

Has the Recession Increased the NAIRU?

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ABSTRACT

The increase in job vacancies over the last two years has not been accompanied by a decline in unemployment. When this has happened in the past it has coincided with an increase in the NAIRU. Despite some qualifications as to why it might not be appropriate to view the recent increase as indicating such a shift, I use updated data to estimate the model developed in my 2009 paper that links movements in the Beveridge curve (the trade-off between job vacancies and unemployment) and the NAIRU. That exercise suggests that the NAIRU has risen from about 5% before the most recent recession to 5.8% in the first quarter of 2011.

I then consider possible explanations for this outward shift including the persistence of high rates of long-term unemployment, extended unemployment benefits, a mismatch of skills between the unemployed and available jobs, and geographic mismatch exacerbated by problems in the housing market. I find little evidence to support the view that an increase in the level of long-term unemployment in the U.S. will lead to an increase in the NAIRU, but no strong evidence against the hypothesis either. A review of the evidence on the impact of extended unemployment benefits suggests that they probably have played a significant role in increasing the NAIRU, and the best estimates could explain the entire increase. Analysis of data on unemployment rates and vacancy rates by industry suggest that it is unlikely that skills mismatch has played an important role in the increase in the NAIRU. Similar evidence on geographic mismatch also calls that explanation into question. A number of recent papers have examined the extent to which problems in the housing market may be responsible for very low labor mobility that might be causing geographic mismatch. Most of the evidence suggests that this is not currently a problem though it is possible it could become more of a problem when the economy begins to pick-up.

I conclude that while the NAIRU has probably increased, that is unlikely to be an important consideration for monetary or fiscal policy for some time. I also comment on the role that aggregate demand management and monetary policy could play in reducing some of the problems that might be causing the increase in the NAIRU.

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Introduction

Starting with Blanchard and Summers (1987) it has been observed that there is a tendency for unemployment to remain high in some countries after a recession. In a series of papers, Lawrence Ball (1997, 1999, 2009a&b) has suggested that in most OECD countries the NAIRU increases after each recession. An exception, at least in the past, has been the United States. Here the unemployment rate has returned to levels that prevailed before recessions except during the period of rising unemployment in the 1970s.

Ball has suggested that the reason for U.S. exceptionalism in this matter is the aggressive counter cyclical policy that the Federal Reserve has pursued to fulfill its dual mandate of stable prices and full employment. Ball also points to several cases where countries other than the U.S. successfully lowered high unemployment rates with aggressive monetary policy at the expense of small increases in inflation.

Ball has proposed several explanations for this phenomenon, but here I focus on those that relate to the efficiency of the labor market matching function. In particular, Ball argues that the long-term unemployed may put less downward pressure on wages than those unemployed for a shorter period either because their search intensity decreases or because they are viewed as less able by employers.

Below I argue that there is already evidence of a decrease in the efficiency of matching in the U.S. and that this has led to a moderate increase in the NAIRU. I will review a range of evidence on the hypothesis that prolonged periods of high long-term unemployment lead to an increase in the NAIRU and conclude that there is no strong evidence for this mechanism, but that the conjecture that it is at least a partial cause of the decline in labor market efficiency cannot be dismissed.

Having not found a complete and convincing explanation for the decline in efficiency I turn to several other possible explanations to see what they might contribute. Extended unemployment benefits likely explain a significant part of the change and possibly the entire change. I argue that structural mismatch of the skills of the unemployed and the skill demands of available jobs probably has not contributed importantly to the growth of unemployment. Evidence on geographic mismatch does not suggest a role for it either, though it is possible that housing market problems could prevent labor mobility and increase the NAIRU in the future. I conclude with a discussion of the policy implications of the findings.

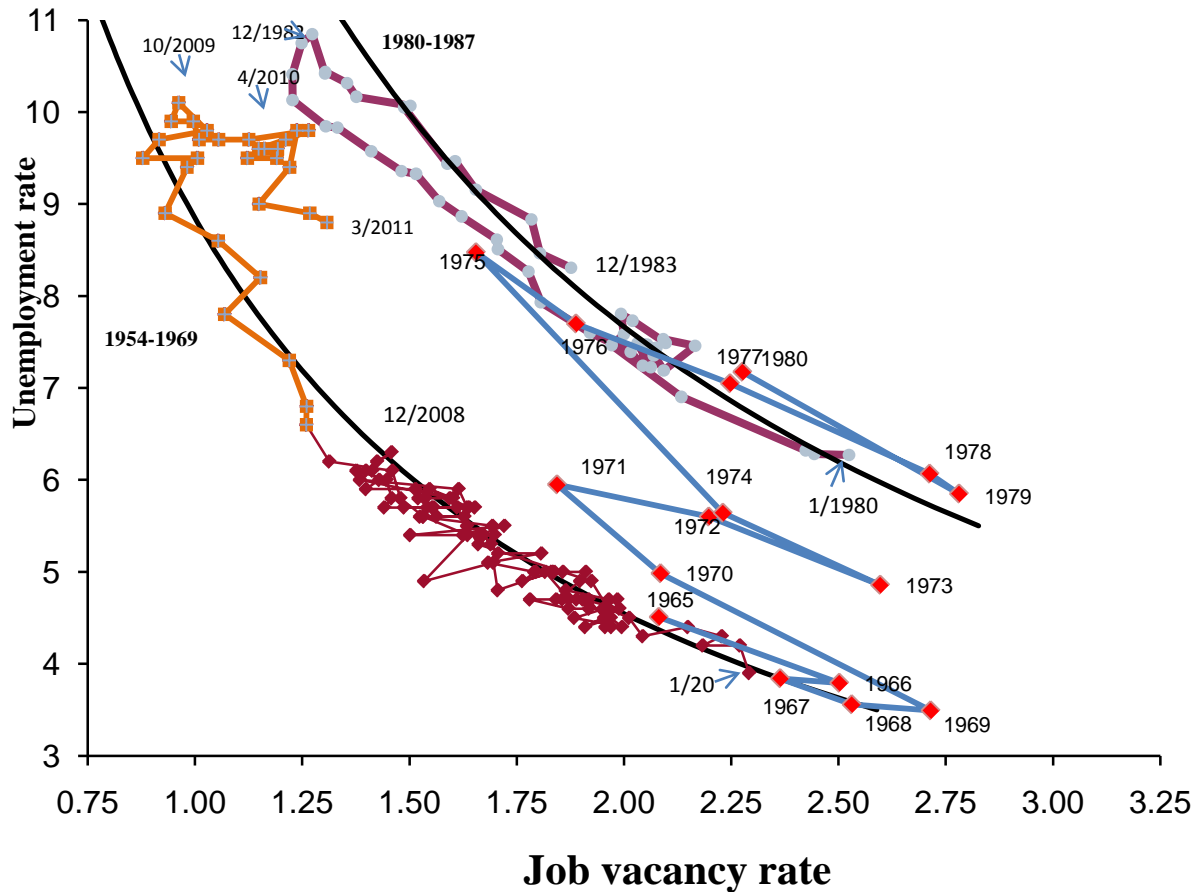
What is happening to the Efficiency of the Labor Market and the NAIRU?

Figure 1 shows monthly data for the rate of unemployment and a measure of the vacancy rate constructed from the Conference Board's help-wanted index for the period 1980-1983 and annual average data for those same measures from 1965-1980. The unemployment rate and the vacancy rate from the Job Openings and Labor Turnover Survey (JOLTS) for the period 2001-2010/7 is also presented where the JOLTS vacancy rate has been adjusted to be compatible with the vacancy rate from the help-wanted index.¹ Beveridge curves for the 1980-1987 and the 1954-69/2001-09 periods are also drawn. In models of frictional (Blanchard and Diamond 1989, 1991) or mismatch unemployment (Shimer 2005) the Beveridge curve is derived as the locus where the number of jobs being filled is equal to the number of new unemployed and the number of new jobs becoming available. On this curve both the unemployment and vacancy rates remain constant so long as the rate of new job creation and the inflow rate of new unemployed stay constant. The position of the Beveridge curve is often interpreted as a measure of the efficiency of worker-job matching. The further the curve is from the origin the more unemployed there are with the same number of available jobs. The Beveridge curve relation fits remarkably well for long periods of time. In each of the periods for which the curves are drawn, monthly data on vacancies and unemployment remained remarkably close to these curves.

¹ See Dickens (2009) for an explanation of the method.

Figure 1

Historical Beveridge Curves



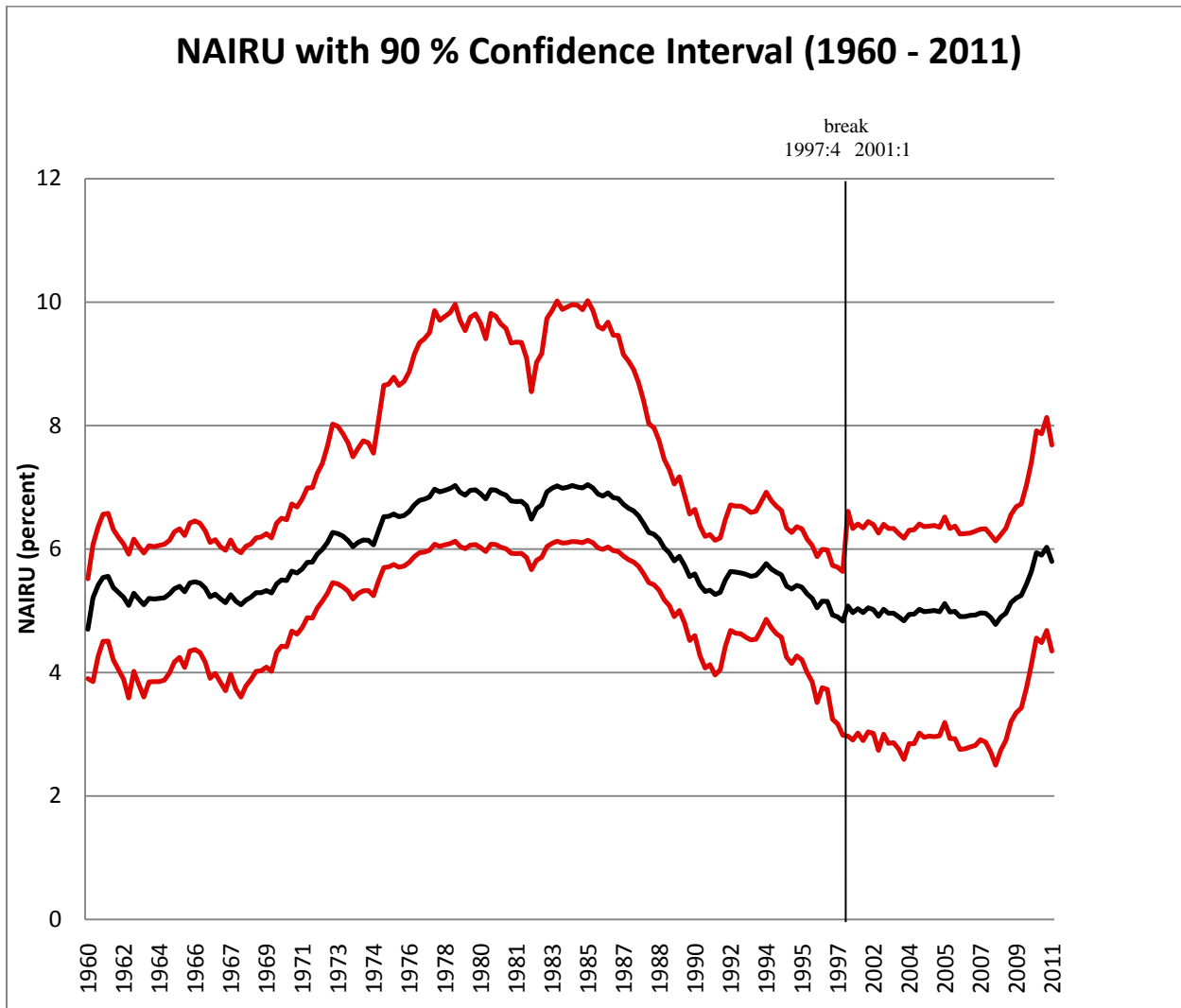
Starting about two years ago the vacancy rate began to rise while the unemployment rate remained mostly unchanged.² The last time there was a sustained increase in the vacancy rate, at similar levels of unemployment was during the 1970s. That rise coincided with a period during which it is widely believed that the NAIURU increased. Similarly, during the late 1980s and 1990s the level of vacancies that coexisted with a particular level of unemployment fell and this coincided with a period during which most estimates suggest that the NAIURU fell (Gordon 1987, Staiger et al. 1997).

In Dickens (2009) I developed and estimated a model of the Beveridge curve and the Phillips curve that links movement in the Beveridge curve and the position of the long-run Phillips curve or NAIURU. The results from estimating the model suggest that *all* shifts in the NAIURU in the U.S. result from changes in the efficiency of worker-job matching as reflected in movements of the Beveridge curve. Using this model I can determine the implications of the recent increases in the vacancy rate for the NAIURU.

Figure 2 presents quarterly estimates of the NAIURU from the model going back to 1960. It suggests that the last two years have seen a notable increase in the NAIURU from 5% to just under 6%. Similarly, when I estimate a model allowing for downward nominal wage rigidity to affect the inflation-unemployment trade-off as in Akerlof et al. (1996), I find that the lowest sustainable rate of unemployment rises from 3.9% to just under 5%. There is some variation when I estimate different specifications of these models but all suggest that it would be possible to lower unemployment by at least 3 percentage points without risking substantial inflation.

² In April there was a large increase in the vacancy rate that should probably be ignored as it was mainly due to government hiring for the Census. But, even ignoring that month, there is still a noticeable increase in the vacancy rate over the last year.

Figure 2



While the model interprets the increase in vacancies as indicating an outward shift in the Beveridge curve, there are several reasons to question whether the Beveridge curve really has shifted out. First, the high levels of unemployment we are now experiencing have only been experienced once before in the period under study and at that time the monthly values strayed away from the curve that prevailed before and after the recession. In that case the departure suggested an inward shift in the Beveridge curve, but there is a reason to suspect that we might experience a departure in the other direction in the current recession. With adjustments to make the JOLTS vacancy rate equivalent to the one derived from the help-wanted index, the vacancy rate has recently been below that experienced at any other time in the sample period. If there is some minimum level of vacancies that are always present (seasonal jobs that must be filled, firms looking for highly qualified labor at significantly below market wages) then the Beveridge curve will not have the same shape in the vicinity of that minimum. In figure 1 it could bend in to the right as the level of vacancies approached that minimum. That would reduce the extent to which the current level of vacancies departs from the 2001-2009 Beveridge curve.

Note also that the Beveridge curve is the locus where the unemployment rate and the vacancy rate will settle given a constant rate of new job creation and entry of new unemployed to the labor market. During a recession these rates aren't constant. When the rate of new job creation falls, initially the vacancy rate declines faster than the unemployment rate. During an expansion, the opposite happens as new job creation causes the vacancy rate to rise before the unemployment rate begins to fall. These tendencies are exacerbated as frustrated workers leave the labor market when jobs are hard to find (causing the increase in the unemployment rate to lag the decline in vacancies) and enter the labor market as they become easier to find (causing the decline in the unemployment rate to again lag the change in vacancies). This leads to a

clockwise movement around the Beveridge curve as it is depicted in figure 1. This is barely apparent in the 1980 and 2001 recessions, but is pronounced in the 1982 recession – the only other time in the sample that unemployment reached current levels.³

It is possible that the failure of unemployment to fall in response to the increase in vacancies during the last two years is due to the slow response of the unemployment rate to an increase in the available jobs. But, a direct comparison to what happened in 1982-83 makes this doubtful. It only took two months after the vacancy rate began to increase before the unemployment rate began to decline fairly quickly. It has been almost two years since the vacancy rate began to increase in the current recession and the unemployment rate is nearly identical to where it was when the vacancy rate began to increase. This seems like too long a lag to be explained by labor market dynamics. I therefore turn to potential explanations for deterioration in the efficiency of labor market matching.

Evidence on the Impact of Unemployment on Reemployment Prospects

Nearly all studies of the rate of new job finding show rates falling as the duration of unemployment increases.⁴ Two processes could cause this finding. It could be that extended unemployment makes it difficult for people to find jobs or it could be that those who have trouble finding jobs are disproportionately represented among the long term unemployed. A number of studies have attempted to determine the relative importance of these two explanations for the downward trend in new job finding rates for the long-term unemployed. Most studies, using a number of different methods to control for individual differences, still find a substantial downward trend in new job finding rates (Lynch 1985, Arulampalam 2000, Imbens and Lynch 2006). However, all studies rely on restrictive assumptions about the distribution of individual differences, leaving the findings somewhat suspect. Perhaps more important, the rate of job finding at all durations of unemployment increases considerably when labor demand is stronger (Imbens and Lynch 2006) and it could be that such increases cancel out the effects of longer average durations of unemployment.

A related literature examines the effect of unemployment spells on future income and the probability of future employment. Again there is the problem of separating out individual differences from causal effects. Most typically this is done by comparing people's experience before and after a spell of unemployment. These studies often find that spells of unemployment are followed by a medium to long-term reduction in the expected wage (Addison 1989, Arulampalam 2001, Corcoran 1982, Farber 2005, Gregg & Tominey 2005, Gregory & Jukes 2001, Jacobson et al. 1983, Kletzer 1991, Kletzer & Fairlie 2003, Podgursky & Swaim 1987), and a few studies suggest that long spells of unemployment result in a lower probability of being employed in the future (Arulampalam 2000, Lynch 1985, Ruhm 1991), but except for Ruhm these were done with British data. Other studies of U.S. data conclude that there is no long-term scarring effects of unemployment (Corcoran and Hill 1985, Ellwood 1982, Genda et al. 2010, Heckman & Borjas 1980).

The most direct evidence on Ball's hypothesis comes from a study by Laudes (2005). He estimates Phillips curves for a sample of OECD countries separating out the effect of the rate of unemployment for those out of work for more than a year and those out of work for less than a year. He finds that only those out of work for less than a year put downward pressure on prices while those unemployed for more than a year apparently have no effect on wages.

I have been able to replicate that result nearly exactly in an updated data set that I have collected. However, the result is not robust to small changes in the specification. In particular, when the unemployment rate is broken down to as fine a set of categories for duration as possible, only the category for unemployment of duration 6-12 months puts statistically significant downward pressure on wages.

³ Tasci and Lindner (2010) have also pointed out the tendency for the unemployment-rate-vacancy-rate points to circle the Beveridge curve. They present three previous examples, 1975, 1982 and 2001. As shown in figure 1 the cycle in 2001 was quite muted. The cycle in 1975 took place while the Beveridge curve was moving out. Their use of quarterly rather than monthly data makes the 2009-2010 move look muted relative to the comparison periods.

⁴ An exception is that studies often show an increase in the rate of exit from unemployment around the time that unemployment benefits expire.

Further, any set of categories that contains the category 6-12 months will be found to put significant downward pressure on wages while no set of categories that does not contain it is ever statistically significant or has a large negative coefficient. This holds true even if countries whose unemployment benefits normally expire after 6 months are removed from the sample. These results make no sense for the U.S. economy, and little sense for the rest of the world. A possible explanation for them is that the 6-12 months category is the one that is most highly correlated with the overall unemployment rate ($>.9$).

Overall, there is not much evidence to support the hypothesis that extended periods with high rates of long-term unemployment will lead to an increase in the NAIRU in the U.S., but this is not to say that there is strong evidence against the hypothesis either. Given that, I turn to the evidence for other possible explanations for the worsening of labor market efficiency.

Other Potential Explanations for an Outward Shift in the Beveridge Curve

There have been three other explanations for a reduction in labor market efficiency that have been circulating following the rise in the vacancy rate. In response to the increasing numbers of long-term unemployed, the Federal Government has extended the duration of unemployment benefits several times. There is considerable evidence that increases in the duration of unemployment benefits increase unemployment durations and unemployment rates. In addition, mismatch between the skills of the unemployed and those demanded by employers has been offered as an explanation. Finally, it has been suggested that a mismatch between the location of available jobs and unemployed workers might help explain the worsening efficiency of labor market matching. That problem might be exacerbated by difficulties in the housing and mortgage markets.

Extended Unemployment Benefits

Several studies have looked at the role unemployment benefits may be playing in increasing the unemployment rate by extending the time the unemployed are willing to search for jobs. Several of these studies use previous estimates of the effects of benefit duration on unemployment duration to compute the effects of current policy on unemployment (Aaronson et al. 2010, Elsby et al.). Such studies produce a range of estimates from .4 to 1.8 percentage points. A problem with these studies is that the estimates of the impact of extended benefits that they are based on come from a time when the unemployment rate was much lower and jobs were easier to find. It is possible that such estimates overstate the impact in the current recession. Valletta and Kung (2010) take a different approach to estimating the impact of extended benefits. They compare the unemployment durations of those who are eligible for unemployment benefits and those who aren't as the duration of benefits is extended. They conclude that extended benefits are increasing the unemployment rate by about .8 percentage points. Valletta and Kung's estimate of the impact of extended benefits is exactly the same as my estimate of the increase in the natural rate and is at about the mid range of previous estimates. It thus seems likely that the entire increase may be attributable to extended unemployment benefits. If so the increase could be expected to go away as the benefits are withdrawn as the economy improves.

Skills Mismatch

It seems likely that the U.S. will undergo some structural transformation. The housing boom probably brought more workers into the construction field than can be sustained in the long-run. The financial sector may contract relative to its pre-recession size as well. To the extent that it takes a long time for workers to move from one type of employment to another, structural shifts could cause extended increases in the equilibrium level of unemployment (Lillian 1982). The 2001 recession seems to have involved a fair amount of structural reallocation (Groschen and Potter 2003) and this may explain why it took a longer time than usual to bring the unemployment rate down during the recovery. To what degree is structural mismatch present in our economy today and has the degree of mismatch increased with the worsening efficiency of the labor market?

Figure 3

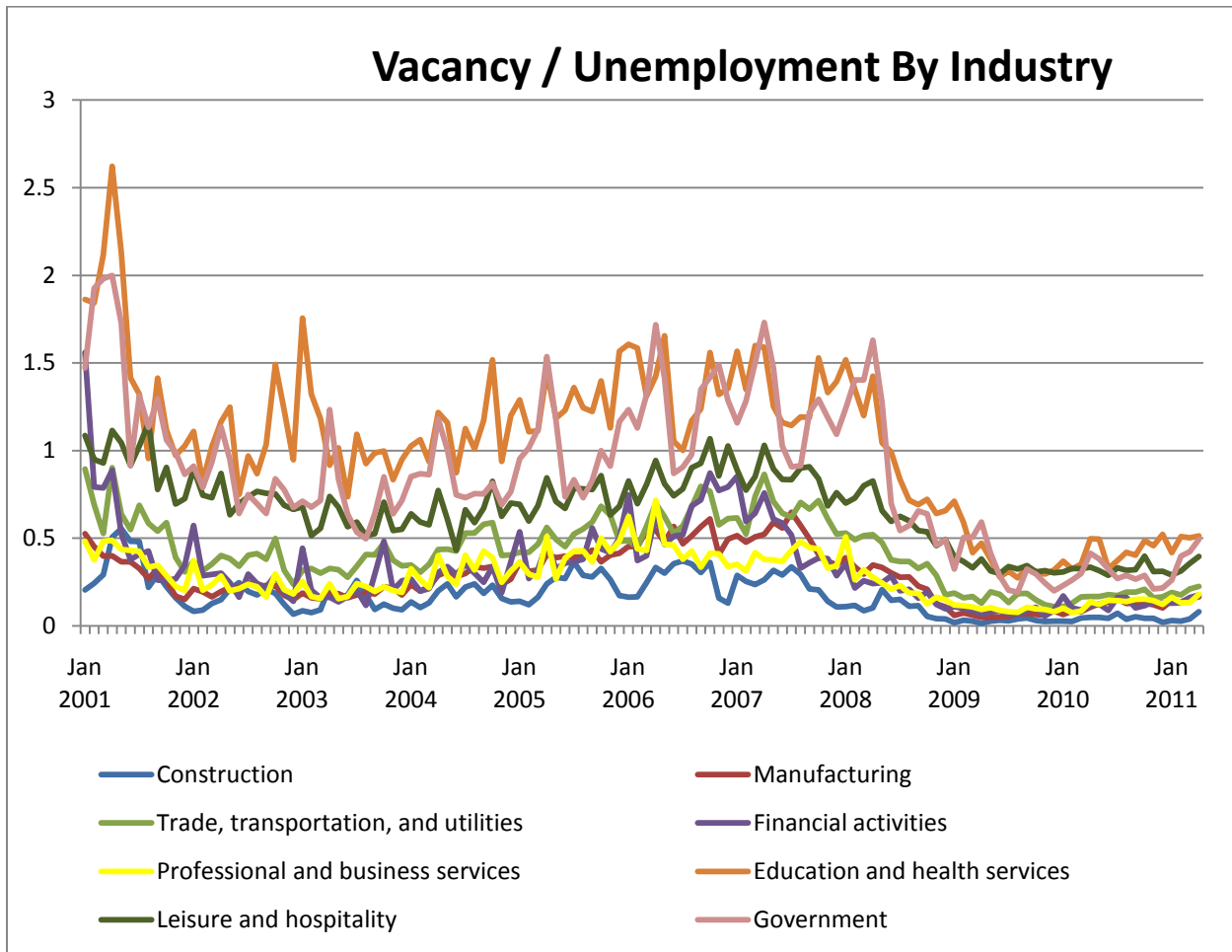
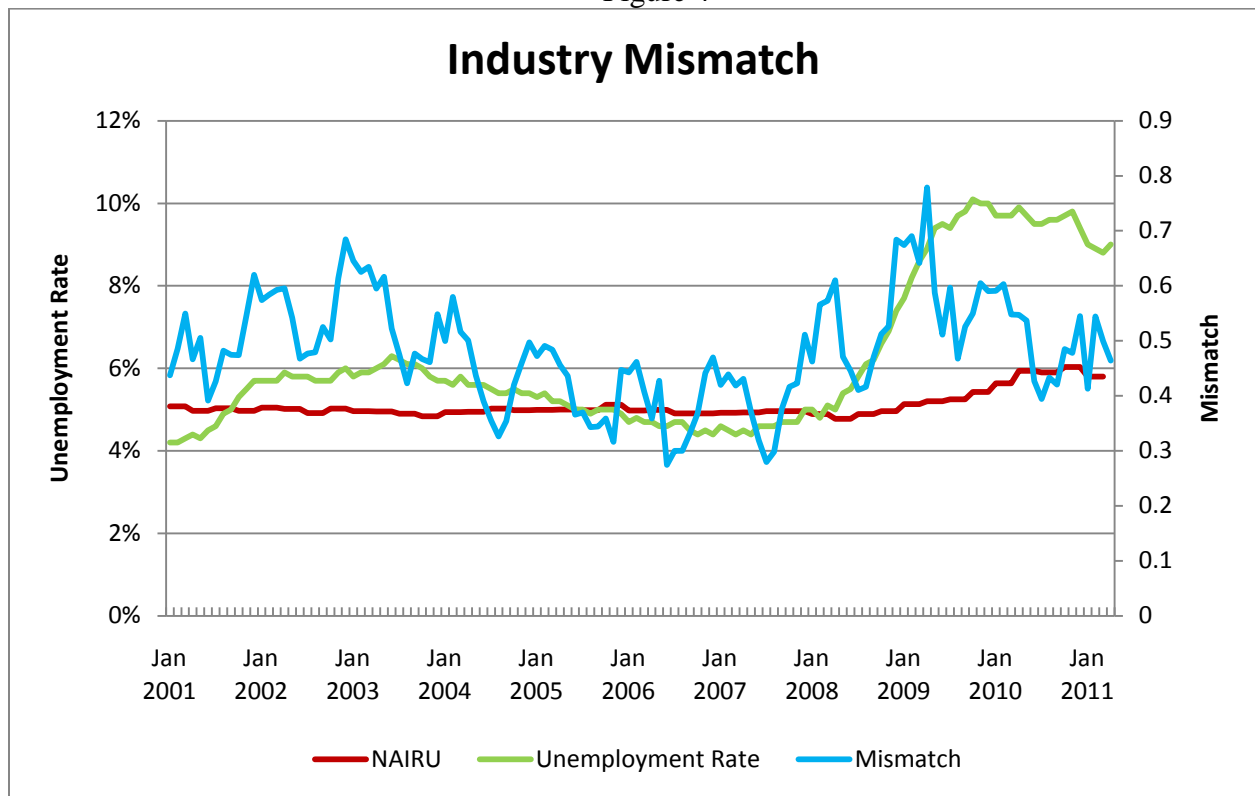


Figure 3 presents the ratio of vacancies to unemployment in 8 different industries. While it is possible to discern the increase in vacancies over recent months in some industries, the ratio remains substantially depressed in all industries. What we do not see is any industries with high vacancy unemployment ratios. It is thus hard to make a case for structural mismatch being a major problem today.

An index of the extent of mismatch between unemployed workers and available jobs can be constructed by subtracting the fraction of unemployed in each industry from the fraction of vacancies in each industry and taking its absolute value. This can be thought of as the fraction of workers who would have to move in order for the fraction of workers unemployed in each industry to equal the fraction of all vacancies in that industry.⁵ Figure 4 shows this measure, my estimate of the NAIRU, and the actual unemployment rate from 2001 to date. While the measure of mismatch rose considerably during the early phase of the recent recession, it has dropped off considerably since then and has returned now to levels that prevailed during the mid 2000s when unemployment was much lower and my estimate of the NAIRU was constant at 5%. The rise during the early part of the most recent recession need not reflect a temporary rise in structural unemployment. Abraham and Katz (1986) showed that business cycles affect different industries during different phases. This can produce the appearance of structural mismatch which dissipates as the effects of the recession become widespread.

⁵ If the matching function exhibits constant returns to scale and the efficiency of matching is the same in all cells, an allocation of the unemployed that equates the fraction of vacancies and unemployed in each cell will maximize the match rate and minimize the unemployment rate.

Figure 4

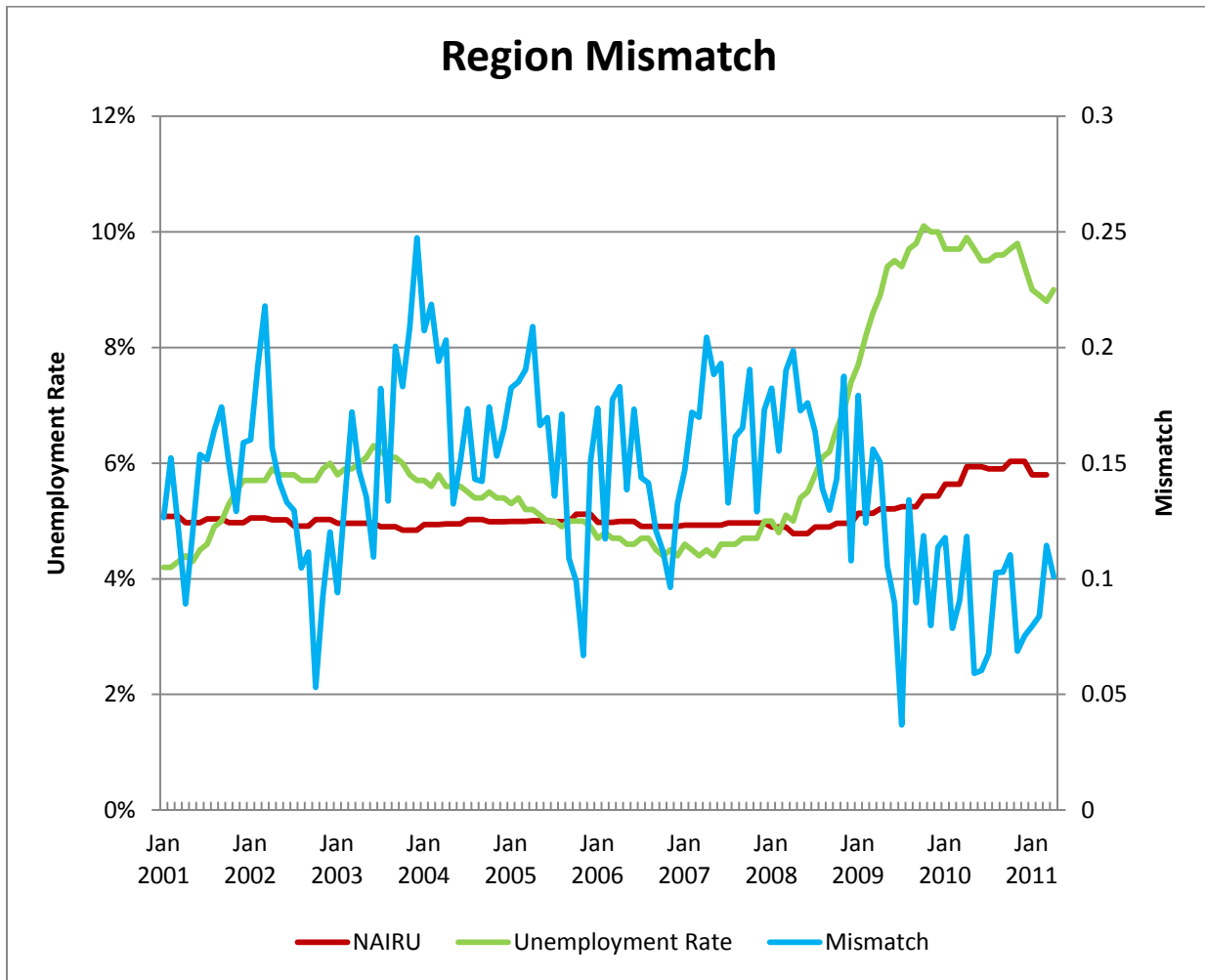


Although the JOLTS does not contain information on the occupation vacancies are for, the Conference Board’s Help Wanted Online data do. Researchers at the New York Federal Reserve (Sahin et al. 2011) have used that data to construct the same sort of mismatch index used here. They find that there has been an increase in the mismatch between workers and jobs, but the pattern is similar to that apparent in figure 4 with a rise beginning in late 2006 and a decline starting in 2009. The timing of these changes suggest that they have nothing to do with the outward shift in the Beveridge curve. Note that it would be entirely possible for mismatch to increase and for it to have no impact on structural unemployment if reallocation of workers between occupations was easy at the margin.

Geographic Mismatch

A similar analysis can be conducted for the extent of geographic mismatch, but the JOLTS data on vacancies are only available at a very high level of aggregation – the four large Census regions: Northeast, South, Midwest, and West. Figure 5 presents a graph of the mismatch index by region from 2001 to date along with the NAIUR estimate and the actual unemployment rate. Not only is there no apparent relationship between the degree of mismatch and my estimate of the NAIUR, but the fraction of workers who would have to relocate to equalize the fraction of unemployed and job vacancies in each region has declined.

Figure 5



Using the Conference Board’s Help Wanted On-line data Sahin et al. (2001) perform a similar exercise at a finer level of disaggregation and reach the same conclusion.

There is some reason to suspect that a combination of geographic mismatch and problems in the housing market could be responsible for the reduced level of matching efficiency in the labor market. In a series of papers Andrew Oswald (1996,1997) has suggested that the level of the NAIU in a country is closely linked to the fraction of housing that is owner occupied.⁶ Oswald argues that high rates of owner occupancy make it difficult for the unemployed to move when jobs become available elsewhere. In the past, the U.S. has been a huge outlier in this analysis, having both a high rate of owner occupancy and a low NAIU. Oswald has explained this by pointing to the greater ease of transacting sales of housing in the U.S. and the efficiency of the U.S. mortgage market. However, with a large fraction of the U.S. housing stock underwater, and the recent tightening of credit standards for mortgages, it is possible that our high rates of owner occupancy are now making the reallocation of labor substantially more difficult.

There have been many studies of the effects of “housing lock” on labor market mobility.⁷ Most studies performed before the recent recession found evidence that distress in housing markets reduced labor mobility. However, more recent studies find little evidence that long distance moves have been retarded.^{8 9}

⁶ See Havet and Penot 2010 for a skeptical view of the relationship that Oswald points to.

⁷ Chan (2001), Ferreira et al. (2010), Henley (1998), Schulhofer-Wohl (2011), Quigley (1987 and 2002). Though see Schulhofer-Wohl (2011) for a different view.

⁸ Short distance moves are defined as within county and a reduction there would be unlikely to affect job matching.

An exception to this is the work by Batini et al (2011) that argues for a substantial role for skills mismatch in combination with a depressed housing market in increasing unemployment, but the paper has a number of serious flaws. The conclusions are drawn from a regression of unemployment on skill mismatch, housing market distress, and an interaction of the two. The first problem is that the index of skill mismatch compares the level of education of the unemployed not to the demands of available jobs but to that of the average employed person. Since unemployment rates tend to rise most for the least skilled during recessions this would induce a positive correlation between mismatch and unemployment. Second, the correlation between housing market distress and unemployment could be spurious since both could be due to adverse economic conditions in the state. The authors recognize this and attempt to ameliorate the problem using the share of subprime mortgages among all mortgages in the state as an instrument, but this is as likely to be correlated with economic distress as is the state of the housing market as families with poor employment prospects may be forced into taking sub-prime loans.

While there is little evidence that housing lock is currently causing structural unemployment, that could be because there are not enough available jobs to make moving worthwhile. However, if the housing market remains distressed as the economy picks up, it is possible that housing market problems could cause problems in the future.

Conclusion

The recent increase in the vacancy rate, while the unemployment rate has remained mostly unchanged, probably does suggest a decline in the efficiency of the matching process in the labor market and an increase in the NAIRU. Estimates from my model of the NAIRU as a function of labor market efficiency suggests that it has increased by about .8 of a percentage point. If this is close to correct, further increases in aggregate demand can bring the unemployment rate down considerably without creating persistent inflationary pressures. It will do this by increasing the vacancy rate to its new equilibrium level which is certainly above its current rate. Whatever problems with structural unemployment we currently face, they will not be an issue for some time unless they worsen considerably.

Of the explanations for this increase considered here, it seems likely that extended unemployment benefits explain some, if not all, of this shift. An improvement in the rate of unemployment will allow the Federal Government to drop extended benefit programs and that should further reduce the rate of unemployment – possibly bringing back the levels of unemployment that prevailed before the recession.

Even if this is not the case, if the NAIRU is increasing due to an increase in long-term unemployment, Ball's evidence suggests that the problem can be overcome by more aggressive aggregate demand policy at the expense of a small increase in inflation. Inflation is now relatively low and some evidence suggests that inflationary expectations have moved lower as well. A commitment to return the unemployment rate to levels similar to those that prevailed before the recession could move expectations back up to more desirable levels and help prevent deflation.

If the increase in the NAIRU is mainly due to skills mismatch then demand policy would likely have more limited effectiveness. However, people are more likely to seek training for new jobs when there are lots of jobs available requiring training, and employers more likely to provide training when they are having trouble finding skilled workers.

Similarly geographic mismatch would be less amenable to demand policy than some of the other potential causes for the increase in the NAIRU, but again, a tight labor market would induce more people to move than a weak one and an improvement in employment prospects in general could allow lenders to be less cautious in making mortgage loans. Also, monetary policy could help alleviate some of the problems in the mortgage market. To the extent that quantitative easing can lower real long-term interest rates that could help. Further, a restoration of normal levels of inflation would help buoy nominal housing prices and lower the number of properties that are underwater.

⁹ For example see Donovan and Schnure (2011), Barnichon and Figura (2011), and Molly and Smith (2010).

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