

Chicago Fed Letter

Macroeconomic policy and labor markets: Lessons from Dale Mortensen's research

by David Benson, associate economist

On April 15–16, 2011, Northwestern University and the Chicago Fed co-sponsored a conference in honor of Dale Mortensen—a Northwestern University professor, Chicago Fed consultant, and co-recipient (along with Peter Diamond and Christopher Pissarides) of the 2010 Nobel Prize in economics, awarded for his analysis of markets with search frictions. This article summarizes one panel that presented work on the current state of the U.S. labor market, using Mortensen's research.

The panel featured Gadi Barlevy, Federal Reserve Bank of Chicago; David Andolfatto, Federal Reserve Bank of

St. Louis; Lawrence Christiano, Northwestern University; Robert Hall, Stanford University; and Gianluca Violante, New York University.¹ The panelists discussed how Mortensen's work provides a useful framework for interpreting recent labor market developments (e.g., sustained high unemployment). The Diamond–Mortensen–Pissarides framework predicts a downward sloping relationship between unemployment and job vacancies—what economists call a “Beveridge curve.”

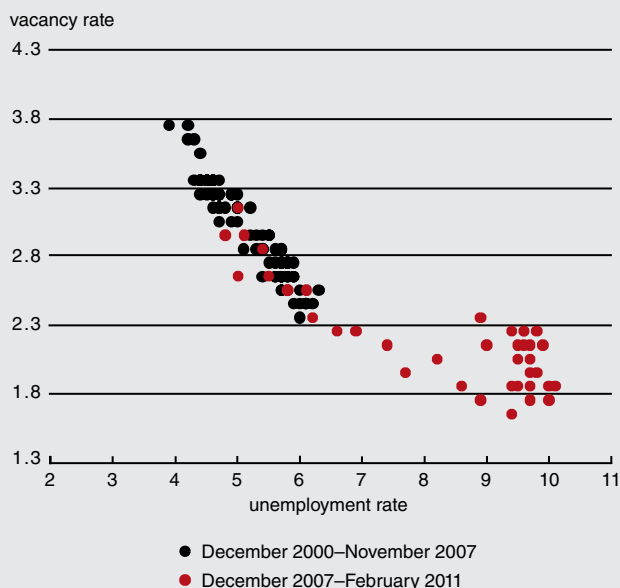
Most of the time, and certainly before the Great Recession,² the job vacancy rate (the number of unfilled jobs divided by the

is negatively related to the unemployment rate (see figure 1). The panel focused on the fact that from 2009:Q2 through much of 2010, job vacancies rose while unemployment remained virtually unchanged, suggesting a shift in the Beveridge curve. The difference between the black data (pre-shift) and red data (post-shift) in figure 1 illustrates this. The panelists debated whether and how the underlying parameters that affect the Beveridge curve might have changed, and they discussed whether the changes are a sign of a “structural shift”—e.g., a shock that makes it harder for firms to find workers who possess the skills for the types of jobs firms are seeking to staff. The panelists also discussed the role of monetary policy in addressing the high rate of unemployment in light of the apparent shift of the Beveridge curve.

The value of a filled job

In his presentation, Barlevy argued that two types of shocks can affect the unemployment rate in a typical Mortensen-style model: a shock to the ability of firms to find workers (or labor market mismatch) and a shock to the profitability of filling any given

1. U.S. Beveridge curve



NOTE: See the text for further details.

SOURCES: U.S. Bureau of Labor Statistics, *Job Openings and Labor Turnover Survey* and civilian unemployment rate series, from Haver Analytics.

job vacancy for firms.³ He argued that monetary policy can do little to address labor market mismatch. Barlevy then showed how the same model can be used to calculate a bound on how much a shock to firms' hiring ability affects unemployment.

Assuming an initial unemployment rate of 5%, he argued that a hiring shock alone would have raised the unemployment rate by at most 2.1 percentage points. This shock can thus account for no more than 40% of the total increase in the unemployment rate in the recent data—from 5% to 10.1%. Barlevy concluded that the other source of shocks in the model, the value of filling a job vacancy for firms, must have fallen relative to normal times to account for the high rate of unemployment. Unlike an increase in mismatch, a fall in the value of a filled job for employers may justify more accommodation from monetary policymakers. However, Barlevy cautioned that to make the case for a more aggressive policy response, one must understand why filling job vacancies now appears less valuable.

Structural shocks

Andolfatto argued the recent data may be consistent with structural shifts playing a larger role in contributing to high unemployment. He noted that since work by Abraham and Katz⁴ the telltale sign of a structural shock for economists has been a positive co-movement in unemployment and job vacancies (i.e., the unemployment and job vacancy rates increasing in tandem). But Andolfatto argued that a structural shock may appear not as a positive co-movement of the two, but as a Beveridge curve that appears flatter than in the past.

In particular, Andolfatto simulated structural shocks in a model economy developed by Mortensen.⁵ He found that unemployment and vacancies are negatively correlated in the hypothetical economy, though the resulting slope of the curve relating the two is flatter when the economy is hit by aggregate demand shocks. Andolfatto then turned to unemployment and vacancy data from December 2000 through February 2011. Unlike other panelists,

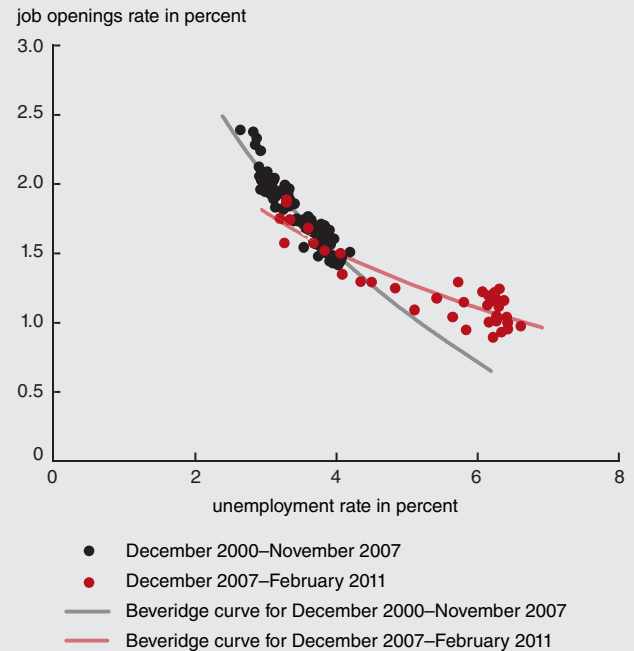
he constructed the unemployment rate relative to the U.S. adult population (aged 16 years and older), rather than just relative to the labor force. Highlighting recent data, he argued that the unemployment–vacancies relationship during the Great Recession looks very much like a flatter Beveridge diagram (see figure 2). In figure 2, the line fit to data from December 2007 through February 2011 is flatter than the one fitted to data from the earlier period. This indicates that even though the unemployment and job vacancy rates did not rise in tandem in December 2007–February 2011, the data still may be consistent with structural shocks. However, Andolfatto was careful to point out that his findings are meant to be suggestive and require further research.

Data measurement and match inefficiency

Christiano asked why the unemployment rate isn't falling faster. He argued that the shocks that drive unemployment can be decomposed into two types: those due to insufficient aggregate demand and those due to inflexible labor markets.

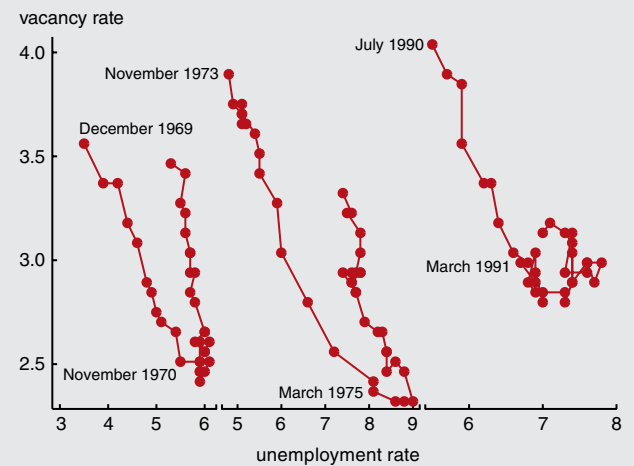
Christiano offered some arguments as to the role of these two shocks. He

2. A flattened U.S. Beveridge curve



NOTES: Curves are fitted lines through the relevant data. See the text for further details.
SOURCES: David Andolfatto's calculations based on data from the U.S. Bureau of Labor Statistics, *Job Openings and Labor Turnover Survey* and civilian unemployment rate series, from Haver Analytics.

3. U.S. Beveridge curves, by recession period

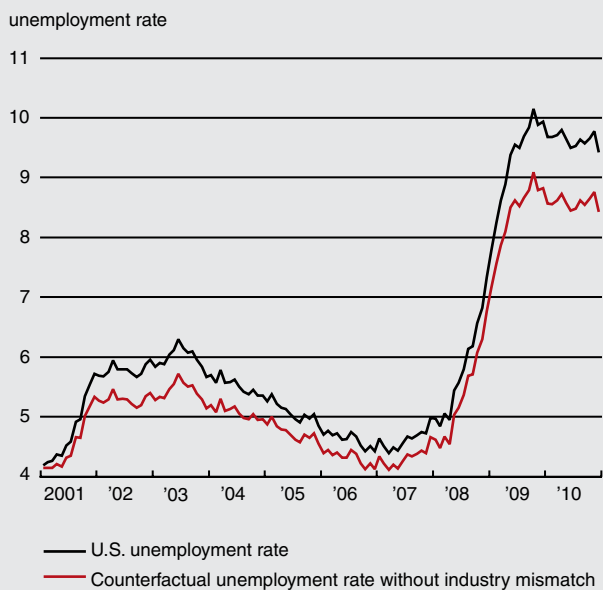


NOTES: The plotted data are for the December 1969–November 1972, November 1973–March 1977, and July 1990–March 1993 periods. The dates within the figure indicate the starts and ends of recessions according to the National Bureau of Economic Research. See the text for further details.

SOURCES: Lawrence Christiano's calculations based on data from the U.S. Bureau of Labor Statistics, civilian unemployment rate series; and Conference Board, *Help-Wanted Advertising Index*.

noted that in the 1969–70, 1973–75, and 1990–91 recessions, there was a consistent “fishhook” data pattern of rising vacancies without a change in unemployment (see figure 3), similar to what is shown in figure 1. Yet economists did not argue

4. Impact of mismatch on U.S. unemployment



NOTE: See the text for further details.

SOURCES: Gianluca Violante's calculations based on the U.S. Bureau of Labor Statistics, unemployment rate data; and Conference Board, Help Wanted OnLine™ Data Series.

that inflexible labor markets were important for unemployment to the same extent as they do now. Christiano also noted that the decline in match efficiency implied by the data is 40%, which is too large a deterioration to be rooted entirely in inflexible markets. He suggested the decline may be biased because of composition effects—e.g., changes in the shares of vacancies posted by large versus small firms. Larger firms tend to post more vacancies per worker hired, so a shift in hiring toward large firms would make hiring seem less efficient than in the past. If shocks to credit access particularly hurt small firms, as seems to have been the case during the Great Recession, hiring would have indeed shifted to large firms.

Flexible Unemployment Hypothesis

Hall reexamined why the value of a filled job for firms is lower now than before the most recent recession. He noted that worker productivity is the driving force of the value of a filled job in the Mortensen and Pissarides (1994) framework, but that worker productivity rose during the Great Recession, so low productivity could not explain why firms were reluctant to take on new workers. He then discussed

several alternative hypotheses for why the value of a filled job might now be lower than usual.

One possibility is worker–employer mismatch. While the other panelists interpreted labor market mismatch to mean difficulty in hiring, Hall provided another implication of mismatch—namely, that firms may still end up hiring workers, but ones who are a poor fit for their jobs. Firms therefore expect to earn fewer profits from any given match, which explains why they find hiring more workers less valuable.

Other possibilities for why the value of a filled job is lower now than in normal times may be explained by what Hall referred to as the “Old New Keynesian” view and the “New New Keynesian” view. In the “Old New Keynesian” framework, “sticky” product prices (i.e., prices that do not adjust as quickly as they would in a classical, perfectly competitive market) are too high during a recession and thus there is less need for additional workers. In the “New New Keynesian” view, the problem is not sticky product prices, but sticky wages. Wages are “too high,” meaning that hiring additional workers is less profitable than during normal times.

Hall’s last explanation for why the value of a filled job is lower than usual—which he found the most persuasive—is what he called the “Flexible Unemployment Hypothesis.” As in the “New New Keynesian” view, wages do not fall and might even rise in a recession, making hiring more costly. However, rather than emerging from a theory where wages are somehow “stuck” at too high a level, this hypothesis arises in Mortensen-style models where workers and firms bargain over wages and where unemployment emerges explicitly. Hall

pointed out that, while wages may be higher, on the whole workers are still worse off because the value of the time spent working and/or searching for a job is lower.

Sectoral mismatch

Violante continued the discussion of labor market mismatch and presented joint work with Aysel Şahin, Joseph Song, and Giorgio Topa, all from the Federal Reserve Bank of New York. Violante described three theories on why the efficiency of the process matching unemployed workers with job vacancies has fallen since the Great Recession. One explanation is that the effort unemployed workers exert when job hunting has fallen, e.g., because of the extension of unemployment insurance benefits. Likewise, employer recruiting effort may have fallen, perhaps because of increased uncertainty about future profits.

Violante focused on a third explanation: sectoral mismatch. He described this as a situation in which employers looking to hire and workers looking to get hired are in different market sectors (e.g., industries, occupations, and locations).

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That is, the inability to learn new skills that employers are looking for or the inability to move across the country to where jobs are located may lead to high unemployment. Building on the framework of Mortensen and Pissarides (1994), he showed how the across-sector dispersion of both job vacancies and unemployed workers can be used to measure the contribution of mismatch to the unemployment rate.

Violante used disaggregated vacancy data from an index of Internet help-wanted postings to see which market sectors vacancies are associated with, and he used unemployment data from the U.S. Bureau of Labor Statistics to see which sectors unemployed workers come from. With these data, Violante quantified the contribution of sectoral mismatch to unemployment. When market sectors correspond to U.S. states, he found mismatch contributed almost nothing to the overall recent rise in the unemployment rate from 5% to 10.1%. When market sectors instead correspond to industries, mismatch can explain 15%, or roughly 0.8 percentage points, of the rise in the unemployment rate. That is, the fact that firms that post more vacancies tend to be in industries different than those where unemployed workers

come from can partly explain why unemployment is high. Figure 4 shows Violante's calculation of the hypothetical unemployment rate in the ideal case in which unemployed workers could costlessly move to the industries where firms are hiring. In figure 4, this counterfactual unemployment rate still rises sharply, implying the mismatch between industries where firms are hiring and where unemployed workers last worked can explain only a small share of actual unemployment. Finally, when market sectors correspond to occupations, mismatch between the occupations firms are seeking to fill and the occupations the unemployed held in their previous jobs can account for 25%, or about 1.25 percentage points, of the rise in the unemployment rate. From this, Violante concluded that the diminished ability of firms to hire new workers may indeed have contributed to unemployment, but that most of the recent increase is due to something else.

Conclusion

Speakers on the macroeconomic policy panel showed how Mortensen's research can be used to make sense of phenomena such as persistent high unemployment. The discussion particularly focused on

apparent changes in the efficiency of the matching process that pairs unemployed workers with job vacancies. Aside from Andolfatto, who argued that the data could be driven mostly by shocks to match productivity, the panelists contended that the contribution of match inefficiency to overall unemployment is important but cannot by itself explain the total increase in unemployment in the wake of the Great Recession.

¹ The full conference agenda and some presentations from other panels are available at www.econ.northwestern.edu/seminars/mortensen-conference.html.

² According to the National Bureau of Economic Research, the Great Recession began in December 2007 and ended in June 2009.

³ Dale T. Mortensen and Christopher A. Pissarides, 1994, "Job creation and job destruction in the theory of unemployment," *Review of Economic Studies*, Vol. 61, No. 3, July, pp. 397–415.

⁴ Katharine G. Abraham and Lawrence F. Katz, 1986, "Cyclical unemployment: Sectoral shifts or aggregate disturbances?," *Journal of Political Economy*, Vol. 94, No. 3, June, pp. 507–522.

⁵ Dale T. Mortensen, 1992, "Equilibrio de búsqueda y ciclos económicos reales," *Cuadernos económicos de ICE*, No. 51, pp. 151–172.