

Unemployment in the Great Recession

Christopher A Pissarides
London School of Economics

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Abstract

This paper studies the responses of unemployment in Germany, the United States and Britain to the Great Recession of 2008-09 by making use of Beveridge curve analysis, and in the entire OECD with other techniques. It is shown that Britain suffered from recession but no structural problems; the United States suffered from structural unemployment during the recovery; Germany exhibited a much better performance both during and after the recession. The rise in OECD unemployment is broken down into parts due to aggregate activity, the construction sector and a residual attributed to policies and institutions, which is used to reach conclusions about policy.

Keywords

Unemployment, Great Recession, vacancies, Beveridge curve, construction sector, policies and institutions

JEL Classification codes

E24, J6

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The Great Recession of 2008 is the deepest that many countries of the OECD have experienced since the 1930s. In most countries it started sometime in 2007 or 2008; by the collapse of Lehman Brothers in September 2008 all countries were in some kind of recession. The worst affected sectors of the economy were construction and finance but from there it spread to the rest of the economy. Had this been a normal recession most economies would be seeing signs of recovery by 2009. But then a new “crisis” began, concentrated in Europe, and involving the debt levels of sovereign nations. This was a further negative and economy-wide shock that started in Greece and spread elsewhere, especially in the European South, largely because of high domestic public and private debt levels and the fixed exchange rates within the Eurozone. As this is written at the beginning of 2013 the debt problems of the Eurozone are unresolved and the recession in the indebted countries is continuing.

OECD labour markets responded in a variety of ways to the recession. Given the role of construction and finance, and the labour content of the former, some differences in overall response due to the relative size of construction in each economy would be expected. But there were other differences too, that could not be explained by the relative size of construction. My purpose in this paper is to take a close look at the differences in the response of unemployment across the OECD and make inferences about the functioning of different types of labour markets in recession. The ultimate objective is to reach conclusions that would be useful to policy-makers in designing an optimal response to a negative shock.

I will compare unemployment outcomes in 2009 and 2007. The earlier year was the last that labour markets operated under normal conditions, and we can take the unemployment level at that time to be close to a “natural rate”. By 2009 the recession had taken hold everywhere, and so the unemployment rise between the two years gives a fairly accurate picture of the impact of recession on unemployment. Following this comparison, I will briefly discuss the subsequent changes in unemployment, up to 2012. I will argue that the countries that suffered most from sovereign debt experienced a deeper recession, if it is measured by the rise in unemployment.

Section 1 describes the response of unemployment to the recession in OECD countries. Section 2 briefly outlines the theoretical framework behind the Beveridge curve, which is used to compare the experience of Britain, the United States and Germany in section 3. Section 4 introduces a less structural approach and compares outcomes in all OECD countries, whereas section 5 discusses the impact of reforms associated with the debt crisis on the economies of Europe.

1. The impact of recession on unemployment, 2007-2009

Figure 1 shows the initial response of unemployment to the recession. Unemployment went up in all countries of the OECD except for Poland and Germany. Polish unemployment was declining rapidly up to 2007 and the decline continued for one more year, before rising again above the 2007 level. Germany is the exception in this recession and I will discuss its case in some detail. In the rest of the OECD unemployment went up, the rise ranging from a low point of 0.1 in the Netherlands to a high point of 9.7 percentage points in Spain. On average in the OECD unemployment went up by 2.7 points whereas in the Eurozone by 2 points, as the worst of the Eurozone's problems had not yet began.

Men were affected worse by the recession than women were, with average increases of 2.7 and 1.2 respectively in the euro area (average figures for the OECD as a whole are not published). This, however, is common in recessions as the industries which have a higher concentration of men, the production industries, are more cyclical than service employment, where women are relatively more plentiful. The higher incidence among men would be particularly pronounced in this recession because of the plight of construction, which is male dominated. But the ones who have really borne the brunt of recession are the young workers. In normal times youth unemployment (ages 15-24) is on average twice as high as overall unemployment, although there are variations across countries, from 1.4 in Germany to 3.1 in Italy and 3.8 in Luxembourg. These ratios remained remarkably constant during the recession, being virtually the same in 2009. But of course the stability was in the ratios, not in the differences between percentage unemployment rates. Youth unemployment increased on average by nearly 5 percentage points, close to twice the increase in the overall unemployment rate of 2.7 points. Germany is the exception again, experiencing a small fall in youth unemployment.

The rise in unemployment was matched closely by the fall in employment across the OECD. This is shown in figure 2 for all 34 countries. The correlation between the rise in unemployment and the fall in employment is close, with a simple correlation coefficient of 0.87. There are no obvious outliers, although Spain, Estonia and Chile experienced bigger rises in unemployment than justified by their fall in employment (and Iceland a smaller rise in unemployment given the fall in employment). I take the evidence in this chart as a reason to ignore changes in the labour force in the discussion of the impact of recession on unemployment and talk interchangeably between job loss and unemployment rise.

When looking at disaggregated data most job losses would appear to be in industry. Industrial employment is more cyclical than service employment so often recessions are blamed for destroying the “industrial base” of the economy. This, however, is either outright false or exaggerated. Cyclical recessions hit mainly industry but just as employment falls more in recessions, it rises more in recoveries. A second reason that the claim is misleading is that there are trend changes in employment across sectors associated with the structural transformation that should be taken into account when apportioning blame for job loss. Dealing only with the latter problem is revealing. Figure 3 shows the raw data on job loss across four sectors, all production industries except for construction, construction, all service sectors and agriculture. It is obvious from this figure that most job losses are in industry, with services actually contributing substantial net employment additions in Europe. Construction is a large contributor to job loss for such a small sector, because of the nature of this particular recession.

Now extrapolating from the trends of sector employment rates over the period 2000-2007, when OECD labour markets were going through a calm period, we find the unsurprising fact that industry and agriculture were losing jobs fast and services were gaining them. Construction employment exhibited no trend but the other sectors exhibited linear trends that fitted the data extremely well. I used the 2000-2007 trends to predict employment rates for each sector in 2009, and then deducted the actual employment rate from the predicted to find the deviation of actual employment from trend that can be blamed on the recession. The predicted job loss for the entire economy is very close to the actual loss but of course the two differ a lot in individual sectors, because of different trends. The result is shown in figure 4, drawn to the same scale as figure 3.

In the European Union industry still emerges as the biggest job loss sector, although not to the extent that the raw data indicated. Services contributed a small number of jobs over and above the ones predicted by the structural transformation. Another interesting fact is that agriculture contributed to job creation: the exit from agriculture slowed down during the recession, a feature normally associated with developing countries. In the OECD as a whole the story is different. The biggest shortfall is in services, implying that as jobs were lost in industry and elsewhere because of the structural transformation, service sectors during the recession were not creating enough jobs to absorb the displaced workers.

One final point to make about the response of unemployment to this recession concerns the relative unemployment experience of those employed at the onset of recession and those already unemployed. The stock of measured unemployment can increase either

because more workers become unemployed and join the pool (known as an increase in *incidence*) or because those who are unemployed remain in the pool longer (known as an increase in *duration*). The most common experience during recession is that in the beginning more workers join the pool. Those who are unemployed find it more difficult to exit to new job openings, but because the pool gets augmented by a number of workers with very short durations, the mean duration of unemployment falls. But as time passes the inflow drops and the durations lengthen because of limited job creation, so eventually the main part of the increase in unemployment is explained by higher durations.

Figure 5 uses an approximation to distinguish between the contribution of new entry and longer durations to the rise in unemployment. On average and over periods as long as a year, fluctuations in the unemployment rate ensure that the number of workers that flow into unemployment is about the same as the number of workers that flow out. Let E be the inflow and O the outflow, then approximately, $E=O$. I divide through by the number of unemployed workers, U and then use another approximation that gives the average duration of unemployment as the ratio U/O . This is intuitive in the sense that if out of a stock U , a number O leave each period, on average a person should expect to leave after U/O periods. Then I can write

$$\frac{E}{U} = \frac{1}{d} \quad (1)$$

Where d is the average duration of unemployment. I divide through again by the labour force and rearrange to get, $u = ed$, where u is the rate of unemployment and e is the rate of entry into unemployment.

We have data for u for all countries of the OECD (used to derive figure 1) and data for d for several countries. I divide one by the other to get a series for e and then break up the log change in u between 2007 and 2009 into the sum of two terms, the log change in the constructed e and the log change in d . The result is shown in figure 5, with countries ranked according to the relative importance of new entry in accounting for the changes in unemployment.

The figure shows that the contribution of new entry is positive everywhere and important in the decomposition of unemployment changes. Its importance is due to some extent to the closeness of 2009 to the start of the recession. If I repeat the same exercise for 2010 the relative importance of new entry decreases and that of duration increases. The severity of the recession is also important, with many workers losing their jobs in 2008 and 2009. The mean duration of unemployment falls everywhere because of the inflow of so

many workers, with the exception of Mexico and the two North American countries, where it is higher. The big exception is the United States, where duration increases and the contributions of duration and new entry to the rise in unemployment are about the same. This is a new experience for the United States, where new entry is usually a bigger contributor to the dynamics of unemployment than duration, at least at the onset of recessions, because of its lax employment protection system.

Of course, the fact that mean duration falls does not imply that workers were leaving unemployment faster in 2009 than in 2007. Those already unemployed were experiencing longer durations because of the collapse of job vacancies but that increase was offset in the computation of the average by the very short durations of new entrants.

2. Theoretical framework

The theoretical framework that I use to explain the cross-country differences is based on the theory of search and matching. I describe it only briefly here because fuller descriptions can be found in easily-accessible texts elsewhere (Pissarides, 2000). The most relevant non-technical description for the purposes of this paper is in Pissarides (2011).

The theory is based on the need to reallocate labour across employers because of changes in demand, worker preferences, technology and other factors that influence a firms' profitability, and the slow speed at which workers are matched to new jobs. The slow speed is due to "matching frictions" that summarise a host of factors, such as differences across jobs and people and imperfect information about each other. Jobs become unprofitable and close down, creating a flow of workers into unemployment and job matching creates a flow out of unemployment. Their interaction implies that at any point in time there are vacant jobs and unemployed workers searching for each other. The number of workers that join unemployment depends on both aggregate conditions and on the intensity of structural change, whereas the speed at which workers leave unemployment depends partly on what they do during search and partly on how many job vacancies are available.

A common criticism of this framework is that the matching frictions are irrelevant in recession. The reason that workers are unemployed is not that they have not located a job opening yet, but that there are no job openings (for a recent statement of this view see Michailat, 2012). The framework that I will outline, however, can still be used to analyse situations characterised by a very low level of vacancies. The attractive feature of it is that it does not change as the economy moves from boom to bust, or from bust to boom: the same simple framework applies for the determination of unemployment in all situations.

Unemployment is obtained from an equation that makes the flow into unemployment equal to the flow out of unemployment. Although this equality is a “flow-equilibrium” condition, we can use it as the equation that gives us actual unemployment at all times. Empirically any differences between inflows and outflows are followed by fast adjustments to the rate of unemployment that bring the two back into equality. In this paper we will be focusing on the dynamics of unemployment over a two or three-year period and during periods of this length the dynamics are driven by changes in either inflows or outflows, not by beginning-of-period differences between the two.

The flow into unemployment is the sum of new entry and the number of workers who separated from their jobs. In an analysis of youth unemployment the new entry is crucial in the determination of unemployment but if the objective is to study the response of overall unemployment to the recession it can be ignored without loss of generality. The reason is that new entry does not fluctuate much from year to year and is not a cause of changes in unemployment over the business cycle. The correlation between the changes in unemployment and the changes in employment shown in figure 2 provides further support for this claim.

The flow out of unemployment is the sum of workers who have found jobs and those who exit the labour market. Exit is related somehow to recession, with more workers exiting in recession, at least temporarily (Shimer, 2012, Petrongolo and Pissarides, 2008). But again a simplification worth making in the study of the responses of unemployment to recession is that the flow out of unemployment consists only of workers who have found jobs.

Suppose now during a short period of time the average probability with which each employed worker loses her job is s and the average probability that each unemployed worker finds a new job is p . Of course, there are large variations in these probabilities across workers, but at the macro level we work with averages, as if all workers were faced with the same probabilities. Then in a large market, the number of workers who leave employment to enter unemployment during the period is $(1 - u)s$, where u is the unemployment rate; and the number of workers who leave unemployment to enter employment is up . Our claim that flows are large enough to bring the two into equality quickly implies that we can write the following equation for unemployment:

$$(1 - u)s = up. \quad (2)$$

In recession more workers lose their jobs, so the average probability s is higher than in normal times. This is especially important at the onset of recession, when s increases

temporarily. It returns to its normal level fairly quickly, before the end of recession. Such is the importance of s at the onset of recessions that some economists have argued that it is the driving force of the dynamics of unemployment (Fujita and Ramey, 2009). In our equation unemployment increases with s because as more workers flow into the unemployment pool the stock rises to raise the number that flow out (at constant probability) to the higher inflow rate.

But in recession the number of new job openings also drops and unemployed workers get matched to new jobs at slower rate. In our equation this corresponds to a fall in p , the probability of leaving unemployment. The fall in p is another reason for the rise in unemployment. Normally, s is restored to its average value fairly quickly, as firms complete their labour shedding before the official end of recessions, but unemployment remains high because p remains low for longer periods of time, due to slack job creation. Over long periods of time and on average, changes in p are more important in explaining fluctuations in unemployment, especially in more recent periods (Fujita and Ramey 2009, Shimer, 2012, Petrongolo and Pissarides 2008).

Two easily-derived elasticity expressions follow from (2). By total differentiation we obtain,

$$\frac{du}{ds} \frac{s}{u} = - \frac{du}{dp} \frac{p}{u} = 1 - u. \quad (3)$$

With $1 - u$ approximately equal to 1, equation (3) says that a change in either probability approximately causes changes in unemployment in the same proportion – increasing when the probability of job loss increases and falling when the probability of finding a job rises. In recession both probabilities change, s rises and p falls. But my main interest in this paper is in the dynamics of unemployment after the start of recession, when the job loss probability recovers but the job finding probability remains low.

The key relation in the search and matching theory of unemployment is the matching function. The matching function describes in a simple functional relation the speed at which the unemployed find jobs, out of the pool of job vacancies v . It is plausible to assume, and corroborated by a large number of empirical studies, that the number of productive jobs created in each period through matches is larger when there are more unemployed workers or more job vacancies looking for each other (see Petrongolo and Pissarides, 2001, for a survey). From this result we get the intuitive prediction that the probability that an unemployed worker will leave unemployment during the period increases in the number of job vacancies for each unemployed worker, v/u . If recession is so deep that there are no

vacancies at all, something that has never been observed, the probability of leaving unemployment is at its lowest, zero.

The ratio v/u is known in the literature as the “tightness” of the market. If it is high it means that there are many vacancies for each unemployed worker, and so the market is tight, or thick; there is a lot of recruitment activity. It contrasts with the situation where it is low, when the market is slack, or thin, and not much recruitment activity is taking place. The probability of leaving unemployment for the typical unemployed worker depends positively on the ratio v/u . With these assumptions our equation for unemployment, (2), becomes,

$$(1 - u)s = up(v/u), \quad p'(v/u) > 0. \quad (4)$$

Equation (4) is a famous one in the economics of search and matching. We can derive from it a curve in a plane with vacancies on the vertical axis and unemployment on the horizontal that slopes down. It slopes down because in a market with more job vacancies there are more job matches and unemployment is lower. This curve is known as the Beveridge curve, named after William Beveridge who in 1944 in his famous book *Full Employment in a Free Society* described how vacancies in one industry can coexist with unemployment in another, as workers take time to migrate between jobs. I show the Beveridge curve in figure 6.

To a first approximation we can treat the economy as if it is always on the Beveridge curve. Small deviations from it do happen but they are not important in our analysis of unemployment in the Great Recession. We are mainly interested in unemployment changes over two or more years and for that length of time the changes in unemployment given by movements along the curve, or by shifts, are far more important than those given by small departures from the points on the curve.

The point on the curve at which the economy will rest is an open question. This question occupied a lot of attention in the development of the theory. Some early investigators claimed that as an extension of the supply and demand condition of classical theory, equilibrium with frictions should be at the point where vacancies and unemployment are equal. But this is not necessary. There are two unknowns in figure 6, vacancies and unemployment, and one equation, (4), and the rest point will depend on a second equation that determines vacancies. The natural assumption to make about vacancies is that firms open new jobs to maximize their profits, so in general the location of the economy on the Beveridge curve will depend on the strength of demand for labour, given by the relation between labour productivity and the cost of labour that are appropriate to this environment. For our discussion, however, we do not need to know exactly where the resting point will be

located. The reason is that we are interested in *changes* in unemployment; in how the labour market responded to the recession, and the exact location of the initial point is not important in this discussion. The important point to note is that if the demand for labour falls, the economy slides down the curve.

An economy that operates at high levels of demand and low levels of unemployment will be at a point on the Beveridge curve up and to the left. Denote one such point *A* and suppose that it is the location of the economy before the recession, say in 2007, the last year that “full employment” conditions prevailed. Now recession arrives and the number of vacancies falls, unemployment rises and we move down the curve, to some point *B*. Inspection of equation (4) will show that if s is now higher the curve will move out too, worsening the situation, but this movement is not important beyond the first few months of recession. We can simplify our diagrams by assuming that the curve is in a fixed position initially. Our interest is in developments in the 2-3 years after this initial rise in unemployment, when the economy has reached point *B*.

After the initial rise in unemployment one of four things could happen. First, recession could continue with firms not increasing the number of vacancies and the economy remaining in the vicinity of *B*. We could say that an economy that exhibits this behaviour is one where lack of demand is stopping unemployment from falling, but it is not necessarily one suffering from inflexibility or structural deficiencies. A second response is for recession to continue as in the first case, but unemployment to continue to rise. In the diagram this is shown by a shift of the curve to the right, and a movement of the economy from *B* towards some other point *C*. In this case the economy has a labour market in which recession exposes some other weakness that is causing a further increase in unemployment despite steady (but low) demand. The movement out to *C* is evidence of a *structural* problem in this economy. Third, the economy could start a recovery with more new job openings and a movement back up the Beveridge curve. In this case the economy is recovering well and it eventually reaches its initial point *A*. But another possibility is that the economy starts a recovery with more job vacancies but unemployment is not falling as much as indicated by the Beveridge curve. In the diagram we then get a movement of point *B* upwards, almost vertically, or at best with a small bend to the North-West. This economy combines the recovery of the third case with the structural problems of the second. It moves up to some point like *D*.

Of course, eventually recessions are reversed and economies return to their steady states. But this process could take long, and if a recession is mismanaged or if the country has poor institutions that create more problems during recession, the recovery phase could take

long. Experience with the Great Depression of the 1930s and even the more recent long European recession of the 1980s shows that it is not unrealistic to expect to find such prolonged unemployment experiences.

3. Country experiences: Making use of the Beveridge Curve

Unfortunately not many countries collect vacancy statistics on a comparable basis to unemployment, so it is not possible to apply the theoretical framework that we have outlined in all its detail. The United States and Great Britain are the only two countries that have a fairly long monthly time series of vacancies based on a survey that is comparable to the surveys that are used to compile unemployment data. Most countries, however, have a time series for registered vacancies, an administrative time series of a much smaller number of job vacancies that are reported to the government employment service. I will use this time series for Germany to show the contrast between the German and the US and UK labour markets, because of the importance of that country in the results of this paper.

Because the British and US methods of data collection are comparable, I plot the Beveridge curves of the two countries on the same figure, shown as figure 7. The UK Beveridge curve exhibits fewer fluctuations and is closer to the axes, indicating that at given vacancy rate the unemployment rate is a little higher in the United States than in Britain. This should mean a somewhat lower natural rate of unemployment in Britain than in the United States, which is a reversal of the situation in the 1980s when British natural rate unemployment was considered to be much higher. The different span of the curves also indicates that the United States has experienced more business fluctuations since 2001 than Britain has, experiencing recession and recovery before the Great Recession hit in 2008, in contrast to Britain which was on steady state throughout the pre-2008 period.

The impact of the Great Recession on unemployment and vacancies started in the very beginning of 2008 in both countries and by spring 2009 it was complete. In both cases the economy slides down a Beveridge curve, confirming that the rise in unemployment was due to the fall in aggregate activity (mimicking the movement from *A* to *B* in figure 6). Since then, however, an interesting contrast emerges. Whereas the British economy remained in the lower-level equilibrium until the end of our sample in July 2012, the United States economy created more jobs which were not taken up at the same rate as in the past. The UK economy is exhibiting *macroeconomic* rigidity, with no movement in the three and a half years following the rise in unemployment, but there is no evidence of *microeconomic* rigidity which could have led to higher unemployment at the very low vacancy rates, as happened in

the 1980s. In contrast, the United States economy is exhibiting its usual macroeconomic flexibility, beginning to create new jobs soon after the bottom of the recession was reached. But unusually, the jobs were not being taken up at the same rate as in the past, implying an unemployment rate that is close to two percentage points higher than its corresponding value when the economy was on the way down four years earlier. This is evidence of some new microeconomic rigidity in the United States labour market.

The British case can easily be explained. The reforms to the institutional structure of the labour market in the 1980s and their consolidation in the 1990s and 2000s clearly had an effect. The reforms shifted the labour-market policy incentives to employment through tax reductions and tougher unemployment (and non-participation) support, and increased the institutional flexibility of the labour market. Important reforms took place in the role of trade unions and employment protection legislation. The decline of manufacturing and the breaking up of large public sector monopolies also contributed greatly to the decline of trade union power.

Government policy after the Conservative and Liberal coalition took over in 2010 was aimed at reducing public sector spending and employment, in the hope that the private sector would create enough jobs to replace the jobs lost in the public sector. But this was not to be, partly because the public sector spending cuts had an impact on aggregate demand which checked the expansion of the private sector but also because of the debt crisis in the Eurozone, which reduced export demand. The result was a replacement of the lost public sector jobs by new private sector jobs but no job creation over and above this level, with the economy remaining at the initial depressed state.

In the United States matters are different at both the micro and macro levels. At the macro level monetary and fiscal policies have been more expansionary. A new type of policy in recession is the “Quantitative Easing” programme of buying private assets with new money creation. A similar policy was tried in Britain soon after the recession started but it was at a lower level than in the United States and not enough to offset the fiscal austerity, which was not matched in the US. Although the more expansionary US policies have not convincingly pulled the country out of recession, they must be important explanations of the differences in aggregate job creation between the US and Britain. At the micro level, however, the US labour market is showing less flexibility than it did coming out of past recessions. In the past the recovery of the economy followed a path very close to the original Beveridge curve, which indicated an economy without rigidities. But at the official end of the recession in June 2009 new vacancy entry in the US moved the economy up and away from

the Beveridge curve, and this process continued until the end of the sample. We are observing macro flexibility combined with micro rigidity, in contrast to Britain, which is characterised by micro flexibility and macro rigidity.

The reasons that the United States economy is characterised by micro rigidity, probably for the first time in its history, are not yet well understood. In the framework of the search and matching model, when there is new vacancy entry not accompanied by a fall in unemployment it can mean only one thing: the matching efficiency of the labour market has deteriorated, at least temporarily. The reasons for it, however, can be many. They can be one of three types. Less willingness to accept job applicants by firms, less willingness to accept jobs by unemployed workers, or more mismatch, namely less good combination of characteristics of vacant jobs and workers (such as more diverse locations, more diverse industry distributions and others).

All of the above have been mentioned in the literature as possible causes for the failure of unemployment to fall in the United States, in the face of economic recovery. Two stand out as more plausible and interesting in the context of our model. The first is the extension of unemployment compensation from a maximum of 26 weeks' entitlement to 99 weeks, introduced over a number of steps across the nation between 2008 and 2010. Such a policy change is expected to have two effects in the framework of the Beveridge curve. The first is an increase in reservation wages and less urgency to accept job offers because of less fear that compensation will run out before a better job comes along. Published estimates of this effect with a variety of samples over the last four decades have revealed small but significant effects. The second effect is an increase in the willingness to stay in the market to satisfy the criteria for collection of benefit, rather than drop out temporarily when benefit is exhausted. In the formal structure that we have used to derive the Beveridge curve we ignored this effect, but in reality one might expect some movement in and out the labour force. Entitlement to unemployment compensation should have an impact on the Beveridge curve by increasing the incentive to continue active job search. There is evidence that both effects have operated in the Great Recession, although probably not to the extent needed to explain the entire two-point displacement of the Beveridge curve (Rothstein, 2011).

A second feature of the labour market in the Great Recession is the reduced mobility of labour. Labour mobility in the United States has been on a declining trend since 1980 and although it is still high when compared with European mobility, the difference between the United States and countries such as Britain is not significant anymore (Molloy, Smith and Wozniak, 2011). Traditionally, the United States labour market is considered to be a flexible

one in which workers move quickly to take advantage of new job opportunities in the location that they arise. A fall in migration flows slows down the taking up of new job opportunities, giving rise to an outward shift of the Beveridge curve such as that shown in figure 7.

Recessions are periods when workers are less likely to move, but this cannot be the explanation for the fall in mobility or the outward shift of the curve, because jobs are being offered but not taken up. A more appealing explanation in the current recession is the housing market crash. Homeowners are traditionally less mobile than renters and it is plausible that the huge expansion of home ownership in recent years contributed to the falling mobility. Researchers have failed to find evidence that falling house prices and the negative equity in many houses are factors behind the fall in mobility (described in the literature by the term “house-lock” effect – see Molloy, Smith and Wozniak, 2011, and references therein). But composition effects due to the shift to more home ownership could still be significant. If this is the case, or if the secular decline in mobility, whatever the cause, is to persist, we should expect future recessions in the United States to be characterised by Beveridge curves of the kind shown in figure 7. In the past the US Beveridge curve was a much thinner line of points.

Figure 8 shows the German Beveridge curve. As Germany has no vacancy survey, both the vacancies and unemployment series in figure 8 are based on administrative definitions reported by the OECD. However, the unemployment data are much more complete than the vacancy data, so the absolute number of vacancies shown and their ratio to unemployment is not an accurate measure of German labour market tightness. Tightness and the position of the curve should certainly not be compared with those of the US and British Beveridge curves in figure 7. But the shape of the curve and its shifts should be a good reflection of the underlying trends in German labour markets before and during the Great Recession.

The dynamics of the German Beveridge curve are in complete contrast to the dynamics of the US and British Beveridge curves. There are two Beveridge curves, one lying further away from the origin for the years 2005-2007 and one lying closer to the origin for the years 2008-2012. The shift of the curve can be traced from early 2007 to October 2008. In terms of unemployment the economy is showing mild improvement through demand expansion in 2005-07, a sharp structural improvement in the transition period of 2007-08, a demand depression in the period 2008M10 to 2009M5 and a demand recovery from June 2009 to the present time. The feature of the German labour market that stands out is the

structural improvement beginning just before the recession, which helped the economy to deal more effectively with recession than the United States and Britain were able to do.

The structural improvement in Germany followed a comprehensive reform programme that was implemented over four phases, between 1 January 2003 and 1 January 2005. The programme is known as Hartz I-IV, or as the Schroeder reforms (the former after the head of the Commission that recommended the package and the latter after the Chancellor who appointed the Commission and recommended the implementation). The incentive to introduce the programme, one of the biggest ever to be implemented over such a short period of time, was in response to the secular rise in German unemployment, to the loss of competitiveness and to a long recession and slow growth over 2000-05, that led many to call Germany the “sick man of Europe”.

In 2003 the main reforms were designed to improve the flexibility of the labour market by relaxing employment protection and other restrictions on labour contracts. They also reduced labour costs, especially for low-wage jobs. In 2004 the main reforms were to the employment services and the efficiency of matching in the labour market. The most controversial part of the programme was introduced in 2005, when unemployment benefits to the long-term unemployed were drastically reduced, as were taxes on labour (Jacobi and Kluge, 2006). So overall, the reforms shifted the balance of public spending from social transfers to giving more incentives for work and made the labour market more flexible. Although the method of implementation was very different from Margaret Thatcher’s in 1980s Britain, following a more cooperative approach with unions, many of the objectives behind the market reforms were similar in the two cases. But in Germany there was more emphasis on active labour market policy, such as training programmes and subsidies for employment and self-employment, especially for disadvantaged groups.

In matching theory the reforms introduced in phases III and IV, in 2004 and 2005, lead to a leftward shift of the Beveridge curve. The 2004 reforms improve the efficiency of the matching services, so they produce more matches for given stock of unemployment and vacancies. The reduction in unemployment benefits in 2005 increase the search intensity of the unemployed, which also leads to more matches at given vacancies and unemployment. The phases I-II reforms, introduced in 2003, are directed at job creation, so they are more likely to increase vacancy entry at given Beveridge curve position; that is, they are more likely to move the economy up the curve.

Figure 8 shows the path of the economy starting March 2005. Changes in the definition of unemployment at the beginning of 2005 make comparisons before and after

March 2005 troublesome, although up to January 2005 there was no change and the economy was in a long recession. The recovery and movement up the Beveridge curve between March 2005 and March 2007 are indeed consistent with the objectives of the 2003 reforms. But as the rest of Europe was also growing strongly at the time, it is difficult to entirely attribute this recovery to the reforms; it is more likely that the reforms helped speed up the recovery process.

But starting early in 2007, matching efficiency is improving in Germany and the Beveridge curve is moving inwards. Given the path of vacancies, which were not increasing, the reason for this shift cannot be demand-related or cost-related but has to have something to do with the matching process. The full reduction in unemployment due to this shift was about 1.5 percentage points. Some authors have argued that the main reason for the shift is the reform to unemployment insurance that increased search intensity (Krebs and Scheffel, 2013) and others doubted that any programme had a big enough impact to shift it by this much (Akyol, Neugart and Pichler, 2013). But the alternative explanation offered by the last three authors, wage moderation, cannot be the only, or even main, reason behind both the movement along the curve and the two-year shift in the curve. It could be a reason for the movement up the curve, as lower wage costs increase vacancy entry, but not of the leftward shift in 2007-08.

4. Comparisons with other OECD countries

In order to make comparisons between a larger set of countries I now revert to a more parsimonious framework that identifies the impact of policies and institutions on unemployment conditional on the fall in output. In particular, bearing in mind that the recession started in housing and financial markets and aggregate demand fell because of the subsequent fall in wealth and bank liquidity, we could ask the following question. Given the fall in output in a country, and the share of construction in employment, how well did the country manage to absorb the shocks without undue rise in unemployment? We can compute a residual rise in unemployment that cannot be explained by either the fall in output or the size of the construction sector and attribute it to factors like labour-market policy and institutions which affect unemployment.

The comparison is done relative to the mean of the OECD, because we do not have precise models for individual countries. In order to compute the mean response of unemployment to the shocks I run a regression for 33 OECD countries with dependent

variable the rise in unemployment from 2007 to 2009 and independent variables the rise in GDP in the same years and the share of construction in employment in 2007, to obtain:

$$\Delta u = -4.66 - 0.19\Delta \log GDP + 0.75CON \quad (5)$$

(1.24) (0.064) (0.15) $R^2 = 0.63$

One straightforward interpretation of the estimated equation (5) is that the term for the change in GDP picks up the average impact on OECD unemployment from the aggregate shock, and the term in the employment share of construction (*CON*) picks up the impact of the sectoral shock. The remainder change in unemployment shows how well (or how badly) each country has managed to absorb the shocks when compared with the mean.

Table 9 shows the residual change in unemployment obtained from equation (5). Referring first to the countries that we studied in the Beveridge curve analysis, we find consistent results. The United States experienced a residual rise in unemployment of nearly 2.5 percentage points, which indicates a bigger burden of adjustment to the shock on unemployment than the average of the OECD. Britain is at the average and Germany well below, close to -2 percentage points.

Noteworthy among other countries that fared badly in their unemployment response is Spain, which experienced the biggest rise in residual unemployment of nearly 4 percentage points. This took place despite the large construction sector in that country, which accounted for 10 percentage points higher unemployment between 2007 and 2009. The only other country in which construction plays such a big role is Ireland, where the fall in construction activity also accounts for a 10 percentage point rise in unemployment. But in Ireland there is no further residual rise in unemployment, indicating that in that country the large rise in unemployment was due to the fall in aggregate demand and (especially) the size of the construction sector, whereas in Spain there is in addition a large rise due to the institutional structure of the labour market.

Greece, Portugal and Italy are showing below-average increases in unemployment in 2009. The reason is the excessive employment protection in those countries that kept unemployment artificially low in the first stages of recession. But these three countries, along with Spain and Ireland, are the countries that experienced the biggest rises in unemployment after 2009, when their excessive debt levels excluded them from international lending markets and they embarked on programmes of strict fiscal austerity.

Changes in unemployment in other countries are closer to the average. In the two Asian members of the OECD unemployment went up by less than predicted by the fall in

GDP, due to the labour hoarding characteristic of the large companies in those countries. Austria's experience is close to Germany's whereas Sweden and Denmark, perhaps surprisingly, experienced bigger rises in unemployment than predicted. The support given to the unemployed in those countries might be a reason for the absence of labour hoarding and the large rise in unemployment.

The country that is an outlier, even among the five highly indebted countries (Ireland, Greece, Portugal, Italy and Spain) is Spain. Although these countries experienced the biggest rises in unemployment after 2009, in Spain and Greece unemployment went up to 25% whereas in Ireland, Portugal and Italy it remained at 15% or below. The rise in unemployment in Greece and the other countries, however, can be explained by the extent of the austerity measures required by the "troika" of the International Monetary Fund, European Commission and European Central Bank. In Spain unemployment went up by much more.

The institution that contributed to the big rise in Spanish unemployment is the dual structure of labour contracts in that country. Following the introduction of democracy in the 1970s, workers in regular employment were "protected" from business fluctuations with strict tenure policies and penalties on employers who terminated employment contracts. The result was excessive wage rises that could be demanded behind the safety net. But this caused big rises in unemployment in groups that were excluded, mainly young workers and women.

Given the difficulty of reforming existing contracts, the Spanish government introduced in 1984 a second type of contract of limited duration, up to four years, with very little protection. There have been several reforms since then but the dual structure was preserved. With the majority of new jobs preferring to offer the fixed-term flexible contract, the Spanish labour market at the onset of the recession in 2008 was characterised by large numbers of both types of contracts.

As shown by Bentolila et al. (2012) when the labour force is divided into two types of jobs, one protected by law and the other completely flexible, employment is more volatile over the cycle than if all workers had one type of contract. This is true even if the one type of contract is a flexible one. The reason is that in recession employers become overly cautious about giving permanent contracts to good employees on fixed-term contracts, fearing that they might be stuck with the employees if market conditions worsen. So they dismiss even good employees at the end of their term, instead of moving them on to regular contracts, whereas in a one-type fully flexible market they would not dismiss them.

5. The impact of reforms

Spain reformed its labour market starting 2010 (see Bentolila, Dolado and Jimeno, 2012). So did the other countries that applied for loans from the European Financial Stability Facility (the predecessor of the European Stability Mechanism). Sweeping reforms were requested by the troika that examined the case for granting the loans, aimed at increasing market flexibility. In some cases reforms were introduced voluntarily to increase the flexibility of the market. In Spain, the reforms that began in 2010 made the dismissal of employees for economic reasons easier and increased somewhat the costs of dismissing employees on fixed-term contracts. Firms were given tax incentives for short-time working, following the success of this policy in Germany, and the matching process was improved, also along the lines of reforms in Germany. Further reforms were introduced with the aim of making the market more flexible. These reforms should have positive effects on labour market performance, and yet, they seem to have had very little impact on unemployment so far.

One reason for the absence of impact so far might be that the success of the reform process depends on cooperation with the unions, and unions were reluctant to cooperate, in contrast to Germany during the Hartz reforms. A second reason is related to the extent of the reform process. Although the reforms were in the right direction, they did not go far enough, in that the dual structure of the labour market has been preserved – although with less sharp contrast between the permanent and fixed-term contracts. But a third reason could be the more decisive one.

Structural reforms that increase the flexibility of the labour market are beneficial for productivity, growth and eventually employment. But they take time to have an impact. In Britain in the 1980s the reforms undoubtedly helped productivity growth and employment, but unemployment did not respond for 5 to 6 years. Productivity responded before then as employers could now shed more labour but unemployment continued to increase because of the redundancies of unwanted employees.

In Germany the reforms were introduced over the 2003-05 period in a more cooperative manner, which should have reduced the lags. Yet, it was not until at least two years later when their impact is detectible in the data. Similarly in Spain, Greece and Italy; the reforms were introduced at the same time as fiscal austerity, which made it very difficult for unions and the public to accept them and cooperate in a climate of wage reductions and spending cuts. Under these circumstances their implementation and effectiveness are reduced.

Three years later there is no obvious impact of these reforms on labour market outcomes, in contrast to the fiscal austerity, which has had an immediate impact through aggregate demand and is causing high unemployment in all these countries.

An obvious lesson from the experience with fiscal austerity and reforms is that it is difficult to get the timing right to avoid a deep recession. Fiscal austerity has an immediate negative impact on the economy because it operates through aggregate demand, which penetrates all sectors of the economy. Structural reforms eventually have a positive impact but this positive impact comes in through supply-side changes that improve productivity and the incentives to hire labour. Supply-side changes always take longer to have an impact on aggregate economic activity, as they might involve things like the replacement of old equipment with new ones, the closure of some firms and the opening of others, and the shedding of labour in some establishments and the creation of jobs in others. In the short term there might even be a negative impact of the reforms as the first reaction of employers is likely to be to get rid of labour before they have enough confidence to start new job creation. Something like this has been discussed in the literature since at least Joseph Schumpeter's "creative destruction," which moves the economy to recession through the destruction of old unproductive capital giving the incentives to entrepreneurs to create new jobs to fill the gap.

Another important factor in the success of structural reform is a favourable political environment. A favourable environment speeds up the implementation and reduces the lags because the social partners are more likely to cooperate with each other to bring about the intended results. When fiscal austerity is so deep and is introduced as fast as it was in the indebted countries of the European South, unemployment rises to such levels that conflict and opposition to the structural reforms becomes inevitable, putting at risk their effectiveness. Slower and more cooperative approaches to fiscal austerity have a better chance of creating the right political environment for structural reforms and bring about their success.

6. Conclusions

The countries of the OECD went into recession in 2008 but their unemployment experiences differed substantially. An examination of three major economies, the United States, Britain and Germany, has shown that the introduction of structural reforms in Britain and Germany that increased the flexibility of the labour market avoided the structural problems of previous recessions. This contrasts with the United States, where the recovery of employment was slower in this recession than in previous ones, most likely because of

temporary structural problems introduced by the extension of unemployment insurance to nearly two years and the secular decline in labour mobility.

Extending the comparisons to the rest of the OECD reveals the contrast in the behaviour of unemployment between the indebted south of Europe and the other countries. Although some differences in the response of unemployment across countries can be explained by the dynamics of GDP and the size of the construction sector, a lot remains to be explained. We have argued that Spain in particular has poor institutions that raise unemployment above the levels that can be explained by construction and aggregate demand. In the other indebted countries unemployment went up fast because the combination of fiscal austerity and structural reforms brings deep recession before the positive effects of structural reforms have time to have an impact on the economy.

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Data sources

All data for the figures, except for figure 7, are from the OECD statistics portal, <http://stats.oecd.org/index.aspx>. For figure 7 the sources are national, JOLTS (Job Openings and Labor Turnover Survey) for the United States, from the Bureau of Labor Statistics website, and the Office of National Statistics for Britain. In both countries unemployment includes everyone unemployed 16 and over and vacancies are defined as the number of vacant jobs divided by the sum of employment and the number of vacant jobs

Figure 1. The rise in OECD unemployment, 2007-09

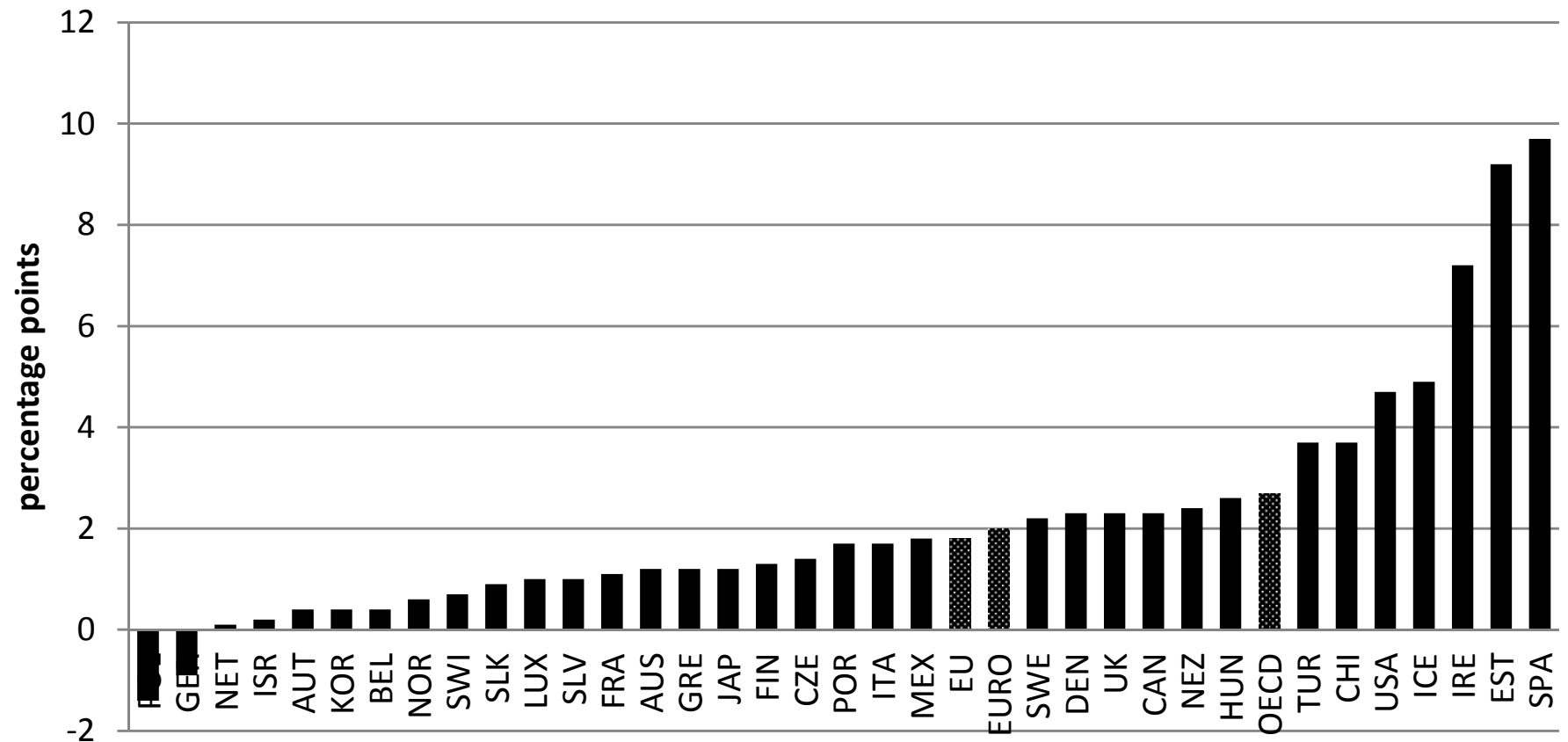


Figure 2. Correlation between rise in unemployment and fall in employment, 2007-09, 34 countries

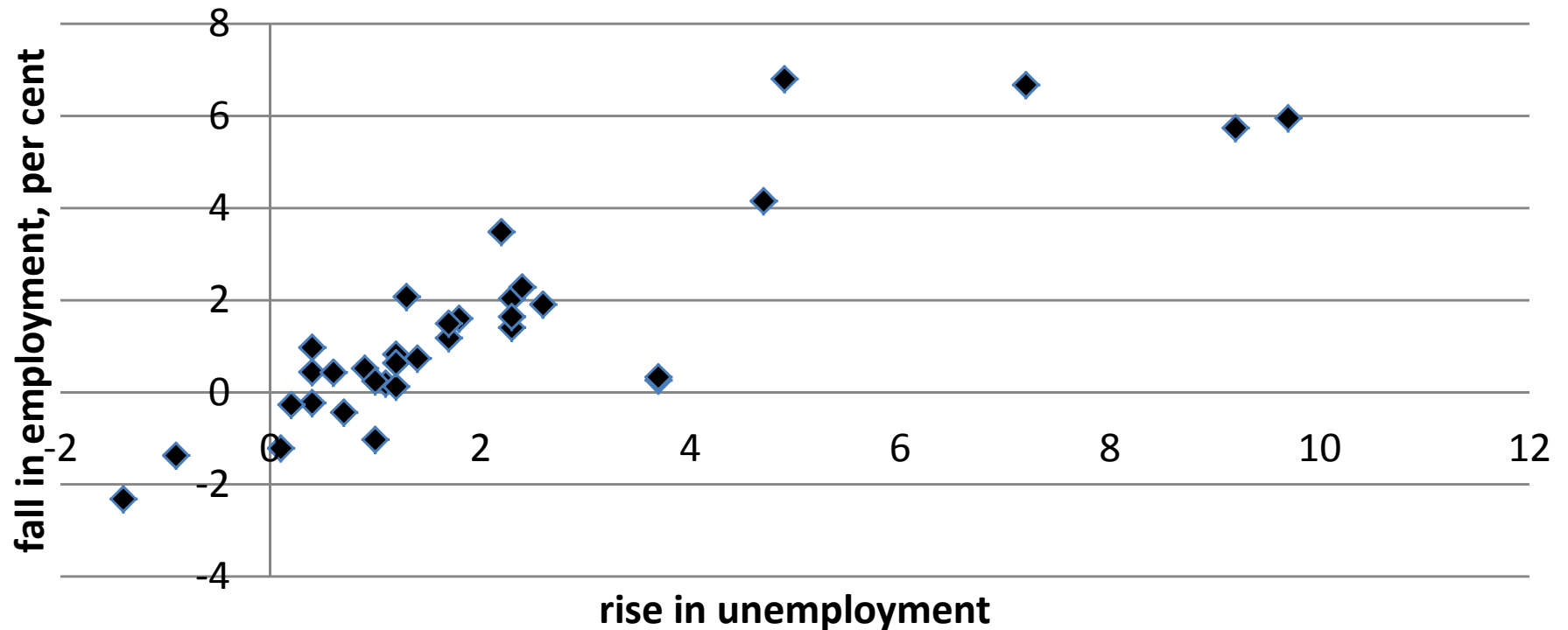


Figure 3. Job losses by sector, 2007-2009

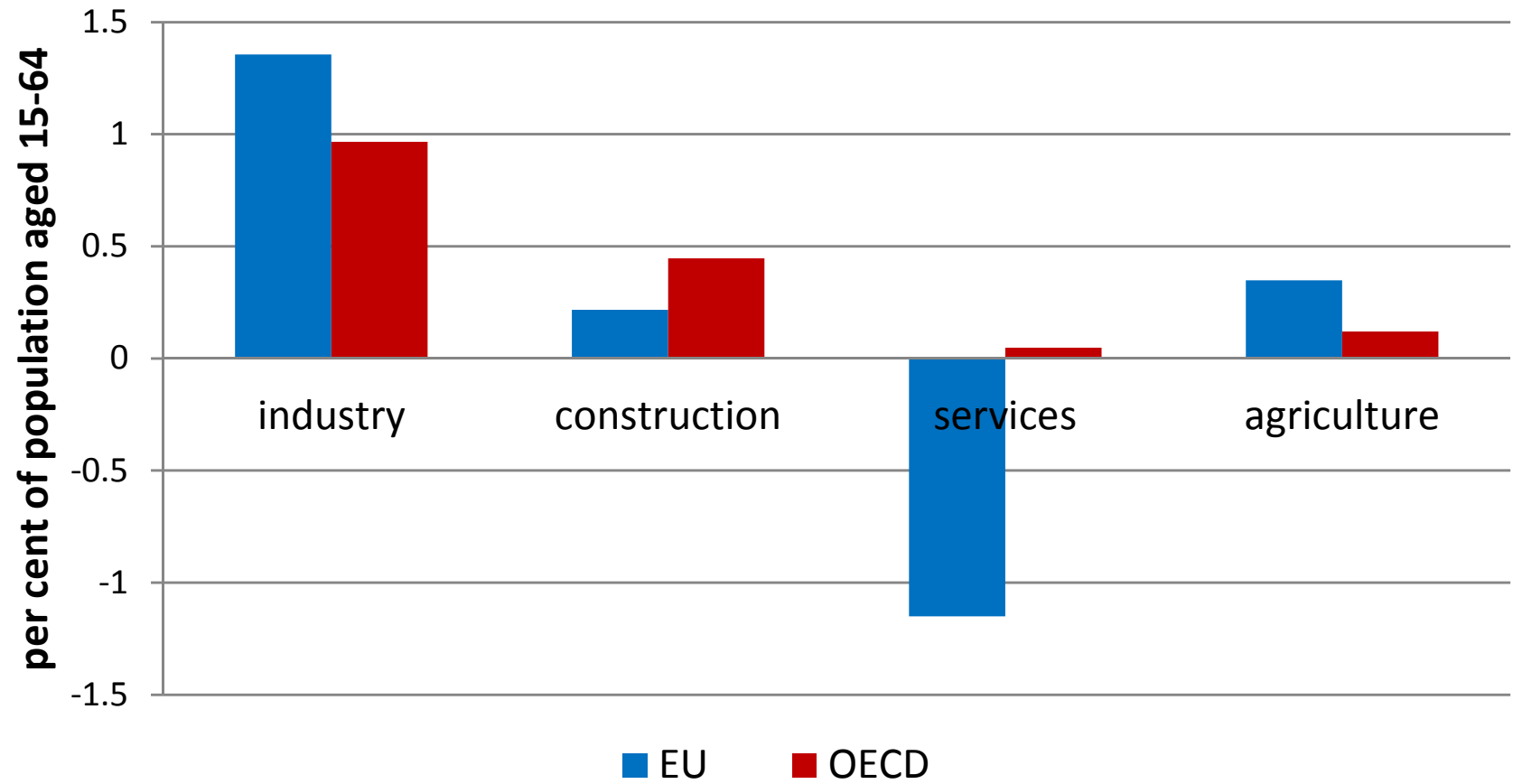


Figure 4. Predicted job losses by sector, 2007-2009

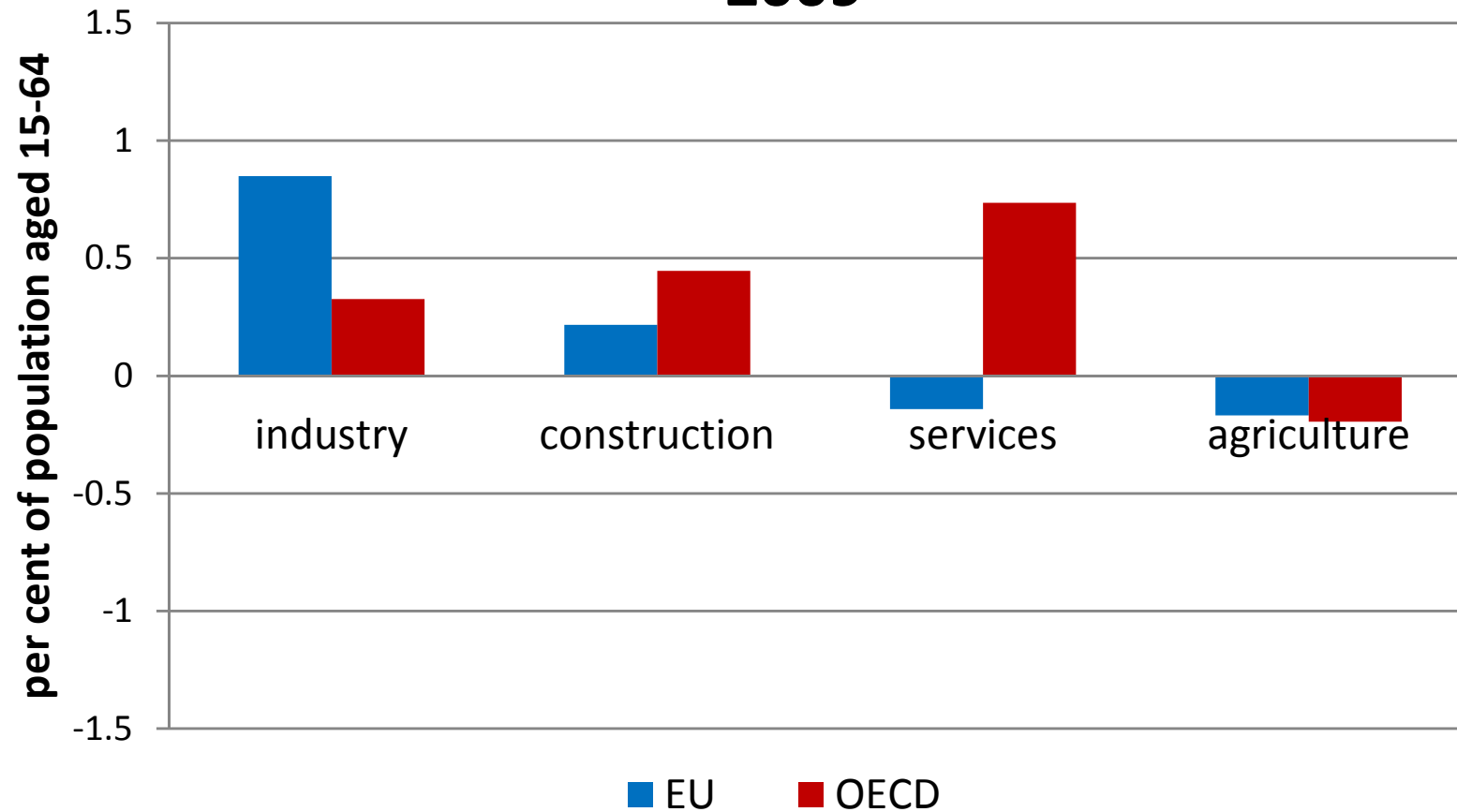


Figure 5. The contribution of new entry and duration to the rise in unemployment, 2007-2009

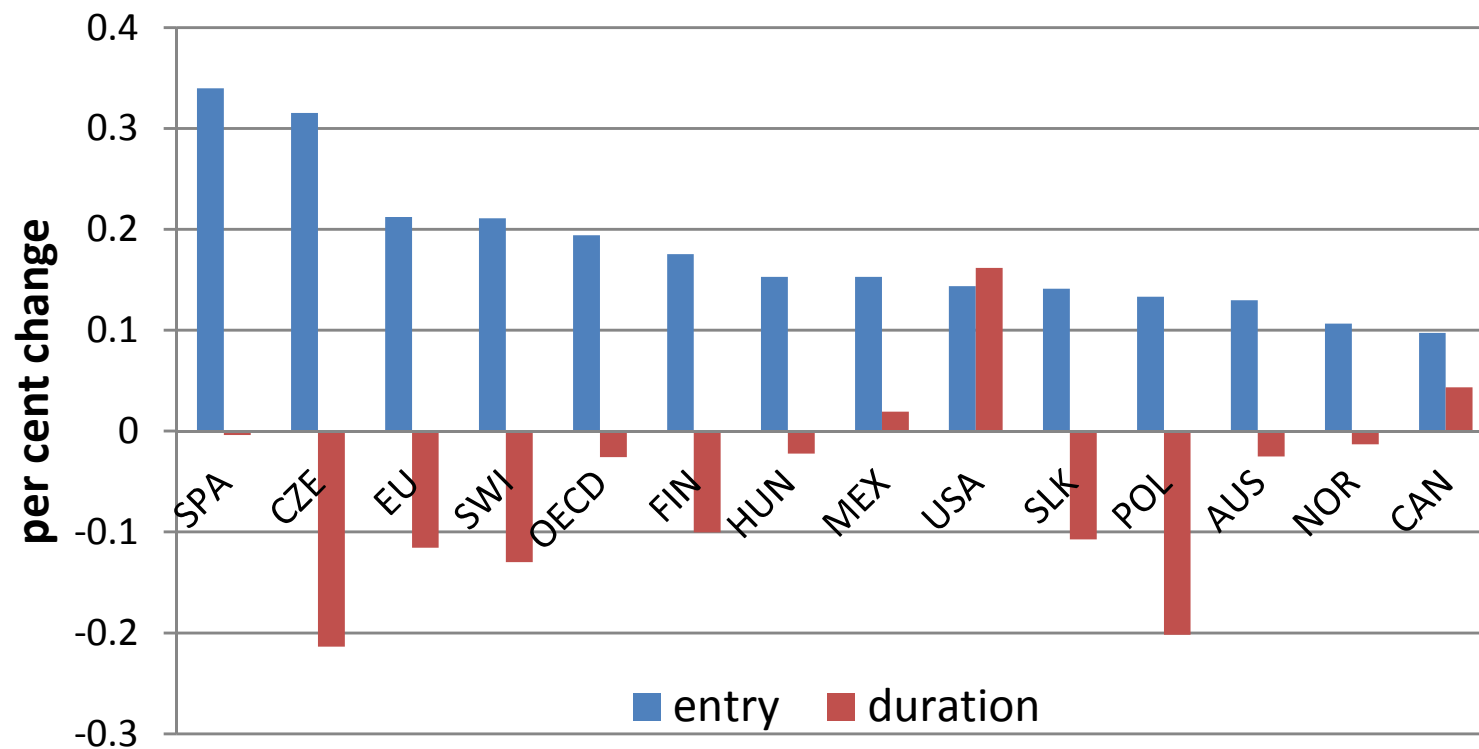


Figure 6. The Beveridge curve

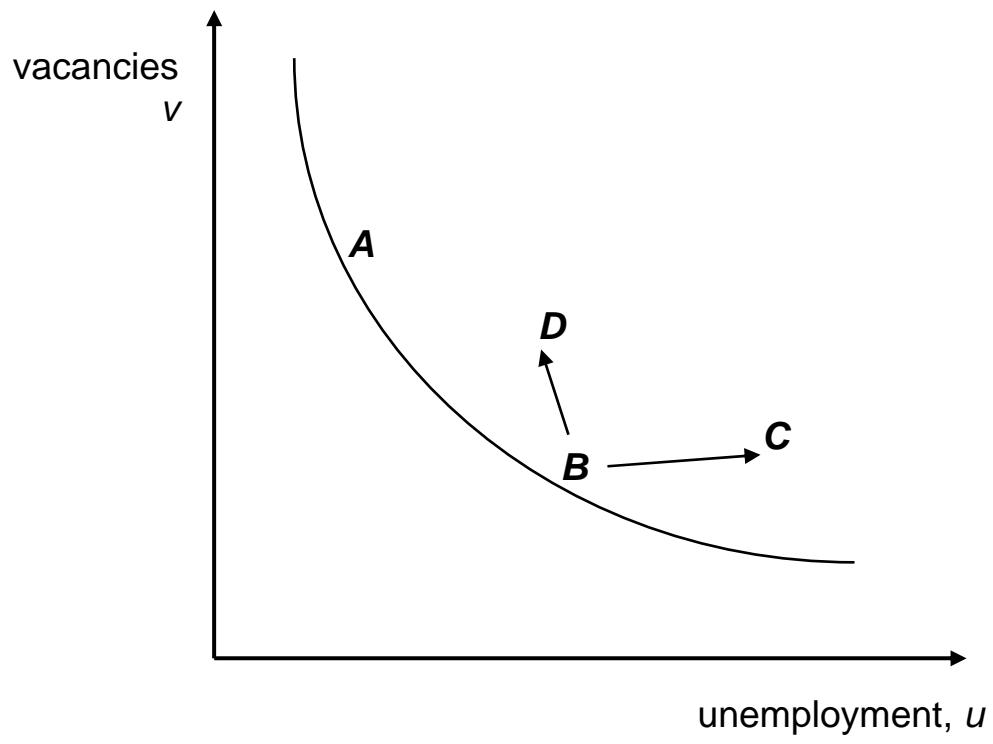


Figure 7. The US and UK Beveridge curves, 2001-2012

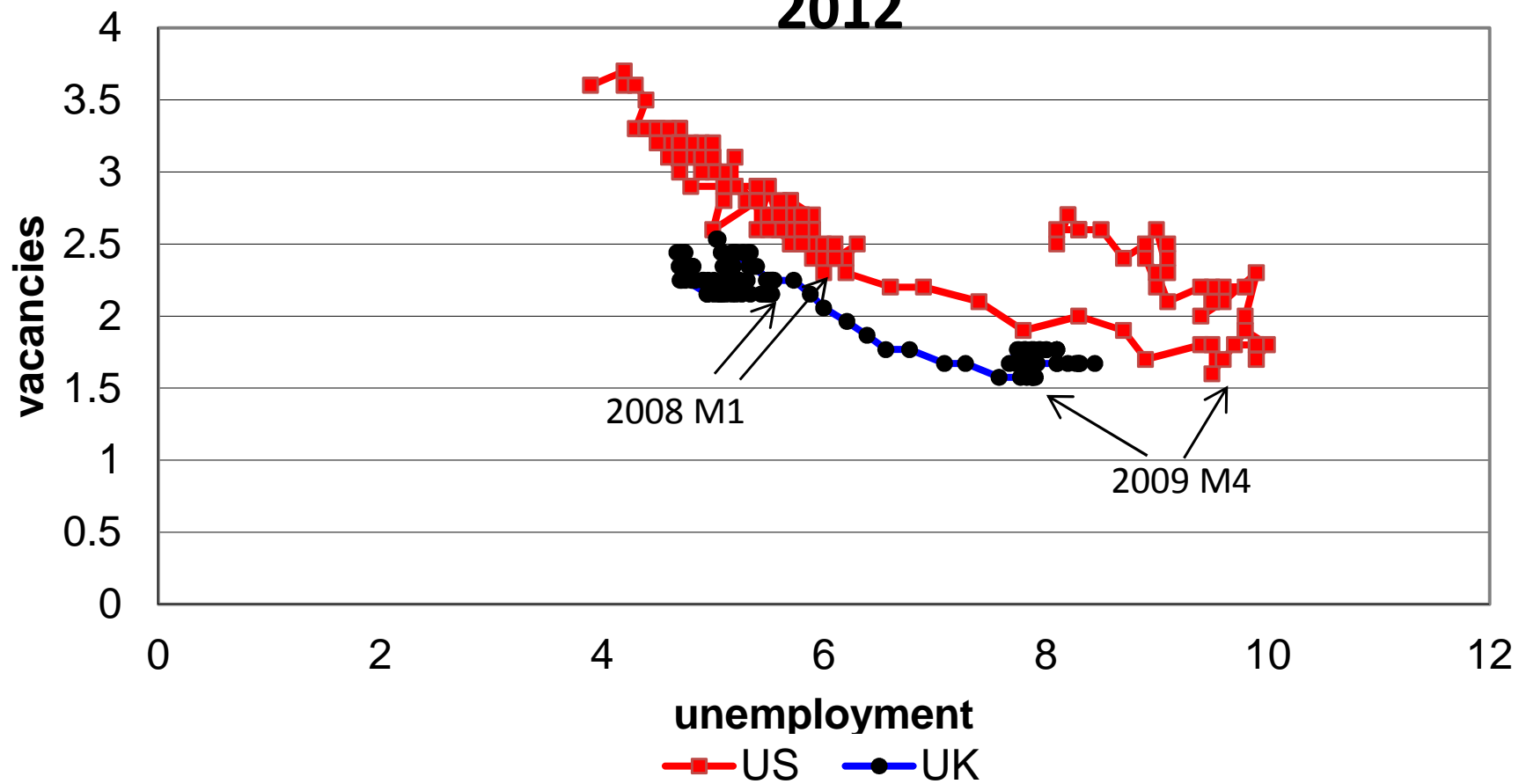
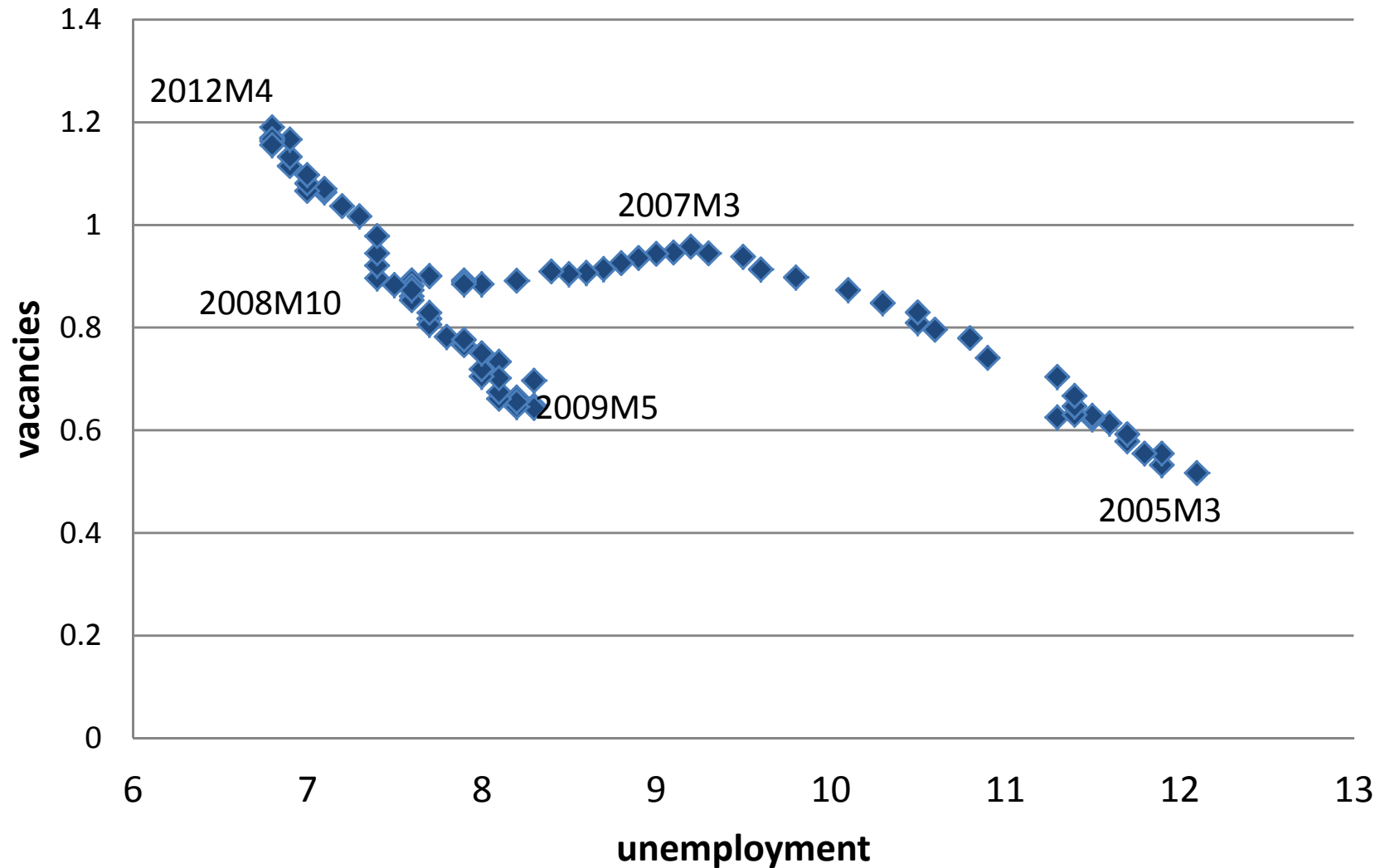


Figure 8. The German Beveridge curve, 2005M1-2012M4



**Figure 9. The residual rise in unemployment,
OECD 2007-09**

