously damaged. Moreover Robbins' weapons were drawn from methodology and epistemology, which Pigou was loath to enter. Debates over fundamentals were usually pointless because the premises of interlocutors were mutually inconsistent, failing to provide common ground on which intelligent discussion was possible. The premises themselves could not be debated because they had the status of final principles. As conditions for the possibility of debate, they were beyond dispute.

In the main, Pigou had no grounds to suppose that *The Economics of Welfare* was vulnerable to Robbins' arguments. Robbins saw welfare economics as an ensemble of policy recommendations based on value judgements. *The Economics of Welfare* was not a set of policies but a theory of policy analysis. It did not advocate policies or make value judgements on the question of which welfare measures should or should not be taken in a given situation. Pigou's 'axioms of welfare', as Robbins called them, were not axioms at all but theses that Pigou supported with an array of arguments based on evidence. He conceived them not as value judgements but key empirical propositions in economic science. Like Robbins, he regarded economics as a purely positive science. On this point, he was more exacting than Robbins, who reserved a place for policy in political economy. Barring extraordinary circumstances, Pigou confined policy to politics. Unless a crisis imperilled bedrock institutions of the British social order, the function of the economist was not to make policy, even in the subordinate Robbinsian domain of political economy. The economist's place in the social division of labour was to analyse policies: their premises, the conditions under which they can succeed or fail, and the consequences they can be expected to produce. Like Robbins, he was an adherent of value neutrality in economics. He not only endorsed Robbins' Weberian principle of value neutrality, but applied it in a more stringent fashion than Robbins himself. True, he did not agree that the principle of equal capacities for satisfaction was unverifiable. He regarded this principle as verifiable in theory and specified the sort of evidence that he regarded as sufficient to substantiate it. Pigou saw a potentially fatal threat to his conception of economics in only one of Robbins' criticisms: his attack on interpersonal comparisons of utility.

Pigou's anti-critique

In meeting a request from the editor of the *American Economic Review* (*AER*) for an article on 'Some Aspects of Welfare Economics', Pigou finally broke his silence on Robbins' critique, albeit in an oblique fashion.[3] A successful attack on the principle of interpersonal comparisons of utility, he acknowledged, would be disastrous for economics. Without the principle, the validity of all claims about the consequences of transfers of goods from richer to poorer persons would be placed in doubt, leaving both analysis and policy in shambles. Thus the issue of whether interpersonal comparisons are, in principle, empirically verifiable was not 'an idle question' (Pigou 1951a, 292).

In his *AER* article, Pigou made no significant concessions, reaffirming the theses and, with the exception of an important new argument, employing the rationales he had introduced in *Wealth and Welfare* almost 40 years earlier. However, he did not identify a target, mentioning neither Robbins nor the *Essay*. Rejecting the position that interpersonal comparisons of utility are scientifically inadmissible because they are unverifiable in principle, he argued that their verification was not only possible but could in fact be performed. Because his reasoning was somewhat convoluted, with several steps and numerous caveats and qualifications, it imposes somewhat strenuous demands on the reader. A reconstruction of his logic follows.[4]

Contra micro-comparisons

The principle does not apply to comparisons of utilities produced by consumption of the same good by two specific persons. Like Marshall, Pigou supposed that micro-comparisons of individual utilities were out of the question. In considering interpersonal comparisons in the early pages of the *Principles*, Marshall argued that there are many circumstances in which the same experience produces different kinds and amounts of satisfaction and dissatisfaction for different persons. 'It would therefore not be safe to say that any two men with the same income derive equal benefit from its use; or that they would suffer equal pain from the same diminution of it' (Marshall 1920, 25). Thus both cardinal and ordinal comparisons of the utilities of individuals were ruled out, with comparisons restricted to the utilities of 'representative members' of groups of economic actors (Pigou 1951a, 292).

Measurement and magnitude

In 1903, Pigou's sometime Cambridge colleague Bertrand Russell published his seminal treatise *The Principles of Mathematics* (1903).[5] Employing Russell's analysis of cardinality, ordinality, and measurement, Pigou argued that insistence on measurability as a criterion for utility comparisons was misplaced and inconsequential. As in *The Economics of Welfare*, he quoted at great length Russell's argument on the relationship between measurement and the determination of differences in magnitude. Russell held that magnitudes – relations that can be distinguished as greater or less – fall under two headings. Extensive magnitudes, such as distances and divisibilities, can be measured: one-to-one correspondences between a series of magnitudes and a series of numbers can be established. As Russell put it, 'the order of the magnitudes measured should correspond to that of the numbers' (Russell 1903, 176). Magnitudes that are not measurable in this sense are intensive. In principle, however, measurability is of no significance in determining intensive magnitudes. Judgements of equality between two items can be made irrespective of whether the items in question can be measured. The same holds for judgements of greater or less. From these considerations, for which Russell offered no support, he concluded that quantities that cannot be measured can still be ordered in a series of larger or smaller magnitudes. Nothing is lost by the impossibility of measurement, which he characterized as a 'strictly quantitative achievement'. Independent of measurement, we can determine whether one magnitude is greater or less than another and whether a third lies between them. Because differences in magnitudes are also magnitudes, in principle we can establish whether the difference between one pair of magnitudes is greater than, less than, or the same as the difference between another pair of magnitudes of the same kind. 'Without numerical measurement, therefore, the quantitative relations of magnitudes have all the definiteness of which they are capable – nothing is added from the theoretical standpoint, by the assignment of correlated numbers' (ibid., 183).

Pigou contended that Russell's case for the irrelevance of measurement in determining magnitudes showed that a measurability criterion for comparing interpersonal utilities rests on a philosophical mistake. On this view, Robbins failed to see that determinations made in comparing intensive magnitudes such as utilities do not depend on measurement. Thus a measurability criterion for interpersonal comparisons collapses.

Verifiability

Pigou claimed that a range of interpersonal comparisons of utility sufficiently broad to provide a foundation for a theory of economic welfare is empirically verifiable, not only in principle, but in fact. Contrary to Robbins, therefore, the principle is scientifically legitimate. In the various editions of *The Economics of Welfare* as well as the *AER* article, Pigou claimed that the principle of equal capacities for satisfaction can be adequately substantiated, from which he inferred that the principle of interpersonal comparisons of utility also holds true. For example, he wrote that 'objective tests' show there are many respects in which randomly selected groups of people of the same 'race' and national background are, on average, 'pretty much alike'. From these tests, we are warranted in inferring by analogy that these groups are 'probably pretty much alike in other respects' as well (Pigou 1951a, 292). If this reasoning is applied to the principle of interpersonal comparisons, the similarities observed in the behaviour of Pigou's randomly selected groups justify conclusions concerning average similarities in their experience that cannot be observed: namely, the satisfactions they receive from economic goods. Unless we have good reason to believe the contrary, 'a given amount of stuff may be presumed to yield a similar amount of satisfactions' not, of course, when we compare the satisfaction of one individual with another, but when 'representative members' of groups are compared – Pigou mentioned inhabitants of British industrial cities such as Birmingham and Leeds (ibid., 292). Thus scientifically respectable interpersonal comparisons of utility can be drawn.

From Robbins' perspective, this argument seems weak. Pigou's studiously qualified and equivocal language – 'on the average', 'probably pretty much alike', 'representative members' of groups – does not add up to an argument establishing verifiability of the principle on the standards that Robbins insisted. Pigou's claims are assertions, suggested by analogical reasoning, that the principle holds true. Instead of developing an empirical test to dispose of Robbins' objection, he employed a much less exacting mode of reasoning, which he characterized as 'analogy, observation and interpretation' or 'experience, reflection and conversation' (ibid., 292, 301).

In Pigou's thinking, what did these labile expressions signify? He did not regard capacities for satisfaction as fixed. Neither genetic nor other factors render them immutable. Due to changes in dispositions and habits produced by secular shifts in the size and distribution of the national dividend, capacities for satisfaction can be expected to change.

Robbins conceived satisfactions as a hidden cosmos that lies in scientific darkness. I know my own capacities for satisfaction, and I can compare my satisfactions and order them according to my preferences. I also know whether my capacities vary and, if they do, the extent to which this is the case. However, the utilities experienced by others remain utterly obscure to me. For Robbins, therefore, the project of constructing a developmental sociology of satisfaction was an absurdity. This was one of the many projects Pigou envisioned in *The Economics of Welfare*. In his sociology of utilities, capacities for satisfaction are cultural artefacts, formed by history. He argued that – taking into account restrictive conditions and qualifications that can be fully specified only in case-by-case investigations – higher wages, education for the working class, and redistributive schemes that transfer income from the rich to the poor will elevate the standard of living of those not well endowed with the goods of this world and increase the scope and refinement of their capacities for satisfaction. He did not see these consequences as near-term results of economic policy. On the contrary, he took what he characterized as a 'long-run view', conceiving transfers 'not as single, casual acts, but as lasting modifications of income distribution'. In his view, 'cutting down large incomes probably leaves the people whose incomes are cut with substantially as much satisfaction as before, while the poor, whose incomes are increased, gain both directly and indirectly by having their desire attitudes pushed up' (ibid., 300). In the main, Pigou understood these changes as intergenerational. They can be expected only when the working poor who have prospered are able to socialize their children in acquiring a broader and more sophisticated range of capacities for satisfaction. These long-term changes in capacities for satisfaction would also produce significant institutional consequences: a workforce ethically more elevated in its preferences, more disciplined and efficient on the job, and thus better qualified to contribute to the national dividend (Pigou 1920c, 50–4).

The *Essay* did not share this conception of the long-term historical transformation of capacities for satisfaction. Robbins did not consider these capacities from the perspective of either historical or logical time. Nor did he take a position on whether capacities for satisfaction were fixed or variable. In the *Essay*, the conception of satisfaction is not a historical artefact but a theoretical artifice, required as one component of the psychology that underpins Robbins' view of the subject matter of economics as choices between scarce resources that have alternative uses. The motives of economic actors are the psychological basis of these choices. Satisfactions constitute these motives. Otherwise they are not objects of economic investigation at all, a curious position for Robbins to take in light of the public benefits he ascribed to products of high culture such as opera, ballet, and the fine arts.

Pigou's rejection of a timeless utilitarian psychology in favour of a historicist variant of psychological utilitarianism could hardly be expected to satisfy the author of the *Essay*. In the final analysis, the disparity between their positions is grounded in a conflict between their respective criteria for truth in economics. Pigou's criterion drew on the epistemological premises of Sidgwick's *The Methods of Ethics*: what it is reasonable to conclude on the basis of a thorough sifting of evidence, carefully tutored common sense, and prudently considered intuition. Not: what can be proven. Proof as established by Robbinsian verifiability, or by any other method, cannot be expected in economics.

Epistemological nihilism

Robbins' requirements for proof in economics were the point of departure for an argument in which Pigou did not reprise positions he had taken in his earlier work. The direction and force of this argument, briefly sketched in his *AER* article, are quite different from the foregoing. If this sketch is clarified and its implications spelled out, it constitutes a powerful counter to Robbins' objections against the principle of interpersonal comparisons. Pigou's argument rests on the assumption that a position forcing us to accept conclusions that are atrociously inconsistent with both everyday reasoning about human action and elementary economic logic is not only unacceptable, but absurd. A demonstration that Robbins' critique of the principle has this defect is sufficient to refute it. Pigou held that in everyday life we routinely act on the assumption that the principle of equal capacities for satisfactions and the principle of interpersonal comparisons are true. Although we cannot prove that this is the case, that is not a mark of their weakness. They require no proof.

> Nobody can prove that anybody but himself exists, but, nevertheless, everybody is quite sure of it. We do not, in short, and there is no reason why we should, start from a *tabula rasa*, binding ourselves to hold every opinion that the natural man entertains to be guilty until it is proven innocent. The burden is the other way. To deny this is to wreck, not merely Welfare Economics, but the whole apparatus of practical thought. (Pigou 1951a, 292)

How does this argument apply to the principle of interpersonal comparisons, and what does it achieve?[6]

Pigou's argument may be understood as the claim that certain propositions, such as the principle of interpersonal comparisons, state necessary conditions for the possibility of economic science. They are presuppositions of all reasoning in economics, including the methods that count as proof, and can neither be confirmed nor disconfirmed. For example, Robbins' conception of economics as the investigation of alternative means for attaining ends that are given assumes that economic actors can compare and weigh their own utilities. But how can they identify their utilities in order to compare them? This question cannot be answered on the basis of observation because I cannot observe my satisfactions. Nor can it be resolved by introspection because there is no test for the validity of an act of introspection. How could my introspection of my satisfactions be verified? Only by a subsequent introspection of the initial introspection. However, such a 'test' is circular, begging the question of the validity of introspection as a method of verification. Appeals to putative rules for verification procedures performed in the mental interior of the economic actor are empty. As Wittgenstein famously argued, testing one introspection against another is comparable to buying several copies of the same newspaper to determine whether what is published in the paper is true. The belief that we are following rules for the performance of a verification test should not be conflated with the fact that we are actually following such rules. 'For this reason, one cannot follow a rule "privately"; otherwise believing that one is following a rule would be the same as following it' (Wittgenstein 1953, 81, translation amended).

Robbins' critique of welfare economics is grounded in an epistemological distinction between intrapersonal and interpersonal utility comparisons: the validity of the former, but not the latter, can be verified. He employed the verifiability tests of introspection and observation as weapons to expel interpersonal comparisons from the sphere of scientific economics. However, verifiability as a demarcation criterion for partitioning value-neutral economic science from an axiologically grounded political economy is a more blunt instrument than he seems to have fathomed. The same criterion also excludes intrapersonal comparisons as unverifiable, from which it follows that they also have no place in economic science. This result undermines a premise on which economics is based: the ability of economic actors to compare their own utilities. Robbins' repudiation of the principle of interpersonal comparisons undercuts the premises of verification in economics, including his own introspective test for the validity of intrapersonal utility comparisons. If the latter cannot be validated, economics is impossible – if economic action is elided from economics, there are no economic propositions to verify. Thus the argument he used to place the principle of interpersonal comparisons in his index of scientifically inadmissible propositions has an unwittingly self-defeating consequence.

Robbins assumed that an economic actor – let us call him Lionel – experiences an intrinsically private world of satisfactions. Lionel can differentiate his satisfactions, compare each one with all his other satisfactions, and rank them in orders of preference – all without access to a language in which these performances are expressed. What could qualify as a criterion for identifying a satisfaction if there is no language in which it is expressed? If satisfactions are understood intentionally – by reference to what they mean to Lionel when he compares his utilities and establishes orders of preference – and if signification is possible only in a language, how is it possible for him to determine what his extra-linguistic satisfactions signify? If two satisfactions are differentiated by differences in their signification, how is it possible for him to determine whether they are the same or different? Lionel can make distinctions between satisfactions only by identifying differences in utility that can be compared. However, his intrapersonal comparisons are possible only in a language that includes criteria that determine what is comparable and rules that specify how valid comparisons can be made. His orders of preference can be introspectively drawn up only in a language in which preferability relations between comparable satisfactions can be established.

The upshot is that Robbins' verificationist argument proves both too much and too little. It proves too much by crushing intrapersonal comparisons, on which the possibility of economics depends. It proves too little by failing to achieve its objective: his argument can destroy the scientific legitimacy of interpersonal comparisons only if intrapersonal comparisons can be validated. Following Wittgenstein, we can envision Lionel keeping a diary of his satisfactions in order to compare them and order his preferences; perhaps recording the frisson of pleasure he experiences on hearing certain operatic arias, a satisfaction that seems to have ranked high in Robbins' own order of utility preferences. Suppose that in the Tuesday performance of *The Magic Flute* at Covent Garden he feels a satisfaction and marks his diary with an F, for the frisson that thrills him. And suppose that in the Friday performance of *Don Carlos* he has 'the same' satisfaction, also marking his diary for that day with an F. But what is Lionel's private, publicly inaccessible, criterion for determining that the two satisfactions are the same, a condition on which an intrapersonal comparison and preference ordering depend? As Wittgenstein remarked, 'what is this ceremony for? For that is all it seems to be!' In such a case, there is no criterion for a correct identification of satisfactions. 'Here one would like to say: what is correct is whatever will always seem correct to me. And that means only that here we can't talk about "correct"' (ibid., 92, translation amended).

From the standpoint of introspection as verification, intrapersonal and interpersonal comparisons have the same status. Just as it is impossible to verify interpersonal comparisons by introspection, so it is impossible to verify intrapersonal comparisons. The reason: introspection does not qualify as verification. If Robbins' critique of the principle of interpersonal comparisons were admitted, it would follow not only that welfare economics but also economic conduct would disappear from economic science – a manifest absurdity. On this understanding of Pigou's argument, Robbins' critique of the principle is radically nihilistic because it destroys economics by eliminating its object of investigation: economic action.

Robbins held that any legitimate proposition of economic science must be verifiable by its methodological canons. Because he believed it was impossible to test the truth of the principle of interpersonal comparisons, he degraded it to the more humble sphere of political economy. However, not all propositions of a science can be tested within that science. Every discourse rests on premises that have the status of axioms: propositions that are not provable in that discourse because they are conditions for the possibility of proof. If Pigou's argument is taken seriously, the principle of interpersonal comparisons has this status in economics. It is not amenable to verification because it is situated in the bedrock of the discipline, underlying the verifiability of economic propositions and the validity of its arguments. In this regard, it is illuminating to compare the principle to Lord Kelvin's bon mot on measurement and knowledge: if you cannot measure, your knowledge is meagre and unsatisfactory. Because this proposition concerns logical relations between knowledge and measurement, its truth cannot be tested by performing a measurement. It lies between the theory of measurement and the theory of knowledge, the intersection of metrology and epistemology. For parallel reasons, the principle of interpersonal comparisons lies neither within positive nor normative economics, but in the epistemology of economics. As a presupposition of economics, it is not open to verification by any economic method. In every science, our questions and doubts assume that certain propositions are, as Wittgenstein observed, 'exempt from doubt'. They are like hinges on which other propositions turn. 'It is part of the logic of our scientific investigations that we do not *in fact* doubt certain things.' In Wittgenstein's metaphor:

'If I want the door to turn, the hinges must stay put' (Wittgenstein 1969, 44, translation amended).

What must stay put in economics? What is exempt from doubt? Pigou's answer to this question appeals to certain assumptions in philosophical anthropology – the theory of what it means to be human. Postulates such as the principles of equal capacities for satisfaction and interpersonal comparisons of utility form the bedrock of economics. Unless we make these assumptions, not only economics, but all reasoning about human action, even the most elementary judgements made in everyday life, fall to pieces. Robbins had a quite different answer to this question. What lies at the bottom of economic science is a methodology of verification. Like the young Joan Robinson, who published her methodological pamphlet *Economics is a Serious Subject* (Robinson 1932) the same year the *Essay* appeared, he held that economics is fundamentally its technique or method. In this answer, there is a basic error. If all claims in the sciences must be subject to verification tests, how should verification tests be tested? There are two possibilities. One verification test could be tested by another. This possibility is circular, invalidated by the spurious method of testing Wittgenstein described. The other possibility is to employ not verification but some other test. Assuming that such a test could be identified, it would violate Robbins' commitment to the universality of verification. Thus his position ends in a paradoxical result: either a vicious circle or a contradiction.

Robbins did not see that methods of verification are based on premises that lie beyond verification because they are conditions for its possibility. The Robbinsian mystification of interpersonal utility comparisons is a consequence of his enchantment by a methodology. It is ironic that he expressed a cheeky contempt for the reasoning employed in philosophical analysis. He did not seem to understand that in his critique of welfare economics he employed the same kind of reasoning – in Pigou's view, ineptly. From Pigou's standpoint, Robbins' conundrum over the principle of interpersonal comparisons is an idle pseudo-problem contrived by the economic formalist. It has no significance for a theory that investigates the realities of economic life.[7]

Where does the above analysis of Pigou's epistemological argument leave his confusing observations on similarities in 'temperament and constitution', 'desire attitudes', and the sense in which these attitudes are 'pushed up' by income redistributions (Pigou 1951a, 294, 299–301)? Pigou regarded these ideas as essentially unproblematic, intuitively workable, and requiring no elucidation. Thus he was silent on the question of exactly what desire attitudes and similarities in temperament signify. These silences provided grist for Robbins' methodological mill. But to what effect? Although Pigou's lapses on these points are evidence of careless and improvisatory thinking, they seem to leave his theory of economic policy analysis undamaged. If the principle of interpersonal utility comparisons is a condition for the possibility of economics, this principle cannot be substantiated by economic argument. If philosophical analysis establishes that interpersonal utility comparisons generate awkward problems in the philosophy of the mind and even lead to a dead end, these difficulties are of little moment for the economist compared with the implications of undermining the foundations of economic reasoning.

Notes

1. The *Essay* has inspired a substantial literature that cannot be covered here. On the origins of the *Essay*, see Howson (2004). For recent commentaries and critiques, including comprehensive bibliographies of the secondary literature, see the symposia celebrating the 75th anniversary of publication of the *Essay* in *Economica* (2009) and the *Journal of the History of Economic Thought* (2009).
2. In the early 1930s, both Pigou and Robbins preferred the term 'economics of welfare'. Subsequently, they adopted the new nomenclature of the profession, 'welfare economics', which also substantially reduced the scope of a Pigouvian economics of welfare.
3. Between appearance of the *Essay* and publication of Pigou's *AER* article, there were repeated attempts by economists to develop value-neutral welfare criteria that would satisfy Robbins' verifiability requirements. All these efforts were followed by objections showing that the proposed criteria were either empirically empty or failed to satisfy the criteria in this respect. These developments have been examined by several economists, including Mishan (1960, 1964) and Nath (1969, 1973).
4. Cooter and Rappoport (1984) develop much of the analysis essential to an understanding of Pigou's position on the principle of interpersonal utility comparisons. They identify a British 'material welfare school', in which they include Marshall, Cannan, and Pigou. This school, they claim, endorsed an objective conception of utility as a property of economic goods: their power to satisfy material needs. However, Pigou understood utility subjectively – as satisfaction itself, a state of consciousness. Although this error mars the appealing simplicity of their account, their article is one of the few analyses of the principle in the economic literature that qualifies as indispensable.
5. Russell was elected fellow of Trinity College in 1895 and appointed lecturer in 1905.
6. Pigou's *AER* article was anticipated in several respects by Roy Harrod's presidential address of 1938 to section F of the British Association for the Advancement of Science. Like Pigou, he objected to Robbins' strictures against the principle because of their massive violation of the dictates of common sense as well as their inconsistency with the principle of equal capacities for satisfaction,

some version of which he regarded as indispensable to economics. Also like Pigou, he argued that the destructive scope of Robbins' critique was intolerable because it would invalidate not only economic welfare policy, but practical reason generally (Harrod 1938, 396–7). For Robbins' response to Harrod, see Robbins 1938.

7. The above account should not be understood as a full-scale critique of Robbins' attack on welfare economics or even as a thorough assessment of his position on interpersonal comparisons of utility. Our remarks are intended only to spell out the implications of the epistemological argument Pigou sketched in his *AER* article. Although he published essays in philosophy before his election as Marshall's successor, he gave up philosophical publication after 1908. The *AER* article was his first publication on the philosophy of economics in more than 40 years. As noted above, it was not without significant flaws. Perhaps Pigou's most bewildering statement on interpersonal utility comparisons appeared in his Marshall lectures at Cambridge two years later. Indulging in a witticism at Robbins' expense in the lecture on 'Utilities', he maintained that the question of whether interpersonal utility comparisons are empirically verifiable propositions or value judgements was unimportant – merely 'a difference in name' to which he ascribed no significance (Pigou 1953a, 45, n.3). In the same lecture, he badly misread Robbins' main contention on these comparisons. According to Pigou, Robbins intended only to claim that they are de facto impossible given current knowledge, not that they are impossible in principle (ibid., 46).

7
Confrontations with Keynes

Preliminaries

In 1924, Pigou instructed the Colwyn Committee on the National Debt and Taxation that the rate of unemployment is the 'best single index' of national prosperity (5/5/1924, in HMSO 1927, 44). If there is a dominant leitmotif of his thought, it is the analysis of the causes and consequences of unemployment and policies for containing it. These issues appear as early as his contributions to the tariff reform controversy. *Wealth and Welfare*, which he traced to his vision of an ambitious study of unemployment, explores them in a more comprehensive fashion. The same holds for his examination of business cycles in the first edition of *The Economics of Welfare*. Between 1903 and 1913, he constructed an analytical framework – systematized, at least in outline, in *Unemployment* (1913h) – from which he never deviated. Its fundamental premise is the distinction between short-term and long-term unemployment. Routine short-term unemployment in a free market is a brute fact. Although fluctuations of long duration could be expected, from an historical perspective they are transient. In the long run, the immanent dynamic of the economy tends to restore full employment, a state consistent with a positive rate of unemployment determined by wage policy.

After World War I, Pigou wrote frequently, voluminously, and repetitiously on both long- and short-term unemployment. The high unemployment rates of the interwar years marked a period of intensive work on three closely linked books – *Industrial Fluctuations* (1927b, 1929d), *The Theory of Unemployment* (1933h), and *Employment and Equilibrium* (1941a, 1949a) – as well as a stream of related publications, both specialized and general. In all this work, he held fast to the framework of 1913, even as he experimented with alternative formulations, shifting his points of emphasis as historical circumstances changed. In the early 1920s, for example, Pigou held that unemployment was caused primarily by general shifts in aggregate demand. At that point, his thinking was influenced by the post-war economic boom and the devastating slump that followed it. By the late 1920s, he had revised his analysis substantially: structural rigidity – workers' reluctance to accept wage cuts introduced in response to an increase in the scope of unemployment insurance – had caused significant unemployment. However, the framework that he employed in both analyses remained intact.

In Chapter 19 of *The General Theory*, Keynes criticized Pigou mercilessly, and on both methodological and theoretical grounds. Eventually Pigou concluded that Keynes' method of formalizing the macroeconomy was superior to his own. On theoretical matters, however, he rejected Keynes' view that the economy could settle to a long-term state of involuntary unemployment. Pigou's resistance to Keynes' theoretical conclusions was a consequence of his tacit theory of economic action and the conception of agency that it entailed. The labour force is not a passive mass; workers change their behaviour in response to the state of the economy, which they experience as aspects of their own biographies. In the short term, workers may be deceived, tricked, or otherwise bamboozled by macroeconomic changes. Not so in the long run. Pigou believed it was unrealistic to suppose that workers would tolerate a Keynesian regime of prolonged unemployment. On the contrary, they would agree to accept lower wages in order to gain employment.

Construction, 1903–13

The framework

It is clear that the tariff reform controversy piqued Pigou's interest in unemployment (Aslanbeigui and Oakes, forthcoming). Tariff reformers argued that free trade harmed workers: international and domestic markets for British goods were eroded, other countries either protecting their products against foreign competition or producing them more cheaply due to lower wages or less stringent labour market regulations. Pigou detected a damaging fallacy in this reasoning. From the fact that free trade increased unemployment in certain industries, it did not follow that it created aggregate unemployment. Moreover, he could find no empirical support for this inference. In earlier decades, British imports of manufactured and semi-manufactured goods had tripled without increasing the aggregate unemployment rate. Theoretically, free trade, like inventions and improvements in management techniques, was responsible for reallocations of labour among sectors. In fact, the advancing 'industrial army' had left the road 'strewn with abandoned baggage and lagging men' (Pigou 1903e, 19). Pigou was convinced that this phenomenon was a temporary defect of free markets. In time, it was probable that the unemployed would find work in growth industries – in Pigou's time, the service sector. He was confident that the next generation of workers would enjoy this happier fate (Pigou 1904d, 451; see also *Cambridge Review*, 7/12/1905, 140).

The path from debating tariff reform to building a new framework designed to explain unemployment was short. On 26 May 1905, Pigou provided a brief and cryptic account of his reasoning in a letter to the editor of *The Times*, responding to Joseph Lawrence, Conservative MP. Lawrence had asked whether relocating British industries to other countries in order to circumvent tariff walls caused layoffs. Pigou's answer, although implicit, was in the negative. Short-term changes in unemployment were caused by 'fluctuations in the conditions of industry'. Capital flight, which concerned Lawrence, was a consequence of the 'average character of those conditions' (Pigou 1905c). In the next few years, Pigou lifted the veil that obscured these remarks by developing the elements of his framework (1906a, 1910c, 1912, 1913h).

Pigou defined unemployment as idleness that, from the perspective of workers and existing conditions, is involuntary (1913h, 14; see also Pigou 1910c).[1] His analyses invariably began with a theoretical case: a perfectly competitive, stationary-state economy. Under these circumstances, 'there could not exist any unemployment whatever' (1913h, 52). Market forces drive wages to their equilibrium levels – which he variously called normal, efficiency, or economic wages. At these levels, everyone seeking a job would find one. A stationary state would experience unemployment only if extra-market forces – tradition, public sentiment, relocation costs, collective bargaining, or minimum-wage legislation – impeded market operations (Pigou 1910c).

In a competitive but non-stationary world, Pigou identified two types of unemployment. Long-term unemployment, a statistical average of good and bad times, was a result of two sets of factors: the cultural or institutional factors noted above and the amplitude of industrial fluctuations (the more pronounced the business cycle, the higher the average rate of unemployment). Short-term unemployment, a statistical dispersion around the mean, was a result of industrial fluctuations (Pigou 1906a, 27–8; 1906b, 70; 1910c). Three sets of exogenous variables explained cyclical gyrations in economic activity: monetary factors influenced by changes in the preference for money – the relative satisfaction people derive from holding money instead of investing it – or changes in its quantity, convertible to gold or otherwise; real factors, including inventions and variations in climate and the demand for British exports – the latter due to changes in taste, availability of substitutes, sensitivity of demand to prices, or protectionist tariffs; and the psychology of entrepreneurs, which varied with the contingencies of an uncertain world and affected the allocation of resources among personal consumption, the wage fund (investment), and inventories (Pigou 1912, 423–66).

Deliberate policies pursued by the public, unions, or the state introduced a certain rigidity in real and monetary determination of wages, which, as we have noted, produced long-term unemployment. These rigidities formed the setting in which business cycles occurred. However, two additional factors were crucial. First, a maladjustment between wages and the demand for labour. In a non-monetary economy, real wages were rigid in the short run. Entrepreneurs and workers mistrusted each other, each resisting a wage change, fearing that the counterparty would refuse to accept a readjustment when circumstances were reversed (Pigou 1910c; 1913h, 79–83). In a monetary economy, nominal wages were rigid for the same reasons. Additionally, workers suffered from money illusion – a term Pigou did not use – refusing to lower nominal wages when prices fell. Second, a general decline in the demand for labour called for reallocating resources among different occupations and sectors. Without perfect mobility, maladjustments were inevitable. Mobility depended on a number of factors, including the facility of disseminating information and transferring factors of production as well as the cultivation of foresight (Pigou 1906a, 28; 1906b, 71; 1910c).

William Beveridge's monumental book *Unemployment: A Problem of Industry* exercised a pronounced influence on Pigou's framework (Beveridge 1909). Using 'waterside' workers of London as showcase, Beveridge argued that unemployment was caused primarily by failures to allocate productive and employable workers. Aggregate demand for labour was a composite of individual demands, which were numerous and fragmented. Neither the reforms that followed the general London dock strike of 1889 nor publication of Charles Booth's massive poverty studies had significantly altered the fragmented and casual structure of riverside work. In the absence of labour exchanges – institutions that organize the allocation of labour – large reserves of unemployed labour would persist, with workers finding jobs at times of peak demand but otherwise remaining idle. Destitution and demoralization were the unhappy consequences of disorganization (ibid., 77–98). Beveridge proposed to organize labour markets by means of an interconnected system of labour exchanges, which he believed would reduce unemployment substantially, perhaps even eliminate it (see Komine 2004).

Following the line taken by Beveridge, Pigou incorporated labour-market segmentation into his analysis of unemployment. Wage rigidity in industries that used a skilled and permanent work force did not seem to cause unemployment. An artificially high wage neither led to layoffs nor attracted workers from other segments of the labour market. In industries that recruited unorganized, unskilled, and casual workers, insiders and outsiders had an equal chance of finding jobs. In these industries, a higher than market wage led to unemployment. Its extent was determined by relative expectations of earnings on the part of workers: the probability of finding employment multiplied by the wage (Pigou 1913h, 54–7). In industries where work was casual and demand volatile, a reserve pool of labour was formed, satisfying peak employment demands but remaining idle during off-peak periods. Intermittent unemployment was an endemic property of such industries.

In considering welfare costs of unemployment, Pigou argued that it not only reduced average incomes – a disaster for low-income families – but also created volatile expenditure patterns, the good years not compensating for the bad. The consequences of long-term layoffs were more pernicious: erosion of skills and the habit of regular work, loss of self-respect and confidence, eventual unemployability, and a 'haunting sense of insecurity and danger' (ibid., 30–4). In light of these costs, unemployment deserved close analysis. Both long-term and short-term unemployment could be lowered by modifying the institutional structure of the economy. Increased flexibility – plasticity in Pigouvian parlance – could diminish the unemployment of the most inefficient workers. Similar results could be achieved by educating unskilled workers, modifying the currency system to ensure price stability and improving the 'machinery of industrial peace' to reduce labour strife (ibid., 170, 129). Pigou welcomed the passage of the Labour Exchanges Act of 1909. Exchanges were 'powerful informing agencies' that registered the unemployed and filled vacancies. To that extent, they reduced unemployment. However, he did not share Beveridge's progressive optimism that labour exchanges could eliminate unemployment. Even a comprehensive network of labour exchanges would not address the costs of transporting and retraining labour, nor would it compensate for the psychological damage of relocating working families (ibid., 147–69). In considering remedies for short-term unemployment, Pigou followed the minority report of the Royal Commission on the Poor Laws and Relief of Distress: increasing state expenditures in recessions rather than booms. Here as well, his argument for reducing unemployment was prima facie. In each case, 'the probable gain of lessened unemployment' should be weighed against 'the probable social cost of the means employed to bring about that gain' (ibid., 189).

The analytical primacy of supply

In *The General Theory*, Keynes claimed that classical economists – and he singled out Pigou as the classical economist par excellence – believed in Say's law: 'Supply creates its own demand' (Keynes 1936a, 18–19). Long before the Keynesian revolution, Pigou had pointed out the primacy of demand. In considering parallels between economics and politics, subjects taught in the Cambridge Tripos introduced by Marshall, he stated the following: 'In economics and politics alike Demand calls out Supply' (Pigou 1906c, 374). An increase in demand for goods and services increases their supply. Similarly, an increase in demand for specific laws increases legislative supply by the process of legislation (ibid., 374–5).

As Pigou explained in *Wealth and Welfare*, the relationship between the national dividend and economic welfare can be studied from the point of view of either demand or supply. Assuming that supply conditions are constant, it can be shown that factors changing the intensity of people's desires (demand) for goods and services lead to a change in the national dividend and economic satisfaction. Similarly, it can be shown that factors affecting production costs, demand conditions remaining constant, produce the same result. However, he preferred to develop his framework on the basis of supply (Pigou 1912, 20–2), a preference based on two rationales that he did not always make explicit.

First, in considering the writings of Canon Barnett, an enthusiast for social reform, Pigou acknowledged that developing public demand in certain spheres – for instance, good literature, hygiene, and food – had enormous potential for the national dividend and economic welfare. Barnett regarded the standard holiday amusements of the poor as deeply unsatisfying. Instead of enjoying supervised play, guided tours of the country, or lectures on current events, vacationing children of the poor remained idle or became mischievous and quarrelsome. Low-income adults were no better, wasting their money on unhealthy food and drink or trains to the seaside where they observed the leisurely pursuits of the affluent. Barnett's conclusion: the poor required education in the art of self-enjoyment (see Barnett and Barnett 1909, 299–306). Pigou agreed that the training of demand deserved careful study. However, he ruled out demand as the basis of his analysis, 'partly on account of its difficulty'. In the main, *Wealth and Welfare* would investigate 'causes operating on the supply side' (Pigou 1912, 23).

Second, any analysis of the relationship between changes in the magnitude of the national dividend and economic welfare depended on an aggregation of benefits accrued to individual producers and consumers. Such an aggregation, Pigou argued, would be unproblematic on the assumption that individual desires or costs are independent. In several publications, he showed that this assumption is untenable (Pigou 1903f, 1910d, 1913c). On the supply side and under conditions of diminishing and increasing returns, an increase in output of one producer could influence costs of other producers in the same industry. On the demand side, an increase in consumption of a product by some consumers could affect the desire for the same product by other consumers who wanted to achieve either distinctiveness or conformity. As an alternative, Pigou found it easier to analyse production spillovers by using diagrams. Consider a mathematical function representing the price at which individual suppliers are willing to produce a given quantity of a product. Pigou conceived this price, equal for all competitive producers, as a function of two components: the quantity produced by a particular firm and the aggregate quantity of the same product produced by all firms. This equation could easily be translated into diagrams. A market supply curve, for which price–quantity data were available, is drawn first. Another curve, a horizontal sum of individual supply curves, is also easily graphed. The vertical distance between the two curves depicts the production spillovers (Pigou 1913c, 21). There are two reasons why the same method cannot be used for demand curves. Because desire for distinctiveness varies from consumer to consumer, individual desires are not homogeneous. In addition, a mathematical function for independent demand curves in the form discussed would assume that demand price is in part a function of aggregate consumption. However, Pigou argued, consumer desires and satisfactions are determined by consumption patterns of specific reference groups, not by all other consumers. 'If the consumption of a commodity increases among those classes with whom I wish to be associated, my demand for it increases, but, if the consumption increases among those from whom I wish to separate myself, it decreases' (ibid., 23). Thus it would be necessary to replace a simple sum of individual components with a complex formula:

> When the conditions are such that the demand schedule of the separate sources in a market must be represented by formulæ of this

> complex kind, problems, for the investigation of which it is necessary to go behind the demand schedule of the market as a whole, are still, theoretically, soluble; there are a sufficient number of equations to determine the unknowns. The solution, however, must needs be an algebraical solution, and no translation into the language of plane diagrams is possible. (Pigou1913h, 24)

In his early books, Pigou followed Marshall's method of minimizing the use of mathematics, departing from this path only in the 1930s when he used it to model the macroeconomy. By that point, however, supply side analysis had become deeply engrained in his thought.

Labour supply and demand

In his evidence to the Macmillan Committee, Pigou claimed that 'it is always possible to employ more people', implying that the supply of labour invariably exceeds the demand (HMSO 1931, p. 80).[2] Although his analysis of unemployment was replete with discussions of the relationship between wages and the demand for labour, he considered the supply of labour only peripherally. In the long period, he emphasized, wage policy and labour demand were interdependent, because workers attempted to adapt wages to labour demand 'on some permanent plan'. To the extent that such a plan set wages above the competitive level, wage policy caused unemployment. There was also the double-edged sword of unemployment insurance. Although it provided relief in times of unemployment, it also enabled workers to adopt a more intransigent wage policy (Pigou 1927e; HMSO 1931, 84).

In the short period, unemployment was not due exclusively, or even predominantly, to the wage rate. When the demand for labour dropped, wage rates could not easily adapt to new circumstances (Pigou 1933h, 248, 253). As a result, neither the factors affecting the demand for labour nor the wage rate could explain unemployment. Pigou elucidated the problem using an analogy.

> When a ship is too low in the water, this effect is a combined result of the weight of the cargo and of the capacity of the ship. If the capacity of the ship is taken as given, the excess weight of the cargo is called the cause; but, if the weight of the cargo is taken as given, the inadequate capacity of the ship is called the cause. In truth neither of these things taken by itself is the cause, but the maladjustment between them. The evil will be cured if the maladjustment is removed either by decreasing the cargo in sufficient measure, or by decreasing

> the cargo and enlarging the ship in such measures that adjustment between them is attained. (ibid., 27)

In view of Pigou's emphasis on wages and labour demand, what role, if any, did he ascribe to labour supply? Changes in the real wage were irrelevant to long-run labour supply, which was determined by changes in population growth rate, migration, and state regulations on mandatory years of education (ibid., 7). His conception of short-term labour supply was the subject of a correspondence between Keynes and Hawtrey, eventually including Pigou himself. Keynes had written *The General Theory* on the assumption that Pigouvian short-term labour supply was an increasing function of the real- wage rate (Keynes, 1973b, 25, 36). Hawtrey argued that this was not the case, and Pigou concurred. Although individual labour supply curves were sensitive to real-wage changes, bending backward at high wage levels, Pigou ruled them out as empirically insignificant: 'the generality of occupations in the real world' mandate inflexible work hours. However, he agreed that a change in the real wage would affect labour force participation rates in various ways: enabling 'the husband to support his family, without his wife working', or bringing people out of retirement. He assumed that tendencies in the labour force to expand and contract offset one another. The aggregate number of 'would-be wage earners' – employed and unemployed workers – remained a fixed datum (Pigou 1933h, 6). A constant labour force entailed a reverse L-shaped labour supply curve, which Pigou graphed for Keynes in a letter of May 1937 (printed in Keynes 1973b, 54). The horizontal portion of the curve was determined by the current nominal wage, the vertical portion by the size of the labour force. The quantity of unemployment was determined by the distance between the intersection of labour demand curve and the wage on the one hand and the size of the labour force on the other.[3]

Remedies for unemployment

Pigou held that long-term unemployment could be reduced significantly by making wage policy more flexible (Pigou 1933h, 253). Although he examined the idea of a minimum or 'living' wage with some care – its magnitude would be decided by 'our judgment of the minimum requirements of a satisfactory existence, without direct reference to the demand for labour' (see Pigou in Pigou and Robertson 1931c, 29) – he concluded that such a policy would increase unemployment and was otherwise inconsistent with the welfare of workers. Conceived with the average family in mind, it did not adjust with family size and failed to relieve workers who were unemployed or in ill health. A 'national minimum' was a better policy (ibid., 32). Following a parallel proposal by Sidney and Beatrice Webb, he specified this minimum as 'a defined quantity and quality of house accommodations, of sanitary convenience, of food, of leisure, of the apparatus of comfort, of the apparatus proper for promoting safety and health in work and so on' (Pigou 1912, 394).

Short-term unemployment, on the other hand, would not necessarily respond well to wage flexibility. Unlimited flexibility, which Pigou considered as a theoretical possibility, posed several problems (Pigou 1929d, 309; see also HMSO 1931, 49). Wage reductions might fail to lift gloomy business expectations. In some cases, only negative wages could restore full employment. However, even if, implausibly, workers were willing to pay employers for the privilege of a job, they would be unable to do so due to their impoverishment. Finally, extremes in downward flexibility were socially unacceptable, violating 'the moral sense of the time' and the British conception of social order. Pigou's conclusion was predictable: a feasible policy of wage flexibility was limited to modest adjustments. In 1929, he maintained that a reasonable level of flexibility would reduce the amplitude of industrial fluctuations by one-eighth but certainly not eliminate them (Pigou 1929d, 310). However, he was pessimistic about the practicability of even modest increases in wage flexibility. After observing the economic and political toll exacted by the 1926 general strike, he revised his earlier judgement on wage rigidity. In general, workers rejected wage reductions because they thought their wages were already too low. They also resisted because wage reductions were limited to specific groups of workers. General wage cuts were more acceptable to workers because their relative position vis-à-vis other workers remained unaffected. However, there was no institutional structure to facilitate such cuts. Further, workers mistakenly attributed the rise in real wages during recessions to increased efficiency. In fact, it was a consequence of a fall in prices at the same time that nominal wages remained rigid. Finally, public sentiment on wage cuts had changed. On the new view, 'you do not want to cut down people's wages' (HMSO 1931, 84).

Could real wages be reduced through indirect means such as inflation or devaluation?[4] Pigou regarded both measures as unwise on numerous economic and political grounds. At best, their benefits would be only temporary. It was unrealistic to suppose that workers would remain insensitive to the loss of purchasing power following either measure (ibid., 50, 52, 56, 78). Could the state grant wage subsidies to firms in order to reduce the burden of high wages? He was not optimistic. General wage subsidies were impracticable because depressed industries – such as engineering and shipbuilding – required more assistance. If depression in these industries became more severe, there would be calls for higher absolute and relative subsidies. Believing that the state would capitulate to these demands, he concluded that the resulting misallocation of labour would become increasingly damaging, impeding necessary long-term resource transfers (Pigou 1927e, 365).

Given the impracticability of direct and indirect wage reductions, Pigou considered measures designed to increase the demand for labour. The government, local authorities, and public utility companies could promote 'enterprises of a useful character', even if they could not be expected to achieve revenues approximating the market rate of return. The banking system could increase necessary liquidity, ensuring that investment in these projects would not reduce expenditures in other areas of the economy. To ensure success, higher nominal wage demands could be prohibited. Finally, the government could facilitate the recruitment of younger workers into industries with higher prospects of employment (HMSO 1931, 93).[5]

Real-wage reductions and effective demand

Did Pigou understand that real-wage reductions had implications for aggregate expenditure? Assuming an elasticity of demand for labour greater than one (see Pigou 1904d, 451; HMSO 1931, 52), he argued that a wage reduction would increase the aggregate wage bill and expenditure. This view was consistent with the reduced purchasing power of individual workers who had jobs before the wage reduction (HMSO 1931, 79). He also emphasized that advocates of real- wage reductions as a remedy for unemployment – and he was not among them – did not necessarily make a case for a reduction in individual worker incomes: 'it is perfectly possible that you could add to the real income of the wage-earners by indirect methods – through money collected by the State and given them in various forms, instead of through high wages. There are two things. The workpeople can try to raise their income by pushing up the rates of wages very high, or they can have their incomes raised in other indirect ways' such as social services funded by income taxes (ibid., 78–9). Pigou understood that redistribution of income by means of tax increases could eventually diminish labour demand, offsetting any short-term employment gains of real-wage reductions. However, in his testimony before the Macmillan Committee, he discounted this possibility. War casualties and the decline in birth rates had reduced the growth rate of the labour force, which he expected to reduce unemployment. Thus the need to reduce real wages or supplement worker income through higher taxes would be temporary (ibid., 82–3).

From analysis to modelling, 1919–33

The Great Slump

In the decade following the war, British policymakers grappled with demobilization, deregulation, loss of foreign markets, structural change, and monetary disarray. The vigorous boom of 1919–20 was succeeded by the Great Slump. Beginning in mid-1920 and lasting two and a half years, it was the worst recession in British history. Numerous factors resulted in a dramatic fall in wages across the country (Cole 1948, 395–405): deflation, recession, successive deregulation of major industries – coal mining, ship building, engineering, construction, cotton, and agriculture among them – and a relative increase in the bargaining power of employers compared to trade unions. Yet lower labour costs did not reduce the high unemployment rate, which became a signature feature of the decade. It generally fluctuated between 9 and 13 per cent, never falling below 8 per cent and reaching a high of 22–23 per cent during the national coal lockout of April–June 1921 (Hancock 1960, 305; Pigou 1947a, 47).

In the post-war years, a vast literature attributed the unusually high unemployment rate to business cycles. Josiah Stamp declared that economics was on public trial for 'the light it can throw upon, and the reforms it can suggest for, the greatest evil of our time – periodical fluctuations of industrial activity swinging to an extent far beyond the advantageous limits of novelty, rhythm or discontinuous progression' (Stamp 1927, 418). In the early 1920s, Pigou made similar claims about the economic consequences of the war, which had wrecked the world: destitution and dislocation of peoples, destruction of capital, institutional disintegration, and severe impediments to trade. However, he did not think these casualties of the war explained the recession. The world collapse was a consequence of the world boom that preceded it (Pigou 1923b, 38–9). After abandoning the gold standard during the war, states financed their post-war expenditures by freely issuing credit and paper money. The high prices and profits that followed encouraged extravagant economic expansion and a dangerously erroneous optimism on the part of businesses. The excesses of the early post-war recovery sowed the seeds of its own collapse. Higher prices reduced the value of fixed incomes, and workers demanded cost-of-living adjustments. Banks raised interest rates on loans, and the public began to fear deflation. The boom eventually burst. Orders were cancelled and prices tumbled. Because of rigidities in nominal contracts, real-wage rates and interest rates increased. Short-term production was cut and future output contracts were suspended. 'The slump has been abnormally intense because the boom it followed was abnormally intense. Men's minds had swung towards business optimism with extraordinary violence; the sequel was a reaction of like degree. In short, confidence was shattered, and confidence is the mainspring of industrial activity.' How could confidence be restored? It was necessary to temper the facility with which the world monetary system issued money and credit by putting both on a sound footing (ibid., 40). In his article 'Correctives of the Trade Cycle' (1924a), Pigou considered how this objective might be achieved.

Two policy options were open: a concerted international effort to return to the gold standard or a non-gold system that permitted exchange rate volatility in order to stabilize prices. As we have shown, Pigou did not find the latter alternative feasible at that time. 'In practical affairs, to introduce large changes the meaning of which most people cannot understand is dangerous.' In a gold-based system, a much more practicable policy, complete price stability was impossible. However, Pigou thought that the Bank of England had some latitude in using monetary policy to achieve price stability without abandoning the gold standard (Pigou 1924a, 121). Borrowing a page from Marshall's *Money, Credit and Commerce* (1923), he analysed policies targeting 'ignorance' as potentially useful for reducing swings in business expectations. For the benefit of naïve or inexperienced investors, joint-stock companies could be compelled to fully disclose pertinent information. Provision of 'a clear and intelligible statement of relevant facts' by the state could assist investors who were incapable of understanding complex firm regulations. Publication of periodic information on key industry inventories and orders could provide the basis for projections of macro trajectories of costs. Finally, business exuberance and despondency could be controlled in two ways: reining in herd behaviour – the 'common crowd character of business errors' – and offering credit to solvent businesses facing a recessionary shortage of liquidity due to reluctance of banks to make loans (Pigou 1924a, 103–6).[6]

Industrial Fluctuations

The first edition of *The Economics of Welfare* included some 100 pages analysing industrial fluctuations and policies to reduce their intensity. Pigou was unhappy with this material, in part because it was not sufficiently comprehensive. He deleted it from the second edition (1924b), and on 29 September 1925, made preliminary inquiries to publish a new book on the subject (Macmillan Archive). *Industrial Fluctuations*, a synthesis of business cycle theories, appeared in 1927, followed by a second edition in 1929.[7]

Although more elaborate, the 400-pages of *Industrial Fluctuations* followed the course Pigou had taken in earlier publications with some modifications. Three sets of factors – real, psychological, and monetary – routinely shifted the demand for labour. Wage rigidity and factor immobility in a segmented labour market slowed the process of adjustment.[8] The novel feature of the book lay in its elaborate statistical work. Relying on pre-war data – the aberrations of the post-war boom and the depression that followed were too abnormal to be useful (Pigou 1929d, v.) – he compiled 20 statistical charts, using them to identify correlations, test causal relationships, and accept or reject hypotheses. His charts also provided a basis for quantitative estimates. For example, employing the ceteris paribus condition, he estimated that eliminating wage rigidity would reduce the amplitude of fluctuations by 12.5 per cent, variations in crop yields by 25 per cent, errors in business expectations by 50 per cent, and price variations due to exogenous monetary factors also by 50 per cent (ibid., 219–25).

Nearly half the book was devoted to analysing stabilization policies. The 'rigid doctrine', that markets invariably achieved the highest possible level of economic welfare, was subject to 'large qualifications'. A fluctuating economy achieved a lower level of aggregate output than a stable one. It was also more vulnerable to strikes and lockouts: workers generally tried to increase their wages during booms, and employers attempted to reduce them in recessions. Even if private actors were motivated to stabilize the economy, their calculations failed to take spillover effects into account. 'The heart of the matter is that industrial fluctuations involve evil consequences of such a kind that, if an individual takes certain sorts of action to remove or lessen them, the social gain resulting from his action will not enter at full value into his private profit' (ibid., 247, 248). Pigou considered several measures, including monetary and fiscal policies. Monetary policy was not always effective. Although bank loans could be restricted by increasing the discount rate, he believed that extremely high discount rates would 'wreck society'. High interest rates also limited the ability of states to borrow for emergencies, such as a war. In recessions, monetary policy was an even more blunt instrument. In order to persuade people to borrow, it might be necessary to push interest rates into negative territory. In the British polity and economy of his time, he saw no prospects for this decision (ibid., 266–7).

Fiscal policy was more promising. Pigou argued that the state could regulate its expenditures on public works in order to curb demand in booms and expand it during recessions. He rejected the view that public work projects crowded out private-sector initiatives. In recessions, there were various ways to increase the wage fund – real or monetary funds invested in hiring workers: drawing on inventories, tapping into the reservoir of consumption goods set aside for entrepreneurs, borrowing from abroad (assuming a national recession), and making use of unemployment insurance, charity, and Poor Law relief. The social benefits of fiscal policy depended on balancing marginal costs and gains. However, there was a strong presumption in favour of creating employment beyond what would occur 'naturally' – that is, without the intervention of policy (ibid., 316–7, 322).

The genesis of *The Theory of Unemployment*

The origins of *The Theory of Unemployment* are complex. Pigou's debate with Hawtrey on monetary theory of the trade cycle, recognition of permanent structural shifts in labour demand and wage policy, and testimony to the Macmillan Committee all come into play.

Debating Hawtrey

Hawtrey's views on the inherent instability of credit and the monetary origins of trade cycles, expounded in *Currency and Credit* (Hawtrey 1919), were well known to his contemporaries. He argued that a credit policy that succeeded in stabilizing prices would also eliminate business cycles (Laidler 1999, 112–29). In his essay 'Correctives of the Trade Cycle', Pigou criticized Hawtrey's position without mentioning his name – his standard practice in raising objections to the views of another economist. It would, he claimed, be a 'gross fallacy to infer, as is sometimes done, that, because the trade cycle always presents itself in a money garment, therefore the forces that underlie its movement necessarily reside in the money system' (Pigou 1924a, 92). Exactly what was the 'gross fallacy?' In Hawtrey's system, business decisions were based on changes in the general price level that followed monetary shocks. Pigou argued that entrepreneurs made their decisions on expected movements in specific prices. Suppose that a business expected the general price level to remain constant but, at the same time, anticipated a change in its own price. Pigou saw no inconsistency here. '*Every* business man may quite consistently believe *both* that the general level of prices is going to remain constant *and* that the price of the thing he himself has to sell will go up.' Since not every entrepreneur could correctly hold both beliefs, erroneous decisions were made. Nor were miscalculations unique to a monetary economy. 'In a world of pure barter they would still exist: A and B each making at the same time now an exaggerated, now an inadequate estimate of the other's prospective real demand for his stuff. No study of trade cycles can be adequate in which this point is misunderstood' (ibid., 98).

Hawtrey reiterated his position in 1925, also attacking the view that public work projects could promote employment (printed in Hawtrey 1928, 80).[9] Public works were in vogue, he claimed, partly due to the 'high authority' of Pigou, who had defended their potential value since 1912. According to Hawtrey, it was theoretically possible that 'the outlook for industry might be so extremely unfavourable that promoters of new enterprises do not come forward in sufficient numbers, along with public borrowers, to use up savings as they accrue. In that case additional public borrowing might not displace any trade issues' (ibid., 110). However, this possibility was too remote for serious consideration. In the vast majority of cases, state intervention to promote employment would take either of two forms. It might draw on existing funds, in which case it would reduce private expenditures and leave unemployment intact. Or it could be funded by means of additional credit, in which case the policy would be unnecessary, even though it might create employment (ibid., 108, 111–12). Creation of 'credit unaccompanied by any expenditure on public works would be equally effective in giving employment'. How so? The private sector would use the newly issued credit to increase production. Public works were 'merely a piece of ritual, convenient to people who want to be able to say that they are doing something, but otherwise irrelevant' (ibid., 112).

Pigou agreed that much industrial volatility could be eliminated if the international gold standard community co-operated to reduce price fluctuations. However, this was not a panacea. In *Industrial Fluctuations*, he stressed non-monetary factors, especially the psychology of entrepreneurs. He also highlighted the deficiencies of domestic monetary policy, especially in recessions, and emphasized the potential of public works to stabilize employment. In his review of *Industrial Fluctuations*, Stamp speculated whether Hawtrey would change his position on the trade cycle in light of Pigou's new work (Stamp 1927, 423). He did not have to wait long for an answer. In a stinging 40-page review published in a compendium of his 1925–8 essays, *Trade and Credit* (Hawtrey 1928), Hawtrey dissected Pigou's book, finding numerous errors of analysis and interpretation of facts.[10] And he remained intransigent: the non-monetary variables Pigou stressed, especially swings in optimism and pessimism, originated in monetary factors (ibid., 175).

Hawtrey's protracted and barbed critique – some one-third of *Trade and Credit* enumerated alleged defects in Pigou's thinking – moved the non-disputatious economist to respond in the *EJ*. He did not regard this debate as 'barren' or 'boring'. A controversy 'whose objective is what *should be* thought, not what *may be* said', he declared, 'is sometimes a midwife of truth' (Pigou 1929e, 194). And what *was* the truth in this case? It was Pigou's own position – adjusting monetary factors would not eliminate business cycles.

From 1912 to 1927, Pigou's writings on business cycles were couched in broad terms, identifying categories of causes and estimating their quantitative importance. In responding to Hawtrey, he began an exercise in modelling. It was appropriate to 'discuss in a more positive and direct manner the question how far in a regime of stable general prices, i.e. apart from inflation, it is possible by means of Government expenditure to diminish the volume of unemployment' (ibid., 188). Imagining a large, isolated, non-monetary island economy, he divided its productive population into two groups. Nonwage-earners (NWEs) owned all the land, buildings, and equipment. They also hired manual workers, who provided labour services and received wages in kind – 'wage goods' (WGs) in the language of *Industrial Fluctuations*. A homogeneous and perfectly mobile labour force had settled with employers on a weekly wage of one bushel of wheat. Pigou assumed that this wage, in combination with 'environing conditions', would create a 10 per cent unemployment rate (ibid., 188). Each unemployed worker would receive a fraction of a bushel in unemployment insurance. Suppose that instead of contributing to the insurance fund, the island state asked NWEs to fund new employment by paying a tax of R bushels of wheat. How would this tax affect aggregate unemployment? The answer was not straightforward. On the credit side of the cost–benefit exercise, R unemployed workers would find jobs in building or renovating public works. But if the state employed workers in the WG industry – producing wheat – they would generate funds for hiring another cohort of unemployed workers, who would create the wage fund for a third group: in essence an employment multiplier. The exact number of newly employed people would depend on the elasticity of demand for labour, which was high during recessions. On the debit side of the cost–benefit analysis, the wheat tax would deprive employers of WGs that could reduce employment. Forgoing a discussion of the consequences of the tax for the WG industry, Pigou thought its impact would depend on two variables: the proportion of the R bushels that would have been allocated to the production of capital goods and the damage taxation inflicted on capital accumulation. Since capital goods constituted a small portion of total output, he judged that in the first few years, the reduction in employment in the NWG sector would be insignificant. What would be the net effect of state intervention? If the tax were adopted as a temporary measure and if workers did not press for higher wages, the policy could succeed in generating additional employment (ibid., 188–91).

In responding to Pigou, Hawtrey pointed out a logical flaw in his reasoning. Was it not peculiar that taxing NWEs would only affect employment in the NWG sector? It was surely possible that in the absence of the tax, NWEs would have used the commandeered bushels, wholly or partly, to employ workers in the WG industry. In such a case, the diversion would create a negative employment multiplier (Hawtrey 1929, 641). Hawtrey's arguments, as well as comments that Pigou received privately, persuaded him that he had committed an error in estimating the extent of employment creation in his *Gedankenexperiment*. However, he remained obstinate on the essential point: 'I should now say quite simply that the Government can obtain an annual real campaign fund without any set-off in new unemployment except in so far as (1) the taxation it imposes indirectly checks the performance of work by non-wage-earners and the accumulation of capital, and (2) friction and immobility interfere with such shiftings of occupations as the new adjustment requires' (Pigou 1929a, 643).

The Pigou–Hawtrey debate ended in December 1929. Within a few months, Pigou was called before the Macmillan Committee to explain the causes of the employment crisis and discuss possible remedies. In correspondence, Pigou told Keynes that he intended to begin his evidence from the 'real wage – unemployment end'. However, he thought that this decision would be essentially immaterial to his testimony (circa May 1930, JMK/EJ/1.3). Although he did not elaborate on this point, his statement seems consistent with the position he had taken against Hawtrey: a world devoid of monetary disturbance could still experience fluctuations and unemployment. A few days later, Pigou accepted Keynes' suggestion to include in his remarks a 'section bridging real and monetary happenings'. He considered this to be a 'great improvement' and applicable to 'many other problems too besides this one'. At the same time, he informed Keynes of his plans for another book: 'I'm coming to a notion of making my most recent book a general discussion of unemployment' (Pigou to Keynes, circa

May 1930, JMK/PP/45/254). This was *The Theory of Unemployment*, the manuscript of which he submitted to Macmillan in November 1932 (Pigou to Macmillan, 16/11/1932 and 25/11/1932, Macmillan Archive). Some 60 per cent of the book was couched in real terms. Money was incorporated at a late stage of the analysis to demonstrate that although it was not the sole cause of economic instability, it could significantly exacerbate it. Hawtrey's influence on Pigou's analytical strategy is clear in the preface.

> It is possible to study the problem of unemployment either from the money end or from what I shall call, in contrast, the real end. The two studies, if made complete and carried through correctly, must necessarily come to the same thing, their analyses meeting in the middle. There can, therefore, be no question of the one way of approach being right and the other wrong. Both are right, and both can be used with profit. In recent years, as is to be expected in a period of monetary disorganization, economists have been inclined to concentrate attention on the money end. The result, in my opinion, has been to overstress somewhat the rôle that money plays in more normal times, and to put in the background very important factors of a non-monetary character. For this reason, among others, I have chosen to write my book from the real end, and to bring in the monetary factor only at a fairly late stage. (Pigou 1933h, v)

The Theory of Unemployment also owed its two-sector classification to the debate with Hawtrey. The WG and NWG bifurcation was no longer used to demonstrate the efficacy of public work projects in increasing employment. It was generalized to arrive at an aggregate demand function for labour, an exercise fraught with difficulty, and to estimate its elasticity, an important objective of the book.

'The ten-year chaos'

In recommending that the UK return to gold at pre-war parity, the Chamberlain–Bradbury Committee considered several objections to this policy, including 'industrial stagnation and the disturbance of international trade resulting from post-war conditions'. However, the Committee underestimated their gravity (HMSO 1925b, 374). Members were satisfied that the external sector generated enough revenue both to pay for imports and to afford modest external investment. They were also content with the temporary appreciation of the pound to near parity. Thus they concluded that deflationary adjustments necessitated by the return, although of some significance, would prove to be minor and ephemeral (ibid., 374–6). Nearly two decades after the event, Pigou explained the basis for these misjudgements. The unpredictable events of the post-war period – Beveridge called it 'the ten-year chaos' (Beveridge 1930, 43) – had made it impossible to accurately estimate the full scope of demand for employment or to identify growth industries that could absorb the unemployed (Pigou 1947a, 53). In the five years following the fateful decision to return to gold, these uncertainties evaporated, at least for Pigou. He arrived at two realizations.

First, declines in aggregate demand due to recessions – the slump of 1920–2 and the Great Depression of 1929 – were superimposed on substantial irreversible shifts in relative demand for products and labour. In analysing the relative shifts, Pigou drew on 'Quo Vadimus', an essay by Alexander Loveday, head of the Economic Intelligence Service of the League of Nations Secretariat in Geneva. Demand for non-essential goods such as radios, newspapers, cars, electric lamps, and books had increased for several reasons. Income distribution had shifted in favour of unskilled workers, the majority of the poor, increasing their purchasing power. Reduction in work hours had created more leisure time, and the aging population was growing at a slower pace, reducing the emphasis on primary goods. Contemporaneously, many industries – shipbuilding, steel, cotton, coal, and agriculture among them – faced increased competition from other countries as well as new substitutes. Failure to adopt more efficient technology and organizational structures had further reduced competitiveness. Currency devaluation and protective tariffs introduced by other countries had made matters worse. In sum, the ailing British economy faced daunting structural challenges (see Loveday 1931, 84–112; HMSO 1931, 48, 55, 78).

Second, British economic woes were aggravated by institutional rigidities, most importantly an inflexible wage policy. Compared to the pre-war era, the average rate of post-war unemployment was substantially higher. Before the war, real-wage rates exhibited a long-run tendency to adjust, broadly albeit imperfectly, to market conditions. After the war, workers treated pre-war real-wage rates as sacrosanct despite the fact that demand had declined substantially and the workday had shrunk by 10 per cent (Pigou 1927a, 13; 1927e, 355–7). The extraordinary transformation of the national system of unemployment insurance also encouraged intransigence. Before the war, the British National Insurance Act was in its infancy. The Act, which was passed in 1911 and began disbursing benefits in January 1913, covered only 2.25 million workers in a few volatile industries, including construction, shipbuilding, and mechanical engineering (Beveridge 1930, 12). In the decade following the war, coverage was increased and extended to workers and their dependents in all industries except agriculture and domestic services. Workers who suffered from long spells of unemployment received additional coverage through the Ministry of Labour. Beveridge spelled out a widely held view of the damaging consequences of the Act in his Sidney Ball Lecture: 'Once it is admitted in principle that, either under the guise of insurance or in some other form, genuine unemployment can be relieved indefinitely by the simple device of giving money from a bottomless purse, prevention is only too likely to go by the board' (ibid., 43). Although Pigou was not prepared to abolish the national insurance system, he agreed that it had made labour markets more rigid, reduced labour mobility, and increased the average rate of unemployment (HMSO 1931, 49; Pigou 1912, 412).[11]

The Theory of Unemployment included extensive discussions of maladjustments between a fluctuating demand for labour and a rigid wage policy. Despite its highly abstract arguments, Pigou's emphasis on economic and institutional problems is clear. Wage policy had become a much more important variable in the post-war period. Pre-war unemployment 'was, in the main, a function of industrial fluctuations and labour immobility – of short-run frictions rather than of long-run tendencies' (Pigou 1933h, 255). In the 1920s, the problem of unemployment had been transformed. Pigou claimed that the average post-war rate was two to three times higher than pre-war rates, indicating that 'the goal of long-run tendencies in recent times has been a wage level substantially above that proper to nil unemployment'. Although post-war dislocation made it hard to confirm this proposition definitively, he argued that wage policy, conceived as a long-term determinant of unemployment, called for more careful consideration than had been the case two decades earlier (ibid., 256).

In discussing fluctuations in product and labour demand, Pigou defined exceptional depressions loosely. They included not only the 'lower extremity of a normal trade cycle' but the severe unemployment of the 1920s, which could not be understood as a conventional cyclical depression (ibid., 250). He had little to say about general reductions in demand since he had already considered them in some detail in *Industrial Fluctuations*, a book he regarded as complementary to *The Theory of Unemployment* (Pigou 1933h, vi–vii). Instead he explored structural imbalances more thoroughly. Demand fluctuated with changes in 'attitude of desire'. His examples, all drawn from the post-war period, were revealing. The demand for certain products such as munitions could be transformed permanently as a country moved from war to peace. A change in the age distribution of a community would affect the demand for labour in occupations satisfying the needs of children and adults. Increased per capita wealth would reduce expenditures for basic needs such as wheat and coarse textiles, as opposed to dairy products and fruits. A shift in the distribution of income in favour of the poor would tilt demand away from luxuries and perhaps also capital equipment; more commonplace comforts and '*la luxe démocratique*' would be favoured (ibid., 117, 119).

In sum, *The Theory of Unemployment* delineated the realities of its time and place. Consequential historical shifts in relative demand across occupations, centres of production, industries, and sectors had occurred. However, institutional developments had restricted the capacity of labour markets to adapt to the new realities.

Debating Keynes

While testifying before the Macmillan Committee, Pigou was asked two questions bearing on wage reductions as a remedy for unemployment. Could a real-wage reduction increase employment? And would a money-wage reduction, assuming it were viable, lower the real wage? Pigou responded to the first question by resurrecting his wheat economy. If wages were cut from one to one-half bushel, landlords would be able to hire workers at lower marginal productivity (HMSO 1931, 52). Keynes asked whether he could provide an estimate for the elasticity of demand for labour. Suppose that a small reduction (2.5 per cent) in the real wage in the more robust, sheltered industries could create jobs for one million unemployed people. In that case, Keynes thought, the policy would garner wide support. On the other hand, few would support a 10 per cent reduction creating only 100,000 jobs. 'Have you', asked Keynes, 'formed any opinion as to what exactly the quantitative situation is?' Pigou had not yet explored this issue and could only speculate (ibid., 49). The elasticity of demand for labour was frequently underestimated. If the real wage of workers producing certain automobile parts – 'magnetos' – were reduced, its impact on the price of cars would be modest, increasing their demand only marginally. However, it was inevitable that this marginal increase would stimulate demand for other car parts. There were additional spillovers. More employment in the automobile industry would elevate demand for products in other industries. Taking these spillovers into account, Pigou speculated that a general reduction in the real wage could increase employment markedly: 'You would get at least 1 per cent. increase of employment as a result of 1 per cent. reduction of wages' (ibid., 52).

Noting that the British economy depended on trade, Keynes pointed out that Pigou's estimates were based on the implicit assumption of a closed economy. He agreed with Robertson, who in previous testimony had claimed that the demand for British exports was relatively inelastic. Keynes concluded that a real-wage reduction 'might on balance do harm rather than good to employment'. Pigou, who did not commit himself on the question of the elasticity of demand for British exports, disagreed with his two Cambridge colleagues. Even if a real-wage reduction did not create additional employment in the export sector, it would still boost employment in the domestic economy (ibid., 52).

In his response to the second question – would lowering the nominal wage reduce the real wage? – Pigou made two counterfactual assumptions: policymakers deemed real-wage reductions practicable, and nominal wages were perfectly flexible. On these assumptions, he could see two outcomes. In one scenario, employers would hoard the funds released by the wage cut. This would lead to a proportionate drop in prices and no impact on either the real wage or employment. In the second scenario, employers would use their cost savings productively. Prices would not drop but real wages would, increasing both production and employment (ibid., 57). In analysing these scenarios, Pigou was silent on the behaviour of banks. Keynes found it hard to believe that banks would remain passive: 'Something will happen at once to the banking system.' When pressed to make his assumptions explicit, it became clear that Pigou had assumed a monetary system in which banks would take no action on the accumulating deposits of entrepreneurs or the funds they hoarded. Keynes disputed Pigou's analysis of both firms and banks. In the real world, firms did not hold significant bank deposits; their main relationship with banks was through expansion or contraction of loans. On Keynesian assumptions, a reduction in money wages would lead to fewer loan applications. Banks, which would not remain passive, would stimulate borrowing by reducing interest rates. However, significant reductions were not viable in an open economy governed by the gold standard, because they would result in 'foreign lending and loss of gold'. Keynes' conclusion: Pigou's hoarding scenario – no change in real wages or unemployment – was 'extremely real' and the behaviour of banks the 'most fundamental thing' to consider. In Pigou's opinion, the behaviour of the banking system was only one of several factors deserving consideration. Another important variable was business sentiment. If employers responded to interest rate reductions, as Keynes suggested, there was good reason to suppose that they would also welcome wage reductions: 'If an employer thinks he is going to pay

10 per cent. less wages it seems to me he would consider whether it is worth employing more people, just as if he gets a lower rate of interest. So I think you would reduce real wages by reducing money wages, and this other extreme case would not arise, though how far you would reduce real wages is not clear' (ibid., 57).

Pigou and Keynes also debated the extent of real-wage reductions, assuming that nominal wages could be reduced. Keynes maintained that the reduction would be trivial in a closed economy, which he called 'the unreal case'. In an open economy, on the other hand, 'a reduction of money wages would be almost certain to reduce real wages' (ibid., 57). In Pigou's opinion, they agreed more than they differed. 'I think it is a matter of quantity; we would probably both agree it would reduce real wages to a certain extent' (ibid., 58). Neither Pigou nor Keynes provided quantitative estimates of real-wage reductions in their respective capacities on the Macmillan Committee. Their estimates were offered shortly after Pigou concluded his testimony. In July 1930, Prime Minister Ramsey MacDonald invited Pigou to serve on a committee of the Economic Advisory Council – the Committee of Economists – along with Stamp, Henderson, Lionel Robbins, and Keynes, who would chair the Committee. An undated note in Robbins' papers records quantitative estimates of real-wage reductions by committee members. Assuming a nominal-wage reduction of 10 per cent, Pigou gave the lowest estimate, 5+ per cent, followed by Keynes' 5.7 per cent (LR/EAC/1/4).

In writing *The Theory of Unemployment*, Pigou was influenced by his debates with Keynes, and in several respects. He accepted Keynes' proposition that any attempt to model the economy as closed was too 'unreal' to be taken seriously. Thus his two-sector model incorporated transactions with countries outside the UK. He also took seriously Keynes' question on the elasticity of demand for labour: Part II of his book was devoted to estimating the elasticity of labour demand in both real and monetary terms (Pigou 1933h, 33–106). And in discussing the role of monetary factors, he made his assumptions about the banking system clear (ibid., 185–243). In isolating the impact of monetary factors on unemployment, it was irresponsible to compare monetary and non-monetary economies.

> It is illegitimate to abstract money away and leave everything else the same, for the reason that, in the absence of money, everything else would necessarily not be the same. The abstraction proposed is of the same type as would be involved in thinking away oxygen from the earth and supposing that human life continues to exist. It is an

> improper application of the method of difference to imagine a cause to be removed but its effects, nevertheless, to remain. (ibid., 212)

Following this line of argument, Pigou compared the operation of a normal monetary economy with a regime under a hypothetical, 'standard monetary system', where banks played an accommodative role. In the latter case, the discount and interest rate policies of the central bank and the banking system held the stock of active balances in line with general movements of a business cycle. In other words, the monetary system passively followed real decisions of industrialists, increasing or decreasing their funds to the extent that they desired. However, the system did not interject an independent expansionary or contractionary impetus (ibid., 207–12). Pigou rejected the idea that money was a neutral lubricant.

> The conception of a neutral money, which shall allow everything to proceed as it would do if there were no money at all is parallel to that of a "neutral" lubricant, whose presence shall make no difference to anything. The only lubricant which "makes no difference" is a non-existent lubricant. A perfect lubricant generates no frictions and is thus, in a sense, passive. But nobody imagines that the search for a perfect lubricant will lead to the discovery of a "neutral" one! (ibid., 188, n.1)[12]

The Theory of Unemployment: old wine in a new bottle

In writing his book for fellow economists, Pigou used every tool at his disposal, including 'a little elementary differential calculus'. He recognized that he was breaking methodological ties with Marshall, who took 'extreme pains' to conceal the mathematical structure of his analysis. Marshall may have achieved his objective of making the *Principles* widely accessible. However, Pigou doubted that readers without technical training could have followed his reasoning. Would it not have been preferable, Pigou asked rhetorically, if Marshall had presented his ideas in mathematical form, advising readers to master a few simple mathematical tools?

Mary Morgan has argued that in the 1930s, efforts by economists at formalization shifted into high gear under the influence of Ragnar Frisch, architect of an early mathematical model of the business cycle that formed the basis of Jan Tinbergen's pioneering macroeconomic econometric work (Morgan 2012, 10). There is no evidence that *The Theory of*

Unemployment was influenced by these developments.[13] Karen Knight (2013) has documented Pigou's long courtship with mathematics. His performance in mathematics at Harrow was stellar. His *Principles and Methods of Industrial Peace* (1905a) was written under the influence of Edgeworth's *Mathematical Psychics* (1881); its appendix, which modelled collective bargaining, was developed with the help of Keynes, then a Cambridge undergraduate in the Mathematical Tripos. Before the war, Pigou published several technical articles (1904c, 1908b, 1910d, 1913c), some of which indicated his dissatisfaction with Marshall's partial-equilibrium analysis. And he proposed a new method of estimating the elasticity of demand (Pigou 1910b), a problem to which he returned in the 1930s (Pigou 1933a).

In the 1920s, Pigou was preoccupied with analyses that addressed urgent post-war problems and restricted his mathematical forays. Should the UK reform its income tax structure to improve its fairness? Did nationalization of the coal industry make sense? What were the advantages of paying off the national debt over a short period? Should the country return to gold at par? And most important, what were the causes of the persistently high rates of unemployment? It is not clear precisely why he returned to formalization in *The Theory of Unemployment*. There is evidence that he admired the formal analytical structure of *The Economics of Imperfect Competition* (1933), a book published under Joan Robinson's name but written in close collaboration with Kahn (Aslanbeigui and Oakes 2009, Part I). His junior colleague's unapologetic formalism may have prompted Pigou to follow the same course. Knight has another plausible explanation: his work on unemployment exposed complexities that could not be explained by the Marshallian partial-equilibrium analysis (Knight 2013). In 1913, Pigou had hinted as much: consumption spillovers could be formalized mathematically but not diagramatically (see Pigou 1913c, 24). And we have shown above that the formal structure of Pigou's book originated not in the economic innovations inspired by Frisch, but in his earlier debates with Hawtrey and Keynes.

Regardless of which road Pigou travelled and why he chose *The Theory of Unemployment* to formalize the macroeconomy, it is clear that this book marked an undeniable departure from Marshall's conception of economics and how it should be written. The differences between Marshall and Pigou on this matter are a consequence of their different loci in the history of the professionalization of economics at Cambridge. The key event in this history was Marshall's introduction of the Economics Tripos in 1903. Prior to the Tripos, there was no independent curriculum for the professionalization of economics at Cambridge. The Economics Tripos developed and institutionalized a pedagogy for economics as a science with a distinctive methodological and technical apparatus and a theoretical language that placed a high premium on precision and innovation. The rationalization of training created an intellectual sphere of increasingly arcane expertise. The imperative of innovation had the result, as Weber put it, that work in economics was 'chained to the course of progress'. Every scientific achievement poses new problems, the most challenging of which cannot be solved by scientists whose professional socialization rests exclusively on older methods and standards. In this sense, 'the fate to which science is subjected', the '*meaning* of scientific work is that it *asks* to be "surpassed" and outdated' (Weber 1958, 137–8). In consequence, the results of scientific research become increasingly unintelligible to the public and even to scientists trained under an earlier pedagogical regime. As a late Victorian progressive, Marshall was committed to the imperative of innovation in economics. However, he was not prepared to accept the consequences it entailed for a discourse of specialized economic expertise. His preference for a relatively non-technical economic prose accessible to educated laypersons such as businesspeople, civil servants, and politicians is well known. Pigou, who opposed the engagement of dilettantes in economic debate and rejected the democratization of economic analysis as inconsistent with its scientific standing (Pigou 1941c), regarded Marshall's position as an unsatisfactory conception of the place of economics in the social order. If economic controversy remained in the public sphere as an essentially democratized discourse, ease of access to economic reasoning would enable the public to challenge the scientific authority of economists, diminishing the prestige of professional economic analysis. His departure from Marshall on these points can be explained in some measure by generational differences: Marshall and Pigou did their work at different stages in the rationalization of economic science.

In light of our space constraints and the various sources of complexity and confusion in *The Theory of Unemployment*, only a brief survey is possible here.[14] Pigou's model began with a discussion of real variables, competitive markets, homogeneous labour, and a capital stock that was fixed in both quantity and quality. Under these conditions, workers were paid in units of WG – an unchanging blend of goods and services designed to satisfy basic needs (Pigou 1933h, 17–20). These units were either produced domestically or bought overseas with export revenues and investment income. Although NWEs consumed some WGs, they primarily demanded NWGs, non-essential consumer goods or capital equipment, produced domestically or imported. Under a standard monetary system, the volume of employment in both sectors varied due to changes in the real wage, including employer contributions to health and unemployment insurance, or the pool of wage funds devoted to employing workers (ibid., 41).[15]

In Part II, Pigou provided quantitative estimates for the elasticity of real and monetary demand for labour in the aggregate, a matter he had not satisfactorily addressed in his testimony before the Macmillan Committee. However, he advised that his estimates – inevitably based on dubious facts and guesswork – not be taken as sacrosanct. His main objective was to arm fellow economists with a method of analysis (ibid., 88). Recognizing that aggregate elasticities could not be based on partial-equilibrium analyses of individual labour demand curves, he noted significant interdependence among individual industries that produced substitutes or, more importantly in the British economy of the time, complements. Even where labour demand functions were defined by reference to separate groups of industries, ‘so selected that no one group produces commodities competing with, or complementary to, those produced by any other’, a substantial degree of interdependence remained within each grouping and across sectors (ibid., 61–74).

Unable to aggregate individual labour demand functions in a theoretically acceptable manner, Pigou pointed out that under a standard monetary system, the elasticity of aggregate demand for labour depended on several variables: the productivity function of the domestic WG industry, elasticity of demand for labour in the export sector, and NWEs’ relative preference for producing WGs or NWGs. Significant excess capacity characterized periods of deep recession – Pigou’s focal point – making the productivity function in the WG sector highly elastic. Here he disagreed with Keynes and Robertson. The elasticity of demand for British exports was also high because they were non-specialized and thus faced keen competition in international markets (ibid., 91–2, 170–1). NWEs could respond to wage reductions by either of two extreme measures. They could use funds that were released through a wage reduction to increase the supply of domestic WGs. Or they could increase the production of domestic NWGs. Using current data on the proportion of the work force in domestic WGs and exports (three quarters), he estimated the aggregate elasticity of labour demand to be no less than 3.[16] His estimate of the elasticity of money demand for labour was a minimum of 1.5.

Part III was devoted to shifts in the demand for labour, assuming constancy of the real wage. Mindful of interdependence among different industries and sectors, Pigou analysed the impact of relative shifts in demand caused by changes in marketing practices, fashion, productivity, interest rates, tariffs, and income distribution as well as variations in the quantity of raw material and nature's bounty. General factors such as business expectations and exogenous monetary factors had already been discussed in *Industrial Fluctuations*. Here too the expansion or contraction of labour demand depended on the extent to which wage funds were devoted to production.

In Part IV, Pigou moved to a discussion of monetary variables. Under a standard monetary system, authorities used the interest rate – called the 'proper rate' without normative connotations – to change money income based on resources and needs of employers. Under actual monetary systems, the interest rate did not fluctuate as much as the proper rate because central and commercial banks were either incapable of changing the actual rate or were unwilling to do so dramatically over the course of the business cycle. Thus the actual interest rate stood below the proper rate in booms and above it in recessions. In addition, actual monetary systems created wider price fluctuations than the standard system, favouring NWEs in booms and giving rentiers an advantage in slumps. Reminding readers that short-term nominal wages were rigid, Pigou concluded that the wider price fluctuations of the actual monetary system implied wider real-wage changes in both booms and recessions. Structural differences between the two monetary systems created disparate consequences for employment: compared to a standard monetary system, actual conditions experienced higher employment rates in booms and lower employment rates in recessionary periods.

In Part V, Pigou consolidated the various elements of his model. A competitive system would not experience involuntary unemployment in the long run. 'With perfectly free competition among work-people and labour perfectly mobile, the nature of the relation will be very simple. There will always be at work a strong tendency for wage-rates to be so related to demand that everybody is employed. Hence, in stable conditions everyone will actually be employed'. It followed that any long-run unemployment would be voluntary, explained by a deliberate policy of high wages, legitimated by institutional orders, conventions, and public opinion (ibid., 252). Short-term unemployment was due to maladjustments between a fluctuating labour demand (due to structural or cyclical factors) and wages that could not quickly adjust to demand conditions. It was caused by several interrelated variables, and Pigou was reluctant to favour a single explanation (ibid., 26–9, 247–51). Given a reverse L-shaped supply of labour, he held that if demand for labour were assumed as constant, unemployment could be regarded as caused by fluctuations in wages. In that event, the 'resultant fluctuations in the quantity of labour demanded is larger, the larger is the wage shift and the more elastic, over the relevant range, is the demand function'. Alternatively, if wages were assumed as constant, unemployment could be explained by shifts in the demand for labour. It would be larger 'the larger is the horizontal range through which the demand function swings at the level of the ruling wage' (ibid., 273).

Demolition and reconstruction

Reviews

Before 1933, Pigou issued new editions of all his major theoretical books in order to strengthen their analysis and exposition. *The Theory of Unemployment* did not share the same fate. After having 'deliberately discarded cotton-wool' and saying directly what he had to say, he claimed that his aim in *The Theory of Unemployment* was to make it easier for readers to 'grasp his thought' (ibid., vi). Because the book was badly crafted, he failed to achieve this objective. More than 75 per cent of the material was either introductory or preliminary. The complete model did not appear until Part V. Key assumptions remained implicit. The nature of the monetary system underpinning the analysis of unemployment from the real side was only intimated in Part IV (ibid., 185–9), and the shape of the labour supply curve was still implicit as late as page 273. Cyclical shifts in the demand for labour – a major cause of unemployment – were addressed only briefly since they had been extensively treated in *Industrial Fluctuations*. The use of math was a negative function of the model's complexity. As Pigou moved from isolated occupations, centres, or industries – the differences of which were not spelled out – to a general-equilibrium framework that recognized spillovers, he replaced mathematics with elaborate expository analyses. Although Macmillan printed a list of corrigenda, his formal analysis was marred by numerous errors and misprints (Sweezy 1934, 800).[17] Pigou's attempt to develop a synthesis of many variables without underlining their salience compelled the reader, as Roy Harrod observed, to 'do a great deal of translating and retranslating at points where this is not really necessary, that is, at stages in the reasoning which are, in fact, subordinate, but which he does not clearly perceive to be subordinate until he has finished the whole book and reads it for a second time' (Harrod 1934, 21; see also Sweezy 1934, 800).

As an early exploration of the unchartered territory of macroeconomic modelling, *The Theory of Unemployment* inevitably received special scrutiny. Harrod, in a masterful stroke of academic politesse, called it a 'supreme intellectual achievement, a masterpiece of close and coherent reasoning'. However, he found its innovative concepts taxing. Did they fundamentally challenge the orthodox view or simply introduce distinctions without a real difference (Harrod 1934, 19, 20)? Why did Pigou not assume an imperfectly competitive market structure, which Harrod found more realistic? Had he done so, Harrod claimed, his conclusions with respect to the effectiveness of real-wage reductions would have been reversed (ibid., 27). Hawtrey was disturbed by a lack of realism in Pigou's analytical structure. His conception of real demand for labour overlooked the role of profits: any 'study of elasticity which neglects the effects of variation in gross or net profits on the behaviour of employers *must* be futile' (Hawtrey 1934, 151). Because the distinction between WGs and NWGs was murky, the Pigouvian concept of WGs was inexact. Finally and not surprisingly, Hawtrey rejected Pigou's decision to discuss the real economy first, adding monetary factors only at a later stage (ibid., 153–63). Paul Sweezy, at the time a doctoral student at Harvard, was more generous. Pigou's discussion of wage policy was 'difficult to praise too highly' (Sweezy 1934, 807). Unlike Harrod, he thought that Pigou had understated the effects on employment of a real-wage reduction (ibid., 805). However, he also criticized Pigou on grounds of 'vagueness, confusion, and inconsistency' (ibid., 801). Pigou never defined the meaning of WGs and NWGs. Bread was clearly a WG, but were cultivating, transporting, and milling wheat also included in WG industries? Was it consistent to assume that the quantity of capital was fixed and at the same time allow NWG industries to increase their production? And what was the point of the concept of the period of production, the phase between the time when most labour was applied and the time the product was sold? Periods of production varied enormously over industries. The idea of an average of such periods had no plausible content (ibid., 801–3).

The most unsparing review came from Pigou's long-time friend and colleague Keynes. If Keynes' adversary in *The General Theory* was 'classicism', his critiques in Chapter 2 and the now famous appendix to Chapter 19 were explicit attacks on *The Theory of Unemployment*, which he called 'the only detailed account of the classical theory of employment' (Keynes 1936a, 7). Keynes regarded the title of Pigou's book to be 'something of a misnomer'. Pigou could explain voluntary unemployment, due to an unreasonable wage policy, or frictional unemployment, the incapacity of resources to adapt instantaneously to changes in demand. However, he failed to account for involuntary unemployment, which Keynes claimed would exist if an increase in effective demand for output led to increased employment, or if a small increase in the price of WGs relative to money wages increased both the demand for labour and its supply at existing wages (ibid., 6, 26, 15). Attributing to Pigou a 'classical' labour supply function – supply of labour decreasing when the price of WGs increases relative to the money wage – Keynes ridiculed his fellow Kingsman for ignorance of simple facts. Workers and unions were apparently 'instinctively more reasonable economists' than Pigou. They resisted money-wage reductions but ignored, within limits, cost-of-living increases. More fundamentally, Pigou erroneously believed that wage policy determined real-wage levels. Keynes instructed the Professor of Political Economy that the objective of wage policy was to protect relative real wages (ibid., 13, 14). It did not determine general real-wage rates, which depended on economic forces that Pigou had overlooked. It was peculiar, for example, that Pigou's theory of unemployment was silent on fluctuations in investment due to changes in either the interest rate or business expectations (ibid., 275). As a result, fluctuations in the level of investment, which Keynes claimed were 'most often at the bottom of the phenomenon of fluctuations in employment', did not appear in his analysis. The Pigouvian real demand for labour was a function of physical conditions of production in WG industries, which were stable in all phases of a business cycle (ibid., 279). Finally Pigou held the mistaken belief that aside from introducing minor frictions, money was inconsequential in explaining unemployment (ibid., 6, 19–20). Keynes' conclusion: *The Theory of Unemployment* was 'a non-causative investigation into the functional relationship which determines what level of real wages will correspond to any given level of employment. But it is not capable of telling us what determines the *actual* level of employment; and on the problem of involuntary unemployment it has no direct bearing' (ibid., 275).

'Mr. J.M. Keynes' General Theory of Employment, Interest and Money'

The editorial board of *Economica*, which included Robbins (managing editor) and F.A. Hayek, asked Pigou to review *The General Theory*. Stung by Keynes' attacks, he agreed, producing a merciless dissection of the book and the most scathing essay of his career.[18] His review targeted three elements in *The General Theory*. First, Keynes claimed he had achieved in economics what Einstein had actually accomplished in physics – powerful generalizations that subsumed earlier theories as special cases. However, he did not follow Einstein's principle of charity, instead treating his predecessors as a 'gang of incompetent bunglers'. Pigou regarded Keynes' condescension toward Marshall as especially deplorable. This strategy was bad form and a failure on both rhetorical and logical grounds (Pigou 1936b, 115). Second, in belittling a host of theoreticians whom he irresponsibly lumped together as the classical school, Keynes employed an ingenious polemical method. He could damn the entire school for the sins of an individual member, at the same time chastising the innocent for being false to the logic of their school. This device also placed formidable obstacles in the path of reviewers, making it extremely difficult for them to gain a perspicuous view of Keynes' position. Pigou began with a defence of Marshall, whose ideas Keynes had either abstracted from their context or grossly misinterpreted. Keynes' misinterpretations were also directed at Pigou. Providing chapter and verse, Pigou disposed of Keynes' various charges: in both *The Theory of Unemployment* and *Industrial Fluctuations* he had been at pains to show how monetary and psychological shocks caused volatility in labour demand and unemployment (ibid., 116–18). Keynes' 'macédoine of misrepresentations' also included the curious falsehood that Pigou had developed no theory of involuntary unemployment. In fact, he had been careful to show that short-run increases in the cost of living relative to money wages increased, not decreased, labour supply (ibid., 119).[19]

In the third part of his review, Pigou turned to the economic analyses Keynes introduced in *The General Theory*, which he found difficult to assess. How was it possible that the author of *A Treatise on Probability*, a complex subject that Keynes had made accessible to amateurs, had produced a work of such obscurity in the field to which he had devoted most of his academic life? Several factors were responsible for the confusing quality of Keynes' book. He used concepts loosely and inconsistently. For example, in some passages he led readers to suppose that the rate of interest was determined exclusively by monetary factors; in other contexts, he wrote as if it were determined by real variables. His account of the marginal product of labour left open the question of whether this concept referred to value or utility. Pigou saw the same problem in Keynes' failure to distinguish real and money incomes. In addition, Keynes wrote on a level of generality that tempted him to discuss all economic problems simultaneously. Instead of writing independent accounts of the effects of money income and wages on the marginal propensity to consume, he investigated a constant ratio of money income to wage. It was obvious that different trends could create the constancy. Finally, at critical junctures, Keynes seemed to contradict himself. *The General Theory* was based on the premise that the quantity of capital equipment remained fixed. However, it also assumed annual changes in the level of investment, which would change the quantity of capital equipment (ibid., 119–20, 122).

Pigou found the obscurities and apparent self-contradictions in *The General Theory* disturbing, especially on the part of an author whose lucidity and facility of expression had made him famous as a contemporary master of English prose. Moreover, the problem was not new. Pigou and other economists had pointed out comparable instances of confusion and inconsistency in Keynes' *Treatise on Money* (1930).[20] What was their source? The answer lay in Keynes' limitations as a theorist. The logical defects of *The General Theory* were due not to flaws in exposition but deficiencies in Keynes' thinking.

> Nobody could make use of inconsistent hypotheses in this way if he had achieved complete coherence among his ideas. The lack of clarity in Mr. Keynes' explanation is *mainly* due, I suggest, to a lack of clarity in his thought, a lack of clarity which he now himself recognizes to have been present when he wrote the *Treatise on Money* but, naturally enough, now believes himself to have overcome. (Pigou 1936b, 122)

Although not confident that he had fully grasped Keynes' meaning, Pigou identified six 'dominant themes' in *The General Theory*. He was in general agreement with Keynes' analysis of the multiplier and short-run remedies to unemployment. However, he regarded Keynes' account of these matters as oversimplified and insufficiently nuanced. The multiplier would generate Keynesian consequences only if banking policy did not increase the rate of interest in response to government borrowing. In addition, Keynes seemed to discount the effects of high employment on wage policy. In the long run, workers had a choice between higher real wages and less employment, on the one hand, and lower real wages and higher employment, on the other. If they chose the former, attempts to achieve full employment would fail.

Pigou was less conciliatory in his discussion of the other four themes. In his 'most confusing' account of the money rate and innumerable own-rates of interest, Keynes had 'unwittingly entered a mare's nest'. Pigou agreed that a decision to save was not necessarily a decision to invest. In recessions, saving could constitute hoarding and exacerbate unemployment. However, he disagreed that under existing conditions, a decision to save was tantamount to a decision to hoard. Even when individuals intended to save and hoard, the consequences of their actions depended on banking policy. If the banking system kept aggregate money income stable, it would neutralize hoarding by equal amounts of dishoarding, usually targeting investment goods (ibid., 125–7). Pigou argued that increasing employment in a depression would be much more effectively achieved through inflation, not nominal wage reductions. On this point, his disagreement with Keynes, who had suggested that nominal wage reductions would leave the real wage and unemployment intact, was theoretical. Keynes failed to grasp that the consequences of nominal wage reductions would be indeterminate until banking policy was settled and known. At the time, evidence showed that actual banking policy, together with policies that targeted income or price stability, was correlated with a reduction in the real-wage rate and an increase in employment (ibid., 127–9).

Pigou was most fundamentally at odds with Keynes on his confident prediction that the economy would follow a path of secular stagnation, ending in a state in which investment would cease because returns would no longer be positive. As Pigou understood Keynes, investment would come to a halt but holders of wealth would continue to save (hoard). As a result, incomes and employment would decline precipitously, reducing savings to zero. Pigou declared that he was not 'greatly afraid of Mr. Keynes' cumulative débâcle'. If the recent past opened a window into the future, electrical devices, automobiles, the wireless, airplanes, and new war machines substantially changed the plausibility of Keynes' forecast. Even if the average rate of return on capital assets reached zero, many assets would have higher returns. As long as the rate of return of investment was low but not zero, the wealthy would prefer to hold capital assets rather than indulge in sterile hoardings. Leaving these considerations aside, however, and admitting the possibility of a 'Day of Judgment', Pigou believed it was unreasonable to anticipate a financial disaster of catastrophic proportions that Keynes imagined. In the face of widespread unemployment, workers would surely acquiesce to wage reductions. This would mitigate unemployment, even though it would not solve the problem. Based on these arguments, Pigou was unwilling to 'pay a high premium to insure against Mr. Keynes' Day of Judgment!' (ibid., 130)

'Real and Money Wage Rates in Relation to Unemployment': a Pigouvian heresy

In summer 1937, Pigou submitted 'Real and Money Wage Rates in Relation to Unemployment', written in place of a presidential address to the Royal Economic Society, to the *EJ*. The article was his response to recent scepticism concerning the old doctrine that 'a general reduction in money wage rates may be expected to increase the volume of employment' (Pigou 1937a, 405). It was a recondite text of some 5,500 words laboriously organized into 23 brief sections that attacked key assumptions of *The General Theory*. The controversial part of the essay explored the impact of a general reduction of money wages on employment under competitive conditions. Pigou assumed a fixed stock of capital that does not depreciate and is not reproducible, an assumption entailing that saving and investment are equal to zero (ibid., 406). In section 6 of the paper, he maintained that no general conclusions about the relationship between wage rates and employment can be established without a knowledge of banking policy (ibid., 408). Section 7 introduced the concept of a 'normal banking policy', in which the amount of money that banks place in circulation (M) varies directly with the rate of interest (r). M is also equal to the amount of money economic actors want to hold. These two premises ensure that the equilibrium r is equal to the rate of time preference (ρ), at which the representative individual discounts future money incomes. A wage cut, Pigou claimed, would leave ρ and r intact if employment and therefore real income remained constant. Section 8 introduced the assumption that money income (I) at equilibrium is equal to the quantity of money multiplied by its income velocity (V) – the frequency with which people turn over their money balances in a given period. Like M, V is a positive function of the interest rate. V also depends on the distribution of income between wage and non-wage earners. Since NWEs hold larger money balances, V declines as the income share earned by this group increases (ibid., 409–10). In the remainder of section 8, Pigou analysed the effects of a money-wage (w) reduction on employment (x). Assume that w drops but x does not change. Since real income does not change – employment and output remaining the same – ρ, r, and labour's share of real income remain constant. A constant r maintains a constant M, and a constant r and an unchanged distribution of income maintain a constant V. As a result, I (MV) also remains constant.

Sections 9 and 10 explained why the analysis of section 8 is inconsistent with competitive equilibrium. In Pigou's model, price (p) is equal to I/f(x), where f(x) is output. Constant I and x leave p intact. A change in w, however, reduces marginal costs and increases entrepreneurial profits, a disequilibrium position. A new equilibrium is achieved when higher profits lead to increased output and employment.

Pigou believed that money-wage reductions affect employment through a decline in the real wage (ibid., 410). His position did not necessarily entail that r (or MV) would remain constant during disequilibrium states. It could fall immediately after the wage cut, a possibility that 'may seem at first sight to confirm the view sometimes put forward, that a cut in money wage rates can only increase employment if and in so far as it causes a reduction in the money rate of interest; so that the same result could be secured more simply by reducing the money rate of interest and leaving the money rate of wages alone'. Pigou regarded this view as mistaken. A reduction in r unaccompanied by a wage reduction would increase employment only temporarily, until 'bankers return to their original practice'. The effect of a wage reduction was more durable. Thus the two mechanisms were 'entirely different'. However, the relative merits of these methods were not at stake in his analysis. 'It is enough for my purpose to show that a money wage cut is not simply a piece of ritual that enables the real cause of employment expansion – a fall in the rate of money interest – to take effect' (ibid., 411).

Pigou's paper was reviewed by Robertson. Keynes, who edited the *EJ*, approved publication for the September issue, even though he had not seen the essay himself – at the time, he was seriously ill with a cardiac condition and confined to bed in a sanatorium. After finally reading it in early August, he wrote two letters: one to Austin Robinson, assistant editor, and the other to Kahn, his closest confidante on theoretical matters in the 1930s. In both notes, he chastised Robertson for committing 'an unforgivable crime', passing for publication an article that was clearly the 'work of a sick man, which no one would print who was in his right mind'.[21] Keynes instructed Robinson to withhold the September issue from publication. His duty as editor obligated him to give Pigou an opportunity to reconsider his position before his mistakes were 'exposed to the world'; after all, everyone was 'capable of writing, from time to time, the most frightful rubbish'. However, he also asked his two colleagues to comment on his reply to Pigou, drafted on the assumption that the article would be published without modification.[22]

Why the hyperbolic reaction? In the first draft of his comments, Keynes claimed that sections 7 and 8 of Pigou's essay were mutually inconsistent. 'If I am right', he observed, 'these passages are a good illustration of Bertrand Russell's *dictum* that from two inconsistent propositions *any* proposition can be made to follow' (Keynes 1973b, 235). However, Pigou's 1937 views on the relationship between wages and unemployment, which predated World War I, were hardly novel. In 1927, he published a defence of the same position in the *EJ*, also under Keynes' editorship (Pigou 1927e). The two debated the relationship between nominal and real wages and unemployment in Pigou's testimony before the Macmillan Committee in 1930. As we have demonstrated, *The Theory of Unemployment* emphasized wage rigidity as one cause of unemployment. It also included a skeleton of the arguments of his 1937 article (1933h, 100–2). Moreover, Pigou's thesis was hardly an idiosyncratic doctrine. As he noted in the first sentence of his 1937 article, until recently no economist would have questioned this view. Judging by the 1930 report of the Committee of the Economists, he was not misrepresenting the facts (Howson and Winch 1977, 180–231).

In an earlier essay (Aslanbeigui and Oakes, 2007), we have linked Keynes' reaction to Pigou's paper to the advent of *The General Theory*. Although Pigou's views were not new, Keynes' had undergone significant change from 1930. In *The General Theory*, he claimed that his theoretical framework explained the 'facts of experience' better than the classical position, to which he had subscribed for most of his academic career. As he understood it, his book subsumed the classical world as a special case of the larger universe of economic relations, disposed of the erroneous doctrines of the classical theory, and thereby superseded classicism. Keynes investigated the effects of money-wage reductions by examining their impact on the marginal propensity to consume, the marginal efficiency of capital, and liquidity preference, which together, he suggested, determined the level of effective demand. In addition, he argued that a reduction in wages and an increase in the quantity of money amounted to the same thing, at least theoretically, because their impact on employment was achieved through a reduction in r. As methods of restoring full employment they had the same limitations. Neither was capable of employing all workers who were willing to work. The economic system could not 'be made self-adjusting along these lines' (Keynes 1936a, 266, 267). Keynes had a host of reasons for objecting to Pigou's 1937 essay. Pigou had ignored his theoretical framework entirely, conducting his own analysis along the lines of *The Theory of Unemployment*, which Keynes had ridiculed. He maintained that wage reductions and interest rates were alternative means of increasing employment and created the impression that wage reductions could restore full employment. Finally, at a time when many economists – including Beveridge, Harrod, Hawtrey, Hicks, Ohlin, and Robertson – were trying to understand *The General Theory*, Pigou published an article in Keynes' journal without a single reference to it.[23] Thus Keynes' intemperate response is perhaps understandable.

Notwithstanding Keynes' occasional lofty pronouncements on the ethics of editorship, his editorial obligation to Pigou, and his responsibility to the economics profession at large, he did not give Pigou an opportunity to withdraw or revise his article. He did not contact Pigou prior to the appearance of the September issue, nor was Pigou ever shown Keynes' initial reply. On 14 August, Keynes directed Robinson to proceed with publication of the issue, which included Pigou's essay as the lead article.[24] In Keynes' mind, publication of Pigou's article called for a rebuttal from him in December. Beginning in late August, he engaged in an intensive two-month discussion with Kahn on how to revise his response most advantageously. Although they were never able to reach agreement on what Pigou's inconsistency actually was, they did agree that the best way to defeat Pigou was to demonstrate the logical incoherence of his arguments. As Kahn wrote Keynes: 'It is of the *highest* importance to make it abundantly clear, so that the casual reader will recognize, that as far as Pigou is concerned the issue is not one of schools of thought but of the most *crashing* and *stupid* errors of statement and of reasoning such as nobody would deny once his eyes were opened' (10/22/37, Keynes 1973b, 260).

While Keynes and Kahn deliberated over the source of incoherence in Pigou's reasoning, Nicholas Kaldor, then a young lecturer at LSE, sent Keynes a critique of Pigou's recently published essay. Keynes judged the article 'not bad', but too long and excessively formal, burying the main point in a mass of technical detail. However, he thought it might be worth revising once Kaldor had studied Keynes' note (Keynes to Kahn, 7/10/1937, Keynes 1973b, 258). During the following month, Keynes and Kaldor corresponded on fundamental differences between Keynesian and classical economists as well as the question of whether Pigou's assumptions were mutually inconsistent. Although they seemed to agree on the first point, they remained divided on the second.

On 12 October, Keynes sent Pigou a revised copy of his original note, informing him that he had received a 'much longer and more formal' note from Kaldor (ibid., 255). In a week, Pigou replied that Robertson, with whom Keynes had also corresponded on Pigou's essay, had shown him a copy of Kaldor's response to his article. Pigou thought Keynes had misunderstood his essay but found Kaldor's interpretation accurate. Hence his suggestion: 'Trying to abstract myself from personal interest in the thing, I think it would be best for Kaldor's article to be published, but not yours' (ibid., 256). On reading this suggestion, Keynes concluded that Pigou was attempting to quash publication of his note (Keynes to Kahn, 20/10/37, ibid., 259).

In the December 1937 issue of the *EJ*, Keynes objected to Pigou's arguments on three grounds. His assumptions regarding banking policy and income velocity of money were mutually inconsistent; his saving function was flawed because it presupposed that saving did not depend on the level of income; and his equilibrium was neutral, entailing that the wage rate did not influence employment (Keynes 1937). Kaldor, whose paper was published in the same issue, did not charge Pigou with logical incoherence. Using a Hicksian IS-LM model, he contrasted the positions of Keynes and Pigou on the relationship between money wages and employment (Young 1987, 55).[25] The fundamental difference between Pigou and Keynes was the saving function. Although tacitly assuming it, Pigou had failed to specify a classical saving function that made saving (S) a sole and positive function of r. Pigou's conclusions – a reduction in wage resulting in increased employment independent of a change in r – followed from Pigouvian premises. However, Kaldor claimed that since the publication of *The General Theory*, the profession had reached a consensus that saving was a function of both interest rates and income. Arguing that inclusion of income in the saving function would nullify Pigou's results, he maintained that a wage reduction that increased employment and income would also increase S. Because Pigou's model assumed that saving and investment were equal to zero, a mechanism was needed to return S to zero. Kaldor considered two options. Prices might fall by the same percentage as wages, restoring the original income and employment levels; in this case, Pigou's conclusion that employment would increase as a result of a wage cut would be violated. Or r would drop, which, in the Pigouvian framework, would reduce S, the process continuing until S assumed a value of zero; this scenario would allow employment to increase but only through a reduction in r (Kaldor 1937, 749).

> Thus Professor Pigou's view that a "money wage cut is not simply a piece of ritual that enables the real cause of employment expansion – a fall in the money rate of interest – to take effect" cannot be upheld. If the above analysis is correct, it is indeed such a piece of ritual; although, if we want to be quite accurate, the increase in the size of idle balances [savings], rather than simply the fall in the money rate of interest, should be regarded as the ultimate cause of employment expansion. (ibid., 753).

Remaining convinced that his arguments were valid, Pigou planned a reply in which he would restate his position, this time specifying the nature of his saving function and challenging Kaldor's contention that nominal wage cuts were indeed a piece of ritual (Pigou to Keynes, 21/10//37, Keynes 1937b, 257–8). As he informed Keynes on

14 December, he had finished a long draft of this reply and had lent a copy to David Champernowne – a former student of Keynes – who had expressed a keen interest in seeing it (ibid., 265). Working with Pigou in the inter-term vacation and receiving detailed briefs from Kahn, Champernowne succeeded in convincing Pigou that his arguments were fallacious.[26] The fallacy lay in the relationship between ρ and income. Pigou had originally assumed ρ to be insensitive to changes in income. He had now changed his mind: if a wage reduction increased employment and income, it would also reduce the average ρ. In his model, ρ was equal to r at equilibrium. Thus r would necessarily fall (Pigou 1938, 135).

> It follows that, in a mixed community containing men of varying degrees of wealth, a rise in employment, and so in the general level of real income, is likely to be associated with *some* fall in the representative man's rate of time preference, and so in the rate of interest. If we assume that this is so, it follows that, as between different equilibrium positions of our model, employment cannot increase *unless* the rate of interest is reduced; but, whatever happens to anything else, *must* increase if it *is* reduced. (ibid., 135)[27]

On receiving the final draft of Pigou's 1938 paper, Keynes thought that he had capitulated 'in toto' (Keynes to Kahn, 29/12/1937, Keynes 1973b, 266).[28] In admitting that saving was a function of income as well as r, however, Pigou was merely reiterating a position that he had held in *The Economics of Stationary States* (1935b). In this book, published before *The General Theory*, Pigou argued that time preference, and hence saving behaviour, depended on income. People in extreme poverty had very high rates of time preference; their 'minds are of necessity so concentrated on the urgencies of the present moment that the future looms for them very small'. As their incomes increased, the poor would acquire a more expansive vision of the future; hence ρ would drop. Once incomes reached a 'certain moderate size', ρ would plateau: 'further enlargements are not likely to make much difference' (Pigou 1935b, 171). In failing to formulate saving as a function of income, Pigou had betrayed his own theoretical stance, not Keynes'.

The klassical theory of unemployment

After he had read Pigou's reply, Keynes encouraged him to reassess Chapter 19 of *The General Theory* and its appendix, 'dealing with your theory of unemployment' (3/1/1938, Keynes 1973b, 267). Pigou seems to have taken this suggestion seriously. Shortly after the British declaration of war on Germany, he finished a draft of a 'high-brow book' on which he had been working for 'some time'. In correspondence with his publisher, he pondered the date of publication. Low demand in wartime suggested a delay until after the war. However, he was 62 and expected that the war could last as long as five years. 'Might it perhaps be a good thing to have a final tinker at the book and get it into print fairly soon?' Macmillan received the final draft in July 1940. *Employment and Equilibrium* was published in 1941, and a second edition was released in 1949.[29]

Pigou's wartime book was based on several simplifying assumptions: unchanging tastes, technology, stock of capital, and population; and homogeneous labour and capital. Keynes' influence was obvious. The closed economy consisted of two sectors, one producing WGs and the other NWGs, which he renamed consumer and investment goods. Significantly, he abstracted from 'intolerable' and cumbersome details of individual occupations, centres, and industries that had encumbered his modelling efforts in 1933 (Pigou 1941a, 1–2). Moreover, the analysis was no longer conducted in steps. A set of simultaneous equations – a Pigouvian IS-LM model – determined values for employment in consumer and investment goods industries (x and y respectively), the money rate of interest (r), and the nominal wage (w). His main objective was to identify conditions for short-run 'flow equilibrium' in which '*all* the rates of demand and corresponding rates of supply' were constant (ibid., 32). Four equations described these conditions:

(1) Φ (r)=f{r, F(x)}. The demand for labour in the investment goods sector [Φ (r)] is equal to the supply of labour [f{r, F(x)}] in the same sector. The demand is a negative function of r, given technology and the state of business confidence. The supply is a positive function of both r and output of consumer goods, F(x), which provides the wage funds for employing labour in both sectors.
(2) y= f{r, F(x)}, where y is labour employed in the investment goods sector.
(3) (K_1+K_2) w=MV=g(r). The value of total output $[(K_1+K_2)w]$ is equal to money income, which is equal to the supply of money times its income velocity. K_1 and K_2 depend on the elasticities of marginal costs and demands in the two sectors. Velocity is a positive function of r; Pigou excluded income distribution as a variable since data showed that it remained relatively stable over time. M depends on banking policy but is commonly a positive function of r.
(4) w=T; in the short run, nominal wages are constant (T). (ibid., 64–71)

Using comparative statics, Pigou measured the impact on employment and money income of changing individual parameters under ceteris paribus conditions. This method allowed him to calculate employment and money-income multipliers, which generally but not invariably displayed Keynesian signs (ibid., 135–208). Characteristically, he claimed that 'expectations of businessmen – alias business confidence, alias again, if we like, the (expected) marginal efficiency of (given quantities of) capital' were the most important cause of changes in employment and income (ibid., 217). Since recessions ruled out full employment, he assumed that increases in investment demand would not be thwarted by labour-market shortages.

In Pigou's construction of long-period flow equilibrium, investment and savings were equal to zero. Wages were indeterminate, but aggregate employment was equal to a constant quantity consistent with full employment.[30] Adopting a Keynesian technique allowed him to identify what he regarded as his fundamental difference with Keynes. In Keynes' caricature, classical economists ruled out involuntary unemployment both in the short run and in the long run. Pigou considered this interpretation a 'travesty'.

> What, then, *is* the classical view? It is – and, as one who is supposed to hold it, I am perhaps in a better position to know than those who say that they do not – that full employment does, indeed, not always exist, but always *tends* to be established (ibid., 78).

Although Pigou acknowledged short-term unemployment as a brute fact, he had an unshaken belief that competitive markets would self-adjust to restore full employment in the long run. This faith was based on three premises. Nominal wages would not remain rigid in the face of prolonged economic decline. Under actual or conceivable banking policies, reducing nominal wages would lead to lower real wages; and a decline in the real wage would motivate employers to hire more workers. Given these premises, he was satisfied that the classical view 'stood up successfully against a severe theoretical testing'. From the perspective of British economic history since the late Victorian era, empirically it had not 'done badly' (ibid., 88, 91).

Pigou a Keynesian?

Keynes had attacked Pigou on both theoretical and methodological grounds. In two 1949 retrospective lectures delivered at the behest of the Faculty of Economics and Politics at Cambridge, Pigou acknowledged that Keynes had clearly bested him in the field of methodology. The passage of some 15 years persuaded him that Keynes' crowning achievement in *The General Theory* was what he also attempted but failed to accomplish: to model the macroeconomy.

> In my original review-article on *The General Theory* I failed to grasp its significance and did not assign to Keynes the credit due for it. Nobody before him, so far as I know, had brought all the relevant factors, real and monetary at once, together in a single formal scheme, through which their interplay could be coherently investigated. His doing this does *not*, in my mind, constitute a revolution. Only if we accepted the myth – as I regard it – that earlier economists ignored the part played by money, and, even when discussing fluctuations in employment, tacitly assumed that there weren't any, would that word be appropriate. I should say, rather, that, in setting out and developing his fundamental conception, Keynes made a very important, original and valuable addition to the armoury of economic analysis. Any economist afterwards elaborating or refining on that conception is, so far, a follower of Keynes. (Pigou 1950a, 65–6)

As a theoretician, however, Pigou remained unpersuaded. In fact, he reinforced his arguments by introducing what is now called the Pigou or real-balance effect.[31] Pigou's *Employment and Equilibrium* (1941a) and Alvin Hansen's *Fiscal Policy and Business Cycles* were both published in 1941. Their assessments of markets differed markedly. Pigou stressed their tendency to self-adjustment. Hansen highlighted a juxtaposed tendency toward 'an *equilibrial* self-perpetuating income level far short of full employment' (Hansen 1941, 306). In August 1943, Pigou asked Keynes to publish his essay 'The Classical Stationary State' (Pigou 1943b), in which he contested Hansen's case that 'in certain circumstances "full employment" is impossible irrespective of wage policy' (circa 28/8/1943, JMK/EJ/1.6). His principal thesis held that an 'appropriate wage policy' would secure full employment in a stationary state under '*all* circumstances' (Pigou 1943b, 344; see also 1945a, 20). Pigou began by assuming a fully employed economy that had not yet exhausted all its investment opportunities. Without technological innovations, these opportunities would diminish until investment and interest rates were both zero. If saving were motivated by considerations other than future rewards – 'a desire for possession' or 'conformity to tradition or custom' (Pigou 1943b, 346) – people would continue to save. Since the interest rate could not fall below zero to induce investment, stagnation would ensue, with real income and employment both falling. However, Pigou argued that this Keynesian scenario would be unstable and transitory. Faced with long-term unemployment, workers would not remain inert masses unwittingly subject to opaque macroeconomic forces. Behaving in an instrumentally rational fashion, they would agree to reduce nominal wages, decreasing both money income and prices. Lower prices would increase the real value of the stock of money. Since saving depended on the real value of 'existing possessions', an increase in the value of real balances would reduce and ultimately eliminate the desire to save, resulting in a classical full-employment stationary state (ibid., 349–50).

In 1944, Michal Kalecki challenged the logic of this dynamic, the Pigou effect. He distinguished two forms of money. Inside money – created by the banking system – was both an asset and a liability: to 'the gain of money holders there corresponds an equal loss of the bank debtors'. Thus the success of the Pigou effect in restoring full employment hinged on the magnitude of outside money, which was backed by gold or government securities. In an economy with very little gold or national debt, the Pigou effect could operate only by creating enormous wage and price reductions. In that event, the real value of debt would rise 'catastrophically', leading to 'wholesale bankruptcy and a "confidence crisis"' (Kalecki 1944, 132). Kalecki found it difficult to believe that policymakers would tolerate such a draconian adjustment process. Under 'pressure of employers', they would impose a wage floor, preventing the Pigouvian adjustment process from reaching completion. Pigou declined an opportunity to write a rejoinder. State intervention, which he believed to be likely, would not alter his analysis of the Pigou effect (Pigou to Keynes, circa late February 1944, JMK/EJ/1.6).

Before the end of World War II, Pigou published a simplified version of his theory of unemployment that incorporated the Pigou effect (1945a, 20–25). Unapologetic in his defence of the classical view, he encouraged interested readers to examine his more rigorously systematic works – *Industrial Fluctuations*, *The Theory of Unemployment*, and *Employment and Equilibrium* (ibid., v, n.1). Acknowledging the obvious fact that there were theoretical subtleties the classicals did not anticipate, he insisted that, in the main, their conclusions were sound (ibid., 25). The title of his book – *Lapses from Full Employment* – clearly marked his dissent from what had become the dominant Keynesian view. Although he held no brief for attempts to reduce unemployment by wage reductions rather than manipulating demand, he held fast to his long-standing theoretical belief that the ultimately benign immanent dynamic of markets would achieve full employment, at least under 'all ordinary circumstances' (ibid., v, 17).

In 1947, Pigou refined his analysis of the real-balances effect in 'Economic Progress in a Stable Environment'. Here he argued that the question of the efficacy of the Pigou effect was an empirical issue, depending on the stock of money, the ratio of loans to deposits in the banking system, and the value of 'non-instrumental property'. However, he believed its consequences could be significant. Kalecki had claimed that the loan–deposit ratio of the banking system would always be equal to 1. Evidence suggested this was not true; in 1938, only 45 per cent of bank deposits had been turned into loans. Pigou regarded the stock of non-instrumental property as important, highlighting 'Old Masters' – paintings by Dürer or Rembrandt – 'which are specially attractive as receptacles for, or embodiments of, savings' (ibid., 186).[32] Notwithstanding these comments, he discounted the empirical importance of alternative possibilities. Policymakers would countenance neither a Pigouvian world of perpetual reductions in wages and prices nor a Keynesian world of equilibrium with massive unemployment.

> Thus the puzzles we have been considering in the last section are academic exercises, of some slight use perhaps for clarifying thought, but with very little chance of ever being posed on the chequer board of actual life. (ibid., 188)

Notes

1. Pigou was one of the first economists to use the expression 'involuntary' unemployment, long before Keynes in *The General Theory*. His concept was also more comprehensive than Keynes'. It included, in contemporary parlance, all forms of unemployment (frictional, structural, and cyclical). For a comparison of concepts of involuntary unemployment in the works of Pigou and Keynes, see Aslanbeigui (1992b).
2. Pigou's evidence, given on 28–29 May 1930, was later published in the second volume of the *Minutes of Evidence Taken before the Committee on Finance and Industry* (HMSO 1931).
3. In his *Industrial Fluctuations*, Pigou described the labour supply of his time as fairly elastic due to wage rigidity. He also discussed a reverse L-shaped labour supply curve (1929d, 197, 127). In *The Theory of Unemployment*, he did not explicitly address the shape of the labour supply curve. On the assumption that the number of workers in the labour force was fixed, he held that the extent of unemployment depended on the horizontal range 'through which the demand function swings' at a given wage (1933h, 273). On the Keynes–Hawtrey–Pigou correspondence concerning the shape of Pigou's labour supply function, see Aslanbeigui (1992b).
4. On the use of tariffs for this purpose, Pigou dissented from the majority recommendation of the Committee of Economists (see Howson and Winch 1977, 224–7).

5. The long-term success of these enterprises depended on more general measures. It would be necessary for the Bank of England, in cooperation with other central banks, to reduce price fluctuations within the parameters of the gold standard. It would also be essential to restructure the British economy by introducing more advanced equipment, technology, and managerial practices (Pigou, 29/5/1930, HMSO 1931, 80, 93). Pigou's analysis of unemployment, its causes, and potential remedies was very close to the majority report issued by the Committee of Economists. The proceedings of the Committee's meetings and its report have been examined by Howson and Winch (1977).
6. Per usual, Pigou claimed that even if all these measures were implemented successfully, industrial fluctuations would not be eliminated. His palliative suggestions were conventional: increased national and local expenditures on public works during recessions (Pigou 1924a, 128–9).
7. We were unable to locate the first edition of this book and refer to the second edition in the ensuing. As the preface to the second edition shows, the additional 20 pages do not modify the essential features of Pigou's analysis.
8. See Collard (1983, 1996b) for an analysis of Pigou's theory of industrial fluctuations from the standpoint of contemporary economics.
9. See also Hawtrey's 1926 article 'The Trade Cycle' (printed in Hawtrey 1928, 82–103).
10. *Industrial Fluctuations* was reviewed by other economists. Warren Persons was especially severe, claiming that Pigou was 15 years behind developments in statistical data and methods. His account of Pigou's errors seems damning: use of annual data instead of more relevant quarterly or monthly figures, generalizations that were merely 'rough first approximations', and a disposition to gloss over important exceptions (Persons 1928, 669–70). On the other hand, Stamp – a renowned applied economist of the time – judged that the book 'will stand as almost a landmark in the development of method, for it employs, to an extent hitherto not found in a work of this size, the method of direct and *ad hoc* statistical verification, by correlation, lagging and the ratio of dispersion or variation' (Stamp 1927, 420). Much later, in 1987, Robert Shiller, a future Nobel laureate in economics, praised the book as 'remarkable', the sole effort since 1929 to offer a systematic analysis of the causes of business cycles (Shiller 1987, 88).
11. In the report of the Committee of Economists, Pigou, Keynes, Stamp, and Hubert Henderson agreed that the insurance system was woefully in need of overhaul: it maintained wage rigidity, impeded labour mobility across industries, imposed a tax on employment, and had been 'gravely abused' (Howson and Winch 1977, 191).
12. In light of these comments, it may seem paradoxical that Pigou entitled his 1949 book, written for the general reader, *The Veil of Money*. However, an examination of the book shows that it is not a significant departure from his earlier work. Money was a veil in the sense that if it disappeared, 'economic life' – made possible by real factors such as labour power and capital – 'would *not* become meaningless'. Disappearance of real factors, on the other hand, would necessarily eliminate monetary factors (Pigou 1949c, 25). Pigou compared the importance of money to property and contract laws, which enable the economic machine to function 'continuously and smoothly' (ibid., 26).

13. The manuscript for *The Theory of Unemployment* was submitted to Macmillan in November 1932. Frisch's model was published in 1933. Although Pigou may have seen a pre-publication copy of Frisch's article, there is no evidence, archival or otherwise, to support this possibility.
14. *The Theory of Unemployment* has been explored in a large body of scholarly literature. See for example, Ambrosi (2003), Aslanbeigui (1992b), Bleaney (1987), Brown (1991), Brady (1994), Cottrell (1994), Knight (2013), and Leeson and Schiffman (n.d.).
15. A portion of total wage goods available to the economy is retained as inventories or paid to relieve the unemployed and the poor.
16. The aggregate elasticity of labour demand in a period shorter than the period of production – during which the supply of wage goods cannot expand – was estimated to be no less than 2.
17. See Knight (2013) for an account of letters Pigou received regarding these slips.
18. Hayek found Pigou's review 'immensely sharp', apparently one reason he did not write a critique of *The General Theory* for *Economica*. See Howson (2001, 372–3).
19. On this point, see Aslanbeigui (1992b).
20. Pigou's pre-publication critique of the *Treatise* is well known. Keynes had mistakenly assumed that a change in the Bank rate would not affect real income or output (circa autumn 1929, Keynes 1979, 5).
21. Since the 1920s, Pigou had suffered from an irregular heartbeat.
22. Keynes to Kahn, circa 7/8/1937, Keynes (1973b, 238); Keynes to Robinson, 7/8/1937, Keynes (1973b, 234).
23. Pigou's silence concerning Keynes seems to have implied no malice. He was careful not to draw his ill colleague into controversy, meticulously eliminating from proofs 'all passages which had any bearing' on Keynes' work (Kahn to Keynes, 18/10/1937, Keynes 1973b, 259). His intended target was apparently Joan Robinson's new book *Essays in the Theory of Employment*, which elucidated what she took to be the Keynesian position that reducing money wages has no effect at all on employment (see Aslanbeigui and Oakes 2007, 24).
24. On the reasons behind Keynes' decision, see Aslanbeigui and Oakes (2007).
25. On the origins and development of the IS-LM model, see Young (1987), and Darity and Young (1995).
26. See Kahn to Keynes, 19/12/1938, Keynes (1973b, 265); Pigou (1938, 134).
27. In *Employment and Equilibrium* (1941a, 95–117), Pigou emphasized that the relationship between the rate of time preference, income, and saving remained somewhat imponderable due to the lack of satisfactory data.
28. Pigou claimed he had not addressed Keynes' concerns directly because he had been unable to follow the logic of his note. However, he acknowledged that his discussion of the relationship between wage rates, employment, and interest rates was now 'much closer' to Keynes' 'general view' (Pigou 1938, 134, n.1). On Pigou's IS-LM conversion, see also Takami's views (2014a).
29. Pigou to Macmillan, 18/9/1939; 11/18/39; 24/11/1939; and 12/2/1940, Macmillan Archive.
30. Treating the long period as a stationary state, Pigou also assumed that investment was equal to zero.

31. In a letter of 27 September 1979 to Collard, Kahn recalled sitting with Pigou during a dinner at King's. On that occasion, Pigou asked him to explain the Pigou effect (courtesy of Collard).
32. Pigou was silent on the relationship between the Pigou effect and the national debt. Kalecki and Keynes believed that if the national debt were financed through taxation, the net wealth effect of price reductions would be zero. For the Keynes–Kalecki correspondence on this point, see Patinkin (1982, 102–3).

8

Legacy: Demythologizing a Cambridge Eccentric

The death of Pigou

Despite anxiety over his heart problems, Pigou lived a fairly healthy life under the care of Dr Leslie Cole, a Cambridge cardiologist. In September 1958, he became seriously ill while vacationing in Zermatt and died on 7 March 1959, in Addenbrooke's Hospital, Cambridge. The death certificate records the cause as bronchitis, aortic atheroma, and an abdominal aneurysm.

Pigou's death was observed as he preferred to live: without pomp and circumstance. A service was held on 13 March in King's College Chapel with the Reverend H.C.A. (Tom) Gaunt, his former student and friend of many years, as one of the officiants. A few close friends and former students attended. There were also pro forma appearances by University and King's professors and administrators. Robertson represented the Royal Economic Society. Otherwise, with the exception of Kahn, the British economics establishment as well as economists at Cambridge during the years of his professorship were notable for their absence. Pigou was buried in the churchyard of St Andrew and St Mary, Grantchester, open to all Christian denominations. Facing a yew hedge, an unpretentious tombstone bears his name.

Is history, as is generally claimed, written by the victors? By the time of Pigou's death, the sun had set on classical economics as he understood it. The economics faculty at Cambridge was dominated by Keynesians, and Keynesianism in its various incarnations had captured the imaginations and inspired the research programmes of economists who had been educated in the 1930s and 1940s and taught in post-war universities. No major economics journal took notice of Pigou's death much less celebrated his achievements to the discipline – not even the *Economic*

Journal, for which he wrote some 90 articles, notes, and reviews.[1] Following a King's College convention, on the occasion of his death a pamphlet was published based on recollections of fellows (Saltmarsh and Wilkinson 1960). The account of Pigou's contributions to economics was written by Kahn: Keynes' favourite student, a member of the fabled Cambridge Circus, Keynes' chief confidant in writing and defending *The General Theory*, and the executor of Keynes' estate. Perhaps obligatory because of his status as the senior economics fellow of King's, the choice of Kahn as author of an appreciation of Pigou was not ideal in other respects. Instead of emphasizing Pigou's own work, he underscored his reception of *The General Theory*, praising a 'characteristic magnanimity' on Pigou's part in finally crediting Keynes for the originality and importance of the book (ibid., 14).

Beginning with his biographical entry on Pigou in the *Encyclopaedia of the Social Sciences* (Robinson 1967), Austin Robinson – another Keynesian, who served as his assistant editor of the *EJ* – began a long post-retirement career of retailing his recollections of Pigou, Keynes, and Cambridge economics and economists. Robinson's accounts were based on his memories of events after a lapse of several decades, in some cases more than half a century. Perpetuating Keynesian and other myths of Pigou and creating some of his own, he wrote or spoke with an indifference to elementary canons of historiography that seemed to be complete. Robinson's memories of the 1920s and 30s, recorded in the 1970s, 80s, and 90s, were formed by subsequent experience. They exhibit what we have called 'the revisionism of distant recollections': the fact that what is recalled, or at least recorded for publication, is refracted through the prism of later decades and recollected from the perspectives and interests of the present (Aslanbeigui and Oakes 2009, 12). Thomas Mann, Ford Madox Ford, Franz Kafka, and Vladimir Nabokov all made masterful use of the unreliable narrator in their literary works: a storyteller whose veracity is questionable or whose reliability proves to be doubtful. Although it is conceivable that there are historians of economics who possess a sophistication and subtlety of wit that would enable them to achieve comparable results by employing an unreliable narrator such as Austin Robinson, to date, none has appeared. However, the penchant of historians of economic thought to circulate as historical fact recent recollections of remote events by people of advanced age is commonplace.

'The evil that men do lives after them; the good is oft interred with their bones.' So proclaimed Shakespeare's Mark Antony, another unreliable narrator, in the oration following the death of Caesar. Yes and no.

Human action and its artefacts are not self-interpreting texts. The difference they make and how they are assessed are determined by what is made of them – the circumstances of their reception. This also holds true for Pigou and his work, which do not constitute a legacy the meaning of which can be read on its face. Have economists sifted, analysed, and made use of it? Or have they ignored, distorted, or falsified it? In this regard, as we have argued, he was not altogether fortunate.

A revival in Pigouvian studies has been underway for some years. However, misconceptions about the man and his work persist, sufficiently numerous and reiterated often enough to qualify as a pseudo-biographical mythology. We have covered misconceptions of the work. In this final chapter, we dissect some of the mistaken truisms in circulation about Pigou that have formed his legacy.

Mountains and men

In his memorial on Pigou, Champernowne wrote that 'there can be few men of equal intelligence who have known so clearly what was the right life for them to lead and who have lived it so successfully' (Champernowne 1959, 264). Pigou's conception of the ideal life was simple. Disdaining the status accoutrements of the Cambridge professor of his day and unencumbered by aesthetic pursuits, he wrote economics and dedicated much of his leisure to a small circle of friends who passed through Cambridge as undergraduates. When not working, he enjoyed an athletic life – boating, camping, cricket, cycling, golf, squash, running, and walking. He was, as he put it, 'addicted to high places' (Pigou 1929c, 6), whether in the English Lakeland, France, Norway, or Switzerland. In a memorial essay on Clapham, he credited his Cambridge colleague for introducing him to climbing in 1910, giving birth to his passion for ascending the English rocks (Pigou 1947c). Thereafter, he built Lower Gatesgarth, a cottage near Lake Buttermere in the Lake District. Known to Pigou cognoscenti as the Climbing House, it became a vacation home for him and his friends, a training site for numerous Cambridge undergraduates and mountaineering enthusiasts, and a retreat for his honeymooning young friends and their brides.

Pigou's love for climbing began before the encouragement of Clapham. In January 1905, Pigou, John Sheppard – a classics postgraduate and later provost of King's – and Charles Goodall, another Kingsman, spent a vacation at Gowbarrow Park near Ullswater, the second largest lake in the Lake District. In his diary, Sheppard recorded that Goodall and Pigou climbed the Little and Great Mell Fell peaks, making their way through mud. Sheppard himself demurred (11–13/1/1905, JTS/4/1). Pigou returned to the Lakes in the Easter vacation of 1907 with a reading party that included Sheppard, whom they dragged up a mountain covered with snow (Pigou to Keynes, n.d., JMK/PP/45/254). In that summer, Pigou became more adventurous, exploring the Alps for the first time with an undergraduate friend, Donald Welldon Corrie. On this trip, Pigou, an avid reader of detective stories, crossed with some trepidation the Gemmi Pass in Switzerland, the same pass traversed by Sherlock Holmes on his fatal path to the Reichenbach Falls, where he encountered his arch-rival and nemesis Professor Moriarty in Arthur Conan Doyle's story 'The Final Problem'. Over the following six years, the apprehensive novice became an expert and intrepid mountaineer. With the help of guides – a practice he discontinued after his first few summers in the Alps – and in the company of friends, he climbed many of the major Swiss, French, and Norwegian peaks, earning a membership in the Alpine Club in 1913. The Great War suspended Pigou's Alpine summers for four years. He resumed climbing in 1919 with George Mallory, the legendary British climber who fell to his death in 1924 attempting the first ascent of Mount Everest. Between 1919 and 1925, Pigou climbed in the French and Swiss Alps every summer (Pigou 1923d, 1923e, 1942b; Gaunt 1959). A typical summer expedition began in July. Several weeks of climbing followed, crisscrossing the French and Swiss border and interrupted only by inclement weather. The 1922 expedition began 1 July and ended 19 August (Pigou 1923e).[2]

While climbing the Swiss Alps in July 1925, Pigou was struck by several episodes of heart fibrillation. It soon became apparent that he could expect to suffer from an arrhythmic heartbeat the rest of his life, a condition that imposed severe limitations on his mountaineering. At first, he restricted himself to shorter Alpine expeditions that did not tax his endurance. After 1930, he climbed only vicariously through the expeditions of others, most notably his young Cambridge friend Wilfrid Noyce, whose expeditions he supported liberally. Unable to indulge in one of his greatest passions, Pigou turned to other sources of pleasure. He became a devotee of the long, afternoon Victorian ramble – walking to Coton, near Cambridge, and returning through Grantchester. He played chess with mathematicians such as his fellow Kingsmen Hugh Alexander and Alan Turing. And he read detective novels, placed in the Combination Room of King's for his enjoyment. A few months before his 70th birthday, the 'Viscount of the Independent Republic of Gatesgarth', as he playfully dubbed himself (Pigou to Noel-Baker, 18/8/1941, NBKR/9/58/3), sold his retreat to his friend Claude Elliott, Provost of Eton, an arrangement that allowed him to continue as tenant until either a breakdown in his health or his death (Pigou to Noel-Baker, circa July 1947, NBKR/9/58/2).

The literature on Pigou includes occasional references to his homoerotic disposition, with little offered in the way of documentation. The result is speculation about his sexual orientation. David Collard, for example, has maintained that although it 'is almost certainly the case that the young Pigou had male partners', his relations with Cambridge undergraduates became platonic in the 1920s, this supposedly due to two causes: his heart condition and psychological scars left by the Great War (Collard 1999, viii). 'Almost certainly the case?' There is no evidence documenting Pigou's sexual conduct. Moreover, the evidence that has survived is inconsistent with Collard's speculation. Before considering the record of Pigou's friendship with undergraduates, a few general historiographic points are in order.

Pigou lived an essentially homosocial existence, first by circumstance and subsequently by inclination. Harrow and King's were all-male institutions. As a member of the Cambridge faculty, he followed his penchant for a certain type of young man. He was drawn to undergraduates whom he found physically appealing, intellectually stimulating, athletically fit, and companionable. During their undergraduate years and thereafter, these were the men with whom he enjoyed intimate friendships. They were his regular companions during leisure hours at Cambridge and in inter-term vacations. With very few exceptions, women were relatives, servants, or relatives of colleagues or friends. From the genesis of English romanticism through the interwar period, British upper-middle class culture permitted and legitimated intimate and overt expressions of non-sexual affection and love between men. This was especially true for institutions such as Cambridge – in Pigou's time, male-dominated and dedicated to the cultivation and celebration of masculinity. As the tendency to reduce homoerotic conduct to homosexual behaviour became more pronounced and the latter was medicalized as a physically and morally debilitating disease, forms of the masculine life that had been treated as innocent were regarded as increasingly suspicious, unacceptable, and potentially criminal. As a result, the boundaries between permissible and transgressive homoerotic behaviour were redrawn. There is no evidence that Pigou breached these boundaries.

Almost 40 years after publication of Michel Foucault's *The History of Sexuality* and the immense body of research it inspired, it would be gratuitous to belabour the obvious truth that a man such as Pigou could live an intensely homoerotic life without committing a homosexual act, without desiring to do so, and thus without becoming a homosexual in any coherent sense. As the following account of Pigou's homosocial and homoerotic life shows, there are no manifest reasons to doubt that he lived and died a virgin.

On 7 July 1903, Maynard Keynes wrote Lytton Strachey that Pigou was 'very nice but a little depressed and lovelorn' (quoted in Moggridge 1992, 83). Collard reads this letter as compelling evidence of Pigou's homosexuality. However, a letter Pigou wrote Sheppard some two weeks later explains his state of mind: excessive work on his Cambridge lectures, research, and boredom during the long summer vacation (24/7/1903, JTS/2/160). Pigou's most important friendship during his early years on the Cambridge faculty was with Corrie. Arthur Benson, the avid and indefatigable diarist of Cambridge gossip, devoted an entry to Pigou following a dinner at Marshall's house that he, Pigou, and Corrie attended. 'It is really rather *infra dig*: for a Fellow & lecturer to go out to escort an undergraduate [Corrie] back like a nurse-maid. Pigou is a fool; these romantic attachments may do great good both to the inspirer and the inspired, but they should be conducted with some seemliness and decorum' (13/5/1907, AB/Volume 92). In 1907, Pigou and Corrie travelled together to Littlehampton in West Sussex for a fortnight. Pigou wrote Browning that both were working hard, Corrie at his studies and Pigou at his report for the Poor Law Commission (circa Christmas, OB/1/A: Pigou, A.C.). Corrie's memoirs of his friendship with Pigou recount numerous juvenile antics and exploits involving exploding eggs and igniting fireworks and rockets; vacations in the Alps or English lakes; and much squash, tennis, and golf (Corrie to Saltmarsh, 19/2/60, King's/PP/ACP/1/Corrie). Perhaps the ultimate basis for Corrie's claim that he knew Pigou better than anyone during those years was the fact that, for a time, Corrie lived with Pigou in his set of rooms at King's. Most probably this was after he sat for the Tripos and while he was preparing for the civil service examination, following which he relocated to London.

In a letter to Maynard Keynes, the King's economic historian Fay gave a wickedly clever account of his visit to the living quarters of the two friends, whom he called 'Mr. and Mrs. Pigou', written very much at Pigou's expense. Pigou was 'the party of execution, gently rough, possessing, laughingly exciting his mate to fond remonstrance or sham complaints before third parties'. Corrie was 'bustling about + arranging her new furniture, playfully disobedient, & ingeniously inviting his friends to make themselves at home, while she silently chuckled at having made it impossible'. Pigou and Corrie shared a bedroom: 'the two beds near [each] other, in one corner a masculine chest of drawers, in the other a dainty table, with bottles & such like: next door a common bath' (circa 1908, JMK/PP/45/101).

Several comments are in order. Benson's observations on Pigou should be taken with a grain of salt. As an admirer of Corrie – 'a charming creature' (7/2/1905, AB/volume 78) – he was hardly an impartial observer. Fay's letter cannot qualify as substantiation of Pigou's homosexuality. It is not credible that the Corrie family would entrust to a Cambridge academic with demonstrable homosexual tendencies the care of all their sons, allowing Pigou to take them on reading and walking tours in the Lake District and North Wales and inviting him to celebrate Corrie's 21st birthday with the family at Goathland in the North Yorkshire Moors. Pigou made his position on sex, homosexual or otherwise, in King's College quite clear in a piece he wrote in 1910 for the *Basileon*, a King's periodical. His subject was the college peacock, which had been, as he put it, brutally assaulted. In his view, the graceful bird was a symbol of the College, in whose life 'we may find our own portrayed'. In what respect? It was celibacy that the peacock shared with the dons of King's. 'Celibate you are and celibate, per force, must remain' (Pigou 1910e). Finally, in parsing Corrie's reminiscences of 1960 on sharing rooms with Pigou, British homophobia of the 1950s and 60s should not be ignored. Homosexuality in Britain was not decriminalized until 1967, and then only in an incomplete and ruthless fashion. If found guilty of legally prohibited homosexual acts, men faced two options: a prison sentence or a programme of behaviour modification. The latter covered a host of possibilities that might include psychoanalysis, administration of hormones, and electric shock (King et al. 2004; Smith et al. 2004).[3] If Corrie had a sexual liaison with Pigou, it is not credible to suppose that he would have revealed their living arrangements in a King's College memorial volume for Pigou (Saltmarsh and Wilkinson 1960).

After Corrie left Cambridge, the two remained friends, celebrating the coronation of George V by rowing from London to Oxford. Because he had developed a 'poor head for heights', Corrie could no longer join Pigou in mountain climbing (Corrie to Saltmarsh, 25/2/60, King's/PP/ACP/1/Corrie). By this point, however, Philip Noel-Baker had appeared at King's as an undergraduate (1910–12).[4] The friendship between Pigou and the extraordinary athlete – he won a silver medal for the British track team in the Olympic Games of 1920 – is the longest and best documented of his life. Noel-Baker was an ardent heterosexual, and there is no reason to suppose that his relationship with Pigou exceeded the limits of an intimate friendship. From 1912 until Pigou became seriously ill in 1925, Noel-Baker was a regular companion on his major climbs. A letter Noel-Baker received from his brother Alan shows that Pigou had become a friend of the family as well (11/4/1913, NBKR/9/97/3). Finally, in 1915, Pigou coached Noel-Baker's sister Josephine, who was reading economics at Newnham, one of the two women's colleges at Cambridge (Pigou to Noel-Baker, circa 1915, NBKR/9/97/3).

Terrence Hickman, a Kingsman who climbed with Pigou and was killed in the war, warned him about the risks of making Noel-Baker the anchor of his world. Would he, Hickman asked, be left bereft 'with nothing' if Noel-Baker married? Pigou responded to this probing question in a letter to Noel-Baker himself. His sense of the significance of their friendship would not be damaged unless Noel-Baker married a woman who would insist on cutting off their friendship altogether – 'a lady who will never let me see you at all'. In spring 1915, however, Pigou was stunned by news of Noel-Baker's betrothal to Irene Noel, a field hospital nurse whom they had both met during their ambulance work in the war. Later, he held Noel-Baker responsible for an initial animosity between Irene and himself. Noel-Baker had apparently concealed his feelings about Irene from Pigou. On Pigou's view, the mutual misunderstandings and ill will were caused by Noel-Baker's bad judgement. In a 'meditation on life and destiny', written shortly after learning of the couple's engagement, he shared his feelings with Noel-Baker. There was, he wrote, a selfish and possessive aspect to affections for a friend as well as a purely unselfish aspect. Pigou hoped to be an unselfish friend to Noel-Baker, expecting nothing in return. 'All blessings on what you have done and all happiness from it now and for all the days. I can't think the war wholly black any longer, now that it has given this chief thing to you – But language is no good for this, and you must *understand* what I can't say. Good bye for a little dearest friend. Good night with all love' (n.d., NBKR/9/97/3). Pigou and Irene arrived at a rapprochement, and he invited the couple to spend their honeymoon at Lower Gatesgarth (Pigou to Noel-Baker, circa spring 1915, NBKR/9/97/3). Noel-Baker continued to vacation with Pigou in the Alps and the Lake District, and the couple chose Pigou as godfather to their only son Francis.

In 1923, Benson confided to his diary a conversation he had with Clapham, an old-fashioned rock-ribbed Victorian moralist, concerning Pigou's 'fatuous worship' of an unnamed King's undergraduate. 'They are always together. The undergrad reads the lessons in the Chapel, & Pigou, who *never* attends, appears in his place & the undergrads giggle. P. has always a passion on hand. He goes no-where [and] accepts no invitations' (27/10/1923, AB/Volume 172). This student was very probably Tom Gaunt: Kingsman, Alpinist, future headmaster of Malvern College and sacristan and preceptor of Winchester Cathedral – another life-long friend of Pigou. There is little evidence that bears on their friendship.[5] However the official biography of Bertrand Hallward, an undergraduate at King's during the same period and later the first vice-chancellor of Nottingham University, challenges Benson's judgement of Pigou, interpreting his friendships with students from a quite different perspective that Benson did not consider. Pigou was remarkably fond of his undergraduate friends, an attitude expressed in acts of generosity that, by later standards, were extraordinary. He organized climbing parties for them in the Lake District and took them on Alpine expeditions that he planned and financed. This was one aspect of his devotion to their moral education. Pigou was a confirmed believer in the Victorian conception of the powerful benefits of athletics in forming a sound moral character (see Pigou 1923c). In training his students in the skills and disciplines of his favourite sport – teaching them the essentials in working with ropes, belaying, and rappelling – he was forming the virtuous masculine identity celebrated at Cambridge. Although mountaineering expeditions were filled with excitement and adventure, they also developed character in young men by overcoming fear, building self-confidence based on hard earned skills, and instilling personal and team responsibility (see Winterbottom 1995, 37–8). Hallward, therefore, represented Pigou's friendships with undergraduates as chaste, morally exemplary, and a contribution to the ideal education of promising young men.[6]

Wilfrid Noyce (b. 1917), who read modern languages at King's in the mid to late 1930s, was one of Pigou's closest young friends of that period. When he was 17, Noyce learned climbing from the psychiatrist and mountaineer John Menlove Edwards, whose love for Noyce remained unrequited (Roberts 1986, 192). Pigou's affection for Noyce is clear in his letters to Noel-Baker, especially in late summer 1937. He had recently returned to Lower Gatesgarth from Zermatt, where he suffered another episode of severe heart fibrillations. Noyce and Edwards visited in mid-September on a mountaineering vacation. On ascending Scafell, the second highest peak in England, Noyce was struck by a double misfortune: a grass ledge near the top of the climb broke away under his weight, and two of the three strands of his belaying rope snapped. Although Edwards was able to save him, Noyce suffered severe injuries that left him in a coma for three days. After he was moved to Lower Gatesgarth, a team of doctors and nurses, his parents, Pigou, and Patrick Wilkinson provided care and monitored his condition. Pigou summoned John Fraser, Regius Professor of Clinical Surgery at the University of Edinburgh and surgeon to the King when he was in Scotland. At his request, Fraser visited the patient twice, operating on the second occasion. Pigou gave full expression to the psychological strain under which he laboured. As he wrote Noel-Baker, the surgeries and the responsibility for Noyce's care were sources of immense strain, leaving him 'too terrified to do things' for Noyce (Pigou to Noel-Baker, circa mid-September 1937, NBKR/9/58/3; see also Roberts 1986, 192).

On 3 September 1939, the day Britain declared war on Germany, Parliament passed the National Service (Armed Forces) Act, conscripting all men between the ages of 18 and 41. Pigou quickly went into action on behalf of Noyce, gathering information from Noel-Baker – then a Labour MP – on the procedure for registering as a conscientious objector. Shortly thereafter, Noyce joined the Friends' Ambulance Unit (FAU), and Pigou contributed £100 to its operations. By mid-June 1940, however, Pigou wrote Keynes that 'Noyce, after much mental stress, has asked for his name to be withdrawn from the conscientious objectors register and to go into the army' (n.d., JMK/PP/45/254). When Noyce began his military training in England, Pigou fretted over the modest dimensions and dubious cleanliness of his living quarters. His frequent visits were followed by reports to friends, in which he relayed the latest news of Noyce's welfare (Pigou to Noel-Baker, circa late 1939 to early 1940s, NBKR/9/58/3).

In April 1946, Noel-Baker, Elliot and his wife, and Noyce met Pigou at the cottage. In another mountaineering accident during this vacation, Noyce was swept off a ridge by a violent gust, falling 150 feet. Miraculously, he survived with only a broken leg and injuries to his left arm and wrist. Pigou took responsibility for his convalescence in hand. On 28 April, Noyce's mother wrote Noel-Baker, who had led the search and rescue through a blizzard. As usual, Pigou had been 'overpowering in his kindness & is now in charge of everything' (NBKR/9/58/2). During Noyce's convalescence, Rosemary Davis, his future wife, replaced his parents as primary caregiver. There is no indication that Pigou resented Rosemary. Quite to the contrary. As Noel-Baker wrote Lady Noyce: 'Rosemary was simply splendid throughout. She took the news like a heroine, and from beginning to end never thought of herself, but only of Wilf[rid] and of the Professor, and was brave and self-sacrificing. ... But perhaps you and she do not know the tremendous difference it made to the Professor, who was loud in his praises of her, and who was greatly comforted by her fortitude' (1/5/1946, NBKR/9/58/2).

In sum, from the standpoint of surviving documents on Pigou's personal life, confident claims concerning his sexual conduct cannot be substantiated. There is no evidence that before the Great War, Pigou engaged in 'homosex', to use a term currently favoured in gender studies: sexual activity of any sort between two males, without implications concerning the sexual proclivities of the actors. Nor is there reason to suppose that his erotic dispositions, whatever they might have been, changed after the war or that his friendships became less intimate, intense, or sustained. After his young men left Cambridge, Pigou generally retained their friendship – in some cases for the rest of his life – also taking a lively interest in their wives and families. As a professor of economics, a coach in mountaineering, and a man, Pigou had strong feelings of affection for young men in an era when it was possible, even conventional, for one man to express his love for another and be taken seriously without producing a scandal, causing embarrassment, or even raising an eyebrow.

The Great War

On 4 August 1914, the British ultimatum protesting German violation of Belgian neutrality expired, and Britain and Germany were at war. Pigou, vacationing in the Swiss Alps with friends and taken by surprise, was stranded in Zermatt as he searched for a way to return home. At the same time, in England some members of the Religious Society of Friends (the Quakers) – including Noel-Baker and his family – formed an organization to provide relief work and medical care behind the front for casualties. After the rout of the Belgian army at the end of October, the First Anglo-Belgian Field Ambulance, later renamed the FAU, began operations in Belgium and France. Pigou left Cambridge on 18 December to work with the group, commanded by Noel-Baker. In the inter-term vacation of 1914–15, he served in the FAU, driving a Ford car that he had bought for use as an ambulance and miraculously surviving two major accidents. In Dunkirk and Ypres, he transported the wounded, evacuated refuges, distributed milk, and delivered anti-typhoid vaccine – German artillery had destroyed the public water works in Ypres, contaminating the water and threatening an epidemic. When Italy entered the war on the Allied side in May 1915, George Trevelyan, the Cambridge historian and fellow of Trinity College, organized the First British Ambulance Unit in Italy. Noel-Baker and his brother resigned their FAU posts and relocated to Italy as Trevelyan's seconds-in-command. From August 1915 until the end of the war, Pigou devoted all his vacations to work with the Unit on the Italian front, driving his Ford that had been converted into a lorry. A collision with an Italian lorry almost proved disastrous both for the Ford and him (Noel-Baker, undated notes, NBKR/11/3/2;

Greenwood 1975; Saltmarsh and Wilkinson 1960, 8–9; Tatham and Miles 1919, 180–93).

On 9 January 1915, Maynard Keynes, then secretary of the Special Board, learned that Pigou did not expect to return to Cambridge until sometime in February. Since three other lecturers – Fay, Layton, and Keynes himself – were leaving Cambridge for war work, the economics lecture list appeared to be disintegrating. Although Keynes cancelled lectures to accommodate leaves caused by the war, he hoped that Pigou would return shortly to deliver the lectures on general principles of economics, 'indispensable for the second year men, and all the papers in Part II [of the Economics Tripos]'. Otherwise there would be no teachers for most of the students (Keynes to Pigou, 9/1/1915, JMK/UA/5/1). Two days later, Keynes complained to his father, at the time chairman of the Special Board: 'As you will gather from the enclosed copy of a letter which I have sent Pigou, our lecture list as good as collapses. I am much annoyed to find on returning here that Pigou proposes to drive a motor in France until the middle of February' (JMK/PP/45/168). On receiving Keynes' letter, Pigou returned to Cambridge. The diary of Neville Keynes took note of a lunch with him on 16 January, as well as a meeting with Clapham, Maynard, and Pigou to settle the economics lecture list for the Lent term (JNK/Add.7865 1915).

In the anecdotal history of economics, Pigou generally appears as a conscientious objector. There is no support for this view. In March 1916, the British government passed the Military Service Act, requiring single men below the age of 41 – Pigou was 38 at the time – to register for military service. The act exempted conscientious objectors who could convince military service tribunals of the authenticity of their convictions. Pigou received an exemption, but not on the basis of conscientious objection or his volunteer work as an ambulance driver. In December 1915, Neville Keynes recorded in his diary that Pigou was 'necessary for the Economics work in Cambridge – It seems to be a clear case. He would of course like to be back in Italy' (10/12/1915, JNK/Add.7865 1915). By the end of 1915, Pigou was the only lecturer in economics at Cambridge. The Special Board petitioned to exempt him from military service on the ground that he was indispensable to the University curriculum. The Pigou exemption case, which caused some controversy, was eventually settled on 21 June 1916, in favour of the University.[7]

There is also no support for the position that Pigou was a pacifist, a view taken by Skidelsky (1992, 19). Although he was certainly not an advocate of war with Germany, once it began he wrote voluminously on Britain's most effective options for war financing (Pigou 1916b, 1920a, 1921a). In the late 1930s, he supported appeasement. Shortly after Prime Minister Neville Chamberlain signed the Munich Agreement, accepting Adolf Hitler's terms for avoiding a general European war over Germany's grievances against Czechoslovakia, Chamberlain's wife Anne wrote Pigou a note of thanks for a letter of appreciation he had written the Prime Minister, expressing gratitude for his efforts on behalf of peace felt by many British citizens in the face of a European war that seemed imminent. Anne Chamberlain told Pigou that his letter had assured the Prime Minister that he had taken the proper course at Munich (25/10/1938, courtesy of David Gaunt). Appeasement should not be conflated with pacifism. Some advocates of appeasement endorsed this policy on tactical grounds, to gain time required for British rearmament in preparation for a war with Germany. When the war began, Pigou remained at Cambridge, feeling that he should do additional teaching in order to replace faculty who had left Cambridge for war work. When rumours reached him that the 1940 Cambridge Michaelmas term would be cancelled, he contemplated shifting from teaching to war work. Restive in Cambridge, he contacted Patrick Wilkinson, a Kingsman at the Government Communication Headquarters at Bletchley Park, the centre of British code-breaking and deciphering research (Pigou to Keynes, circa June–July 1940, JMK/PP/45/254). In the end, he did not take a position as translator at Bletchley Park, work for which he was admirably qualified. However, pacifism had no bearing on his reasons. Cambridge decided not to suspend the term. In addition, Dr Cole advised against it because the stress of the job would aggravate his heart condition – he would be expected to work regular eight-hour days and occasional double shifts translating German, Italian, and French documents (Pigou to Noel-Baker, n.d., NBKR/9/58/3).

Shortly after returning to Cambridge from Dunkirk and Ypres in 1915, Pigou published a short piece in *The Nation*, warning of the immense costs and risks of prosecuting a war that would press Germany to its utmost limits, forcing an unconditional surrender as the *sine qua non* of an honourable peace.

> I have seen the shattered ruins of Ypres Cathedral; I have watched the mud-stained soldiery staggering homeward from their trenches; I have been near by when children in Dunkirk have been maimed and killed from the air. And the sorrow, terror, and pain that these things represent – the pitiful slaughter of the youth of seven nations, the awful waste of effort and of organizing power, the dulling and stunting of our human sympathies. (Pigou 1916h, 590)

Pigou argued that it was imperative to arrive at a 'proper attitude' for concluding the war. A punitive policy of battering Germany until it was crushed would not cure the nation of the 'madness by which we suppose her to be affected'. Germany would not remain prostrate and defenceless indefinitely. Pigou darkly warned that if the British government persisted in its intransigence, another much more destructive European conflict could be expected. In the years of Germany's enforced submission, 'the seeds of another, and perhaps more terrible, conflict will surely and steadily grow'. An honourable peace contracted with a nation that was still strong and confident was the intelligent course. It might even temper the bellicose spirit of European nations and encourage creation of an international commonwealth. If the Allies could agree on the principle of a negotiated peace, it was crucial to decide its terms as quickly as possible. If they were circulated to the Central Powers, Germany would probably reject them, in which case the war would continue until a point of cessation by mutual exhaustion was reached. But if a frank statement of terms had a chance of ending the war, Britain would be irresponsible in refusing to propose them. The combatant nations, which had risked everything on the prospect of winning a short war that now seemed interminable, could venture a small risk to end it (ibid., 591).

Although Pigou's plea drew a few sympathetic responses, it was overwhelmingly repudiated in *The Nation* and *The Morning Post*. G.G. Coulton, the distinguished ecclesiastical historian of Trinity College, ridiculed Pigou for political naïveté: 'It is precisely the frequent irresponsibility of the idealist which gives so much practical power in human affairs to the most brutal realism. Here, as in so many other cases, the children of this world know their business better than the children of light.' William Cunningham, Archdeacon of Ely and an economic historian at Cambridge, argued that Germany would be eager 'to interpret any generosity as a sign of weakness on the part of the Allies and as a tribute to her own rectitude'.[8] The editor of the *Morning Post* accused Pigou of 'selling the bear-skin before killing the bear' and warned the public against 'those few eloquent apostles of pro-Germanism [who] surrender in the guise of magnanimity'. Perhaps the most extreme reaction was expressed in a letter addressed to Pigou by an 'anonymous admirer' of the editor of the *Morning Post*: 'Repent in time, you puling and sickening traitor to your country, or else join the foul and murderous race who kill women and children ferociously and are all liars' (see Aslanbeigui 1992a).

When Pigou published his article, British enthusiasm for the war and confidence in victory had not yet been dimmed by the catastrophic losses suffered in the massive offensives and counteroffensives later in 1915. Anti-German sentiment, fuelled by state propaganda and the tabloid press, was at a peak. The German army, which had committed outrages in the invasion and occupation of Belgium, was depicted in lurid political cartoons as a horde of 'Huns' – bestial predators bent on rapine and destruction. Given the prevailing British conception of Germany and its war aims and Pigou's much more temperate and pragmatic position, the decision by the British Academy to refuse to elect him as a fellow in 1919 was perhaps a fitting postscript to his modest entry into wartime political discourse. He was finally elected in 1927 but resigned after World War II. As he put it in a matchless Pigouvian bon mot, membership seemed pointless since 'he didn't get anything out of it' (Saltmarsh and Wilkinson 1960, 16).[9]

The 'recluse'?

When Harry Johnson began to read economics at Cambridge in 1945, he met Pigou, who had retired in 1943. 'Eccentrically garbed', in the warm months he could be found 'reclining in a deck chair on the grass by the Porter's lodge inside King's front court' (Johnson 1960, 150). Johnson maintained that Pigou had been emotionally shattered by his experience in World War I, which transformed 'the gay, joke-loving, sociable, hospitable young bachelor of the Edwardian years into the eccentric recluse' of the 1950s (ibid., 153).

Accounts of Pigou's personality generally mark him as a life-long eccentric, even by the standards of the Cambridge culture of his time and its idiosyncratic figures. He was, for example, notorious for sartorial insouciance. Wearing white, black-laced, open-toed sneakers for comfort, he made the necessary alterations himself. He routinely appeared in rumpled and otherwise ragged jackets. Marshall was shocked to see his successor leave a shop 'in a Norfolk jacket with holes in both elbows' and appealed to Fay to speak with him about this lapse from correct professorial self-presentation – 'so bad for the Economics Tripos!' (quoted in Saltmarsh and Wilkinson 1960, 18). Corrie remembered meeting him for lunch at the Royal Automobile Club, where Pigou arrived in the height of the London season dressed in 'full Alpine kit' and 'clamping an ice axe!' (Corrie to Saltmarsh, 19/2/60, King's/PP/ACP/1/Corrie). Thus Maynard Keynes' surprise, on one occasion, in seeing Pigou in a new suit: 'Piero's [Sraffa's] lunch yesterday went off very well – Mrs. Marshall found to be the only woman at a men's party in College and Pigou turning up in a completely new suit!' (Keynes to Lydia, 25/10/1929, JMK/PP/45/190/4).

Pigou had no taste for formal wear – important in Cambridge rituals of sociality then as now – and no interest in acquiring it. His wardrobe generally lapsed far behind fashion trends, sometimes by four decades. By the early 1930s, he seems to have cultivated a mode of self-presentation based on peculiar but otherwise inoffensive modes of speech and conduct. He was contemptuous of British upper-class hauteur, vanity, pomposity, flummery, and any departure from a scrupulous and uncompromising truthfulness. In general, he was acutely uncomfortable in the company of women and disdainful of 'a ridiculous concern with finesse and artful persuasion', vices he regarded as especially conspicuous among politicians, women, and foreigners. However, he was quite flexible in admitting numerous exceptions.[10]

There is no doubt that the carnage of the war horrified Pigou. 'The economic wreckage', he wrote in July 1916, 'immense and unprecedented though it be, is to my mind trivial and insignificant in comparison with the human and moral wreckage – the mangled bodies of men, the shattered fabric of ideals – with which it is so fatally accompanied' (Pigou 1916a, 4). The war left Pigou, like millions of other survivors, diminished in many respects. He was not one of those men such as Churchill, Weber, Ernst Jünger, or Ernest Hemingway who found war and wartime exhilarating, an experience that animated their spirits and enlivened their energies. It is inconceivable that Pigou could have made the statement of his German contemporary Weber, who asserted, shortly after the general mobilization, that regardless of how it ended, the war was a great and wonderful event. But there is not a shred of evidence that the war made Pigou a recluse, either in private or in professional life.

Private life

On the termination of the Great War, Pigou reinstated the routines of his private life. Climbing parties returned to Lower Gatesgarth, and he resumed his Alpine expeditions. Although his King's College memorialists claim that he became more 'withdrawn' following the discovery that he had an incurable heart disease (Saltmarsh and Wilkinson 1960, 22), his Sunday dinner parties for students during term, invitations to honeymoon couples to enjoy the beauty of the Lake District, and the hospitality of his cottage continued. In June 1934, he invited Austin Robinson to bring the Robinsons' newborn daughter for a visit to Lower Gatesgarth, and when Joan Robinson was recovering from a nervous breakdown in winter 1939, he invited her to convalesce at his cottage (letters to Austin and Joan Robinson, n.d., JVR/7/347).

Although World War II suspended the Lakeland excursions, drawing much of the Cambridge student body and faculty into military or government service, Pigou was not left isolated. He served as temporary treasurer of King's Amalgamation Club, which controlled the finances of student clubs. Because so many of his colleagues were engaged in war work, he supervised economics students – which his professorial chair formally prohibited – inviting them to lunch every day of the Tripos examination period (Saltmarsh and Wilkinson 1960, 24–5). Immediately after retiring from his professorship, he taught the sixth form boys at Malvern College – evacuated to Harrow for the duration of the war (Pigou to Noel-Baker, circa March 1943, NBKR/9/58/3). After the war, he continued to play a role in the life of King's College, organizing chess matches and hiking parties for students, and occasionally attended Alpine Club dinners with climbing friends (Johnson 1960, 150; Pigou to Noel-Baker, 4/11/1947, NBKR/9/58/1; Gaunt 1959, 293). Although he refused to celebrate his 70th birthday with the economics faculty – preferring a jar of good marmalade (Pigou to Noel-Baker, circa late November 1947, NBKR/9/58/1) – he did attend a celebration at King's. Noel-Baker's reminiscences of Pigou do not suggest a hermetic existence: 'It was wonderful to see the reception which you got from the young men, and I hope it made you feel that with your help and that of Russia monkey gland experts, you have another seventy years of vigorous life before you' (Noel-Baker to Pigou, circa November 1947, NBKR/9/58/1). Finally, if Pigou was no longer the 'gay, joke-loving, sociable, hospitable' bachelor of his Edwardian days, Johnson's memoir does an excellent job of concealing it. 'It was always interesting to sit near him at dinner – he had a knack of stimulating entertaining conversation.' Johnson recalled a meeting of the fellows of King's in 1956, convened to elect a successor to Provost Stephen Glanville, who had died unexpectedly. As the senior fellow, Pigou presided over successive rounds of votes. Exasperating his colleagues, he reported the results by affecting the rhetoric of British horse-race journalism (Johnson 1960, 151).

Professional life

During the Great War, Pigou became more active in government committees and public service organizations. In spring and summer 1916, both government and labour organizations asked him to examine probable dimensions of the post-war economic transition. On 21–23 July 1916, the Conference of Working-Class Associations was held at Oxford. Visitors joined delegates from unions, trade councils, cooperatives, and other labour organizations to hear experts explore the prospects for post-war reorganization of industry, commerce, and finance. Pigou analysed the possible effects of transition to a peacetime economy on unemployment, the reallocation of labour, real wages, and incomes of workers, also sketching how these changes could be managed most effectively (Pigou 1916a). At roughly the same time, he joined the Committee of Economists, formed in June by the Board of Trade and assigned the task of preparing memoranda on the prospects for employment in British industries following the war. Although his brief was to investigate the construction, quarry, brick and cement, and wood and furniture industries, he and Clapham wrote a general introduction to the entire set of memoranda and also edited and summarized the contributions of their colleagues on the Committee (Ashley Papers).

Shortly after the Committee of Economists completed its work, Pigou responded to a request from the Prime Minister's secretariat to do some confidential work for the British government (Pigou's report to the Special Board, 22/11/1918, CUA/Min.V.115). In June 1917, Prime Minister Lloyd George called for an Irish Convention, to be chaired by Sir Horace Plunkett. In convening representatives of diverse Irish political factions, the Prime Minister hoped to finally settle the vexing question of Irish home rule. A 20-member Grand Committee supplied Plunkett with constitutional and economic information. Nine of its members formed a subcommittee to negotiate issues that were regarded as critical and highly controversial. In early November, Pigou drafted ten questions on contentious fiscal issues for the subcommittee. In Plunkett's view, their answers would reveal the precise reasons why the Irish had been unable 'to subordinate their differences of economic faith to the supreme need of their distracted country'. Half the questions were intended for the Ulsterites – advocates of fiscal union with Britain. Pigou's brief was to discover the bases of their reservations concerning Irish fiscal autonomy as well as measures that could alleviate their fears. The other five questions were posed to Nationalists, defenders of Irish fiscal autonomy. Exactly what were their objections to fiscal union, and what degree of fiscal independence did they demand in direct and indirect taxation (see McDowell 1970, 123–4)? Plunkett's strategy in performing this exercise was to convince the Unionists and Nationalists that their differences were not unbridgeable.

Plunkett's letter of 27 November 1917 to Pigou shows that this strategy was not a success. After Pigou had completed his assignment, the Grand Committee suffered a series of crises due to the recalcitrance of the Ulstermen, who proved unwilling to strike indispensable compromises. Although Plunkett regarded the prospects for a settlement as futile, he still held out hope that a compromise might be reached once the Ulstermen grasped the consequences of a complete breakdown in negotiations (ACP Papers). The causes of the failure of the Irish Convention and its various committees to reach a consensus lie beyond the scope of this account. In April 1918, Plunkett reported to Lloyd George that despite establishing some common ground on broad issues, Nationalists and Ulstermen remained sharply divided over the fiscal powers of the Irish government (*The New York Times* 1918, 8).

While the Irish debated home rule, waves of strikes and mutinies pounded Britain. An increasingly militant British working class was provoked to action by weariness over a war of immense suffering, low wages and miserable working conditions, and revolutionary movements in Russia and Germany. Industries critical to the British war economy – metal, mining, munitions, and transport – were hit especially hard. The number of British workers engaged in strikes increased from 235,000 in 1916 to 923,000 in 1918. When the war ended, industrial disputes increased exponentially: more than 2.4 million workers were on strike in 1919 (Cronin 1980, 128). Nor were the rank and file of the army – generally employed by the state to suppress labour strife – immune from discontent. Instead of post-war demobilization, they faced the prospect of quelling rebellions in India or fighting Bolsheviks in Russia (Lamb 1977). In February 1919, mine workers voted to strike, demanding higher wages, shorter work hours, and nationalization of the coal industry. Other members of the triple labour alliance – railway and transport workers – promised to support them. Troubled by fears of a Soviet revolution in Britain, Lloyd George persuaded workers to postpone the strike.[11] On 26 February, he appointed a 12-member Royal Commission on the Coal Industry, chaired by Justice John Sankey, to investigate the miners' demands. Three weeks later, the Commission issued an interim report, recommending higher wages and reduced work hours. Lloyd George accepted the recommendations, and the Commission promised to reach a conclusion on the question of nationalization in its final report in June.

Although Pigou was not an expert on the coal industry, the Commission summoned him to give evidence on the issue of nationalization. Sidney Webb – a leading Fabian, member of the Commission, and vigorous advocate of nationalization – wrote his wife Beatrice that in the 'uneventful' morning session of the Commission, Pigou had taken the couple's position (23/4/1919, Webb and Webb 1978, 117). However, the minutes of Pigou's testimony record his persistent denials that he was prepared to support 'any definite plan'. In a typically Pigouvian exercise of economic policy analysis, he distinguished six alternative schemes for organizing the coal industry and assessed their strengths and defects. Because he had no quantitative estimates indispensable to a precise analysis, he regarded it as irresponsible to recommend one alternative as superior to others (HMSO 1919a, 423).[12]

From 1918 into the 1920s, Pigou worked on various government commissions and committees formed to solve problems of war debt, economic reconstruction, and the transition to a peacetime economy. In January 1918, he was appointed to the Committee on Currency and Foreign Exchanges after the War, which, as we have shown, reported on steps required for a smooth transition to a peacetime economy. In May 1919, some six months before the Committee concluded its work, Pigou was appointed to the Royal Commission on the Income Tax. In its report of March 1920, the Commission made recommendations designed to improve the fairness of the British income tax system. In 1924–5, he was a member of the Chamberlain–Bradbury Committee on the Currency and Bank of England Note Issues, service we have discussed in detail. In 1924–5, he also testified twice before the Committee on National Debt and Taxation on the most effective way to retire the national debt accumulated during the war.

For a few years, Pigou's heart condition interfered with his work, leading him to cancel some of his lectures in Michaelmas 1925, February–May 1928, and Easter 1933. On 19 May 1929, Maynard Keynes wrote his wife Lydia that he and Kahn, at the time his student, had detected a 'terrible mistake' in a letter Pigou had sent to *The Times*. Keynes, who believed Pigou might be 'a little gaga in his head from illness', persuaded him to withdraw the letter. The following day, Keynes wrote Lydia that Pigou was extremely troubled about committing serious errors in his work. 'He consulted me yesterday whether I thought his illness had spoilt his intellect and if so whether he ought to resign his Professorship' (JMK/PP/45/190/4). The episode proved to be ephemeral. In a few months, Keynes was applauding Pigou's favourable judgement on Kahn's Adam Smith Prize essay, which he later submitted as his fellowship dissertation at King's. 'Pigou has now been reading Kahn's Essay and I am very happy to find that he agrees with me. He thinks it is the best he has read from a young man since mine more than twenty years ago, and perhaps the best he has ever read' (Keynes to Lydia, 21/10/1929, JMK/PP/45/190/4).[13] On 28–29 May 1930, Pigou gave evidence before the Committee on Finance and Industry. On 23 July of the same year, Prime Minister Ramsey MacDonald appointed him to the Committee of the Economists to examine British economic woes and recommend policies for recovery (Ramsey MacDonald to Pigou, courtesy of David Gaunt).[14]

In sum: Pigou's extensive public service over a period of some 15 years, from 1916 to 1931, hardly documents the professional life of a man who had been left psychologically scarred by the war. Nor does the evidence support the view that the war left Pigou damaged and personally isolated in his private life.

Pigouvian pessimism: Cambridge micropolitics and British economic policy in the 1930s

In January 1935, Keynes attempted to persuade Pigou to deliver the address at the annual meeting of the Royal Economic Society (RES). Cannan, whose three-year term as president would end at the meeting, was reluctant to give a fourth performance. W.R. Scott, the Adam Smith Professor of Political Economy at the University of Glasgow, had agreed to succeed Cannan as president only on the condition that he would not be responsible for the address. Pigou, Keynes playfully noted, was 'the only one of our vice-presidents under a hundred years of age', and both he and Cannan coaxed him to accept the invitation (Keynes to Pigou, 14/1/1935, JMK/RES/1.2). Pigou would not be moved. As he replied to Keynes: 'I'm sure when I agreed to be vice-president, I conditioned that with [:] should involve no duties. Why not get [Josiah] Stamp? He always says yes, + he likes it. To each according to his needs' (Pigou to Keynes, circa mid-January 1935, JMK/RES/1.2). After a lapse of four years, Pigou finally wrote a presidential address, apparently drafted in light of Keynes' advice to avoid technical sophistication in light of the training of the general membership (Keynes to Pigou, 14/1/1935, JMK/RES/1.2). Fay, who attended the address, complained to Keynes that it was essentially empty (Fay to Keynes, circa June 1939, JMK/PP/45/101). However, Pigou's address included an important commentary, albeit brief, on the prospects for economics and economists.

If the joie de vivre of the young professor became muted in his later years, the cause lay not in the Great War but in the 1930s. The change in Pigou was not expressed in a disposition to sequester himself in hermit-like isolation. It was due to the loss of his youthful enthusiasm for the promise of economics and an increasing scepticism about what academic economists could expect to achieve. The change in his thinking was occasioned by two developments: the acrimonious intramural conflicts at Cambridge, both scientific and personal, as Keynes abandoned Marshallian orthodoxy and moved in the direction of *The General Theory*; and the economic policies of the British government between 1931 and the beginning of World War II. He considered both developments in his presidential address, alluding to the former much more obliquely than to the latter. Pigou was the last man to wash the linen of Cambridge economics before the assembled membership of the RES. Noting that recent conflicts in economic theory had created 'centres of disturbance', he argued that students were left confused by current pedagogies. 'Plunged into controversy on fundamental matters too early', they were 'tossed to a turbulent sea' (Pigou 1939, 220). In addition, the performance of British policymakers in the 1930s fell far below Pigou's standards for statesmanship. Economic policy was not being made on the basis of established facts or sound analysis but by happenstance, the 'blind pressure of events', and the influence of 'political sharp practice' (ibid., 221). Pigou's conclusion was bleak. Although economists could hardly be expected to close shop, their work had become largely meaningless.

The Keynesian revolution and the Economics Tripos

In a letter of 17 November 1926 to *The Times*, Ernest Benn – publisher, recent convert to laissez-faire principles, and tendentious commentator on economics – chastised teachers of economics for their alleged socialist proclivities. Singling out the examination papers set for the Cambridge Economics Tripos in May 1926 for criticism, Benn objected to the excessive weight, as he saw it, assigned to questions on distribution, trade unions, poor relief, and public finance to the neglect of issues such as scarcity, production, exchange, and capital (Benn 1926, 135–43). These biases could be eliminated only if teachers of economics paid 'as much respect to the views of the business classes as they now appear to do to those of the politicians and doctrinaires' (ibid., 143). Benn's letter drew a stinging response from Pigou, who was chairman of the Faculty Board at the time. The details of his defence of Cambridge economic pedagogy are less important than the case he made for the value neutrality of a Cambridge education in economics.

The political views of lectureship candidates at Cambridge, Pigou emphasized, were not considered in deciding on appointments. Once appointed, lecturers had the obligation 'to discover and teach what is true' irrespective of public opinion, predilections, and ideologies. If experts in a field disagreed, lecturers were obligated to spell out differences and conflicts fairly. 'These things are our duty at once to our University and to the spirit of science. For an outsider, ignorant of our practice and an amateur in our subject, to charge us with violating it is an impertinence' (Pigou 1926c). In 1926, Pigou was prepared to assert with sovereign confidence that Cambridge lecturers in economics fulfilled the severe requirements of their calling in both science and the University. This confidence was shattered in the 1930s.

What was responsible for the recent conflicts among economists? In his presidential address, Pigou maintained a discrete silence on this question. However, there is no doubt that he saw Cambridge as the epicentre of disturbance. The chief cause of the breakdown of comity among Cambridge economists that had been created by Marshall and persisted for more than thirty years was Keynes – his charismatic power to enchant and inspire disciples, and their evangelical fervour in conducting a crusade to defend *The General Theory* as a unique and incontrovertible synthesis of economic reasoning. Pigou's dismal outlook on Cambridge economics is nicely documented in his view of Joan Robinson. In 1932, he was her principal senior mentor, offering her counsel and new ideas on her work in imperfect competition that became her first book. He also supported her appointment to lecture part-time the same year as well as her promotion to full-time lecturer in 1938 (see Aslanbeigui and Oakes 2009). However, in her increasingly strident and, in his view, doctrinaire, Keynesianism, Pigou saw his vision of Cambridge economics threatened.

In this period of contention, Kahn served as Keynes' adjutant and source of theoretical stimulation. Joan Robinson was his most passionate and aggressive advocate. Even as a probationary, part-time lecturer teaching a course on monetary theory in 1935, she exhibited no scruples in transgressing the academic proprieties of the Cambridge economic guild. During the 1920s, the etiquette of Cambridge economics was governed by a principle of liberal civility: unsparing candour in debate in the interest of arriving at the truth tempered by a punctilious respect for interlocutors – an absolute distinction between ideas and persons. Intellectual positions but not their advocates were open to ruthless criticism. This principle rested on a dichotomy – difficult to sustain, unrealistic, and perhaps ultimately indefensible – between who you are and what you think. Robinson was not averse to ad hominem tactics that violated this etiquette. Moreover, her transgressions exhibited a lack of finesse and tact that suggested malice. As Fay complained to Keynes: 'It is a pity she's so bloody rude' (6/3/1935, JMK/UA/5/4/31–32). Robertson, with whom she clashed on issues of theory and curriculum, was a favourite object of invective. By early 1935, he was convinced of her determination to reconfigure the Cambridge curriculum in money in order to strengthen Keynes' position, denigrate his own lectures on monetary theory, and marginalize him generally. Fay shared this view and was much more frank than Robertson in voicing it: 'The assumption has always seemed to me that if she wants it, of course she can have it' (Fay to Pigou, Keynes, and Shove, 2/3/1935. JMK/UA/5/3/137–38). However, Robertson's ability to remain silent was not without limits. In 1935, the Faculty Board, which he chaired at the time, approved her proposal to teach a two-term course on money for second-year students as a precursor to his third-year lectures in the same area. He was not pleased with the prospect of lecturing to students who had been taught that his treatment of the subject was laughable. In a letter of 28 September 1936 to Keynes, he summed up his judgement on the consequences of Robinson's interventions in the economics curriculum.

> Yes, I accept the Cambridge lecture-list arrangement as the least bad in the circumstances. But of course I *don't* think it good that people coming over from other subjects [into Part II of the Economics Tripos] should get their first introduction to the subject from someone who seems to think that everything that has been said and thought about it is 'moth-eaten' rubbish except one book [*The General Theory*] – and that, whatever its merits, a very difficult one. And I *do* feel that over this business there is an atmosphere of dogmatism and proselytisation about into which our Socialist[s] and Communist[s] have never landed us + which is new and un-Cambridge-y. However, I realize it's no use at present our trying to see eye to eye about this: and also that the position is complicated by my inability, after years of effort for Austin's [Robinson] sake, to preserve personally cordial relations with Mrs. R. (quoted in Moggridge 1992, 600–1)

Fay interpreted the influence of Keynes' Cambridge disciples in more catastrophic terms. As Fay understood him, Keynes now seemed to think that solutions to most problems in economic theory could be derived from the theory of money. If the new Cambridge monetarists had their way, they would impose 'a sort of theoretical suzerainty', stratifying the faculty along the lines of theoretical allegiances. This was a dangerous prospect. He feared a new Keynesian regime creating a radical shift in the balance of power on the faculty and realigning the status of its members. An elite of monetary theorists – Keynes and his followers – would be positioned at the top of this new social order. Those who failed to demonstrate the requisite enthusiasm for the new orthodoxy would suffer a loss of prestige. In essence, a theoretical loyalty test would determine the career chances of Cambridge economists. The golden age of the Marshallian guild and its liberal intellectual culture of debate and innovation within the capacious and vaguely defined limits of Marshall's *Principles* would be succeeded by a dark age of Keynesian dogmatism, sectarianism, and endless ideological warfare (Fay to Pigou, Keynes, and Shove, 2/3/35, JMK/UA/5/3/137–38).

Conflicts between Cambridge Keynesians and sceptics did not abate. In 1938, Robertson gave up the struggle. Notwithstanding Pigou's efforts to arrive at a detente that would prevent his departure, in early October, he decided to accept the Cassel Professorship at LSE (see Aslanbeigui and Oakes 2002). With Robertson exiled and most economics lecturers engaged in war work by late 1939, the influence of Robinson on the economics faculty became more pronounced. Troubled by her extremism in reducing monetary theory to Keynes' work, even in teaching new students, Pigou appealed to her for moderation in a letter of March 1940. Noting that the Lecture List Committee had just approved her proposal to lecture on monetary theory by deriving her material from Keynes' lectures on his own theories, he informed her that he agreed with the Committee's decision, but not without 'a slight hesitancy'. His reservation was based on dissension at Cambridge over *The General Theory* and the consequences of theoretical disagreement among the faculty for the teaching of economics. On the one hand, students would find the entire area of monetary theory more intelligible if all lectures were delivered by faculty who agreed on fundamentals. On the other hand: 'I think it would be a great pity if they get the impression that everybody who wrote about money before Keynes was an imbecile and that this [*The General Theory*] was a sort of second gospel of which every word was inspired'. The cause of Pigou's hesitancy was Robinson's theological Keynesianism. Although he did not intend to suppress her views or her criticisms of other economists, he was insistent on the point of an objective treatment of pre-Keynesian and non-Keynesian theories. In the event that she did not take this point, he spelled it out bluntly but gently: 'What I am really getting at is to express a hope that you will not use other theories just as illustrations of Keynes, but will treat them on their own merits. Please forgive this. It's really rather an impertinence from me to write it. But, as it's all in a very friendly spirit, I hope you won't mind' (n.d., circa March 1940, JVR/7/347).

Dismayed by the performance of students on the Economics Tripos in June 1940, Pigou wrote Keynes, lamenting the doctrinaire teaching of economics at Cambridge. In his view, the intellectual capacities of students were being damaged by dogmatic lecturing and supervision, leaving them incapable of thinking independently. He attributed the unsatisfactory Tripos results chiefly to Joan Robinson's conception of teaching as indoctrination. 'My own guess – because there is no direct evidence – is that the parrot like treatment of your stuff is due to the lectures and supervision of the beautiful Mrs. R. – a magpie breeding innumerable parrots! I gather that she puts in the Tract [Keynes' *Tract on Monetary Reform*], with an enormous T. with such *Prussian* efficiency that the wretched men become identical sausages without any minds of their own!' (quoted in Moggridge 1992, 599). Pigou suggested that after the war, reintroduction of a more liberal pedagogy in monetary theory was in order. 'Even the muddle into which things were got when Dennis and the beautiful lady were lecturing against one another seems better than this drill-sergeant business' (Pigou to Keynes, circa mid-June 1940, JMK/PP/45/254).

Pigou concluded his letter to Keynes with a piece of good news, perhaps injudiciously in light of his main purpose in writing: in the Tripos, several students had placed in the First Class. Keynes' reply, which expressed his pleasure that five students had received a First, could not have tempered Pigou's dissatisfactions: 'If there can be a few of reasonable merits at the top, I do not so much mind what happens at the bottom' (Keynes to Pigou, 18/6/1940, JMK/PP/45/254). This observation marked an important difference between Keynes and Pigou on the aims of economics generally. Pigou did care about what happened at the bottom and held Cambridge economics responsible for students who had placed below First Class. After all, they would be entrusted with improving economic welfare by pursuing careers in business, the state, and civil society. In Marshall's grand vision, the Economics Tripos would send these graduates into the world with well-honed analytical tools and high moral standards. Because of the civil wars of the Keynesian revolution at Cambridge, Pigou was unable to sustain his early confidence that this vision would be realized.

The failures of British statesmanship

In the opening pages of *Candide*, Voltaire tells a story of an exceptionally susceptible and credulous youth, naturally endowed with a sweet disposition. Living in a castle owned by a powerful baron whose daughter he loved, Candide was taught by the philosopher Pangloss that all was best in their best of all possible worlds. This idyllic life proved ephemeral. When the baron discovered him and the beautiful Cunégonde in a lovers' kiss, he expelled Candide from the Westphalian castle. Conscription, inquisition, shipwreck, and earthquakes were his fate. His journeys across nations, continents, and oceans exposed him to terrible atrocities, some of which he committed. The fortune he had amassed was squandered in no time. In due course, he met the

Manichean philosopher Martin, whose arguments were unrelentingly pessimistic. By the end of the novel, Candide had settled on a small farm near Constantinople, reunited with Cunégonde – now ugly and ill humoured – and some old friends including Pangloss and Martin, all of whom had survived harrowing experiences. All the residents of the small farming community had reasons for discontent. Candide and the two philosophers vacillated between boredom and endless disputes over morality and metaphysics. Others wondered whether their previous lives were perhaps preferable to what they had to endure on the farm. Eventually, two Turks offered a panacea for a tolerable life. A sage dervish demonstrated the futility of fundamental questions about good and evil, and an old Muslim recommended farm work as a cure for boredom, vice, and destitution. Henceforth, Candide's small community devoted itself to strenuous physical work. Temptations to engage in philosophical disputations were invariably met by Candide's reminder: 'We must cultivate our garden'.

The parallels between Candide's experiences and his own were clear to Pigou. As a young man, he had been naively optimistic in believing that economists could make a substantial contribution to social welfare. Statesmen – philosopher kings – would link economic analysis to other variables, arriving at policies that advanced the common good. By the time he wrote his presidential address, this youthful naïveté had been shattered: 'How different from this dream is the actuality! How very unlike philosopher kings actual politicians are! To how small an extent the conduct of affairs is the result of thought!' (Pigou 1939, 220) This transformation in Pigou's thinking can be traced to his assessment of the performance of British political leaders in the economic crises of the early and mid-1930s.

In May 1931, Credit-Anstalt, the largest Austrian commercial bank, collapsed. Without timely international support, the Austrian financial crisis created a panic – a wildfire of withdrawals and capital flight in central Europe. Germany – tethered to international creditors by a complex web of trade, credit, and war reparations – became a major victim. The run on German banks ended in the nationalization of several commercial banks, a moratorium on reparations, and import restrictions. Standstill agreements protected debtors, postponed debt amortization, and froze foreign credit extended to Germany. These arrangements severely damaged British banks and discount and acceptance houses, which were important creditors to German banks and industry. The German crisis of June–July 1931 quickly became British, resulting in a loss of confidence in the sterling. Publication of the Report of the Macmillan Committee on 13 July exacerbated the crisis by its alarming estimates of the short-term debt position of London in international markets. Losses in gold reserves accelerated, and the sterling dropped precipitously. The 31 July report of the May Committee on National Expenditure fanned the fire: the government budget deficit for 1932–3 would stand at £120 million. The Committee recommended public-sector retrenchment, including large reductions in unemployment insurance. The failure of the Labour government to reach a consensus on these cuts further eroded confidence in the sterling and its convertibility to gold. The Bank of England refused to take measures to stem the run on the currency; sharp interest rate increases would damage an economy already weakened by post-war structural maladjustments, falling export revenues, and high unemployment rates. The gold standard could no longer be sustained, and Britain abandoned it on 21 September 1931.[15]

The financial crisis precipitated a political crisis. The deadlock over retrenchment split the minority Labour government, which had formed a coalition with Liberals after the May 1929 election. With cabinet members from both parties threatening to resign, on 24 August Ramsay MacDonald dissolved the coalition and formed an all-party National government that won a landslide victory in the general election of October 1931. Although Conservatives took the majority of seats in Parliament, McDonald, now expelled from the Labour Party, remained Prime Minister. One of his first acts was a fateful decision: appointment of Neville Chamberlain as Chancellor of the Exchequer. Chamberlain was the chief architect of the Conservative response to the crisis, an 'unauthorized programme' of retrenchment (Self 2006, 145). He made deep cuts in public-sector wages and unemployment insurance, believing they were necessary to restore confidence in the sterling. He also introduced protective and preferential tariffs, which the country had rejected when his father Joseph had championed them decades earlier (ibid., 164). And on 4 February 1932, he proposed the Imperial Duties Bill, imposing a general tariff of 10 per cent – in some cases quickly increasing to 33 per cent – on a wide array of goods imported from countries outside the Dominion. Products of the Dominion, India, and Southern Rhodesia were exempted until November 1932. Intra-empire preferential tariffs were negotiated at the Imperial Economic Conference of July 1932 in Ottawa.[16]

In the 30 years since he had opposed Joseph Chamberlain's proposals for tariff reform, Pigou had not changed his views on the follies of the policy: he singled out protective and preferential tariffs as the most fundamentally flawed policy of the decade. Events of the 1930s had radicalized his judgement on the issues,[17] and he claimed that two factors were responsible for the demise of the 'century-old' policy of free trade: the 'blind pressure of events' – the financial crisis of summer 1931 – and the 'political sharp practice' of tariff reformers, a thinly veiled reference to the parliamentary machinations Neville Chamberlain had employed in passing the Import Duties Bill. The central European panic and the flight from the sterling gave proponents of tariffs a powerful new argument to support their case: defence of the gold standard. Even when the gold standard was abandoned – in Pigou's metaphor, when 'the patient died' – tariff enthusiasts did not relent, instead administering 'their remedy to the corpse!' (Pigou 1939, 220–1).

The road to Neville Chamberlain's tariffs was paved in the early years of World War I, when Chancellor Reginald McKenna imposed revenue duties on luxury imports. In 1919, Austen Chamberlain, Chancellor in the coalition government of Lloyd George, introduced preference by reducing the McKenna duties on a few imperial products (Self 1995, 107). As the first Chancellor to introduce a 'humble' imperial preference, Austen celebrated the appointment of his brother Neville, who was now in a position to consummate the family mission: 'Father's great work will be completed in his children' (Austen to Neville Chamberlain, 5/11/1931, quoted in Self 2006, 163). On the day Neville introduced the Imperial Duties Bill in the House of Commons, his mother observed the family triumph from the visitors' gallery while his brother sat in the very seat once occupied by their father. Concluding his speech to the Commons, Neville paid homage to Joseph's tireless efforts on behalf of tariff reform: 'he would have found consolation for the bitterness of his disappointment if he could have foreseen that these proposals, which are the direct and legitimate descendants of his own conception, would be laid before the House of Commons ... in the presence of one and by the lips of the other of the two immediate successors to his name and blood' (quoted in ibid., 167).

Although they did not appear in his presidential address, Pigou's criticisms of other economic policies championed or enacted under Neville Chamberlain's chancellorship were withering. He was contemptuous of Chamberlain's proposal to form cartels in order to reduce overproduction, in the Chancellor's opinion the cause of the collapse of world prices. The irony of this plan was obvious to Pigou. The goal of a reflationary policy was to increase employment. Chamberlain's recommendation would defeat this objective by reducing production and increasing unemployment (Pigou 1932d, 1933d). Nor did he find wisdom in the 'economy' campaign of the government. Because of the high rate of unemployment and the general atmosphere of gloom, it was unpatriotic to expect private citizens and public authorities to economize on spending. Such a policy could be expected to reduce the national income and further increase what Pigou called the 'mounting wave of unemployment'.[18] In response to 'wholesale condemnation' of public works by politicians, he detailed their advantages for a depressed economy: given idle resources, such projects were not likely to increase interest or wage rates, but would reduce disbursements from the dole. Implemented cautiously, they would not encourage a flight from the sterling, especially if an intelligent media prepared the public. On the eve of the World Economic Conference in June–July 1933, a policy of public works held the promise of changing the thinking of many diplomats, who were otherwise reduced to 'standing still and arguing'. If Britain could demonstrate the advantages of reflation in one country, perhaps it could inspire coordinated efforts to reflate globally.[19]

In sum, the pessimism that characterized Pigou's thinking in his fifties and sixties was not due to the catastrophe of the Great War. His optimistic vision of a rational economic policy based on empirical knowledge, expert analysis, and sound judgement was a casualty of the 1930s. The chancellorship of Neville Chamberlain and changes in the culture of Cambridge economics persuaded him there was little hope for advancing the human prospect by economic science. Yet like Candide, he continued to cultivate his garden, at the same time offering a dismal judgement on the place of economics in his time.

> The hope that an advance in economic knowledge will appreciably affect actual happenings is, I fear, a slender one. It is not likely that there will be a market for our produce. None the less, by a sort of reflex activity, we cultivate our garden. For we also follow, not thought, but an impulse – the impulse to inquire – which, futile though it may prove, is at least not ignoble. (Pigou 1939, 221)

Notes

1. Obituaries appeared in *The Alpine Journal* (Gaunt 1959), *The Cambridge Review* (Wilkinson 1959), *Canadian Journal of Economics and Political Science* (Johnson 1960), *The Harrovian* (5/7/1959), *Journal of the Royal Statistical Society* (Champerowne 1959), *Indian Journal of Economics* (Brahmanand 1959), and *The Times* (9/3/1959; attributed to Robertson).

2. Pigou was a dedicated patron and trainer of Cambridge undergraduates who shared his love of mountains. He instructed his young friends in the techniques of mountaineering and funded their expeditions regardless of whether they climbed with him. When Charles Donald Robertson – a popular British alpinist and fellow of Trinity College – died in a climbing accident in north-western Wales in 1910 (Young 1910), an endowment to support climbing was established in his memory. Pigou was a founding trustee of the fund and bequeathed the generous sum of £200 to it from his estate.
3. Alan Turing, who had performed important cryptanalysis of German military codes during World War II, was found guilty of homosexual acts in 1952. He chose hormone therapy – pharmacological castration – over a prison term. Legal authorities declared that his death in 1954 was by his own hand.
4. Noel-Baker entered Cambridge as Philip J. Baker, changing his name in 1943, when he adopted the last name of his wife, Irene Noel. Because history knows the Nobel laureate for peace as Noel-Baker, we use the hyphenated name throughout.
5. In 1934, Pigou wrote Austin Robinson that Gaunt's two sons had visited Buttermere early in their lives and enjoyed it immensely (circa June 1934, JVR/7/347). Pigou was godfather to one of Gaunt's sons and introduced the other, David, to mountaineering at Zermatt (Pigou to Noel-Baker, circa summer 1950, NBKR/9/58/1).
6. Hallward was a severe critic of the sexual exploitation of young men by their teachers. As he recounted, an interim master of Haileybury, Hallward's school in his youth, attempted to assault him sexually in 1919 during a theatre trip to London. This 'horrific psychological experience' together with the moral lessons he gleaned from George Eliot's *Romola* and Oscar Wilde's *Picture of Dorian Gray*, convinced him that 'good looks and high intelligence can pervert the soul' (see Winterbottom 1995, 27–8, 33–43). Thus Hallward drew a sharp distinction between the teacher as sexual predator and Pigou, the older and wiser friend and ethical mentor of his students.
7. When the University argued that Pigou was indispensable, Foxwell, who had remained bitter over his lost bid for the Cambridge professorship in 1908, protested by pointing out the availability of an expert and willing replacement: himself. Pigou's exemption, which received national exposure in *The Times* and *The Morning Post*, was complicated by Foxwell's intervention. The affair ended in a humiliating fashion for Foxwell, who compelled the University to defend its position by arguing that he was an unsatisfactory alternative. On the controversy over Pigou's military service, see Aslanbeigui 1992.
8. In his diary of the time, Benson noted the controversy at Cambridge over Pigou's support for a negotiated peace (12/3/1915, AB/volume 151).
9. In July 1920, the British Academy also declined to elect Maynard Keynes, apparently disapproving of his criticisms of the Treaty of Versailles in his celebrated book *The Economic Consequences of the Peace* (Keynes 1920). Incensed by its posture on Pigou's candidacy as well as his own, Keynes rebuffed further nominations, relenting only after Pigou's election. Pigou first learned of the Academy's 'scandalous' decision on Keynes following his own election. As he wrote Keynes at the time, had he known the relevant facts, he would have refused election. 'I must tell you this, because you may quite well imagine that I *did* know; in which case you must think my action in accepting membership most extraordinary' (quoted in Keynes 1977, 164–7).

10. According to Saltmarsh and Wilkinson, Pigou 'revelled in misogyny' (1960, 18). An account of Pigou's views on women would require careful examination of various considerations: an 'elaborate *persona*' that he constructed for the amusement of his friends; extreme shyness that could border on panic in the presence of women, one aspect of a life, beginning at Harrow, that was almost exclusively homosocial; a distaste for what he considered to be an excessive and distasteful obsession with personal appearance on the part of upper-middle-class women; and punctiliousness in following University rules that barred women from entering fellows' rooms without chaperones. Some of these matters are explored in Aslanbeigui (1997).
11. In March 1919, Lloyd George concluded that the 'whole of existing order in its political, social and economic aspects is questioned by the masses of the population from one end of Europe to the other' (quoted in Cronin 1980, 128).
12. By a majority of one, the Commission recommended nationalization. Lloyd George, using mine owners' dissent as his rationale, rejected the majority position, breaking his promise that the government would act on the conclusions of the Sankey Commission. On the economics and politics of the interwar British coal industry, see Court (1945) and Brodie (2003, 171–7).
13. Decades of experience and diverse intellectual interests made Pigou an influential member of the King's Fellowship Electors Committee. His ability to 'recognize intellectual merit with unrivalled ease and certainty' was legendary (Saltmarsh and Wilkinson 1960, 12).
14. At Cambridge, Pigou was not endowed with a gift or passion for administrative work possessed by his colleagues Neville and Maynard Keynes and Austin Robinson. When Maynard Keynes joined the Treasury in 1915, Pigou replaced him as secretary of the Board, assuming its chairmanship on Neville Keynes' retirement in 1919. He relinquished the office to Robertson in 1935, only to resume it on Robertson's departure for LSE in1938. With the exception of 1940, he retained the chairmanship until shortly before his retirement in 1943. Although his distaste for administrative work did not lead him to withdraw from meetings of the Board, he delegated liberally, giving Board secretaries a free hand and admonishing them when they failed to meet his expectations (Cairncross 1993, 41). In David Champernowne's experience of the late 1930s, Pigou's main role as a committee chair was to 'get through the business quickly so as to release members for more worthy occupations' (Champernowne 1959, 264).
15. On the Austrian, German, and British financial crises of 1931, see Accominotti (2012), Eichengreen and Jeanne (2000), Forbes (1987), James (2002), Schubert (1992), and Williams (1963).
16. On the British imperial preference system in the interwar period, see Glickman (1947) and Drummond (2006).
17. On Pigou's dissenting remarks on the practicality of revenue and protective tariffs, see the report of October 1930 by the Committee of the Economists in Howson and Winch (1977, 209–11). On the effectiveness of tariffs in raising the price level, see Pigou (1933d). On the rationality of imperial preference, see Pigou (1939, 221).
18. Letter drafted by Pigou but signed by D.H. MacGregor, Keynes, Layton, Arthur Salter, and Stamp (Pigou et al. 1932a).
19. See Pigou (1932d, 1933d, e, f, g, i).

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