

Opening Remarks: Labor Market Dynamics and Monetary Policy

Janet L. Yellen

In the five years since the end of the Great Recession, the economy has made considerable progress in recovering from the largest and most sustained loss of employment in the United States since the Great Depression.¹ More jobs have now been created in the recovery than were lost in the downturn, with payroll employment in May of this year finally exceeding the previous peak in January 2008. Job gains in 2014 have averaged 230,000 a month, up from the 190,000-a-month pace during the preceding two years. The unemployment rate, at 6.2 percent in July, has declined nearly 4 percentage points from its late-2009 peak. Over the past year, the unemployment rate has fallen considerably, and at a surprisingly rapid pace. These developments are encouraging, but they speak to the depth of the damage that, five years after the end of the recession, the labor market has yet to fully recover.

The Federal Reserve's monetary policy objective is to foster maximum employment and price stability. In this regard, a key challenge is to assess just how far the economy now stands from the attainment of its maximum employment goal. Judgments concerning the size of that gap are complicated by ongoing shifts in the structure of the labor market and the possibility that the severe recession caused persistent changes in the labor market's functioning.

These and other questions about the labor market are central to the conduct of monetary policy, so I am pleased that the organizers of this year's symposium chose labor market dynamics as its theme. My colleagues on the Federal Open Market Committee (FOMC) and I look to the presentations and discussions over the next two days for insights into possible changes that are affecting the labor market. I expect, however, that our understanding of labor market developments and their potential implications for inflation will remain far from perfect. As a consequence, monetary policy ultimately must be conducted in a pragmatic manner that relies not on any particular indicator or model, but instead reflects an ongoing assessment of a wide range of information in the context of our ever-evolving understanding of the economy.

The Labor Market Recovery and Monetary Policy

In my remarks this morning, I will review a number of developments related to the functioning of the labor market that have made it more difficult to judge the remaining degree of slack. Differing interpretations of these developments affect judgments concerning the appropriate path of monetary policy. Before turning to the specifics, however, I would like to provide some context concerning the role of the labor market in shaping monetary policy over the past several years. During that time, the FOMC has maintained a highly accommodative monetary policy in pursuit of its congressionally mandated goals of maximum employment and stable prices. The Committee judged such a stance appropriate because inflation has fallen short of our 2 percent objective while the labor market, until recently, operated very far from any reasonable definition of maximum employment.

The FOMC's current program of asset purchases began when the unemployment rate stood at 8.1 percent and progress in lowering it was expected to be much slower than desired. The Committee's objective was to achieve a substantial improvement in the outlook for the labor market, and as progress toward this goal has materialized, we have reduced our pace of asset purchases and expect to complete this program in October. In addition, in December 2012, the Committee modified its forward guidance for the federal funds rate, stating that "as long as the unemployment rate remains above 6-1/2

percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored," the Committee would not even consider raising the federal funds rate above the 0 to ¼ percent range.² This "threshold based" forward guidance was deemed appropriate under conditions in which inflation was subdued and the economy remained unambiguously far from maximum employment.

Earlier this year, however, with the unemployment rate declining faster than had been anticipated and nearing the 6-½ percent threshold, the FOMC recast its forward guidance, stating that "in determining how long to maintain the current 0 to ¼ percent target range for the federal funds rate, the Committee would assess progress—both realized and expected—toward its objectives of maximum employment and 2 percent inflation."³ As the recovery progresses, assessments of the degree of remaining slack in the labor market need to become more nuanced because of considerable uncertainty about the level of employment consistent with the Federal Reserve's dual mandate. Indeed, in its 2012 statement on longer-run goals and monetary policy strategy, the FOMC explicitly recognized that factors determining maximum employment "may change over time and may not be directly measurable," and that assessments of the level of maximum employment "are necessarily uncertain and subject to revision."⁴ Accordingly, the reformulated forward guidance reaffirms the FOMC's view that policy decisions will not be based on any single indicator, but will instead take into account a wide range of information on the labor market, as well as inflation and financial developments.⁵

Interpreting Labor Market Surprises: Past and Future

The assessment of labor market slack is rarely simple and has been especially challenging recently. Estimates of slack necessitate difficult judgments about the magnitudes of the cyclical and structural influences affecting labor market variables, including labor force participation, the extent of part-time employment for economic reasons, and labor market flows, such as the pace of hires and quits. A considerable body of research suggests that the behavior of these and other labor

market variables has changed since the Great Recession.⁶ Along with cyclical influences, significant structural factors have affected the labor market, including the aging of the workforce and other demographic trends, possible changes in the underlying degree of dynamism in the labor market, and the phenomenon of “polarization”—that is, the reduction in the relative number of middle-skill jobs.⁷

Consider first the behavior of the labor force participation rate, which has declined substantially since the end of the recession even as the unemployment rate has fallen. As a consequence, the employment-to-population ratio has increased far less over the past several years than the unemployment rate alone would indicate, based on past experience. For policymakers, the key question is: What portion of the decline in labor force participation reflects structural shifts and what portion reflects cyclical weakness in the labor market? If the cyclical component is abnormally large, relative to the unemployment rate, then it might be seen as an additional contributor to labor market slack.

Labor force participation peaked in early 2000, so its decline began well before the Great Recession. A portion of that decline clearly relates to the aging of the baby boom generation. But the pace of decline accelerated with the recession. As an accounting matter, the drop in the participation rate since 2008 can be attributed to increases in four factors: retirement, disability, school enrollment and other reasons, including worker discouragement.⁸ Of these, greater worker discouragement is most directly the result of a weak labor market, so we could reasonably expect further increases in labor demand to pull a sizable share of discouraged workers back into the workforce. Indeed, the flattening out of the labor force participation rate since late last year could partly reflect discouraged workers rejoining the labor force in response to the significant improvements that we have seen in labor market conditions. If so, the cyclical shortfall in labor force participation may have diminished.

What is more difficult to determine is whether some portion of the increase in disability rates, retirements and school enrollments since the Great Recession reflects cyclical forces. While structural factors have clearly and importantly affected each of these three trends, some

portion of the decline in labor force participation resulting from these trends could be related to the recession and slow recovery and therefore might reverse in a stronger labor market.⁹ Disability applications and educational enrollments typically are affected by cyclical factors, and existing evidence suggests that the elevated levels of both may partly reflect perceptions of poor job prospects.¹⁰ Moreover, the rapid pace of retirements over the past few years might reflect some degree of pull-forward of future retirements in the face of a weak labor market. If so, retirements might contribute less to declining participation in the period ahead than would otherwise be expected based on the aging workforce.¹¹

A second factor bearing on estimates of labor market slack is the elevated number of workers who are employed part time but desire full-time work (those classified as “part time for economic reasons”). At nearly 5 percent of the labor force, the number of such workers is notably larger, relative to the unemployment rate, than has been typical historically, providing another reason why the current level of the unemployment rate may understate the amount of remaining slack in the labor market. Again, however, some portion of the rise in involuntary part-time work may reflect structural rather than cyclical factors. For example, the ongoing shift in employment away from goods production and toward services, a sector which historically has used a greater portion of part-time workers, may be boosting the share of part-time jobs. Likewise, the continuing decline of middle-skill jobs, some of which could be replaced by part-time jobs, may raise the share of part-time jobs in overall employment.¹² Despite these challenges in assessing where the share of those employed part time for economic reasons may settle in the long run, the sharp run-up in involuntary part-time employment during the recession and its slow decline thereafter suggest that cyclical factors are significant.

Private sector labor market flows provide additional indications of the strength of the labor market. For example, the quits rate has tended to be pro-cyclical, since more workers voluntarily quit their jobs when they are more confident about their ability to find new ones and when firms are competing more actively for new hires. Indeed, the quits rate has picked up with improvements in the labor

market over the past year, but it still remains somewhat depressed relative to its level before the recession. A significant increase in job openings over the past year suggests notable improvement in labor market conditions, but the hiring rate has only partially recovered from its decline during the recession. Given the rise in job vacancies, hiring may be poised to pick up, but the failure of hiring to rise with vacancies could also indicate that firms perceive the prospects for economic growth as still insufficient to justify adding to payrolls. Alternatively, subdued hiring could indicate that firms are encountering difficulties in finding qualified job applicants. As is true of the other indicators I have discussed, labor market flows tend to reflect not only cyclical but also structural changes in the economy. Indeed, these flows may provide evidence of reduced labor market dynamism, which could prove quite persistent.¹³ That said, the balance of evidence leads me to conclude that weak aggregate demand has contributed significantly to the depressed levels of quits and hires during the recession and in the recovery.

One convenient way to summarize the information contained in a large number of indicators is through the use of so-called factor models. Following this methodology, Federal Reserve Board staff developed a labor market conditions index from 19 labor market indicators, including four I just discussed.¹⁴ This broadly based metric supports the conclusion that the labor market has improved significantly over the past year, but it also suggests that the decline in the unemployment rate over this period somewhat overstates the improvement in overall labor market conditions.

Finally, changes in labor compensation may also help shed light on the degree of labor market slack, although here, too, there are significant challenges in distinguishing between cyclical and structural influences. Over the past several years, wage inflation, as measured by several different indexes, has averaged about 2 percent, and there has been little evidence of any broad-based acceleration in either wages or compensation. Indeed, in real terms, wages have been about flat, growing less than labor productivity. This pattern of subdued real wage gains suggests that nominal compensation could rise more quickly without exerting any meaningful upward pressure on

inflation. And, since wage movements have historically been sensitive to tightness in the labor market, the recent behavior of both nominal and real wages point to weaker labor market conditions than would be indicated by the current unemployment rate.

There are three reasons, however, why we should be cautious in drawing such a conclusion. First, the sluggish pace of nominal and real wage growth in recent years may reflect the phenomenon of “pent-up wage deflation.”¹⁵ The evidence suggests that many firms faced significant constraints in lowering compensation during the recession and the earlier part of the recovery because of “downward nominal wage rigidity”—namely, an inability or unwillingness on the part of firms to cut nominal wages. To the extent that firms faced limits in reducing real and nominal wages when the labor market was exceptionally weak, they may find that now they do not need to raise wages to attract qualified workers. As a result, wages might rise relatively slowly as the labor market strengthens. If pent-up wage deflation is holding down wage growth, the current very moderate wage growth could be a misleading signal of the degree of remaining slack. Further, wages could begin to rise at a noticeably more rapid pace once pent-up wage deflation has been absorbed.

Second, wage developments reflect not only cyclical but also secular trends that have likely affected the evolution of labor’s share of income in recent years. As I noted, real wages have been rising less rapidly than productivity, implying that real unit labor costs have been declining, a pattern suggesting that there is scope for nominal wages to accelerate from their recent pace without creating meaningful inflationary pressure. However, research suggests that the decline in real unit labor costs may partly reflect secular factors that predate the recession, including changing patterns of production and international trade, as well as measurement issues.¹⁶ If so, productivity growth could continue to outpace real wage gains even when the economy is again operating at its potential.

A third issue that complicates the interpretation of wage trends is the possibility that, because of the dislocations of the Great Recession, transitory wage and price pressures could emerge well before maximum sustainable employment has been reached, although they

would abate over time as the economy moves back toward maximum employment.¹⁷ The argument is that workers who have suffered long-term unemployment—along with, perhaps, those who have dropped out of the labor force but would return to work in a stronger economy—face significant impediments to re-employment. In this case, further improvement in the labor market could entail stronger wage pressures for a time before maximum employment has been attained.¹⁸

Implications of Labor Market Developments for Monetary Policy

The focus of my remarks to this point has been on the functioning of the labor market and how cyclical and structural influences have complicated the task of determining the state of the economy relative to the FOMC's objective of maximum employment. In my remaining time, I will turn to the special challenges that these difficulties in assessing the labor market pose for evaluating the appropriate stance of monetary policy.

Any discussion of appropriate monetary policy must be framed by the Federal Reserve's dual mandate to promote maximum employment and price stability. For much of the past five years, the FOMC has been confronted with an obvious and substantial degree of slack in the labor market and significant risks of slipping into persistent below-target inflation. In such circumstances, the need for extraordinary accommodation is unambiguous, in my view.

However, with the economy getting closer to our objectives, the FOMC's emphasis is naturally shifting to questions about the degree of remaining slack, how quickly that slack is likely to be taken up, and thereby to the question of under what conditions we should begin dialing back our extraordinary accommodation. As should be evident from my remarks so far, I believe that our assessments of the degree of slack must be based on a wide range of variables and will require difficult judgments about the cyclical and structural influences in the labor market. While these assessments have always been imprecise and subject to revision, the task has become especially challenging in the aftermath of the Great Recession, which brought nearly unprecedented cyclical dislocations and may have been

associated with similarly unprecedented structural changes in the labor market—changes that have yet to be fully understood.

So, what is a monetary policy maker to do? Some have argued that, in light of the uncertainties associated with estimating labor market slack, policymakers should focus mainly on inflation developments in determining appropriate policy. To take an extreme case, if labor market slack was the dominant and predictable driver of inflation, we could largely ignore labor market indicators and look instead at the behavior of inflation to determine the extent of slack in the labor market. In present circumstances, with inflation still running below the FOMC's 2 percent objective, such an approach would suggest that we could maintain policy accommodation until inflation is clearly moving back toward 2 percent, at which point we could also be confident that slack had diminished.

Of course, our task is not nearly so straightforward. Historically, slack has accounted for only a small portion of the fluctuations in inflation. Indeed, unusual aspects of the current recovery may have shifted the lead-lag relationship between a tightening labor market and rising inflation pressures in either direction. For example, as I discussed earlier, if downward nominal wage rigidities created a stock of pent-up wage deflation during the economic downturn, observed wage and price pressures associated with a given amount of slack or pace of reduction in slack might be unusually low for a time. If so, the first clear signs of inflation pressure could come later than usual in the progression toward maximum employment. As a result, maintaining a high degree of monetary policy accommodation until inflation pressures emerge could, in this case, unduly delay the removal of accommodation, necessitating an abrupt and potentially disruptive tightening of policy later on.

Conversely, profound dislocations in the labor market in recent years—such as depressed participation associated with worker discouragement and a still-substantial level of long-term unemployment—may cause inflation pressures to arise earlier than usual as the degree of slack in the labor market declines. However, some of the resulting wage and price pressures could subsequently ease as higher real wages draw workers back into the labor force and lower

long-term unemployment.¹⁹ As a consequence, tightening monetary policy as soon as inflation moves back toward 2 percent might, in this case, prevent labor markets from recovering fully and so would not be consistent with the dual mandate.

Inferring the degree of resource utilization from real-time readings on inflation is further complicated by the familiar challenge of distinguishing transitory price changes from persistent price pressures. Indeed, the recent firming of inflation toward our 2 percent goal appears to reflect a combination of both factors.

These complexities in evaluating the relationship between slack and inflation pressures in the current recovery are illustrative of a host of issues that the FOMC will be grappling with as the recovery continues. There is no simple recipe for appropriate policy in this context, and the FOMC is particularly attentive to the need to clearly describe the policy framework we are using to meet these challenges. As the FOMC has noted in its recent policy statements, the stance of policy will be guided by our assessments of how far we are from our objectives of maximum employment and 2 percent inflation as well as our assessment of the likely pace of progress toward those objectives.

At the FOMC's most recent meeting, the Committee judged, based on a range of labor market indicators, that "labor market conditions improved."²⁰ Indeed, as I noted earlier, they have improved more rapidly than the Committee had anticipated. Nevertheless, the Committee judged that underutilization of labor resources still remains significant. Given this assessment and the Committee's expectation that inflation will gradually move up toward its longer-run objective, the Committee reaffirmed its view "that it likely will be appropriate to maintain the current target range for the federal funds rate for a considerable time after our current asset purchase program ends, especially if projected inflation continues to run below the Committee's 2 percent longer-run goal, and provided that longer-term inflation expectations remain well anchored."²¹ But if progress in the labor market continues to be more rapid than anticipated by the Committee or if inflation moves up more rapidly than anticipated, resulting in faster convergence toward our dual objectives, then

increases in the federal funds rate target could come sooner than the Committee currently expects and could be more rapid thereafter. Of course, if economic performance turns out to be disappointing and progress toward our goals proceeds more slowly than we expect, then the future path of interest rates likely would be more accommodative than we currently anticipate. As I have noted many times, monetary policy is not on a preset path. The Committee will be closely monitoring incoming information on the labor market and inflation in determining the appropriate stance of monetary policy.

Overall, I suspect that many of the labor market issues you will be discussing at this conference will be at the center of FOMC discussions for some time to come. I thank you in advance for the insights you will offer and encourage you to continue the important research that advances our understanding of cyclical and structural labor market issues.

Endnotes

¹Nonfarm employment contracted by 6.3 percent from its peak in 2008 to its trough in early 2010, compared with a 5.2 percent loss in the 1948-49 recession that had been the largest since the 1930s.

²See paragraph 5 in Board of Governors of the Federal Reserve System, 2012, "Federal Reserve Issues FOMC Statement," press release, Dec. 12.

³See paragraph 5 in Board of Governors of the Federal Reserve System, 2014, "Federal Reserve Issues FOMC Statement," press release, March 19.

⁴See paragraph 5 in Board of Governors of the Federal Reserve System, 2012, "Federal Reserve Issues FOMC Statement of Longer-Run Goals and Policy Strategy," press release, Jan. 25.

⁵The central role of labor market conditions in monetary policy deliberations has also been apparent abroad. Last year, the Bank of England announced its intention not to raise its policy rate at least until the unemployment rate reached 7 percent, subject to conditions on inflation and financial stability. Since that time, the unemployment rate in the United Kingdom has dropped unexpectedly rapidly, prompting policymakers to consider data beyond this single indicator when assessing the extent of spare capacity in the U.K. economy. As in the United States, an unexpectedly swift decline in unemployment has raised questions about the structural and cyclical effects of a severe recession.

⁶For a discussion of important differences in the evolution of labor market conditions during the Great Recession relative to typical postwar patterns, see Henry S. Farber, 2011, "Job Loss in the Great Recession: Historical Perspective from the Displaced Workers Survey, 1984-2010," NBER Working Paper Series 17040 (Cambridge, Mass.: National Bureau of Economic Research, May).

⁷For convenience, the analysis here is presented as if cyclical factors and structural factors can be neatly delineated. In reality, the line between the two may be indistinct. Moreover, what begins as cyclical weakness may evolve into structural damage. For a discussion of the strategic issues that arise when policymakers believe such evolution from cyclical to structural to be an important feature of the economy, see Dave Reifschneider, William Wascher, and David Wilcox, 2013, "Aggregate Supply in the United States: Recent Developments and Implications for the Conduct of Monetary Policy," Finance and Economics Discussion Series 2013-77 (Washington: Board of Governors of the Federal Reserve System, November).

⁸See Shigeru Fujita, 2014, "On the Causes of Declines in the Labor Force Participation Rate," Federal Reserve Bank of Philadelphia, *Research Rap*, special report, Feb. 6.

⁹On disability, see Mark Duggan and Scott A. Imberman, 2009, "Why Are the Disability Rolls Skyrocketing? The Contribution of Population Characteristics,

Economic Conditions, and Program Generosity,” in David M. Cutler and David A. Wise, eds., *Health at Older Ages: The Causes and Consequences of Declining Disability among the Elderly*, (Chicago: University of Chicago Press), pp. 337-79; and David H. Autor, 2011, “The Unsustainable Rise of the Disability Rolls in the United States: Causes, Consequences, and Policy Options,” NBER Working Paper Series 17697 (Cambridge, Mass.: National Bureau of Economic Research, December). For a focus on developments within the Great Recession, see David M. Cutler, Ellen Meara, and Seth Richards-Shubik, 2012, “Unemployment and Disability: Evidence from the Great Recession,” NBER Retirement Research Center Paper Series NB 12-12 (Cambridge, Mass.: National Bureau of Economic Research, September). On school enrollment, see Bridget Terry Long, 2013, “The Financial Crisis and College Enrollment: How Have Students and Their Families Responded?” working paper (Cambridge, Mass.: Harvard University, July).

¹⁰For surveys of students who report job prospects as an important factor for attending or prolonging school, see John H. Pryor, Kevin Eagan, Laura Palucki Blake, Sylvia Hurtado, Jennifer Berdan, and Matthew H. Case, 2012, “The American Freshman: National Norms Fall 2012”, (Los Angeles: Higher Education Research Institute at the University of California, Los Angeles). On the cyclicity of college enrollment, see Andrew Barr and Sarah Turner, 2013, “Down and Enrolled: An Examination of the Enrollment Response to Cyclical Trends and Job Loss,” paper presented at the PERC Applied Microeconomics workshop, Texas A&M University, College Station, Texas, March 20. For research showing that the high numbers of workers seeking disability status is correlated with sectoral employment declines and demographics and not correlated with the rate of workplace injuries, see Norma B. Coe and Matthew S. Rutledge, 2013, “Why Did Disability Allowance Rates Rise in the Great Recession?” Center for Retirement Research paper 13-11 (Chestnut Hill, Mass.: Center for Retirement Research at Boston College, August); and John Merline, 2012, “The Sharp Rise in Disability Claims,” Federal Reserve Bank of Richmond, *Region Focus*, second/third quarter, pp. 24-26.

¹¹The effects of the Great Recession on retirements are difficult to identify. During the recession and immediately after, the losses in wealth may have put upward pressure on labor force participation; the persistently weak labor market may have subsequently contributed to more retirements and thus put downward pressure on participation. Perhaps as a result of these confounding forces, early research on the effects of the Great Recession on retirement finds unclear results. For example, see Alan L. Gustman, Thomas L. Steinmeier, and Nahid Tabatabai, 2011, “How Did the Recession of 2007-2009 Affect the Wealth and Retirement of the Near Retirement Age Population in the Health and Retirement Study?” NBER Working Paper Series 17547 (Cambridge, Mass.: National Bureau of Economic Research, October). For a discussion of these developments, see Richard W. Johnson, 2012, “Older Workers, Retirement, and the Great Recession” (Stanford, Calif.: Russell Sage Foundation and the Stanford Center on Poverty and Inequality, October).

¹²See Tomaz Cajner, Dennis Mawhirter, Christopher Nekarda, and David Ratner, 2014, “Why Is Involuntary Part-Time Work Elevated?” *FEDS Notes* (Washington: Board of Governors of the Federal Reserve System, April 14); and Murat Tasci and Jessica Ice, 2014, “Job Polarization and the Great Recession,” Federal Reserve Bank of Cleveland, *Economic Trends*, May 28.

¹³For an analysis documenting declines in the rates of hiring, layoffs and quits, along with lower job creation and destruction, see Steven J. Davis, R. Jason Faberman, and John Haltiwanger, 2012, “Labor Market Flows in the Cross Section and over Time,” *Journal of Monetary Economics*, vol. 59, January, pp. 1-18. For a review of a range of evidence and possible explanations, see Henry R. Hyatt and James R. Spletzer, 2013, “The Recent Decline in Employment Dynamics,” IZA Discussion Paper Series 7231 (Bonn, Germany: Institute for the Study of Labor (IZA), February). These authors suggest that much additional work is needed to understand the role of different factors in changes in labor market dynamism. For an analysis that raises the possibility that some of these shifts reflect better job matches, see Raven Molloy, Christopher L. Smith, and Abigail K. Wozniak, 2014, “Declining Migration Within the U.S.: The Role of the Labor Market,” NBER Working Paper Series 20065 (Cambridge, Mass.: National Bureau of Economic Research, April).

¹⁴Among the indicators in the “labor market conditions index” are the labor force participation rate, workers classified as part time for economic reasons, hires and quits. The index does not include the JOLTS job openings series but instead uses the Board staff’s composite help-wanted index, which has a longer history; the two measures generally track each other closely. See Hess Chung, Bruce Fallick, Christopher Nekarda, and David Ratner, 2014, “Assessing the Change in Labor Market Conditions,” *FEDS Notes* (Washington: Board of Governors of the Federal Reserve System, May 22). For a closely related index of labor market conditions, see Craig S. Hakkio and Jonathan L. Willis, 2013, “Assessing Labor Market Conditions: The Level of Activity and the Speed of Improvement,” Federal Reserve Bank of Kansas City, *The Macro Bulletin*, July 18.

¹⁵See Mary Daly and Bart Hobijn, 2014, “Downward Nominal Wage Rigidities Bend the Phillips Curve,” Working Paper Series 2013-08 (San Francisco: Federal Reserve Bank of San Francisco, January).

¹⁶For a recent study of the decline in labor’s share, see Michael W.L. Elsby, Bart Hobijn, and Ayşegül Şahin, 2013, “The Decline of the U.S. Labor Share,” Working Paper Series 2013-27 (San Francisco: Federal Reserve Bank of San Francisco, September). The notion that the labor share of income is a good measure of slack was prominent in the empirical literature on the New Keynesian Phillips curve (for example, see Jordi Galí and Mark Gertler, 1999, “Inflation Dynamics: A Structural Econometric Analysis,” *Journal of Monetary Economics*, vol. 44, October, pp. 195-222), and the connections (or lack thereof) between the labor share and traditional measures of slack (in the statistical sense) were highlighted in, among others, Michael T. Kiley, 2007, “A Quantitative

Comparison of Sticky-Price and Sticky-Information Models of Price Setting,” *Journal of Money, Credit and Banking*, vol. 39, February, pp. 101-125; and Michael T. Kiley, 2013, “Output Gaps,” *Journal of Macroeconomics*, vol. 37, September, pp. 1-18. Moreover, recent research has highlighted the challenges that swings in the labor share have presented for the interpretation of inflation developments (for example, Marco Del Negro, Marc P. Giannoni, and Frank Schorfheide, 2014, “Inflation in the Great Recession and New Keynesian Models,” NBER Working Paper Series 20055 (Cambridge, Mass.: National Bureau of Economic Research, April)).

¹⁷See Glenn D. Rudebusch and John C. Williams, 2014, “A Wedge in the Dual Mandate: Monetary Policy and Long-Term Unemployment,” Working Paper Series 2014-14 (San Francisco: Federal Reserve Bank of San Francisco, May).

¹⁸For example, see Alan B. Krueger, Judd Cramer, and David Cho, 2014, “Are the Long-Term Unemployed on the Margins of the Labor Market?” paper presented at the Brookings Panel on Economic Activity, Brookings Institution, Washington, D.C., March 20-21; and Robert J. Gordon, 2013, “The Phillips Curve Is Alive and Well: Inflation and the NAIRU during the Slow Recovery,” NBER Working Paper Series 19390 (Cambridge, Mass.: National Bureau of Economic Research, August). For research highlighting potential alternative interpretations, see Michael T. Kiley, 2014, “An Evaluation of the Inflationary Pressure Associated with Short- and Long-Term Unemployment,” Finance and Economics Discussion Series 2014-28 (Washington: Board of Governors of the Federal Reserve System, March); and Christopher Smith, 2014, “The Effect of Labor Slack on Wages: Evidence from State-Level Relationships,” *FEDS Notes* (Washington: Board of Governors of the Federal Reserve System, June 2). The interaction of labor force participation and inflationary pressures has been understudied, in part because the strong trends in participation due to demographic factors have implied that it is difficult to identify the cyclical component. For an important example of a study demonstrating, within the core macroeconomic framework widely used in research, that movements in participation should be considered in models of wage and price determination, see Christopher J. Erceg and Andrew T. Levin, 2013, “Labor Force Participation and Monetary Policy in the Wake of the Great Recession,” IMF Working Paper WP/13/245 (Washington: International Monetary Fund, July).

¹⁹See Rudebusch and Williams, “A Wedge in the Dual Mandate,” in note 17.

²⁰See paragraph 1 of Board of Governors of the Federal Reserve System, 2014, “Federal Reserve Issues FOMC Statement,” press release, July 30.

²¹See paragraph 5 in Board of Governors of the Federal Reserve System, “FOMC Statement,” July 2014, in note 20.

