Economic Trends

February 2013 (January 11, 2013-February 12, 2013)

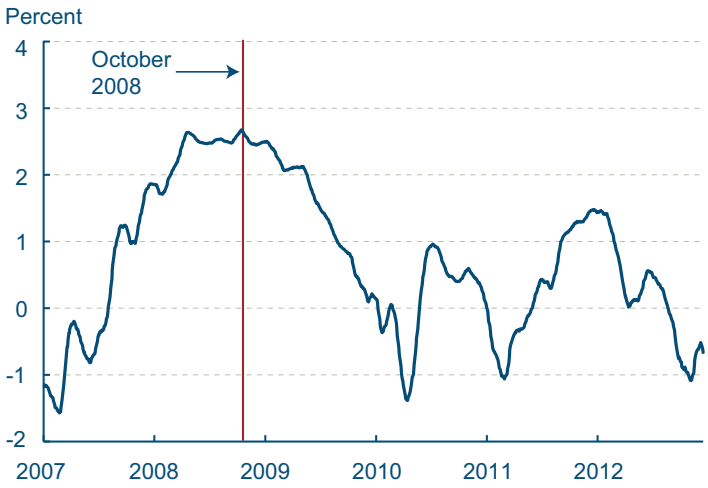
In This Issue:

FEDERAL RESERVE BANK
of CLEVELAND

Tracking Recent Levels of Financial Stress

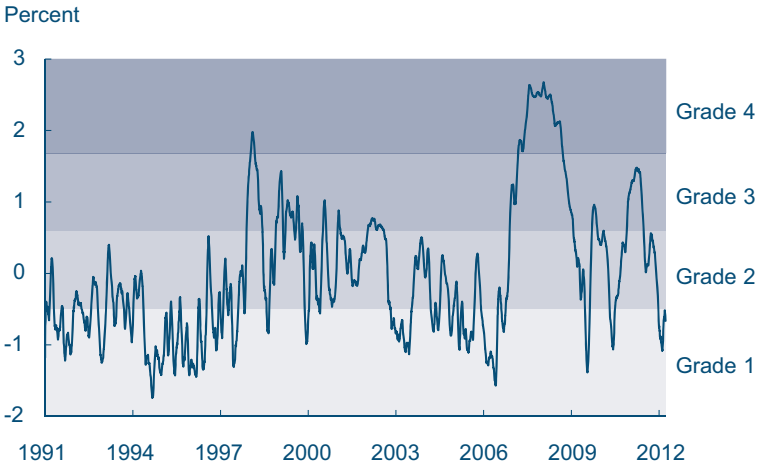
01.16.13
by Timothy Bianco

Cleveland Financial Stress Index



Source: Oet, Eiben, Bianco, Gramlich, and Ong (2011).

Cleveland Financial Stress Index



Source: Oet, Eiben, Bianco, Gramlich, and Ong (2011).

In recent months, the Cleveland Financial Stress Index (CFSI) has remained low as conditions in key financial markets continued to improve. After falling to a recent low of –1.08 on November 2, 2012, the index's latest reading stands at –0.66 (as of December 14). This reading places the level of stress in Grade 1, a "below-normal stress" period. The index is down 2.14 points over the previous 12 months and nearly 3.4 points since its peak in October 2008.

The CFSI is a composite measure of stress in four key financial markets (interbank, credit, equity, and foreign exchange). Stress in each of these component markets can also be monitored by decomposing the CFSI into the contribution each market makes to the total level of system stress (more detail on the index's construction can be found here).

The individual components of the CFSI were increasing in the early part of 2012—though not to the same degree as during the financial crisis—but as the year progressed, stress in all four markets decreased, indicating that the potential for widespread stress had fallen relative to late 2011. Over the final three months of 2012, the interbank market's contribution to the composite index decreased the most markedly, while strains in the credit and equity markets persist.

For more on the CFSI, read the *Economic Commentary* "The Cleveland Financial Stress Index: A Tool for Monitoring Financial Stability" at http://www.clevelandfed.org/research/commentary/2012/2012-04.cfm

Decomposition of CFSI

	December 14, 2012	November 19, 2012	October 15, 2012
Equity market contribution to CFSI	12.70	13.00	9.70
Interbank market contribution to CFSI	7.60	7.37	8.47
Credit market contribution to CFSI	18.38	17.78	16.89
Foreign exchange contribution to CFSI	1.42	1.40	1.82

Note: These contributions refer to levels of stress, where a value of 0 indicates the least possible stress and a value of 100 indicates the most possible stress. The sum of these contributions is the level of the CFSI, but this differs from the actual CFSI, which is computed as the standardized distance from the mean, or the z-score.
Source: Federal Reserve Bank of Cleveland.

Behind the Slowdown of Potential GDP

02.12.13

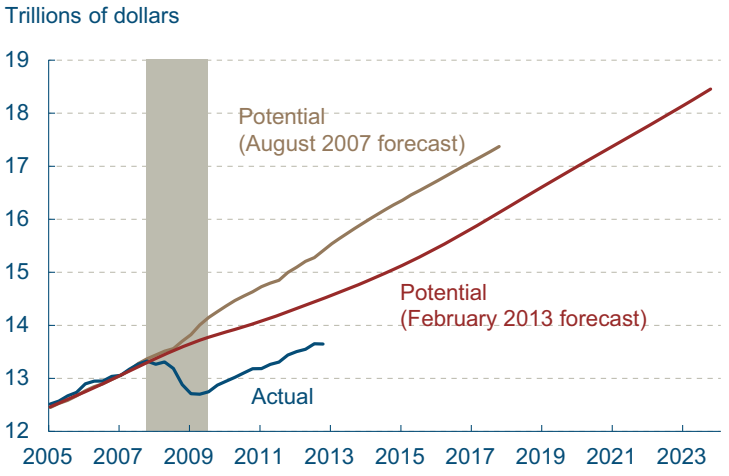
by Margaret Jacobson and Filippo Occhino

The current level of real GDP is 11.4 percent below the forecast that the Congressional Budget Office (CBO) made back in 2007, before the beginning of the crisis. One reason for the lower-than-expected output is that the recovery has been slow and the economy is still producing much less than its potential output level—the level that could be reached if all available capital and labor were being used at a high rate. The other reason is that the level of potential output itself is now estimated by the CBO to be lower. This downward revision accounts for a little more than 50 percent of the gap between the current level of real GDP and the pre-crisis forecast. Forecasts of future potential output have been revised downward as well, and this will have long-lasting implications for economic activity. The CBO now expects future potential GDP to be lower by about 7 percent relative to its pre-crisis path. Since actual output is expected to converge to its potential over time, the long-run path of real GDP is now expected to be lower by about 7 percent as well.

The potential growth rates for the years 2004 through 2016 were all revised downward, with particularly sizeable revisions for the years 2008 through 2015. The long-run growth rate of potential GDP was revised down as well, but by a smaller amount. This pattern suggests that the main factor behind the near-term revisions was the occurrence of the 2007 crisis. The ensuing recession damaged the supply side of the economy, temporarily reduced the potential growth rate and permanently shifted the future path of potential output downward.

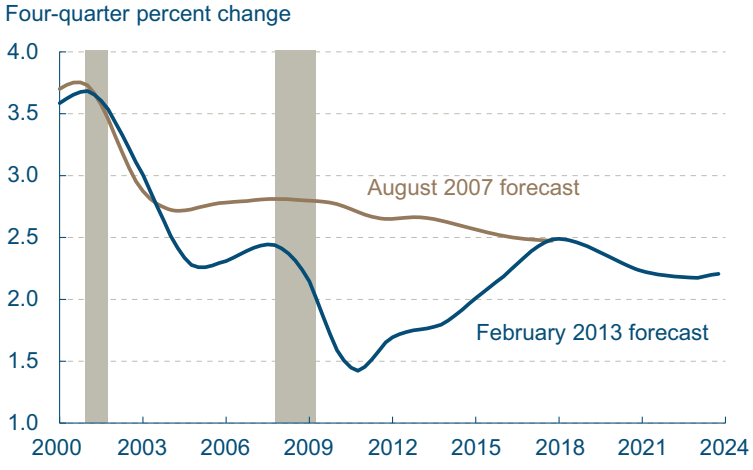
It is quite typical to see potential GDP slowing down after the economy enters a recession. This is because investment generally falls during an economic contraction, which slows down capital accumulation and reduces the growth rate of potential GDP. In the most recent downturn, however, the drop in investment has been exceptionally large and

Actual and Potential Real GDP



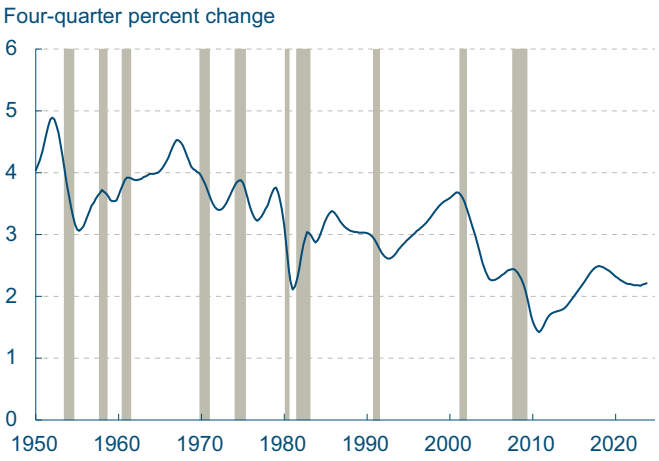
Notes: The 2007 forecast potential GDP is deflated using the 2013 GDP deflator. The shaded bar indicates a recession.
Sources: Bureau of Economic Analysis; Congressional Budget Office.

Potential Real GDP



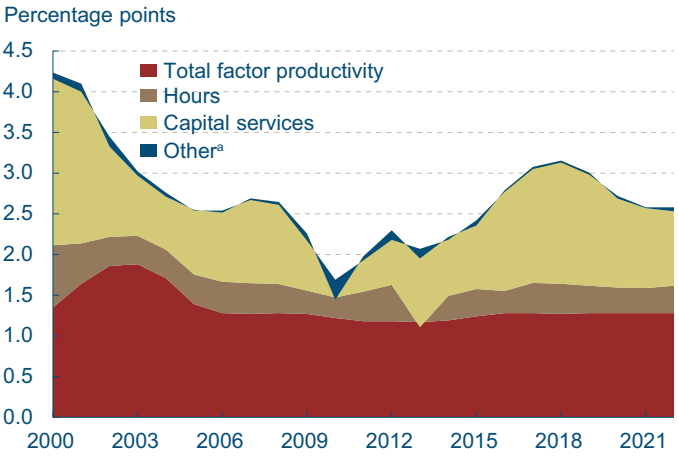
Note: The shaded bars indicate recessions.
Source: Congressional Budget Office.

Potential Real GDP



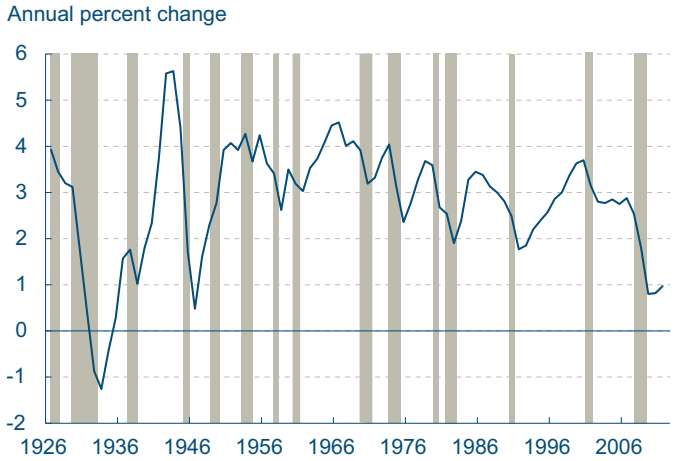
Note: The shaded bars indicate recessions.
Source: Congressional Budget Office.

Contributions to Potential GDP Growth



a. Other is a discrepancy between the authors' decomposition and the aggregate series.
Note: Nonfarm business sector.
Sources: Congressional Budget Office; authors' calculations.

Capital Stock



Note: Net capital stock of fixed assets and consumer durables.
Source: Bureau of Economic Analysis.

persistent, and this has caused potential GDP to decelerate more and for longer than is typical (see "A Return to Lower Levels of Investment Activity").

In an accounting sense, there are three determinants of potential GDP—the capital stock, potential hours worked, and potential multifactor productivity—and changes in any one could be behind the slowdown of potential GDP. The growth rates of potential hours and potential productivity have remained stable since 2006, so they have hardly contributed to the slowdown. The contribution of capital services, however, has decreased significantly since 2008, and almost entirely accounts for the subsequent slowdown of potential GDP. It also accounts for a temporary snapback of potential output growth that is forecasted to occur from 2016 to 2020. This forecasted snapback, however, will not be enough to compensate for the current decline and to bring back potential GDP to its pre-crisis path.

This evidence points to the drop in investment and the resulting slowdown of capital accumulation as the main causes behind the loss of potential GDP. Capital growth dropped from rates consistently above 2.5 percent before the recession to rates below 1 percent after the economy bottomed out. This decline was larger and more extended than was typical in past business cycles. The smaller stock of capital will have long-lasting consequences, permanently lowering the future path of capital, potential GDP, and actual GDP relative to their pre-crisis paths.

Uneven Debt Burdens across the United States

02.08.13

by Yuliya Demyanyk and Samuel Chapman

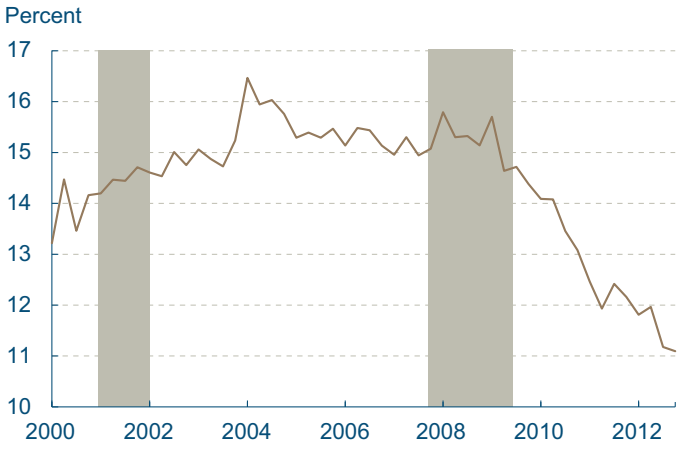
Americans' debt burden—the ratio of debt payments to disposable income—grew steadily before the last recession and fell sharply once the recession began. But the changes were not spread uniformly across all states. Some states saw dramatic swings in the overall indebtedness of their residents. Others experienced little change.

The total U.S. debt burden peaked before the recession at 16.5 percent in the first quarter of 2004 but is now at 11.1 percent. Since incomes have generally been rising, falling debt burdens are likely the result of deleveraging and falling interest rates. Americans had been increasing their debt since the turn of the century but turned course during the recession. By the third quarter of 2012, debt was back down to its 2001 level.

The changes in consumer indebtedness did not go in the same direction for all states. To compare debt burdens across states, we look at the fraction of debt payments—excluding student loans—to total income, since disposable income is not available on the state level at this time. In the first quarter of 2000, this fraction was 12.11* percent for the U.S. as a whole. The states with the highest debt burden during the period were mostly in the West, with a few exceptions. Utah was the highest with a debt burden of 15.57 percent, followed by Montana at 15.39 percent. Washington D.C. had the lowest debt burden at 7.31 percent, followed by New York at 8.08 percent.

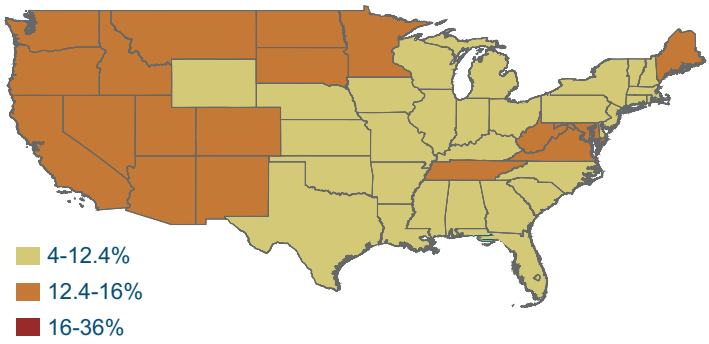
Eight years later, the debt burden was no longer primarily focused in the West but had spread across the nation. The average debt burden in the first quarter of 2008 was 14.54 percent, a slight increase of 2.43 percentage points from its 2000 level. Minnesota had the highest burden at 33.6 percent, followed by Montana at 22.95 percent and Arizona at 20.99 percent. The state with the lowest debt burden was New York at 9.29 percent, followed by Texas at 10.14 percent and Wyoming at 10.58 percent.

Debt Burden: Payments as a Percent of Disposable Personal Income



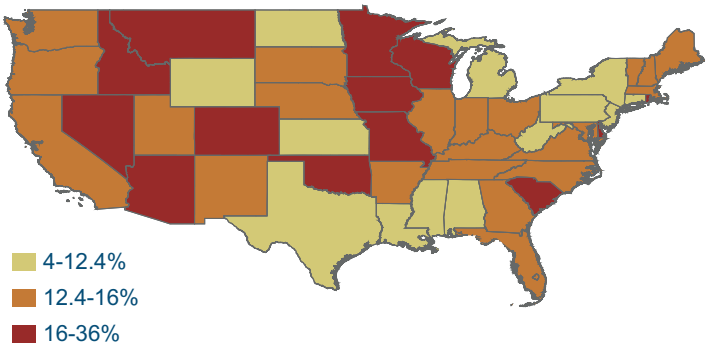
Notes: Debt burden is defined as the aggregated sum of all minimum payments that the consumers are required to make on all of their debt obligations (excluding student loans), as a fraction of aggregate disposable income. Disposable income is seasonally adjusted. Shaded bars indicate recessions.
Sources: authors' calculations based on the Bureau of Economic Analysis, Haver Analytics, the Federal Reserve Bank of New York's Consumer Credit Panel/Equifax.

Debt Payments as a Percentage of Total Income, 2000:Q1



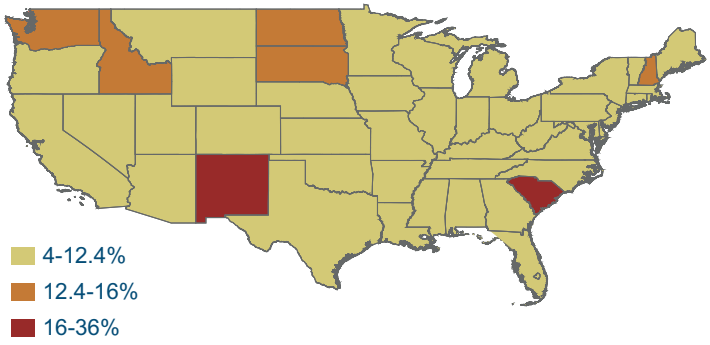
Sources: Bureau of Economic Analysis, Haver Analytics, NYCCP.

Debt Payments as a Percentage of Total Income, 2008:Q1



Sources: Bureau of Economic Analysis, Haver Analytics, NYCCP.

Debt Payments as a Percentage of Total Income, 2012:Q1



Sources: Bureau of Economic Analysis, Haver Analytics, NYCCP.

Finally, in the first quarter of 2012, we see a large drop in the average U.S. debt burden. It stood at 10.94 percent, a drop of 3.6 percentage points from 2008 and 1.7 percentage points from 2000. The state with the highest debt burden was New Mexico at 17.65 percent, followed by South Carolina at 16.02 percent and North Dakota at 15.37 percent. The state with the lowest burden was Washington D.C. at 5.57 percent, followed by New York at 7.05 percent and Texas at 8.46 percent.

Even though the aggregate debt burden was drastically increasing before the crisis and plummeting after it, some states did not change their debt-level category as measured in the charts above. Fifteen states remained in the same debt group through all three periods analyzed, with 12 of them in the 4 percent–12.4 percent group and 3 states in the 12.4 percent–16 percent group. For example, Connecticut, Wyoming, Alabama, and Texas all remained in the 4 percent–12.4 percent group and changed a total of only 1.6 percentage points or less across the three time periods. Nine states actually decreased their debt burden between 2000 and 2008 by an average of 90 basis points. The other 42 states increased their burden by an average of 3.14 percentage points between 2000 and 2008; all of these states, however, decreased their debt burden later, from 2008 to 2012. Furthermore, of the 42 states that increased their debt burden between 2000 and 2008, 36 had a lower debt burden in 2012 than in 2000. A remarkable 49 states decreased their debt burden between 2008 and 2012, with only North Dakota and New Mexico increasing by 3.91 percentage points and 3.94 percentage points, respectively.

Forty-one states ended up with a lower debt burden in 2012 than in the first quarter of 2000; this difference was on average 1.78 percentage points. The 10 states that increased their debt levels did so by an average of 1.33 percentage points. Minnesota saw the largest changes across the three periods: this state's debt burden started at 13.2 percent, increased to 33.6 percent, then returned to 11.8 percent in the first quarter of 2012. The state with the second-highest movement was Montana, which started at 15.4 percent, went to 23.0 percent, and then fell back to 12.2 percent.

*4/15/2013: With respect to the fraction of debt payments to total income, all values in this article have been updated since this page was first posted. For the initial state-level figures we used quarterly levels of debt payments. We have adjusted our calculations so that the level of quarterly debt payments is now annualized.

Japanese Monetary Policy and the Yen

1.29.13
by Owen F. Humpage and Maggie Jacobson

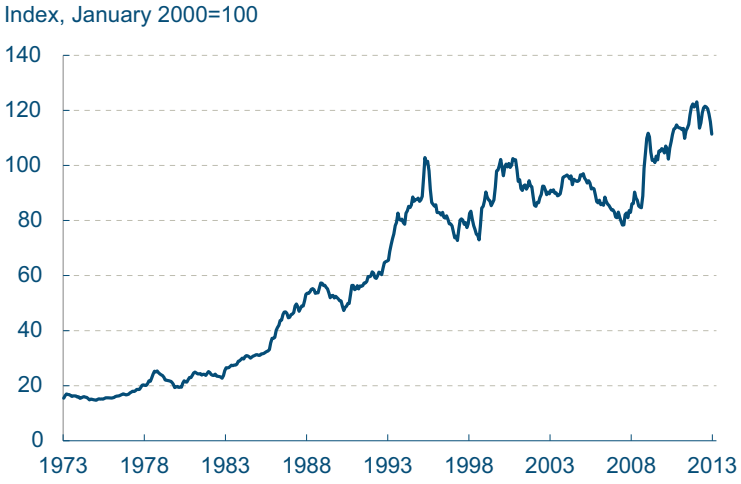
Japan's new prime minister, Shinzo Abe, has been concerned about the yen's appreciation and has attributed the yen's behavior to exceptionally easy monetary policies abroad, notably in the United States and the euro area. He claims that the yen's appreciation puts Japan's exporters at a competitive disadvantage, contributes to slow growth, and adds downward pressure to prices—through lower traded goods prices—in an already deflationary environment. To remedy the situation, he has asked the Bank of Japan to ease up on monetary policy by doubling its inflation objective and expanding its asset purchase program to that end. He also advocates an additional fiscal expansion.

Although an easier monetary policy could lower the yen and lift Japan from deflation, the yen's past appreciation has not obviously hampered the competitive position of Japan's trade sector. The yen does not seem overvalued.

It is true that the yen has generally appreciated in foreign-exchange markets since the inception of generalized floating in 1973, as J.P. Morgan's broad nominal effective—or trade-weighted—yen exchange rate shows. The U.S. dollar contributes the largest single currency weight in the construction of this rate, and movements in the yen-dollar exchange rate account for approximately three-fourths of the trade-weighted exchange rate's annual variation. Since 2006, just prior to the recent global meltdown, the yen has appreciated 32 percent on a trade-weighted basis and 38 percent against the dollar alone.

But exchange rates alone provide an incomplete explanation of trade patterns. Prices matter too. A real exchange rate incorporates information about prices. On a real basis, the yen has shown little movement on balance since 1973, although it has appreciated 15 percent since 2006. This lack of a strong trend in the real effective yen contrasts sharply with the steady appreciation of the nomi-

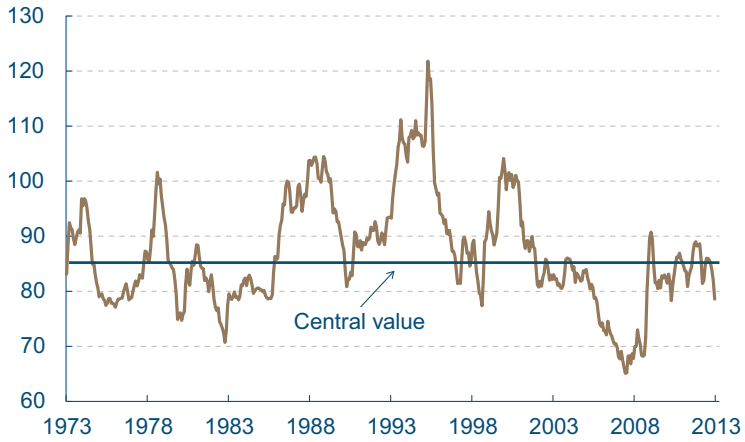
Nominal Effective Yen Exchange Rate



Sources: J.P. Morgan Chase, Haver Analytics.

Real Effective Yen Exchange Rate

Index, January 2000=100



Sources: J.P. Morgan Chase, Haver Analytics.

nal effective yen, but it is not surprising given the growing integration of world markets.

Globalization tends to shift trade away from the high-inflation countries toward low-inflation countries. In the process, traders buy—thereby appreciating—the currency of the low-inflation country, and they sell—thereby depreciating—the currency of the high-inflation country. Over long periods of time, movements in exchange rates should exactly offset cross-country inflation differentials, leaving real exchange rates unchanged. Ultimately, the global search for trade bargains establishes parity among the various currencies' purchasing power, which should leave real exchange rates trendless.

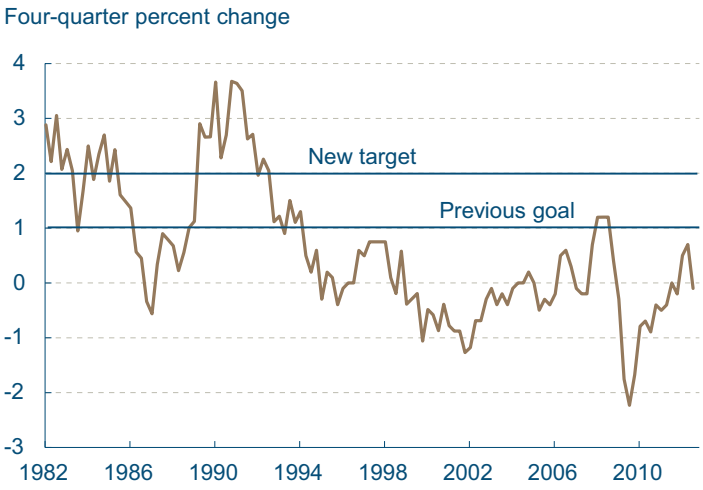
The adjustment to purchasing power parity can take a very long time; in the interim, other economic factors can push exchange rates far off course, and measuring the whole thing presents some exceedingly sticky issues. Still, over long periods of time, real effective exchange rates should tend to return to a value consistent with purchasing power parity. If so, the yen does not look out of line. Its value as of December 2012 seemed to confer neither an obvious advantage nor a disadvantage to Japanese trade.

The long-term movements in the nominal and real effective yen suggest that the yen appreciates because Japan's inflation rates generally remain below those of its trading partners. Since the mid-1990s, for example, inflation in Japan has rarely exceeded 1 percent—the Bank of Japan's recent interim inflation goal—and Japan has experienced persistent and reoccurring bouts of deflation.

Prime Minister Abe has advocated more aggressive fiscal and monetary policies to shock the Japanese economy out of its deflation-induced torpor. Recently, he proposed a ¥20 trillion fiscal package. One-half of the amount represents loan guarantees to small businesses and requires no immediate outlays, and one-quarter represents infrastructure spending. The remainder is spread out over other programs, including incentives for corporate investment.

While this fiscal shock may jolt the economy awake, its long-run consequences could prove trou-

Japanese Inflation (CPI)



Note: Adjusted for consumption, tax effects.
Source: Bloomberg.

blesome. Japan's public debt burden—around 235 percent of GDP on a gross basis and growing—exceeds that of all other advanced economies. Financing it down the road could come at the expense of private investment and economic growth.

At its last policy meeting, the Bank of Japan adopted some of Prime Minister Abe's recommendations for attacking deflation more aggressively. The Policy Board doubled its near-term inflation objective from 1 percent to 2 percent, and it also promised to ramp up the Bank's Asset Purchase Program—quantitative easing—until it reached the new inflation target.

But the Bank of Japan's January policy announcement left markets unimpressed. They expected more, and the yen initially appreciated. The Bank's proposal for another ¥10 trillion in asset purchases may not have seemed any different than past changes to the program. Moreover, the addition pertains to 2014 and years beyond. It does not affect the coming year. The Bank also did not appear to tilt its asset purchases more strongly toward longer-term securities, which conceivably might exert greater downward pressure on long rates. Some observers expected the Bank to lower its overnight policy rate and its interest rate on excess reserves. These are already very low, but seemingly trivial gestures can pay dividends in the credibility department.

Further monetary policy changes may be in the offing. Persistent deflation—like inflation—is a monetary phenomenon. To be sure, a monetary expansion aimed at eliminating deflation may induce a near-term yen depreciation, even on a real basis. It may provide a temporary boost to Japanese exports. Temporary, however, is the crucial word—one often absent in such discussions.

The State of the U.S. Labor Market Recovery

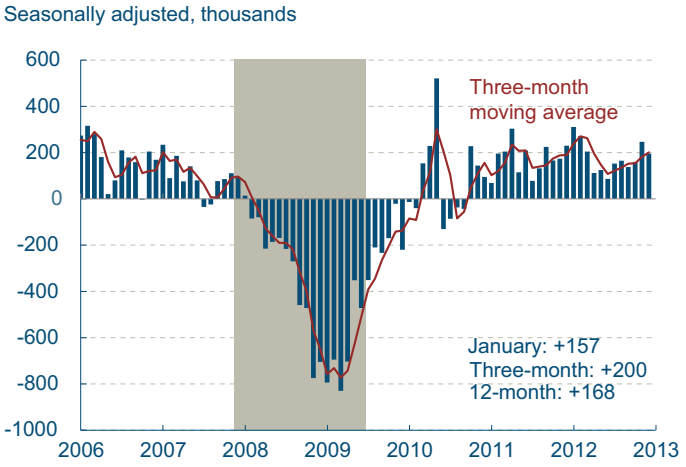
02.07.13
by Murat Tasci and Chris Vecchio

It has been five years since the beginning of the Great Recession, and the labor market recovery, while far from great, has been steady. The total number of jobs lost between the business cycle peak in January 2008 and the trough in February 2010 exceeded 8.7 million and represented a 6.3 percent decline. Since then, the labor market has gained 5.5 million jobs. Nevertheless, we are still more than 3 million jobs short of the pre-recession level. While these numbers underscore the severity and depth of the recession, looking at a host of labor market indicators gives one a mixed message about where we are in terms of the recovery; even though there has been gradual improvement, there are still persistent weaknesses.

Total nonfarm payrolls have grown in each of the past 28 months. The growth in payrolls averaged 181,000 per month during 2012, a healthy number judging by the pace of the recovery. Moreover, with the exception of the government sector, employment growth was widespread across all major sectors of the aggregate economy. Over the last year, payrolls expanded every month by an average of 39,000 in professional and business services, 36,000 in education and health, 36,700 in trade, transportation, and utilities, 28,000 in leisure and hospitality, 9,000 in manufacturing, and 9,000 in financial activities. Even one of the hardest-hit sectors during the recession, construction, registered some expansion in the second half of the year, about 9,000 per month.

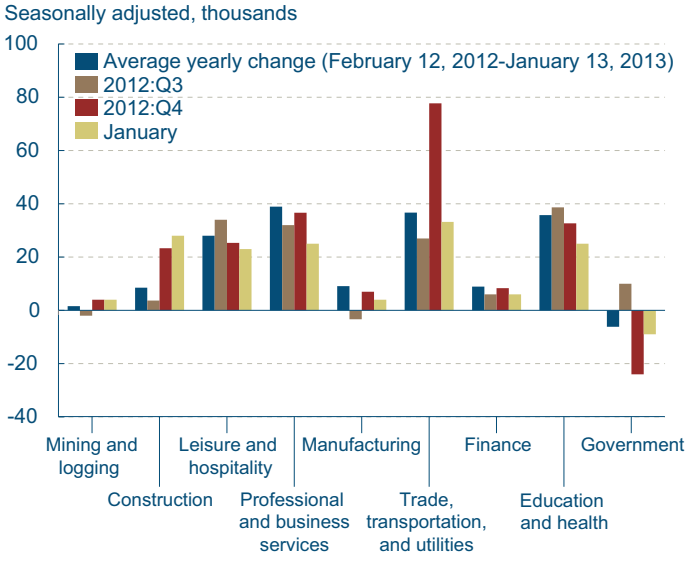
This gradual improvement in payroll employment is fairly consistent with the best measure of near-term-hiring demand we have: job openings. The Job Openings and Labor Turnover Survey (JOLTS), which is conducted by the Bureau of Labor Statistics, shows that job vacancies have rebounded significantly from a low of 2.2 million since the recession ended. According to the most recent release of the monthly survey in November 2012, there are almost 3.7 million vacancies that firms are looking

Payroll Employment Monthly Change



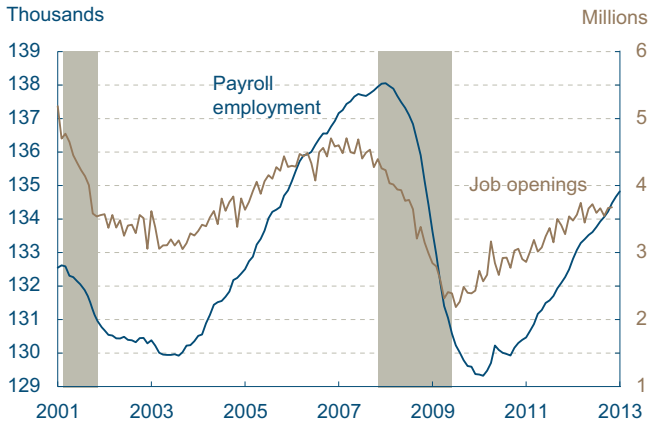
Notes: Payroll employment data comes from the BLS's survey of business establishments, formally called the Current Employment Statistics (CES) survey, and also known as the payroll or establishment survey. Shaded bar indicates a recession.
Source: Bureau of Labor Statistics.

Payroll Employment: Changes by Industry



Note: Payroll employment data comes from the Bureau of Labor Statistic's survey of business establishments, formally called the Current Employment Statistics (CES) survey, and also known as the payroll or establishment survey.
Source: Bureau of Labor Statistics.

Employment and Job Openings

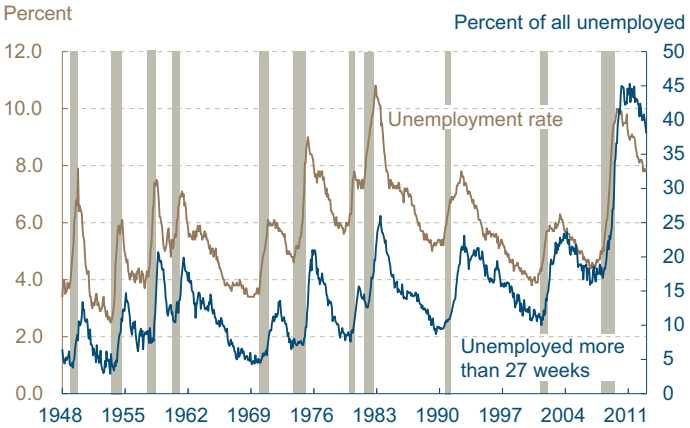


Notes: Employment data come from the Current Employment Statistics (CES) survey and the job openings data come from the Job Openings and Labor Turnover Survey (JOLTS). Shaded bars indicate recessions.
Source: Bureau of Labor Statistics.

Unemployment and Employment-to-Population Ratio

Notes: The unemployment rate and the employment-to-population ratio come from the Bureau of Labor Statistics's survey of households, formally called the Current Population Survey (CPS). Shaded bars indicate recessions.
Source: Bureau of Labor Statistics.

Unemployment Rate and Long-Term Unemployment



Notes: Shaded bars indicate recessions.
Source: Bureau of Labor Statistics.

to fill. This constitutes a significant improvement over the level at the end of the recession. However, vacancies are still about 20 percent below their pre-recession high of 4.7 million. Looking into the numbers for different sectors reveals that the construction and government sectors have relatively low demand and are dragging down the overall level of job openings.

Similarly, the unemployment data show a mixed picture of gradual improvement in some areas and persistent weaknesses in others. The unemployment rate came down from its cyclical high of 10 percent in late 2010 to its current level of 7.9 percent as of January. This decline accompanied a substantial fall in the number of unemployed workers, about 3 million. Even though the unemployment rate improved somewhat, albeit slowly, the employment-to-population ratio, another important gauge of the labor market, declined drastically during the recession and has been hovering around 58.5 percent ever since. In spite of the net job gains over time, employment growth did not keep up with population growth, leaving this rate at its lowest level since the late 1980s.

The major contributor to persistently high unemployment is the large fraction of long-term unemployed, those unemployed for six months or more. During recessions, this group of unemployed workers often expands, as it takes longer during such times for newly laid-off workers to find jobs. However, the expansion usually subsides and the pool of long-term unemployed workers starts declining once the recovery picks up. This time around however, long-term unemployment is more severe and persistent; not only has the share of long-term unemployed workers soared to unprecedented levels, it has also stayed at those high levels since. As of January 2013, 4.7 million unemployed workers have been out of work for more than six months. This constitutes 38.1 percent of all the unemployed. This is only slightly less than the peak of 45.3 percent, which was hit in the wake of the recession. The fact that this recession was a long one can partly explain the depth of the problem. Nevertheless, the fact that this ratio declined almost 5 percentage points over the last 12 months is encouraging.

Persistent Uncertainty for Economic Policymakers

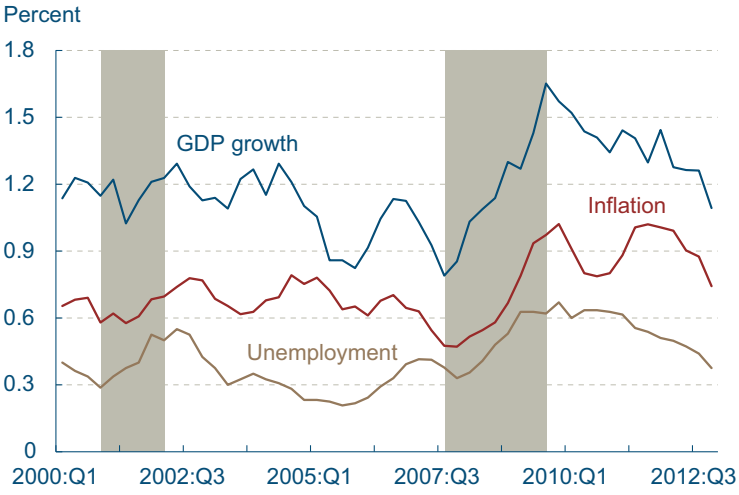
01.17.13
by Bill Bednar and John Carlson

The uniqueness of the most recent recession and its connection to a financial crisis has provided many challenges to policymakers, including the FOMC. The subsequent recovery, which is slowly progressing, still features a number of factors that are creating uncertainty about when the economy might return to a more normal trajectory. The most recently released FOMC minutes, for example, state that "nearly all of the participants judged their current levels of uncertainty about real GDP growth and unemployment to be higher than was the norm during the previous 20 years," and that "participants noted the challenges associated with forecasting the path of the U.S. economic recovery following a financial crisis and recession that differed markedly from recent historical experience." Chairman Bernanke has also commented on the extraordinary level of uncertainty in the economy on several occasions.

Since economic policies are based not only on current condtions, but also on how the economy is going to evolve, forecasts provide market participants some basis for judging how policy will evolve if the economy deviates from its project path. When uncertainty increases, it should be reflected in a larger dispersion of forecasted macroeconomic variables. The Survey of Professional Forecasters (SPF), which is a quarterly survey of macroeconomic forecasts in the United States, provides a measure of dispersion for forecasts of each of the macroeconomic variables included in the survey. A higher level of dispersion suggest a larger discrepency in forecasts, and thus more uncertainty, while a smaller dispersion suggest more agreement among forecasters, meaning that the level of uncertainty is potentially lower.

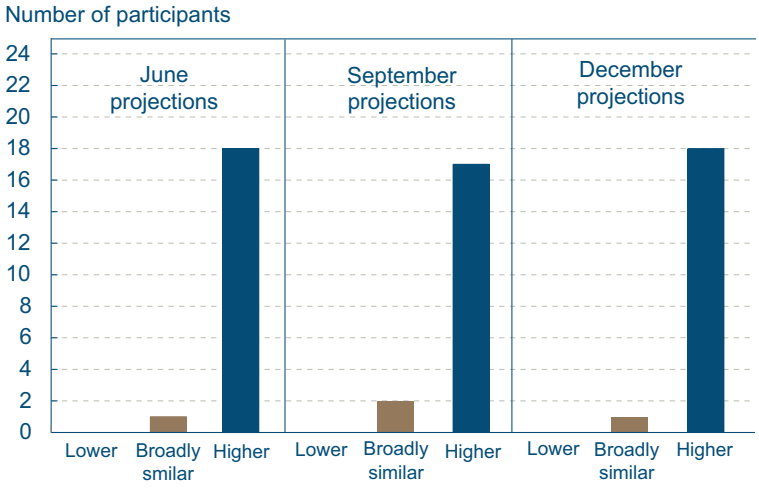
The chart below shows a four-quarter moving average of the dispersion, measured as the interquartile range, of SPF forecasts for GDP growth, inflation, and the unemployment rate for four quarters in the future. During the recent recession, dispersion spiked for all three variables, suggesting that there

Cross-Sectional Dispersion of Forecasts



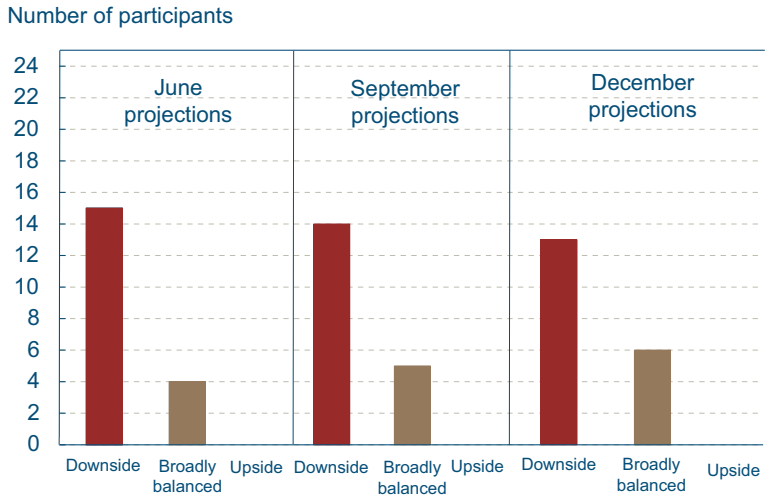
Note: Shaded bars indicate recessions.
Source: Survey of Professional Forecasters

Uncertainty about GDP Growth



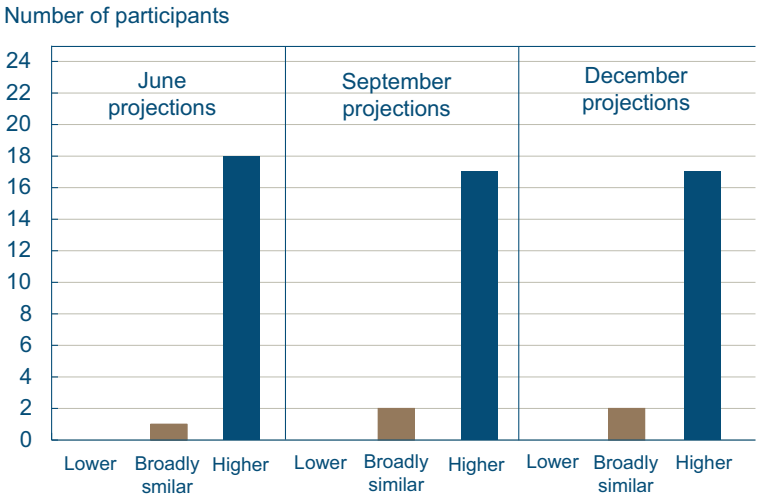
Source: Federal Reserve Board.

Risks to GDP Growth



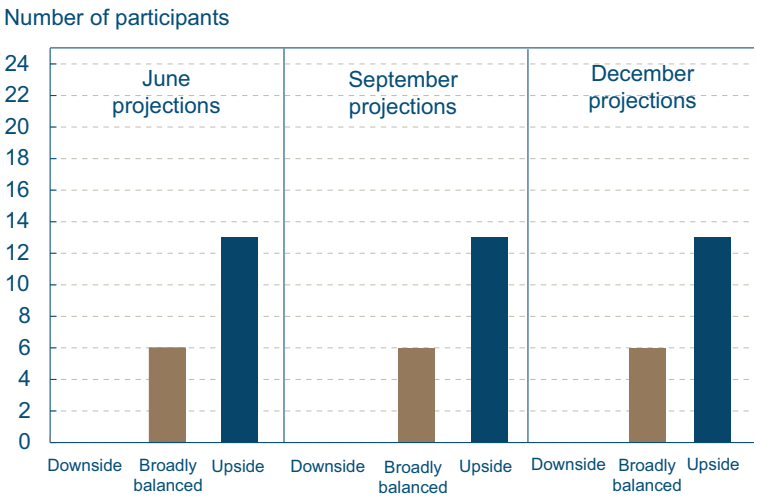
Source: Federal Reserve Board.

Uncertainty about the Unemployment Rate



Source: Federal Reserve Board.

Risks to the Unemployment Rate



Source: Federal Reserve Board.

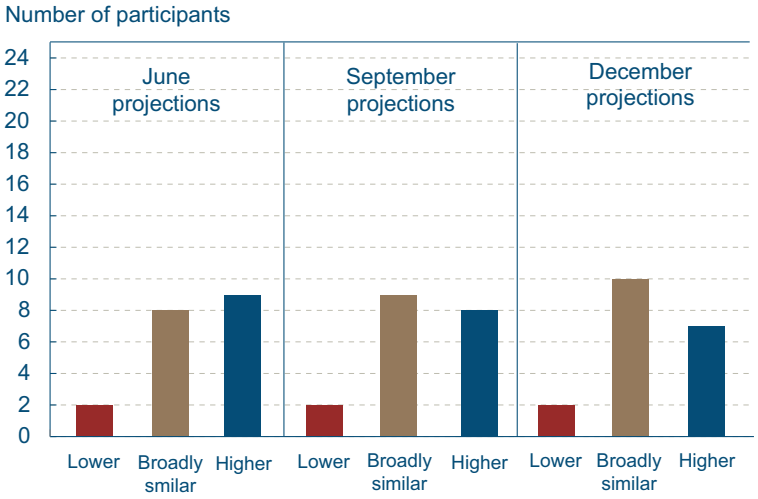
was less agreement from forecasters about the future course of the economy. This measure of uncertainty was generally higher after the recession than it had been over the previous ten years, especially for forecasts of GDP growth, and the higher level persisted for some time. Recently, dispersion has begun to come down to more normal levels, suggesting that uncertainty among forecasters has been declining over the past eight quarters.

Alternative perspectives are presented in the FOMC minutes. The minutes of the December meeting included the FOMC's Summary of Economic Projections for GDP, inflation, and the unemployment rate (SEP). Along with these projections, the SEP includes a survey of each participant's assessment of uncertainty regarding his or her economic projections, compared with the last 20 years for each of the projected variables. In addition, members are asked to assess the distribution of risk—whether is it weighted to the upside or downside, or broadly balanced.

As of the December meeting, FOMC participants generally saw uncertainty related to projections of GDP as higher than it has been in the last 20 years. Only one participant saw uncertainty as broadly balanced, and zero participants saw uncertainty as lower than it has been in the past. This is largely unchanged from the projections reported with the June and September FOMC minutes. More precisely, a majority of participants see the risks to GDP growth as weighted to the downside, meaning that they see a greater potential for GDP growth to turn out lower than expected. However, a growing number of participants did see risks as broadly balanced, meaning that they see some potential for GDP growth to be higher or lower than they project.

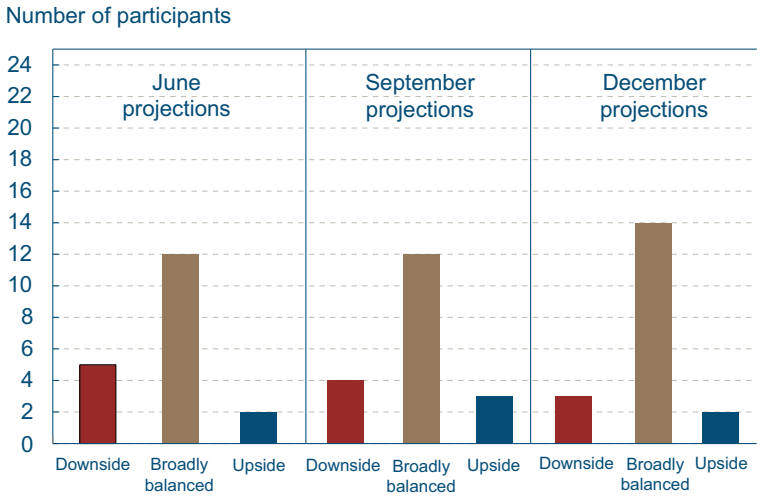
Uncertainty about projections of the unemployment rate was similar to uncertainty regarding GDP growth. A majority of participants saw uncertainty about unemployment as being higher than it has been in the past two decades, while only a few see uncertainty being similar to what it has been in the past. The participants generally reported that they saw the risks to the unemployment rate as weighted to the upside, meaning that

Uncertainty about the Core PCE Inflation



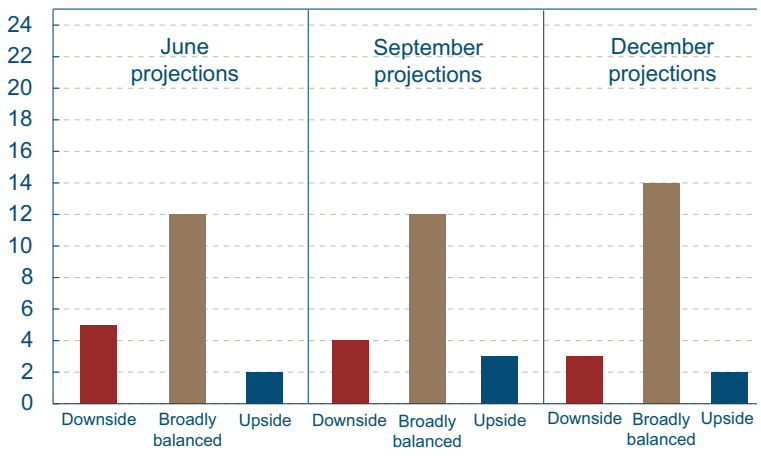
Source: Federal Reserve Board.

Risks to Core PCE Inflation



Source: Federal Reserve Board.

Risks to Core PCE Inflation



Source: Federal Reserve Board.

they saw some potential for the unemployment rate to be higher than expected, given the uncertainty. In contrast to the GDP growth projection, the balance of risks remained unchanged over the past three sets of FOMC projections (April, June, and September).

Unlike uncertainty about GDP and unemployment, uncertainty regarding the projections of inflation has been declining, compared with the past two sets of SEP projections. A majority of participants saw uncertainty about inflation as broadly similar to the level of uncertainty over the past 20 years. Additionally, an increasing number of participants generally saw the risks to inflation as broadly balanced.

It has been more than three years since the end of the last recession, and uncertainty, measured either using differences in forecasters' predictions about the future or by policymakers' perceptions of their own projections, still remains high. As the recovery continues, and conditions continue to normalize, uncertainty should continue to come back down to more normal levels.

Yield Curve and Predicted GDP Growth, January 2013

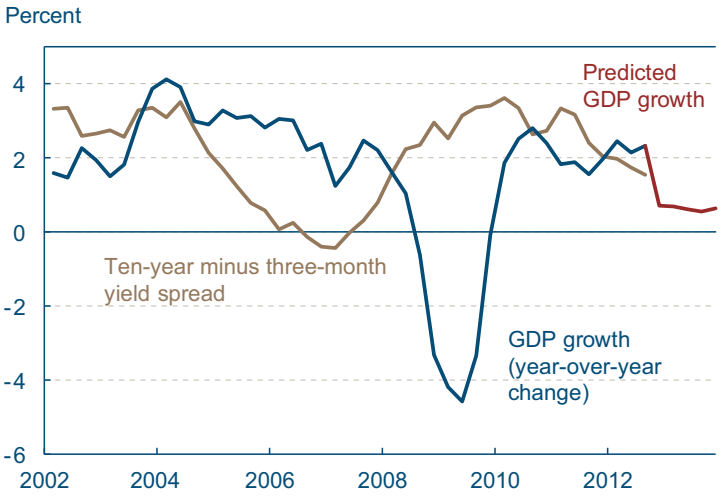
Covering December 14, 2012–January 18, 2013
by Joseph G. Haubrich and Patricia Waiwood

Highlights

	January	December	November
Three-month Treasury bill rate (percent)	0.08	0.07	0.09
Ten-year Treasury bond rate (percent)	1.87	1.69	1.67
Yield curve slope (basis points)	179	162	158
Prediction for GDP growth (percent)	0.6	0.6	0.6
Probability of recession in one year (percent)	7.1	8.6	9.2

Sources: Board of Governors of the Federal Reserve System; authors' calculations.

Yield Curve Predicted GDP Growth



Sources: Bureau of Economic Analysis, Federal Reserve Board, authors' calculations.

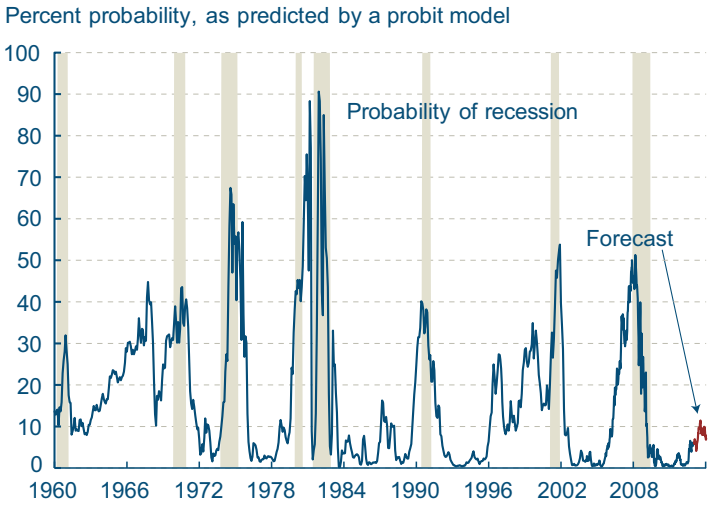
Overview of the Latest Yield Curve Figures

Over the past month, the yield curve has gotten noticeably steeper, with long rates moving up and short rates barely budging. The three-month Treasury bill rose to 0.08 (for the week ending January 18), just up from December's 0.07 percent, though still a hair below November's 0.09 percent. The ten-year rate, at 1.87, jumped up from December's 1.69 percent, and is a full 20 basis points above November's 1.67 percent. The slope increased to 187 basis points, well above December's 162 basis points, and November's 158, and finally above the 179 basis points seen in October.

The steeper slope was not enough to have an appreciable change in projected future growth, however. Projecting forward using past values of the spread and GDP growth suggests that real GDP will grow at about a 0.6 percent rate over the next year, even with both October and November. The strong influence of the recent recession is still leading towards relatively low growth rates. Although the time horizons do not match exactly, the forecast comes in on the more pessimistic side of other predictions but like them, it does show moderate growth for the year.

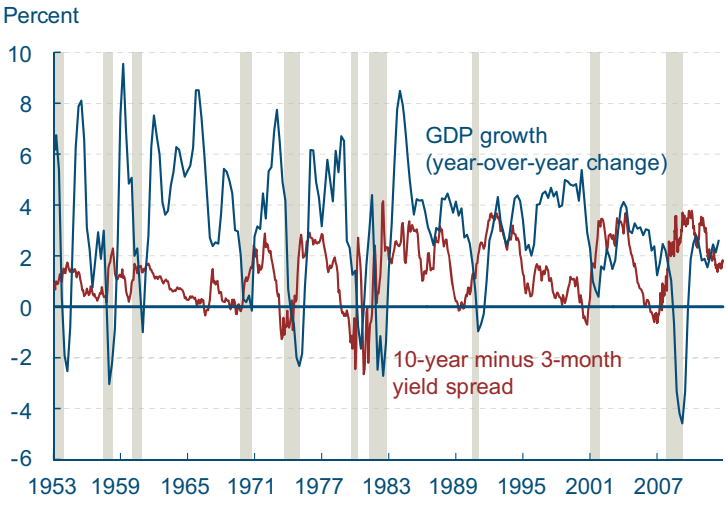
The slope change had a bit more impact on the probability of a recession. Using the yield curve to predict whether or not the economy will be in recession in the future, we estimate that the expected chance of the economy being in a recession next January at 7.1 percent, down from December's value of 8.6 percent, and below November's 9.2 percent, So although our approach is somewhat pessimistic as regards the level of growth over the next year, it is quite optimistic about the recovery continuing.

Recession Probability from Yield Curve



Note: Shaded bars indicate recessions.
Sources: Bureau of Economic Analysis, Federal Reserve Board, authors' calculations.

Yield Curve Spread and Real GDP Growth



Note: Shaded bars indicate recessions.
Source: Bureau of Economic Analysis, Federal Reserve Board.

The Yield Curve as a Predictor of Economic Growth

The slope of the yield curve—the difference between the yields on short- and long-term maturity bonds—has achieved some notoriety as a simple forecaster of economic growth. The rule of thumb is that an inverted yield curve (short rates above long rates) indicates a recession in about a year, and yield curve inversions have preceded each of the last seven recessions (as defined by the NBER). One of the recessions predicted by the yield curve was the most recent one. The yield curve inverted in August 2006, a bit more than a year before the current recession started in December 2007. There have been two notable false positives: an inversion in late 1966 and a very flat curve in late 1998.

More generally, a flat curve indicates weak growth, and conversely, a steep curve indicates strong growth. One measure of slope, the spread between ten-year Treasury bonds and three-month Treasury bills, bears out this relation, particularly when real GDP growth is lagged a year to line up growth with the spread that predicts it.

Predicting GDP Growth

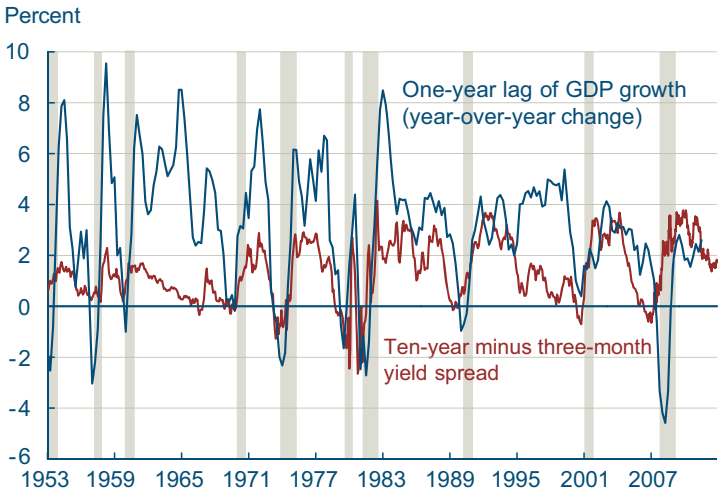
We use past values of the yield spread and GDP growth to project what real GDP will be in the future. We typically calculate and post the prediction for real GDP growth one year forward.

Predicting the Probability of Recession

While we can use the yield curve to predict whether future GDP growth will be above or below average, it does not do so well in predicting an actual number, especially in the case of recessions. Alternatively, we can employ features of the yield curve to predict whether or not the economy will be in a recession at a given point in the future. Typically, we calculate and post the probability of recession one year forward.

Of course, it might not be advisable to take these numbers quite so literally, for two reasons. First, this probability is itself subject to error, as is the case with all statistical estimates. Second, other researchers have postulated that the underlying determinants of the yield spread today are materi-

Yield Spread and Lagged Real GDP Growth



Note: Shaded bars indicate recessions.
Sources: Bureau of Economic Analysis, Federal Reserve Board.

ally different from the determinants that generated yield spreads during prior decades. Differences could arise from changes in international capital flows and inflation expectations, for example. The bottom line is that yield curves contain important information for business cycle analysis, but, like other indicators, should be interpreted with caution. For more detail on these and other issues related to using the yield curve to predict recessions, see the Commentary "Does the Yield Curve Signal Recession?" Our friends at the Federal Reserve Bank of New York also maintain a website with much useful information on the topic, including their own estimate of recession probabilities.

For more on the yield curve, read the *Economic Commentary* "Does the Yield Curve Signal Recession?" at http://www.clevelandfed.org/Research/Commentary/2006/0415.pdf.

For more on the Federal Reserve Bank of New York's estimate fo recession, visit http://www.newyorkfed.org/research/capital_markets/ycfaq.html.

Exports from the Fourth District States

1.31.13
by Stephan Whitaker and Christopher Vecchio

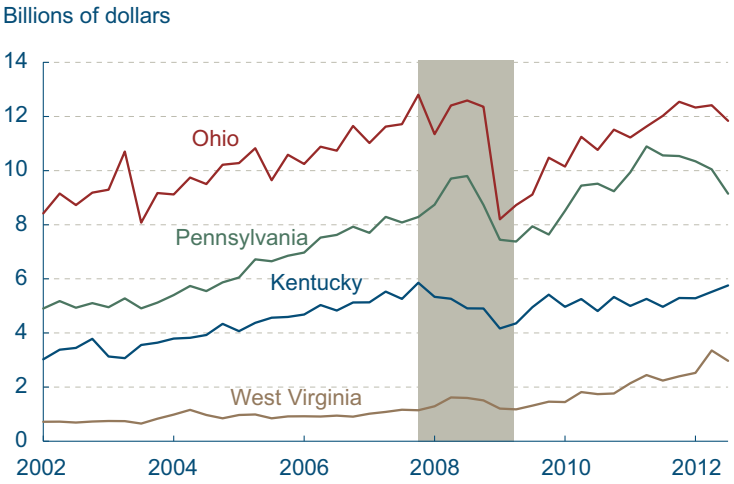
In the Fourth District states of Kentucky, Ohio, Pennsylvania, and West Virginia, exports make a significant contribution to the economy. The total value of goods exported by these states is approximately $122 billion per year, which equals just under ten percent of their combined Gross State Products. In the recent recession, their exports took a hit but have since rebounded. Despite a moderate slowdown in the third quarter of 2012, long-term trends in the Fourth District's exports look promising. Foreign sales of chemicals are increasing, and markets in China and Mexico are growing.

During the recession, total exports from the Fourth District declined by over 18 percent. Since then, exports from Kentucky, Ohio, and Pennsylvania have slowly returned to pre-recession peaks. Meanwhile, West Virginia's exports have soared, as markets abroad have demanded the state's mineral products.

Among the Fourth District states, West Virginia's total exports have shown the most impressive trend. Before the recession, the value of West Virginia's exports was approximately $1 billion per quarter. Since the recession, that value has climbed above $2.5 billion, driven by mining products including coal. (These figures are adjusted for inflation to represent 2012 dollars.) Kentucky's total exports have slowly returned to their pre-recession peak near $5.8 billion per quarter. Ohio and Pennsylvania have also recovered from precipitous drops in exports during the recession. For Ohio, exports averaged a near-peak $12.2 billion per quarter in the first three quarters of 2012. Pennsylvania's exports grew to a new high of $10.9 billion in the second quarter of 2010 before sliding back to $9.1 billion in the third quarter of last year.

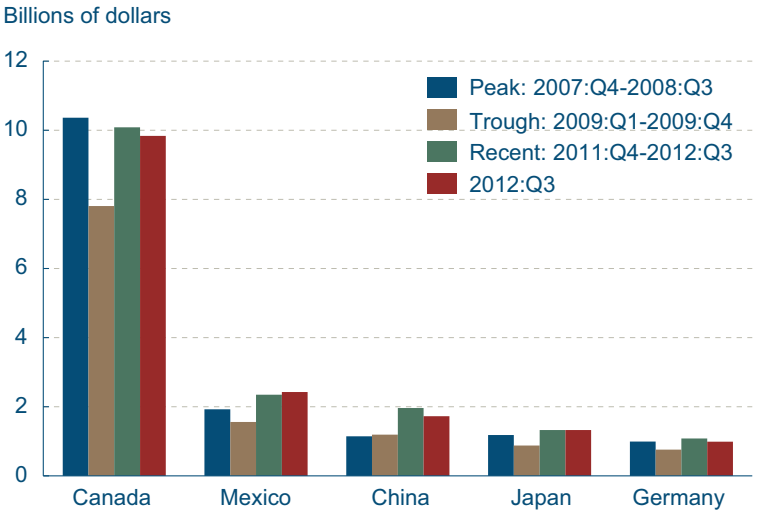
Slowdowns in exports to China and the euro zone received much attention last year, but the greatest concern for Fourth District exporters is still North America. Canada is by far the largest purchaser of

Value of Total Exports



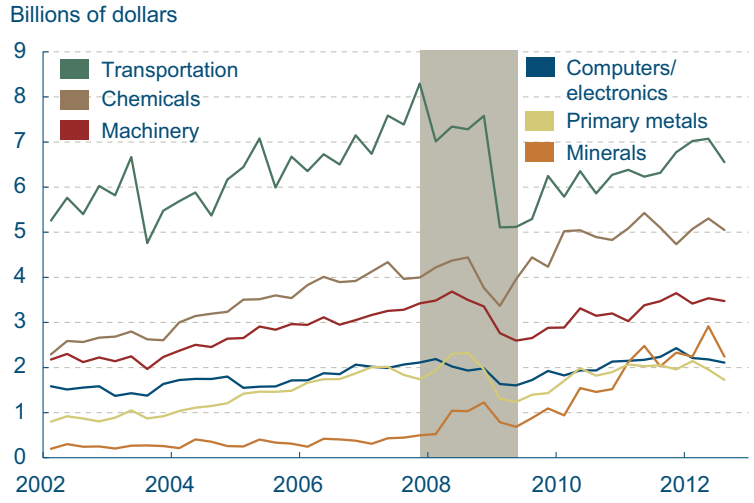
Note: Shaded bar indicates a recession.
Sources: WISER, Haver Analytics.

Average Value of Total Exports



Sources: Bureau of Economic Analysis, WISER, Haver Analytics.

Fourth District Exports by Export Type



Note: Shaded bar indicates a recession.
Sources: WISER, Haver Analytics.

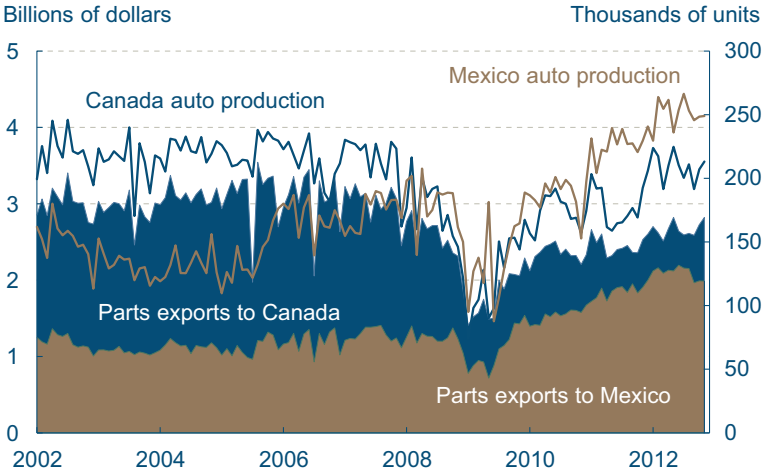
Fourth District exports, followed by Mexico. Despite a relatively mild recession in Canada, exports heading there dropped from a peak of $10.4 billion per quarter in 2008 to $7.8 billion per quarter in 2009. Fourth District exports to Mexico have grown 22 percent above their pre-recession peak.

As of third quarter 2012, exports to Canada and Germany were down 6 to 7 percent from the previous quarter. While sales to China fell from $2.2 billion to $1.7 billion, total exports in those quarters and the two before were nearly double the total value of exports in 2007.

The Fourth District states are major exporters of durable and intermediate manufactured goods. These sectors are highly cyclical, and this can be seen when we look at exports in transportation equipment, machinery, and metals over time. While each of these categories has recovered since 2009, transportation equipment and primary metals are still below their peak values after adjusting for inflation. Chemicals has been a growth category for the district, and the district may benefit from the expansion of natural gas production because natural gas is a key input for the manufacturing of chemicals. The third quarter of 2012 saw declining values for six of the district's most important export categories: transportation equipment, chemicals, machinery, electronics, metals, and minerals.

The underlying driver of several of these trends in Fourth District exports is the integration of the North American auto industries. The volume of U.S. auto parts exported to Canada closely follows Canadian auto production volumes. Auto parts are the highest-value component of Ohio's largest exporting sector, transportation equipment. Canadian auto production dropped 46 percent in the recession, bringing down auto parts exports, the transportation equipment category, and Ohio's total exports. Coming out of the recession, Mexico's auto production grew to exceed Canada's. This is reflected in more Fourth District exports heading to Mexico. A large fraction of the exported auto parts are eventually consumed in the U.S. because many of the vehicles assembled in Canada and Mexico are sold in the U.S.

Parts Exports and Auto Production



Source: Census Bureau, Auto News, Haver Analytics.

Percent of U.S. Total Value of Product Exports

	2002	2007	2011:Q4-2012:Q3
Kentucky	1.52	1.68	1.68
Ohio	3.96	3.64	3.12
Pennsylvania	2.25	2.50	2.54
West Virginia	0.32	0.34	0.71

Source: Bureau of Labor Statistics, Current Employment Statistics.

While the Fourth District exports have rebounded during the economic recovery, so has export production around the country. Indeed, over the last decade, the total value of the Fourth District states' exports as a percentage of all U.S. exports has fallen slightly, from 8.05 percent to 7.77 percent. Pennsylvania and West Virginia have increased their share of total U.S. exports. Although Ohio and Kentucky's exports have returned to peak levels, they have not kept up with the growth of all U.S. product exports, and as such, their share of U.S. exports has declined.

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