

# Economic Trends

January 2011: Supplemental (December 10, 2010-January 11, 2011)

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FEDERAL RESERVE BANK  
*of* CLEVELAND

# The Yield Curve and Predicted GDP Growth: November 2010

## Highlights

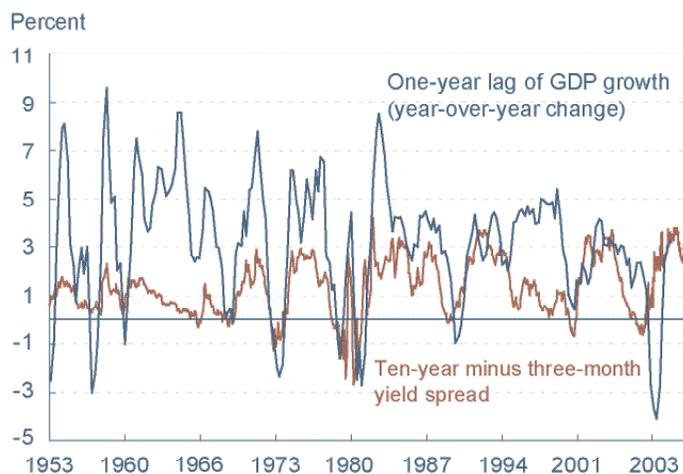
	December	November	October
3-month Treasury bill rate (percent)	0.14	0.14	0.14
10-year Treasury bond rate (percent)	3.18	2.89	2.05
Yield curve slope (basis points)	304	275	236
Prediction for GDP growth (percent)	1.0	1.0	1.0
Probability of recession in 1 year (percent)	1.5	2.3	3.9

## Yield Curve Spread and Real GDP Growth



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

## Yield Spread and Lagged Real GDP Growth



Sources: Bureau of Economic Analysis, Federal Reserve Board.

Covering November 19, 2010–December 10, 2010  
by Joseph G. Haubrich and Timothy Bianco

## Overview of the Latest Yield Curve Figures

Continuing a recent trend, the yield curve moved sharply steeper over the past month, as long rates increased nearly three-tenths of one percent, and short rates held steady. The three-month Treasury bill rate stayed at 0.14 percent, where it has been since October. The ten-year rate rose to 3.18, up from November's 2.89 percent, which itself was well above October's 2.50 percent. The slope rose a hefty 29 basis points (bp) to end above 300 bp for the first time in a while, a full 68 bp above October's 236 bp.

Projecting forward using past values of the spread and GDP growth suggests that real GDP will grow at about a 1.0 percent rate over the next year, the same projection as in October and September. Although the time horizons do not match exactly, this comes in on the more pessimistic side of other forecasts, although, like them, it does show moderate growth for the year.

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 December is 1.5 percent. This drop from November's 2.3 percent and October's 3.9 percent reflects the steeper yield curve.

## 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

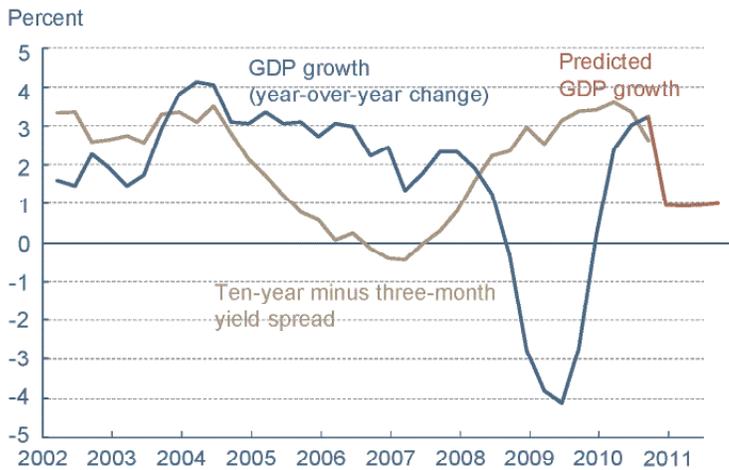
We use past values of the yield spread and GDP growth to project what real GDP will be in the future. We typically calculate and post the prediction for real GDP growth one year forward.

### 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.

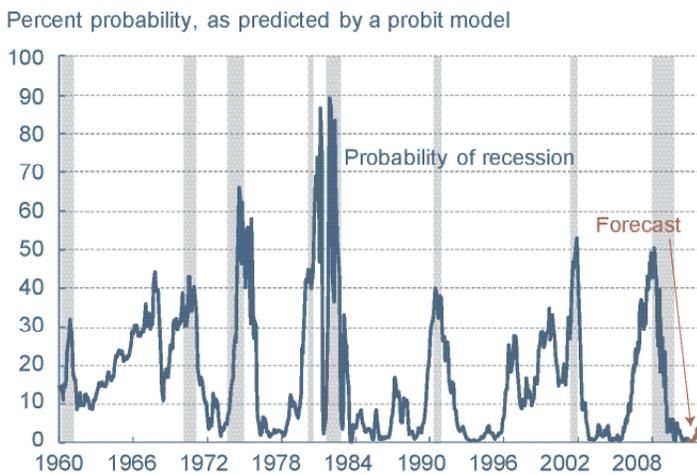
Of course, it might not be advisable to take these number quite so literally, for two reasons. First, this probability is itself subject to error, as is the case with all statistical estimates. Second, other researchers have postulated that the underlying determinants of the yield spread today are materially 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?” The Federal Reserve Bank of New York also maintains a website with much useful information on the topic, including its own estimate of recession probabilities.

## Yield Curve Predicted GDP Growth



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

## Recession Probability from Yield Curve



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

# Ten-Year Treasury Rates

12.20.10

by Ben R. Craig and Matthew Koepke

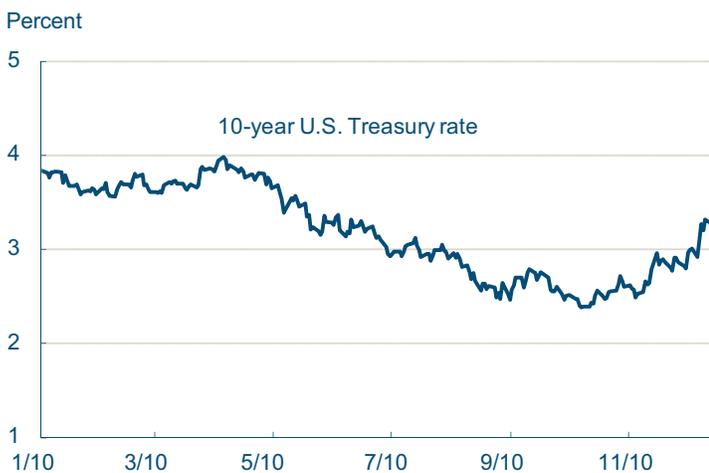
On November 3, 2010, the Federal Reserve Board of Governors announced a second round of quantitative easing. Voicing concern over high unemployment, modest income growth, lower housing wealth, and tight credit, the Federal Open Market Committee (FOMC) stated that it intended to purchase \$600 billion of longer-term Treasury securities through the second half of 2011, at rate of \$75 billion per month. By purchasing longer-term securities, the Federal Reserve hopes to promote a stronger rate of economic recovery by reducing longer-term interest rates. The FOMC reaffirmed its commitment to longer-term Treasury purchases in its December 14 FOMC statement, citing that the recovery has been insufficient in bringing down unemployment.

Since the November 3 meeting, interest rates on 10-year Treasury bonds have increased. Between the November 3 and December 14 FOMC statements, rates on 10-year Treasuries have increased 90 basis points, from 2.57 percent to 3.47 percent. The rate on 10-year Treasuries is at its highest level since May 2010.

The increase in 10-year Treasury rates can be partly explained by examining changes in investors' expectations about short-term interest rates. Thirty-day federal funds futures represent an excellent measure of the market's perception of what short-term rates will be in the future. Since the November 3 FOMC statement, the October 2012 fed funds futures have increased 61 basis points from, 0.48 percent to 1.09 percent. The increase suggests that the market expects average short-term rates to increase, consequently driving up rates on longer-term securities.

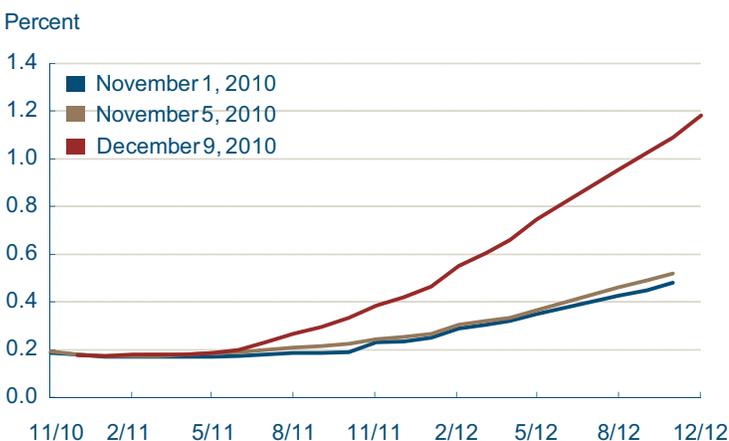
In addition to examining investors' expectations for short-term interest rates, it is also important to examine the factors that influence the premium investors charge for holding securities with longer maturities (the "term premium"). One principal factor included in the term premium is investors'

## United States Treasury Rates



Source: Bloomberg.

## 30-Day Fed Fund Futures



Source: Bloomberg.

## Implied Inflation Rates



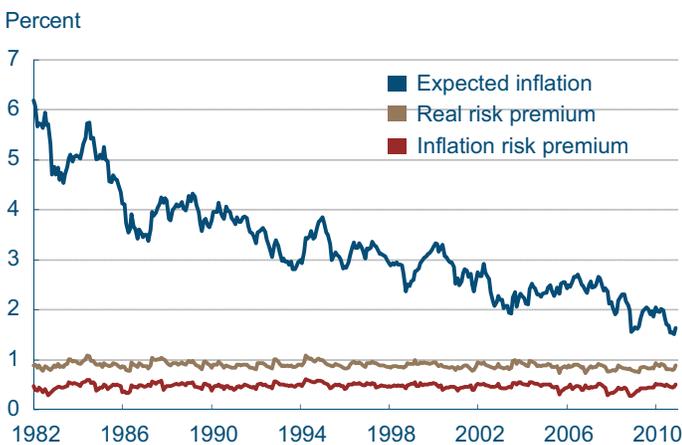
Source: Bloomberg.

expectations of future inflation. Currently, inflation remains subdued, with the latest numbers from the Bureau of Labor Statistics showing that the CPI is up only 1.1 percent over the past 12 months. Additionally, according to the Federal Reserve Bank of Cleveland's recent estimates of inflation expectations, 10-year expected inflation is 1.64 percent, suggesting that the public expects inflation to remain under 2.0 percent for the next 10 years.

Two other potential sources of the increase in 10-year Treasury rates are an improved economic outlook and an increase in the number of Treasuries issued by the United States government. The economic outlook may be improving on account of the recent proposal of a bipartisan tax plan (H.R. 4853), which includes an extension of all income and investment tax rates for the next two years, an extension of unemployment insurance benefits, and a reduction in the employee payroll tax. The passage of H.R. 4853 coincides with upward economic forecast revisions from economists.

The Congressional Budget Office estimates that the passage of H.R. 4853 will add \$857.8 billion to the federal deficit, with the bulk of the increase in the deficit coming in 2011, 2012, and 2013. Given the moderately improved forecasted economic conditions and the likelihood that the federal government will have to issue new debt to finance H.R. 4853, it is possible that the increase in the 10-year Treasury bond rate is measuring the market's perception that the quantitative easing program will end in mid-2011 at the same time the federal government will be issuing new debt to finance the tax plan.

## Ten-Year Expected Inflation and Real and Nominal Risk Premia



Source: Haubrich, Pennacchi, Ritchken (2008).

## Gross Domestic Product Consensus Forecast

	November 2011	November 2012	December 2011	December 2012
Average forecast	2010	9.8	13.0	7.1
Median forecast	2010	28.7	28.2	19.8

Source: Mortgage Bankers Association.

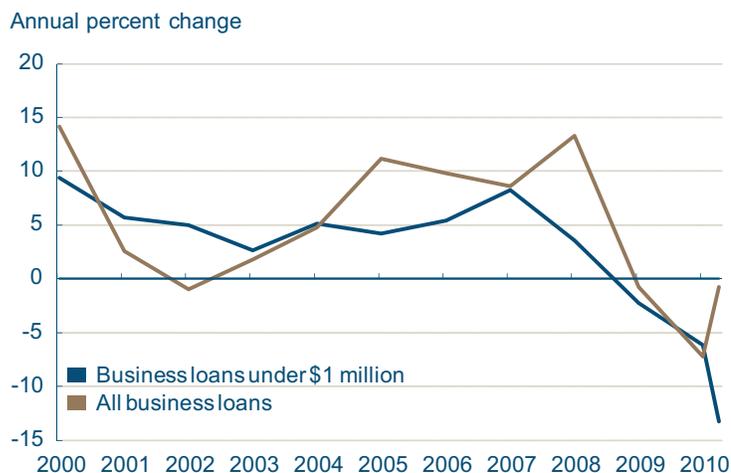
For more information on the Federal Reserve Bank of Cleveland's estimates of inflation expectations, please visit [http://www.clevelandfed.org/research/data/inflation\\_expectations/index.cfm](http://www.clevelandfed.org/research/data/inflation_expectations/index.cfm)

## Continued Weakness in Small Business Lending

12.20.10

by Matthew Koepke and James B. Thomson

### Small Business Loan Balances

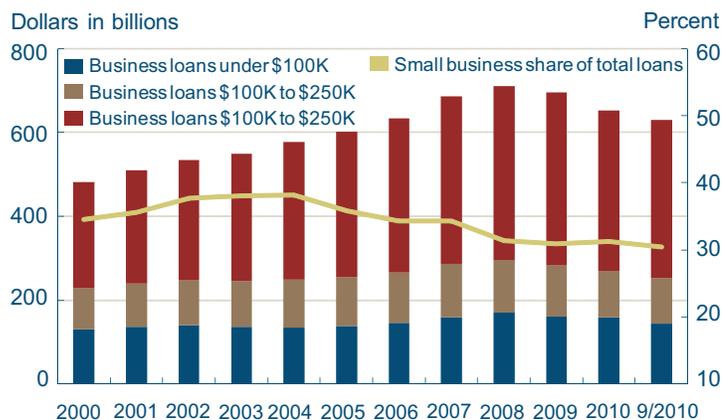


Source: FDIC.

As the economy emerges from the worst economic downturn since the Great Depression, concerns remain about the slow, ongoing weakness in credit markets, in particular, the small business loan market. The most recent data on the primary source of loans to small businesses, FDIC-insured banks and thrifts, adds credence to this concern.

From 2000 to 2008, the overall business loan portfolios of FDIC-insured institutions grew on average 7.2 percent a year. Small business loan balances (loans under \$1 million) grew at a slightly slower annual rate of 5.5 percent over the same period. Since then, however, the business loan portfolios of FDIC-insured banks and thrifts have shrunk a total of 8.0 percent, with small business loan balances falling by nearly 8.5 percent. Third-quarter numbers for 2010 showed that overall holdings of business loans appeared to be stabilizing, but small business loan balances continued to decline at an annualized rate of 13.3 percent from the end of the second quarter.

### Small Business Loan Balance

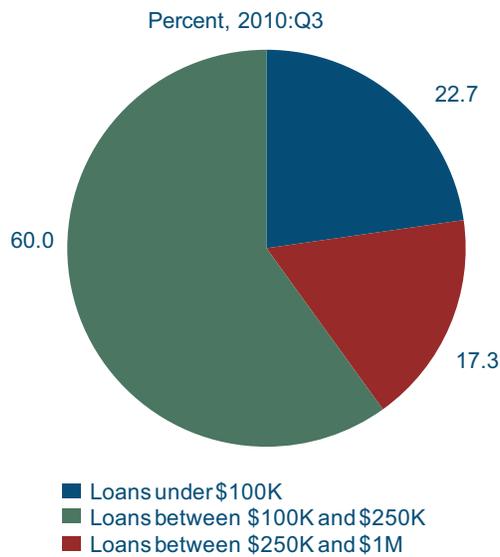


Source: FDIC

Looking at the balances of small business loans held by FDIC-insured banks and thrifts we see a similar pattern. Total holdings of small business loans peaked in 2008 at \$711 billion. Since then, total holdings of small business loans have declined through the third quarter of 2010 to just under \$631 billion, with all three categories of loan size (loans under \$100,000, loans between \$100,000 and \$250,000, and loans between \$250,000 and \$1 million) experiencing the same pattern of growth and subsequent decline. Interestingly, small business loans as a share of total business loans peaked in 2004, well before the peak of the small business loan portfolios in 2008, illustrating the fact that small business loan growth lagged that of total business loans over much of the decade.

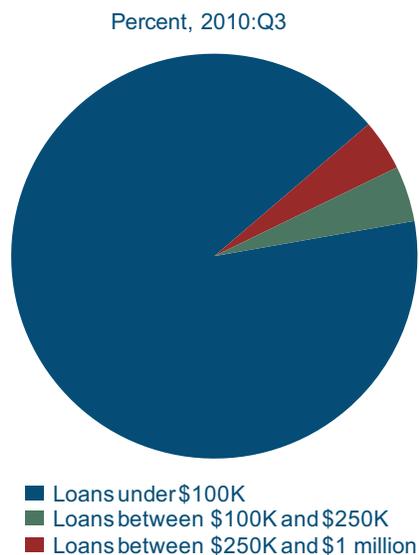
The main driver of the changes in small business loan balances for banks and thrifts is business loans over \$250,000 and less than \$1 million. These

## Small Business Loan Share: Amount



Source: FDIC.

## Small Business Loan Share: Volume



Source: FDIC.

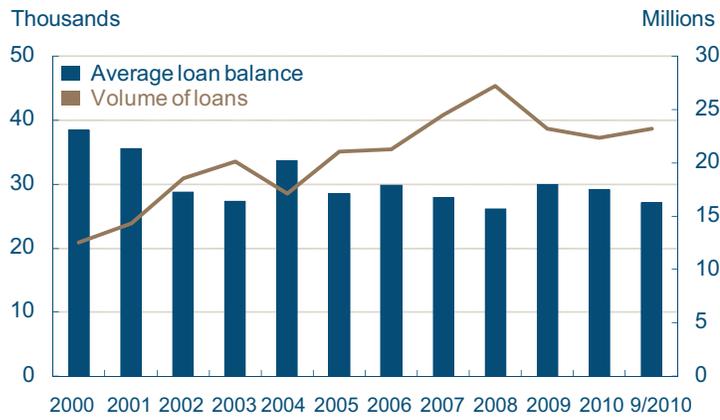
loans account for 60 percent of the total dollar amount of small business loans held by FDIC-insured institutions but only 4.4 percent of small business loans in terms of numbers of loans.

From the 2000 to 2008, the increase in small business loans was driven by an increase in the number of loans made. The general decline in the average small business loan made over this time period was due in large part to strong growth in the number of loans under \$100,000. While the average growth in the small business loan portfolios of banks and thrifts through 2008 was 13 percent, the number of loans under \$100,000 grew 14 percent compared to 6 percent and 7 percent for loans between \$100,000 and \$250,000 and loans between \$250,000 and \$1 million, respectively. From June 2008 to June 2010, the shrinking small business loan portfolios of FDIC-insured institutions have been driven by a combination of shrinking loan balances (falling 4 percent a year) and declines in the numbers of loans (falling nearly 9 percent a year). Again, the reversal of growth in the number of loans has been driven by the decline in the number of loans under \$100,000, which declined nearly 10 percent a year between June 2008 and June 2010. In comparison, the number of loans between \$250,000 and \$1 million fell only one percent a year and those \$100,000 and \$250,000 fell only 4 percent a year over the same time period.

The FDIC's 2010 third-quarter data showed continued decline in small business loan portfolios, as total loans declined at an annualized rate of 13 percent, falling \$22.6 billion. Continued shrinkage of small business loans held by FDIC-insured institutions in the third quarter of 2010 was due to a decline in the average loan balance, as the number of loans increased at a 15 percent annualized rate. A look behind the numbers for the third quarter of 2010 shows that the increase in the number of loans comes from growth in loans under \$100,000 (19 percent annualized); the number of loans between \$250,000 and \$1 million and between \$100,000 and \$250,000 fell more than 3 percent and 1 percent, respectively.

Continued shrinkage of the small business loan portfolios of FDIC-insured banks and thrifts mir

## Small Business Loans Under \$1 Million



Source: FDIC.

rors that of overall business lending by these depositories. However, the strong growth in the number of loans under \$100,000 may be the first glimmer of light at the end of the credit tun

## The Accuracy of CPI Inflation Forecasts

1.7.11

by Mehmet Pasaogullari and Brent Meyer

In a recent study we compared the accuracy of different techniques for forecasting future CPI inflation and found that forecast accuracy varied a lot over time and technique. Here, we provide more evidence on the variation of forecast accuracy over time.

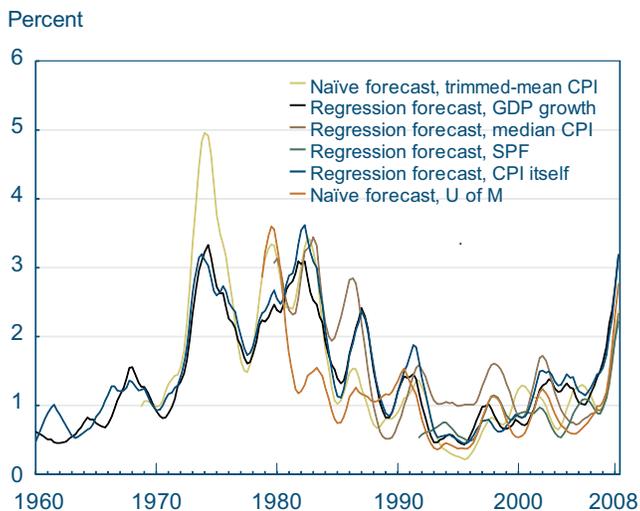
Our study involved constructing many different forecasts of one-year-ahead annual CPI inflation using a number of variables and methods and then comparing the accuracy of those forecasts. Variables included CPI inflation, core measures of inflation, measures of economic activity, and inflation expectations obtained from surveys. We incorporated these variables into regressions or simply took their most recent values as the forecast (the so-called “naïve” method). To assess forecast performance, we used the “root mean square error (RMSE)” statistic. The RMSE is the average squared forecast error over the forecast sample, so the higher the RMSE, the higher the deviation (squared) between the forecasted values and the realized values on average. The table below summarizes some of the results of this exercise.

### RMSEs of CPI Inflation Forecasts by Decade

	1960:Q2- 1969:Q4	1970:Q1- 1979:Q4	1980:Q1- 1989:Q4	1990:Q1- 1999:Q4	2000:Q1- 2010:Q2
Regression with CPI inflation	0.98	2.18	2.31	0.96	2.39
Regression with the annualized growth rate of real GDP	0.93	2.09	2.15	0.88	2.39
Regression with median CPI inflation			2.48	1.22	1.57
“Naïve” forecast with 16% trimmed-mean CPI inflation over the past four quarters		2.84	2.07	0.77	1.57
Regression with SPF one-year inflation expectations					1.37
“Naïve” forecast with University of Michigan one-year inflation expectations			1.51	0.88	1.74

Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve Bank of Philadelphia, University of Michigan Survey of Consumers and authors' calculations.

## Rolling RMSEs of CPI Inflation Forecasts

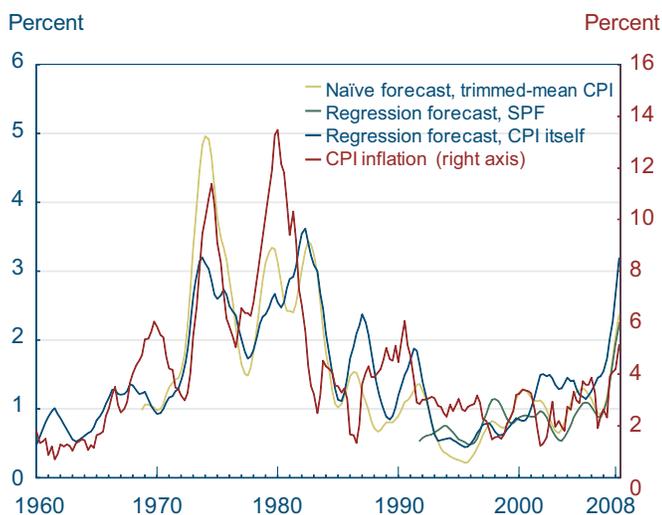


Source: Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve Bank of Philadelphia, University of Michigan Survey of Consumers and authors' calculations.

The rolling RMSEs declined until the mid-1990s. The improved forecast accuracy of the various methods likely reflects the Great Moderation, the period during which many indicators of economic activity became less volatile. However, accuracy for all of the forecasts has deteriorated since the early 2000s. The rolling RMSEs surged especially during the last few observable periods of 2008.

It is also worth mentioning that during most of the time period we examined, forecast accuracy seems to be positively associated with the level of inflation. It might be the case that a higher level of inflation is associated with the higher volatility of inflation, which would make forecasting inflation harder. Given the correlation between forecast accuracy and inflation, one might suggest that the rise in poor performance of the forecasts during 2008 is associated with the higher level of inflation. Indeed, inflation rose in this period after energy and commodity prices spiked. However, we must note that the accuracy of the forecasts for this period is almost as poor as the forecasts made when inflation was in double digits.

## Rolling RMSEs of Inflation Forecasts and the Level of CPI Inflation

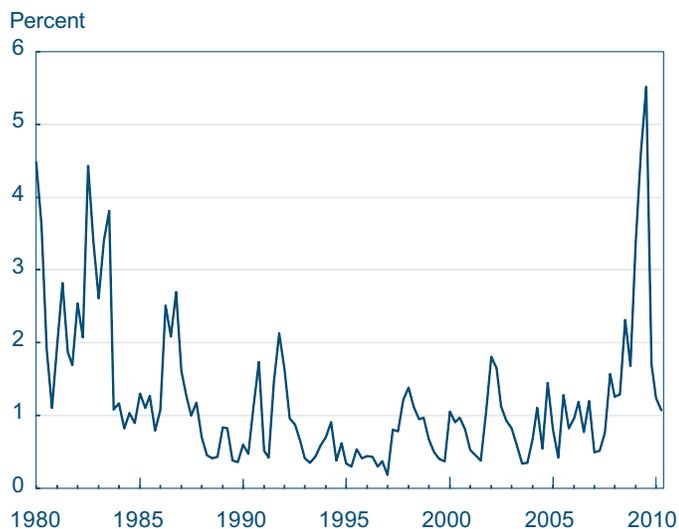


Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve Bank of Philadelphia and authors' calculations.

We also checked the absolute forecast errors of thirteen different forecasts, six of which were used in the above figures. The figure below plots the average absolute forecast error from these forecasts. A look at the figure confirms the general message of the rolling RMSE analysis: Inflation forecasts were pretty accurate in the mid-1990s, they deteriorated in the 2000s, and they performed very poorly in late 2008 and early 2009, during the peak of the financial crisis and the recession.

There are two important implications from these analyses for the accuracy of recent inflation forecasts. First, the rapid increase in the rolling RMSEs in 2008 is mainly due to the considerable deviation that emerged between the predicted and realized values of inflation during the period between the summer of 2008 and the end of 2009. This seems to be related to the large shocks in the economy during this period. First, rising energy prices led to higher CPI inflation in 2008, although this was quickly reversed once the financial crisis hit. Note that the rolling RMSEs started using these observations only from 2007 onward and to a higher

## Average of the Absolute Forecast Errors



Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve Bank of Philadelphia, University of Michigan Survey of Consumers and authors' calculations.

degree for the later periods. The second takeaway is that the accuracy of forecasts improved considerably in the first two quarters of 2010 as these shocks subsided.

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For more information on the Federal Reserve Bank of Cleveland's *Commentary* "Simple Ways to Forecast Inflation: What Works Best?" visit <http://www.clevelandfed.org/research/commentary/2010/2010-17.cfm>

## A Cash Buildup and Business Investment

01.10.11

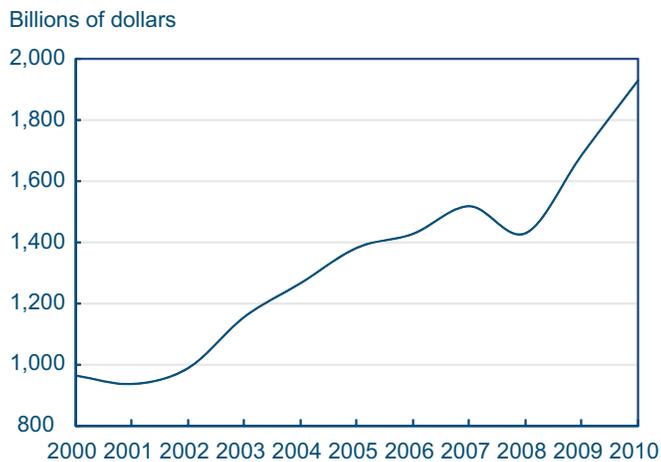
by Robert Sadowski

As the economic recovery continues at a slow pace, some observers point to the vast cash reserves sitting on corporate balance sheets as one reason for a lack of more robust job creation. The thinking is that if firms would simply begin investing this cash in new plants, equipment, and employees, the pace of the recovery would pick up and bring unemployment down. However, many company executives are waiting until the slow pace of the recovery quickens before putting additional cash at risk.

Nonfarm, nonfinancial corporations continue to build their holdings of cash and other liquid assets. By the end of the third quarter 2010, these assets totaled more than \$1.93 trillion, an increase of 14.4 percent over the prior year's level and a rise of 4.7 percent since the end of June 2010. Nationally, cash and checking deposits held by corporate businesses rose by just over 200 percent, or almost \$300 billion, from the beginning of the recession in December 2007 to September 2010. Some of this increase may reflect a reduction in dividend payments (at least through 2009) and the increased proceeds from bond issuance in a low-interest-rate environment. Cash holdings and other liquid assets as a share of total corporate assets also saw a sharp increase, rising around 2 percentage points since the start of the recession. That share is the highest it's been since the mid-1950s (7.4 percent as of September 2010).

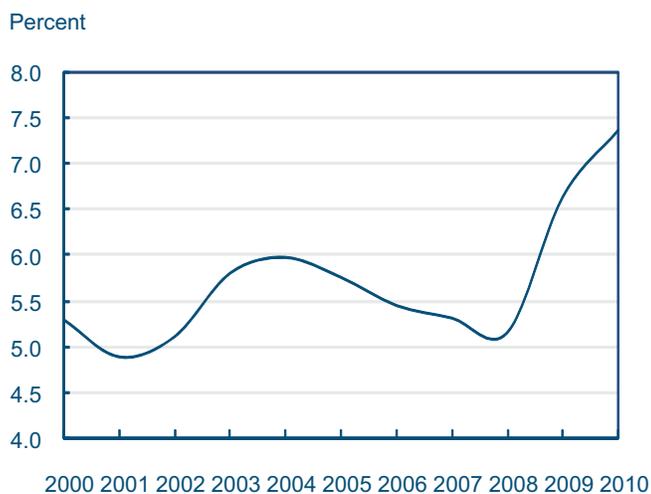
Discussions with business leaders across the Fourth District point to three reasons for the buildup of cash reserves. First, for many corporations, demand uncertainty remains the fundamental issue. As a result, managers are reluctant to put capital at risk. For them, it is difficult to identify projects that make sense at this point in the recovery. Rising exports help some, but they are not seen as a fundamental driver of investment. Second, because of demand uncertainty, companies are very conservative in ordering, which puts additional financial pressure on suppliers, especially those that are small. Banks in turn are reluctant to work with the suppliers, which forces these

### Nonfinancial Corporations: Cash Holdings and Other Liquid Assets



Source: Federal Reserve Board / Haver Analytics

### Nonfinancial Corporations: Cash/Liquid Assets as Share of Total Assets



Source: Federal Reserve Board / Haver Analytics.

businesses to build cash reserves in the event that they cannot obtain credit to cover operating costs. Finally, as long as consumption is moderate, business investment will be moderate. Although recent increases in retail sales are encouraging, many consumers remain wary of committing to big-ticket purchases. This trend is expected to continue until households deleverage and the unemployment rate declines.

The relatively subdued levels of spending by all businesses began to show a modest recovery during the past few quarters. Still, in the third quarter of 2010, spending remained 15 percent below pre-recession levels. Estimated spending in the third quarter was more than \$1.43 trillion (seasonally adjusted annualized rate). This spending is commonly known as business fixed investment (BFI) and includes information processing equipment and software, capital equipment, and structures as its major components.

To gain a better understanding of the near-term investment plans of businesses nationwide, the 12 Federal Reserve Banks were asked by the System's Board of Governors to solicit information from contacts across their Districts in January and July of 2010. Industry sectors included in the Fourth District's inquiries were manufacturing, energy, and freight transportation. The most notable finding that emerged when we compared the District's July results to those from January was a substantial drop among the share of respondents who said that they were planning to increase capital spending.

Our inquiries revealed that during the recession, many District companies cut back or froze capital budgets. As the recovery showed early signs of taking hold late in 2009, managers began to loosen the tight grip they had on spending, and set in motion some projects that had been postponed. By mid-2010, firms felt comfortable with their level of investment, even though it remained substantially below pre-recession levels, and they were determined not to raise it until they felt that a sustainable recovery was under way. Two other possible explanations for the reluctance to raise capital spending as of mid-2010 are suggested by a closer examination of the results of our inquiries.

One explanation is that beginning late in 2009 and continuing through at least the first quarter of 2010, inventory adjustments became a primary driver of

## RMSEs of CPI Inflation Forecasts by Decade

	January 2010 (percent share)	July 2010 (percent share)
<b>Business investment</b>		
Increase	58	37
No change	29	59
Decrease	13	4
<b>Major factors for increasing</b>		
Expect high sales growth	8	19
Need to purchase IT equipment	16	17
Need to purchase capital equipment	29	10
Improved financial position	16	17
<b>Major factors for not increasing</b>		
Expect low sales growth	25	16
Capacity utilization is low	21	14
High level of uncertainty	21	31
Limited need to purchase capital equipment	0	16

Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve Bank of Philadelphia, University of Michigan Survey of Consumers and authors' calculations.

the recovery. In fact, rising inventories accounted for 2.8 percentage points of the 5 percent GDP growth (annualized rate) during the fourth quarter of 2009. To meet this rising demand, many District manufacturers reported a need to replace aging machinery or other equipment. In our January inquiry, the need to purchase capital equipment was the most frequently reported reason for increasing capital outlays (29 percent of respondents cited it). By July, only 10 percent of our contacts saw equipment purchases as important.

The other possible explanation for the decline in planned capital spending is uncertainty about the economic recovery. In the Fourth District's July 2010 inquiry, over 30 percent of respondents cited a heightened level of uncertainty as their primary reason for not increasing current or near-term capital spending. According to our contacts, uncertainty was being driven in part by the policy environment, lingering concerns over the European debt crisis, and sluggish consumer spending. Until more clarity arrives, business owners said that they were likely to postpone decisions on costly investments.

Taking a closer look at national BFI data, we see that business investment declined (21.6 percent) for six straight quarters during the 2007-2009 recession and into the very early stages of the recovery. Since the recovery began, businesses have invested a disproportionate amount of their capital budgets on information processing equipment and software. The average share of BFI used for information processing equipment and software from July 2009 through September 2010 was 42 percent, while capital equipment and structures each garnered about a 29 percent share.

Over the past eight years, business investment in information processing equipment and software rose 45 percent, topping out at \$595.5 billion (nominal) in the third quarter of 2010. With the exception of dips following the dot-com bust and the 2001 and 2007-2009 recessions, spending on information processing equipment and software has shown a strong upward trend. Many business contacts in the Fourth District reported that they never froze capital outlays for technology during the

## Private Investment: Information Processing Equipment and Software

Billions of dollars (seasonally adjusted annual rate)

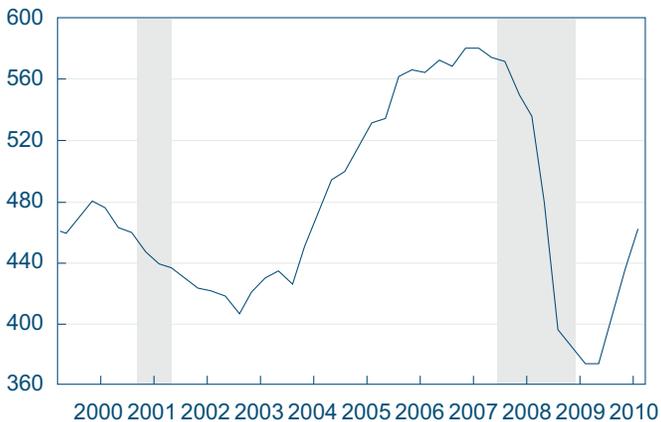


Note: Shaded bars indicate recessions.

Source: Bureau of Economic Analysis/Haver Analytics.

## Private Investment: Capital Equipment

Billions of dollars (seasonally adjusted annual rate)



Note: Shaded bars indicate recessions.

Source: Bureau of Economic Analysis/Haver Analytics.

## Private Investment: Nonresidential Structures

Billions of dollars (seasonally adjusted annual rate)



Note: Shaded bars indicate recessions.

Source: Bureau of Economic Analysis/Haver Analytics.

recession, of which information processing equipment and software is an integral part. Even when demand was at its lowest, the need to contain costs and improve efficiency was ever present. One result of the improved efficiencies they achieved is that as demand picks up, producers feel less of a need to hire new, permanent employees.

When comparing the change in spending for information processing equipment and software during the 2007-2009 recession to the change in investment for capital equipment and structures, three major differences were observed. First, the time between peak spending and a bottoming out was only nine months for information processing equipment and software, while it was more than two years for capital equipment. As for spending on structures, a possible flattening out of the decline was seen toward the end of 2010. Second, the pullback in investment for information processing equipment and software was only 9 percent, while there was a 35 percent drop in outlays for both capital equipment and structures. Finally, the amount of time needed to reach the previous spending peak was much quicker for information processing equipment and software. From the time it bottomed out in the first quarter of 2009, spending on information processing equipment and software reached its previous peak in just over nine months. In contrast, after one year, outlays for capital equipment remain 20 percent below their previous peak. One possible explanation for this large difference in investment is that businesses are not increasing capacity. Data provided by the Federal Reserve show that total industrial capacity leveled out during 2008 and has been relatively flat ever since, although utilization rates are climbing.

Where is business investment expected to head in 2011? Blue Chip consensus forecasts project an increase of 8.7 percent on a year-over-year basis in 2011, which is 3 percentage points more than the year-over-year change that was expected in 2010. Prospects for a rise in BFI would be enhanced if consumer spending continues its upward trend.

Blue Chip Economic Indicators. Randell E. Moore, Executive Editor. Vol. 35, No. 12, December 10, 2010.

## Commodity Prices and Investment in Structures

1.11.11

by Ken Beauchemin and John Lindner

Expansion in drilling and mining has been quite robust. As a result this new activity, nonresidential fixed investment in structures managed to (nearly) tread water in the third quarter, falling only 3.6 percent compared to a 13.5 percent drop over the previous four quarters.

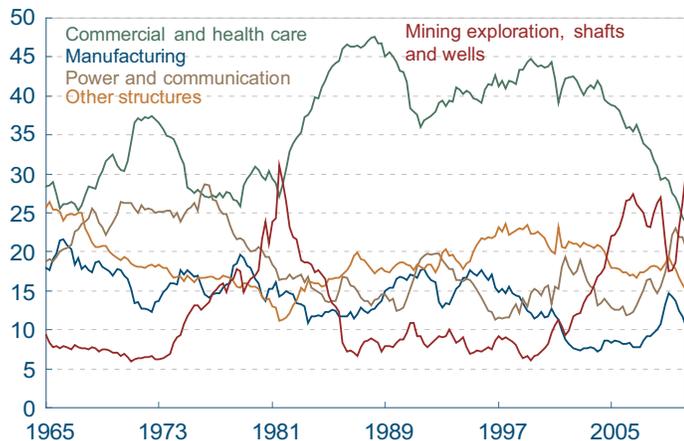
The top line of nonresidential investment in structures is becoming increasingly difficult to interpret due to the rapid rise of China, India, and other emerging-market economies. The devil, of course, is in the details. Natural resources turn out to be the key. Since 2000, the inexorable ascent of the emerging markets has driven world commodity prices higher and with them, the return to investments in oil, gas, and mineral extraction. Commodity demand naturally fell back some during the last recession, but it is once again booming. As a consequence, investments associated with these activities are rapidly becoming one of the biggest pieces of investment in structures and they now comprise nearly one-third of the total.

The chart below reveals the rather tight relationship between oil prices (in 2005 dollars) and structural investment used for mining exploration, shafts, and wells. The second chart depicts a similar, but less tight, relationship with these investments and metals prices. At first glance, it may seem puzzling that investment in structures responds so quickly to price changes. But unlike most other components of structural investment, most of these investments are not in buildings, per se. Instead, a hole in the ground is considered a structure. Not only is a new well counted as an investment in a structure, but so is drilling further into an existing oil or natural gas well. A similar convention applies to mines. Thus when oil, natural gas, and other commodity prices fluctuate, these expenditures can, and do, respond quickly. Analysts beware.

Should one expect further rises in the relative

### Fixed Investment in Structures

Share of nonresidential fixed investment



Sources: Bureau of Economic Analysis, authors' calculation.

### Fixed Investment: Mining, Shafts and Wells

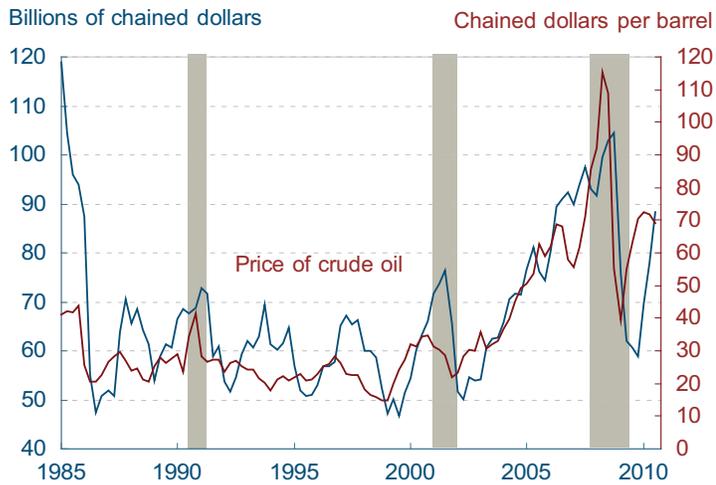
Share of nonresidential fixed investment



Note: Shaded bars indicate recessions.

Sources: Bureau of Economic Analysis, author's calculation.

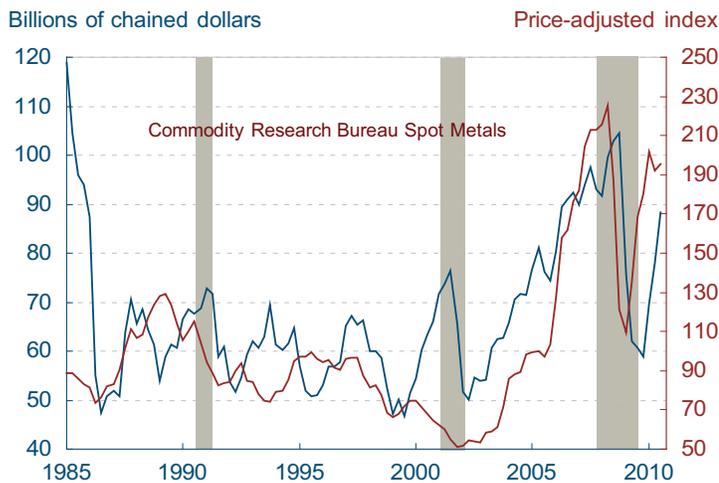
## Fixed Investment: Mining, Shafts, and Wells



Note: Shaded bars indicate recessions.  
Sources: Bureau of Economic Analysis, FIBER.

importance of these investments? After all, the first chart above shows that investments in oil, gas, and mineral extraction contributed a slightly larger share, albeit briefly, to structural investment at the outset of the 1980s, but then fell quickly back. But then was different than now. Oil, and OPEC's tight grip on its supply was the story then. And, as a political phenomenon, it quickly caved to other nations' efforts to economize on oil and find new supplies. Today, the developing world has much farther to go, and will continue to do so in rapid fashion. The currently phenomenal global demand for basic commodities should not give way any time soon.

## Fixed Investment: Mining, Shafts, and Wells



Sources: Bureau of Economic Analysis, Commodity Research Bureau.

## Fourth District Employment Conditions

1.11.11

by Tim Dunne, Kyle Fee, and Mary Zenker

Unemployment remains quite high in the nation and higher still in the Fourth District, though it has been nearly 18 months since the recovery began. The unemployment rate in the Fourth District inched down to 10.0 percent in November, while in the nation as a whole it is slightly lower but still high (9.8 percent in November and 9.4 percent in December).

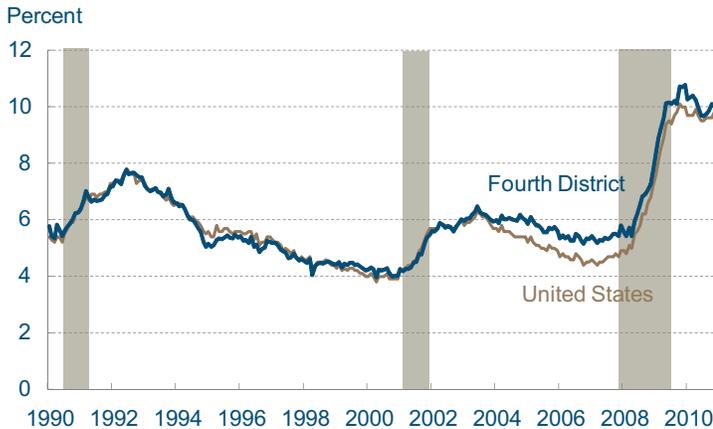
The persistently high levels of unemployment at the national and Fourth District levels reflect both the depth of the recession and the slow pace of employment growth during the recovery cycle. In the past, it has taken Ohio roughly three years from the start of the recession to bring its employment back to the pre-recession level. It has now been 35 months since the last recession began, yet Ohio's employment level remains 7.5 percent below its pre-recession level.

Pennsylvania has experienced considerably smaller employment losses. Employment fell by only 4.4 percent from December 2007 to December 2009. In addition, there has been a somewhat more noticeable, though still anemic, bounce back in Pennsylvania.

Comparing the employment patterns of all the Fourth District states during the latest recession and recovery, we see that in each state, employment declined for roughly two years from the start of the recession before bottoming out. The pace of the recovery has been relatively uneven, with little net employment growth seen over the past six months. In terms of employment losses, the recession has been relatively severe in Ohio, milder in Pennsylvania and West Virginia, and on par with the nation in Kentucky, where losses have closely tracked the national path throughout the recession and recovery cycle.

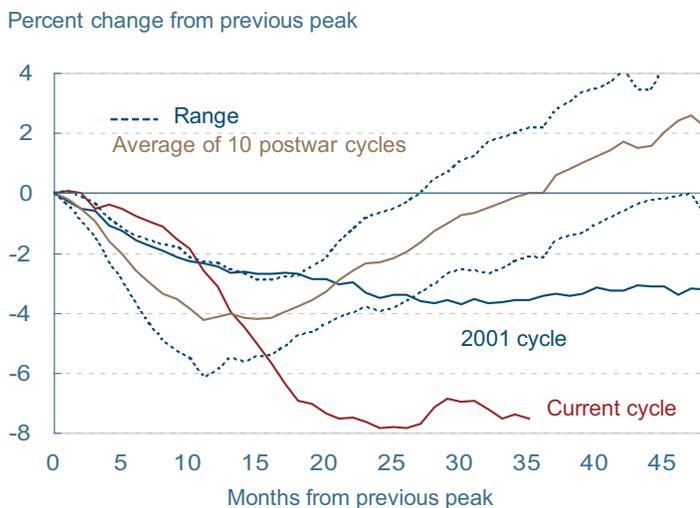
One possible explanation for differences in employment losses across states is that industry structure differs in each state and the recession's impact has

### Unemployment Rate



Notes: Seasonally adjusted using the Census Bureau's X-11 procedure. Shaded bars represent recessions. Some data reflect revised inputs, reestimation, and new statewide controls. For more information, see <http://www.bls.gov/lau/launews1.htm>. Source: U.S. Department of Labor, Bureau of Labor Statistics.

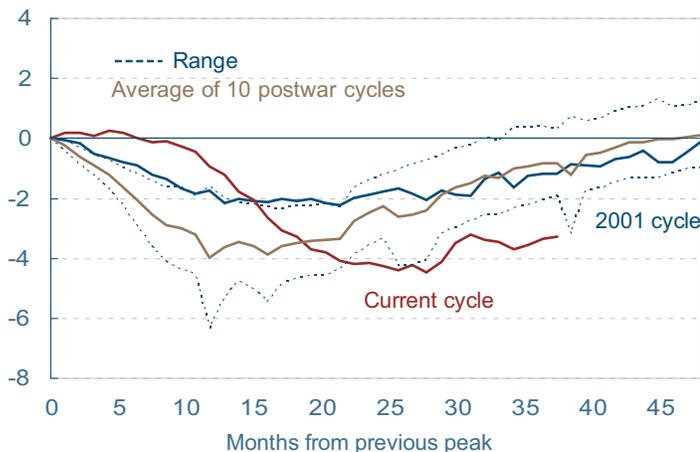
### Ohio Payroll Employment



Source: Bureau of Labor Statistics.

## Pennsylvania Payroll Employment

Percent change from previous peak



Source: Bureau of Labor Statistics.

## Fourth District State Payroll Employment

Percent change from previous peak



Source: Bureau of Labor Statistics.

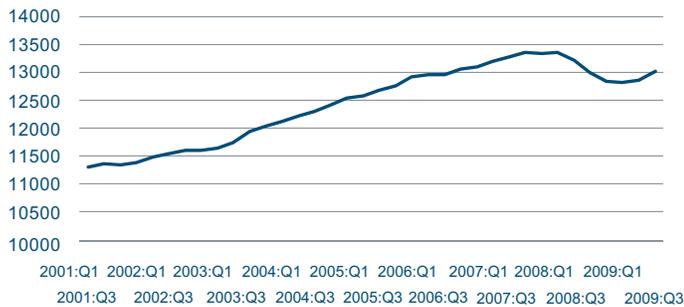
varied markedly across industries. For example, construction and manufacturing have been very hard hit, with construction employment declining by 25.0 percent and manufacturing employment declining by 15.1 percent over the course of the recession, nationally. Alternatively, health and education service employment actually expanded over the recession, increasing by 6.3 percent. If states specialize in industries with different growth paths, this specialization could help explain the relative differences in state employment growth. On the other hand, differences in state-level employment growth could simply reflect differences in the severity of the recession or the strength of the recovery experienced in individual states.

Ohio and Pennsylvania provide examples of some of these possibilities. Ohio's employment growth differed from the nation's for several reasons. On the negative side, in 10 of 11 major industry groups, Ohio's employment growth was lower than the national growth rate. In addition, Ohio had a much larger manufacturing share than the nation as a whole prior to the recession. Together, the higher rate of job loss in manufacturing and the higher employment share in manufacturing can account for roughly half of the difference between the national growth in employment and Ohio's growth in employment. On the positive side, Ohio's construction sector was relatively small and suffered proportionately less employment loss than the nation.

In the case of Pennsylvania, the main driver of its divergence from the U.S. employment level was differences in industry employment growth. In 10 of 11 major industry groups, Pennsylvania's employment growth outpaced the nation's, the only exception being in education and health services. In terms of industry specialization, a slightly higher manufacturing share in Pennsylvania compared to the U.S. was a drag on employment growth. And again, construction was a relative bright spot. Pennsylvania experienced less relative employment loss in construction, though the loss was still substantial in absolute terms. Overall, differences in industry employment growth, as opposed to variation in industry specialization, account for the majority of the employment growth differentials in Pennsylvania and Ohio.

## Trends in Household Income over the Past Decade

U.S. Real GDP (2005 dollars)



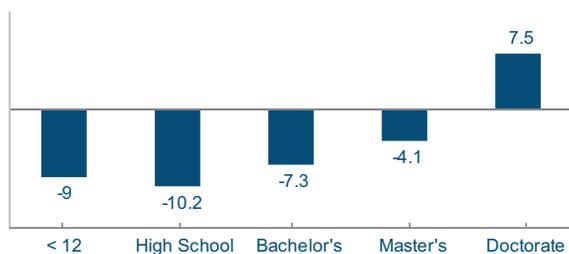
Sources: Bureau of Economic Analysis and Haver Analytics.

S & P 500 Index



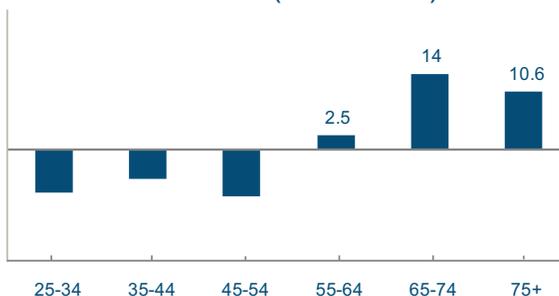
Sources: Financial Times and Haver Analytics.

Percentage Change in Median Household Real Income by Education Level of Head of Household (2001-2009)



Sources: Bureau of the Census and Haver Analytics.

Percentage Change in Median Household Real Income by Age of Head of Household (2001-2009)



Sources: Bureau of the Census and Haver Analytics.

1.11.11

by Daniel Carroll

The past decade has been rough for households. The US economy experienced a small recession in 2001, grew rapidly through 2006, and then finished with a massive recession. An investment in the S&P 500 Composite Index made in January of 2001 would have had a negative return in December of 2010.

Household income has followed a similar pattern, declining by 2.7 percent in real terms over the period. The decline in income has been widespread across education levels, with the exception of the very top. However, education appears to have offered a considerable degree of insulation from the longer-term trend in income, as the decline of real household income is inversely related to the level of education. From 2001 to 2009, while median incomes fell for those with anything less than a PhD, the decline was generally greater for those with less education. The real income of households headed by PhD's actually rose considerably.

As for the income trends of different age groups, today's young and middle-aged households have significantly lower income in real terms compared to their counterparts nearly a decade ago. In stark contrast, real income has increased in all age groups over 55, particularly for those over 65 years, where median income is up 11.9 percent from 2001.

A considerable portion of this growth can be explained by social security income. The average real benefit paid to retired workers and their spouses has risen by 10.5 percent. According to one report of census data by the Employee Benefit Research Institute, nearly 90 percent of age 65+ households received social security, and, on average, social security provided about 40 percent of income for these households.

"Income of the Elderly Population Age 65 and Over, 2008." Notes. Employment Benefit Research Institute. Vol 31, No. 6. June 2010.

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