FRBSF Economic Letter

Sectoral Reallocation and Unemployment

The current downturn has caused the U.S. unemployment rate to rise by nearly 2 percentage points and approach the high of 6.3% reached in the aftermath of the 2001 recession. High unemployment generally is associated with increased slack in labor markets, hence reduced pressure for wage inflation. However, Phelps (2008) has outlined an alternative interpretation for much of the recent increase in unemployment, emphasizing structural imbalances in the economy that require substantial movements of workers across industry sectors. He argues that this reallocation of workers across sectors has led to an increase in the nonaccelerating inflation rate of unemployment (NAIRU). Because the NAIRU plays a central role in the inflationary process, and because many economists agree that the NAIRU has fluctuated substantially in past decades, this argument merits serious consideration.

This *Economic Letter* examines the evidence for this "sectoral reallocation" interpretation of the current downturn. After describing the specifics of the argument, we turn to two primary sources of empirical evidence regarding its extent: the Beveridge curve, which depicts the relationship between vacancies and unemployment, hence the effectiveness of the job matching process; and direct evidence on the degree of sectoral reallocation of employment. Recent changes in the unemployment/vacancy plot are consistent with a modest decline in the efficiency of the job matching process, which may be associated with sectoral imbalances. However, these movements are consistent with cyclical as well as secular changes. More critically, direct measurement of the degree of sectoral dispersion in employment growth suggests that its extent has been limited thus far, providing little support for the claim of a higher NAIRU.

Sectoral imbalance

Economists have long recognized that the prevailing unemployment rate contains an important structural component, which reflects, among other things, imbalances in the growth of labor demand across industry sectors. Such imbalances require sectoral reallocation of workers, and the resulting job changes often entail an intervening spell of unemployment, which raises the overall unemployment rate. Moreover, during periods of intensive sectoral reallocation, a mismatch can arise between the skills of workers who have exited shrinking sectors and the job re-

quirements in expanding sectors. Such individuals may not be viable candidates for available jobs and hence may exert little or no downward pressure on wages, which implies that the increased unemployment due to their job search activities reflects a higher equilibrium unemployment rate, or NAIRU.

In his seminal research, Lilien (1982) provided empirical estimates of the variation in the equilibrium unemployment rate that could be attributed to sectoral reallocation. He concluded that the wide unemployment fluctuations in the 1970s were largely induced by unusual structural shifts in the U.S. economy, which caused the equilibrium unemployment rate to fluctuate by about 3 percentage points over the decade.

In a similar vein, Phelps (2008) has argued that the current U.S. economic slowdown also reflects the influence of important sectoral imbalances that have raised the NAIRU. The sources of the downturn are largely concentrated in the construction and finance sectors, as overshooting of equilibrium housing prices through various mechanisms has caused a sharp reduction in construction activity and widespread, deep downgrading of asset values for many financial institutions. As Phelps argues, the resulting persistent job losses in the construction and finance sectors, and the need to absorb the unemployed workers into other sectors, may raise the NAIRU over an extended (multiyear) period.

The Beveridge curve

Critics of the sectoral shifts approach (notably Abraham and Katz 1986) have pointed to the inherent difficulties of distinguishing between sectoral and purely cyclical movements in unemployment, due to cross-industry differences in sensitivity to aggregate fluctuations. For example, construction and manufacturing are highly sensitive to overall economic conditions, with sharp shrinkage typically evident in these sectors when aggregate demand falls. This sensitivity implies that purely aggregate disturbances can be mistakenly viewed as arising from sectoral disturbances in empirical analyses that focus on contemporaneous movements in sectoral growth dispersion and observed unemployment.

Abraham and Katz pointed to job vacancy data as a means for distinguishing between sectoral and cyclical

disturbances. In particular, they argued that pure sectoral disturbances will increase unemployment but cause little change in overall labor demand, as reflected in employers' targeted hiring (job vacancies), as shrinkage in some sectors is offset by growth in others. By contrast, aggregate disturbances will simultaneously increase unemployment and decrease vacancies.

Examination of the empirical Beveridge curve, which plots the contemporaneous relationship between the unemployment and vacancy rates, can be used to help assess the roles of aggregate and sectoral disturbances in the current economic downturn. The U.S. Beveridge curve is depicted in Figure 1, measured at a quarterly frequency for the period over which job vacancy (openings) data are directly available from the U.S. Bureau of Labor Statistics (Dec. 2000 on; the data points for 2000:Q4 and 2008:Q3 are based on one and two months of data, respectively). The complete line traces out cyclical movements over time from a labor market high point (high vacancies, low unemployment) in late 2000 to a low point in the third quarter of 2003, followed by recovery to another high point in late 2006 and subsequent deterioration through the third quarter of 2008.

By contrast with the negative cyclical correlation between unemployment and vacancies, a pure sectoral disturbance would be associated with movements to the right (and perhaps upward) in the plotted points, as increases in unemployment are not accompanied by declines in the vacancy rate (Valletta 2005 analyzes long-term shifts in the position of the curve). Figure 1 provides modest evidence for such sectoral adjustments: it shows a rightward movement between 2008:Q1 and 2008:Q3 that reflects a pronounced increase in the unemployment rate accompanied by a more limited decline in the vacancy rate. However, the direct rightward movement is not large, about 0.6 percentage points of unemployment relative to the inner envelope of points from 2000:Q4 to 2003:Q3. More importantly, the cyclical movement in the Beveridge curve relationship typically follows a counterclockwise path that is easily mistaken for an outward shift in the locus of the curve (Valletta 2005). At this point, it is not possible to pin down how much of this rightward movement arises from sectoral as opposed to cyclical factors.

Employment dispersion

Additional evidence regarding the role of sectoral imbalances in the current downturn can be obtained through direct measurement of the degree of observed sectoral reallocation, or the dispersion of employment growth across industry sectors. Following Lilien (1982), growth dispersion is measured as the

Figure 1
**U.S. Beveridge curve (quarterly, 2000:Q4–2008:Q3)**
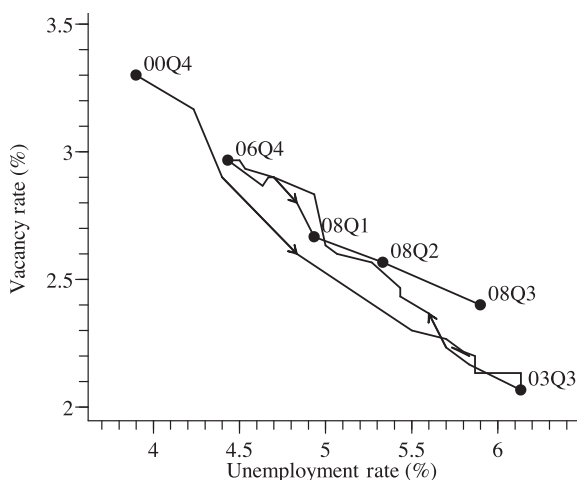
Source: U.S. BLS (JOLTS and CPS data, seasonally adjusted).

standard deviation of annual growth in national payroll employment across industry sectors, with each industry's contribution weighted by its share of total employment. Figure 2 displays this series for the 13 major industry sectors for which consistent data are available on a long-term basis (back to 1973), including construction, manufacturing, and financial activities.

Figure 2 indicates that, during economic expansions, the economy tends toward a baseline level of dispersion on the order of 1.5 percentage points, which reflects employment growth rates mostly ranging from about 2% to 6%. Employment growth dispersion increases sharply during economic downturns or recessions, doubling or tripling as employment in cyclically sensitive industries, such as construction and manufacturing, plunges on the order of 10% while growing in other industries.

The figure shows that the degree of sectoral reallocation has increased in 2008 but remains low relative to past economic downturns—for example, the 2001 recession, when prior excess expansion in sectors related to information technology necessitated sharp employment declines and sectoral reallocation. The increase in dispersion for the first nine months of 2008 is largely attributable to the construction sector, which has seen about a 5% decline in employment, and the education and health services sector, which has maintained a growth pace of about 3%. Employment in the finance industry has been declining since early 2007, but the decline has not been sufficiently rapid relative to overall employment to make a large contribution to sectoral dispersion. Although not shown here, similar patterns are evident when the dispersion series is calculated at a

Figure 2
Employment growth dispersion
(annual, 1973–2008*)
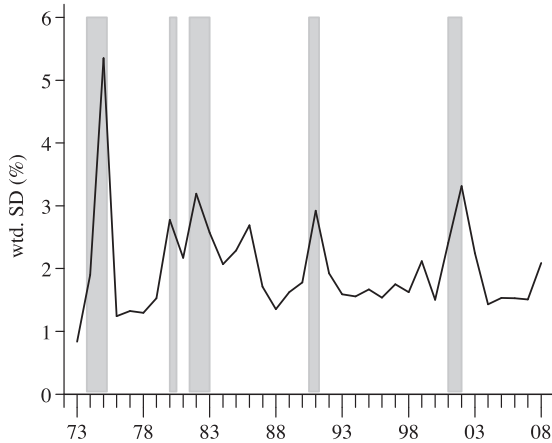
Note: Weighted standard deviation of annual payroll employment growth for 13 nonfarm industry sectors. Gray bars denote recessions. *2008 figure based on first 9 months.

quarterly frequency and when it is calculated using a more detailed industry breakdown (80 industries, available back to 1991).

Looking ahead
Although the extent of sectoral reallocation has been limited thus far in the current downturn, the degree of reallocation eventually may be much larger. The job count in the U.S. financial services sector is down about 150,000 from its peak, and one view suggests that it needs to fall by about 750,000 jobs on net in order for it to reach its fundamental equilibrium level (Philippon 2008, as cited in Lahart 2008; this rough estimate is constructed assuming that the decline in the sector's job count will be equal in percentage terms to the paper's estimated excess share of corporate financial services in national income). Construction employment has fallen by 564,000 jobs since peaking in late 2006, and further declines are likely, although given the sharp reduction in residential construction activity that has already occurred, it is likely that most of the adjustment has been completed.

Combining the hypothesized employment adjustment in the financial sector with potential net losses in construction employment provides a rough, tentative estimate of the total amount of necessary employment reallocation on the order of 1.5 million jobs, which represent about 1 percentage point of additional unemployment. If this reallocation occurs and is reflected one-to-one in a higher NAIRU, the increase would be substantial. However, shifts of this magnitude are not guaranteed, and the impact of such shifts on the NAIRU depends on the re-employment prospects of these workers in other industries. It is

likely that many of the employees in these sectors have skills that are readily transferable to other sectors of the economy, which will help speed the reallocation process and limit the degree to which their increased unemployment raises the NAIRU. More generally, such large reallocations are common during economic downturns and do not necessarily point to an increase in the non-inflationary unemployment rate.

Conclusion
The origins of the current U.S. economic downturn are largely associated with sectoral imbalances caused by excessive expansion in the markets for housing and related financial assets. However, the degree of sectoral employment reallocation associated with these shifts has been limited to date. As such, it is unlikely that the NAIRU has risen much due to required sectoral reallocation or will do so before the U.S. economy is back on its feet. To be fair, Phelps (2008) also points to structural factors broader than sectoral employment reallocation, such as expectations of slower productivity growth and higher mark-ups by exporting firms that have benefited from reductions in the exchange value of the U.S. dollar. However, direct empirical evidence on the role of these factors in the current slowdown, and their impact on the NAIRU, remains to be seen.

Rob Valletta **Aisling Cleary**
Research Advisor **Research Associate**

References
[URLs accessed October 2008.]
Abraham, Katharine, and Lawrence F. Katz. 1986. "Cyclical Unemployment: Sectoral Shifts or Aggregate Disturbances?" *Journal of Political Economy* 94(3), pp. 507–522.
Lahart, Justin. 2008. "Has the Financial Industry's Heyday Come and Gone?" *Wall Street Journal*, April 28.
Lilien, David M. 1982. "Sectoral Shifts and Cyclical Unemployment." *Journal of Political Economy* 90(4), pp. 777–793.
Phelps, Edmund. 2008. "U.S. Monetary Policy and the Prospective Structural Slump." Speech to the 7th Annual BIS Conference on Monetary Policy, Luzern, Switzerland. http://www.columbia.edu/%7Eesp2/recspeech.html
Philippon, Thomas. 2008. "Why Has the U.S. Financial Sector Grown So Much? The Role of Corporate Finance." Manuscript, New York University, June.
Valletta, Robert G. 2005. "Why Has the U.S. Beveridge Curve Shifted Back? New Evidence Using Regional Data." FRBSF Working Paper 2005-25, December. http://www.frbsf.org/publications/economics/papers/2005/wp05-25bk.pdf

ECONOMIC RESEARCH
FEDERAL RESERVE BANK
OF SAN FRANCISCO

Printed on recycled paper
with soybean inks

Index to Recent Issues of *FRBSF Economic Letter*