Economic Trends

November 2010 (October 13, 2010-November 10, 2010)

In This Issue:

FEDERAL RESERVE BANK
of CLEVELAND

The Yield Curve and Predicted GDP Growth: October 2010

Covering September 17, 2010–October 15, 2010
by Joseph G. Haubrich and Timothy Bianco

Overview of the Latest Yield Curve Figures

Long rates dropped over the past month, flattening out the yield curve, as short rates stayed level. The three-month Treasury bill rate edged down to 0.14 percent from September's 0.15 and August's 0.16 percent. The ten-year rate dropped nearly a quarter of a percentage point to 2.50, down from September's 2.74 percent, and even below August's 2.61 percent. The slope dropped 19 basis points to 236, down from September's 255, as well as August's 245.

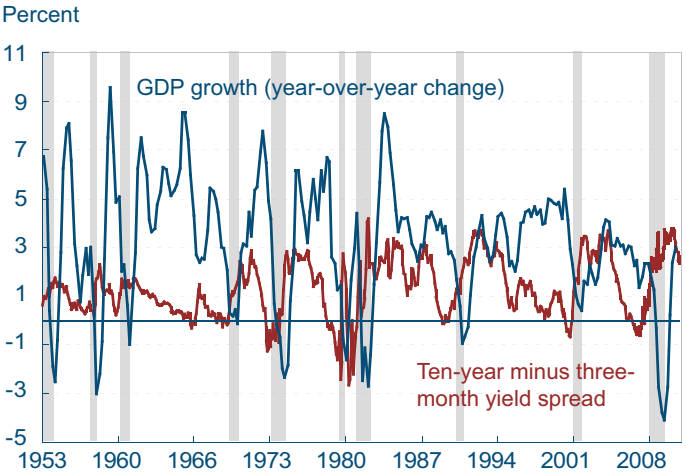
Projecting forward using past values of the spread and GDP growth suggests that real GDP will grow at about a 1.0 percent rate over the next year, the same numbers as for August and September. Although the time horizons do not match exactly, this comes in on the more pessimistic side of other forecasts,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

The NBER has declared an end to the recession, putting the trough at June 2009. Having this data has materially changed the recession probabilities coming from the model. 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 October stands at 3.9 percent, up a bit from the September number of 2.9 percent and well below the August number of 18.5 percent, though the August number is not strictly comparable. The change reflects the addition of another year of non-recession data (as declared by the NBER), rather than any massive improvement in the economy.

The Yield Curve as a Predictor of Economic Growth

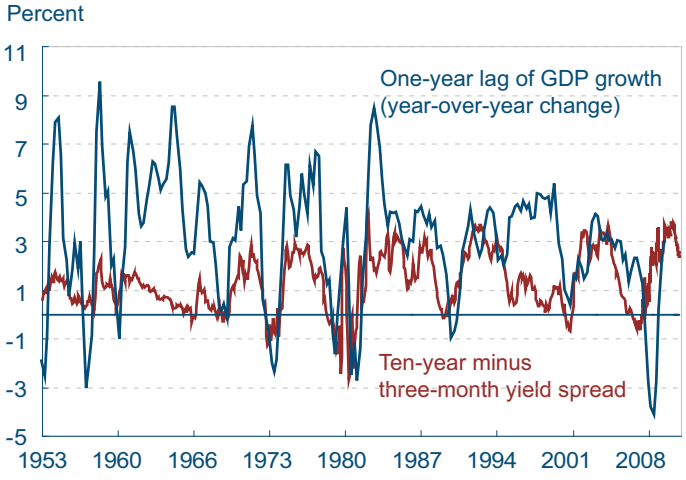
The slope of the yield curve—the difference between the yields on short- and long-term maturity bonds—has achieved some notoriety as a simple forecaster of economic growth. The rule of thumb

Yield Curve Spread and Real GDP Growth



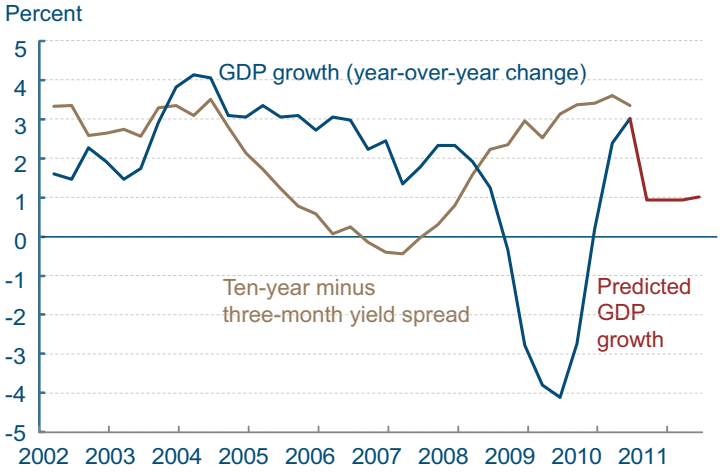
Note: Shaded bars indicate recessions.
Source: Bureau of Economic Analysis; Federal Reserve Board.

Yield Spread and Lagged Real GDP Growth



Source: Bureau of Economic Analysis; Federal Reserve Board.

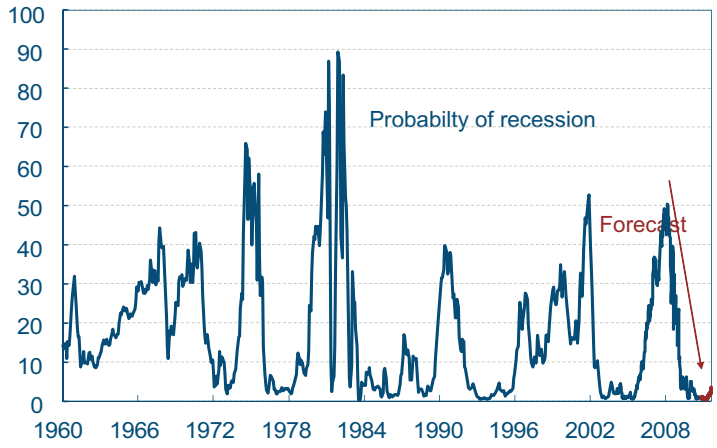
Yield-Curve-Predicted GDP Growth



Source: Bureau of Economic Analysis; Federal Reserve Board; authors' calculations.

Recession Probability from Yield Curve

Percent probability, as predicted by a probit model



Note: Shaded bars indicate recessions.
Source: NBER; Federal Reserve Board; authors' calculations.

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.

A Positive Trend for the Fed's Exposure to AIG

11.08.10
by John B. Carlson and John Lindner

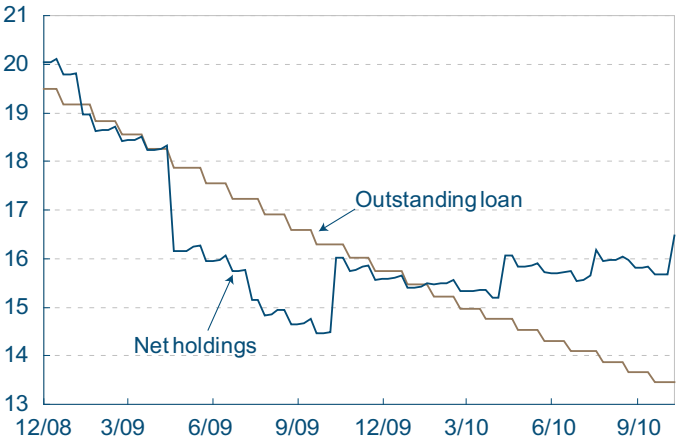
One of the key arrangements used to avoid the bankruptcy of American International Group (AIG) in the fall of 2008 was the creation of two special purpose vehicles (SPVs) named Maiden Lane II and Maiden Lane III. SPVs are legal entities whose operations are limited to the acquisition and financing of specific assets. More precisely, they are subsidiary companies with an asset/liability structure and legal status that makes their obligations secure even if the parent company goes bankrupt. Of course, if the assets are not valued correctly, the SPVs may not be able to pay off any creditors. In the case of Maiden Lane II and III, the creditor is the Federal Reserve Bank of New York, which made the loans that were used to purchase assets from AIG subsidiaries and counterparties.

Currently, the estimated values of those assets exceed the amounts of the respective loans that were extended, and the difference for both Maiden Lane portfolios grew further recently after the assets were revalued according to third-quarter fair-market estimates. Interestingly, asset revaluations in conjunction with the cash flowing in from the assets have been sufficient to maintain both a steady pay down of the loans and a steady if not rising value of the portfolio. Because the New York Fed will share in any profits remaining after the loans are paid in full, the prospects for a positive return on its investment look very good at this point.

Predicting the future value of the Maiden Lane portfolios requires an understanding of how the SPVs are structured. A little history might help with that. AIG was one of the hardest hit financial institutions when housing markets collapsed in 2008. In addition to holding housing-related securities, which were rapidly declining in value, AIG's financial products unit had written insurance on those same types of securities. Inadequate capital reserves and the freezing of funding markets combined to push AIG to a precipice, and the Treasury

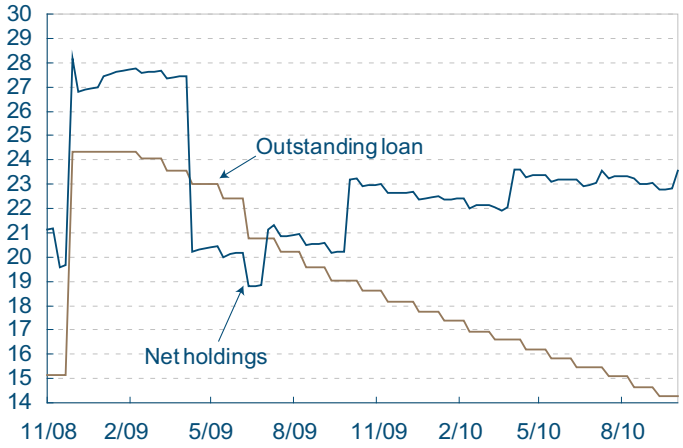
Maiden Lane II

Billions of dollars



Source: Federal Reserve Board.

Maiden Lane III



Source: Federal Reserve Board.

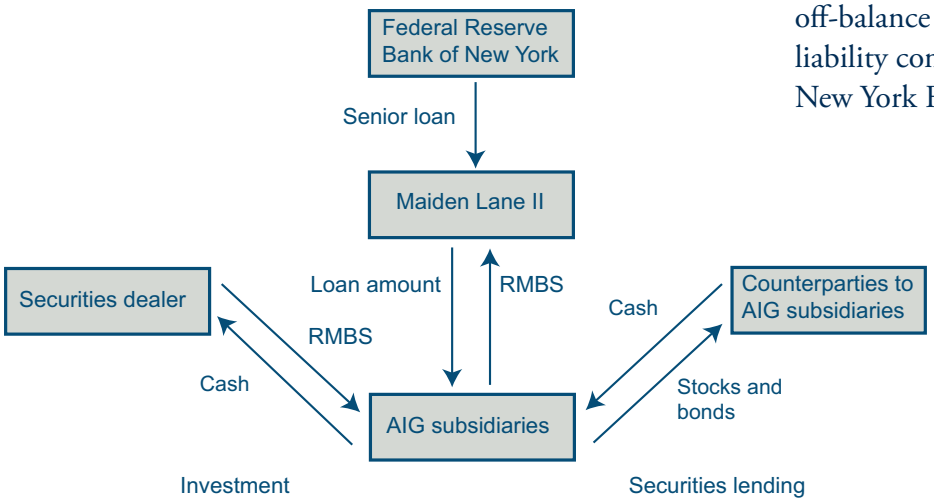
and the Federal Reserve extended a series of aid packages to the company.

The two Maiden Lanes were created in November 2008 as part of a restructuring of the original assistance granted to AIG through the Federal Reserve Bank of New York. Maiden Lane II was formed to provide adequate liquidity to AIG subsidiaries. Those subsidiaries had borrowed to purchase securities, and by doing so had exposed themselves to the risk that their investments would fall in value. When the loans were set to be repaid and the investments had fallen in value, the subsidiaries needed to make up the difference between the amount they'd been loaned and their weakened investment. To ease these liquidity pressures, Maiden Lane II purchased the residential mortgage-backed securities (RMBS) investments from the subsidiaries.

The aim of Maiden Lane III was to help ease liquidity concerns for the Financial Products unit of AIG (AIGFP), which were associated with collateral demands on credit default swaps (CDS) that AIGFP had sold to investors. As the value of collateralized debt obligations (CDO) fell, AIGFP was required by the CDS contract to post collateral to their counterparties. The lower the value of the CDOs, the more AIGFP had to hand over. Maiden Lane III was used to purchase the CDOs for which the insurance was written, and as part of the transaction, AIGFP's counterparties agreed to nullify their insurance contracts.

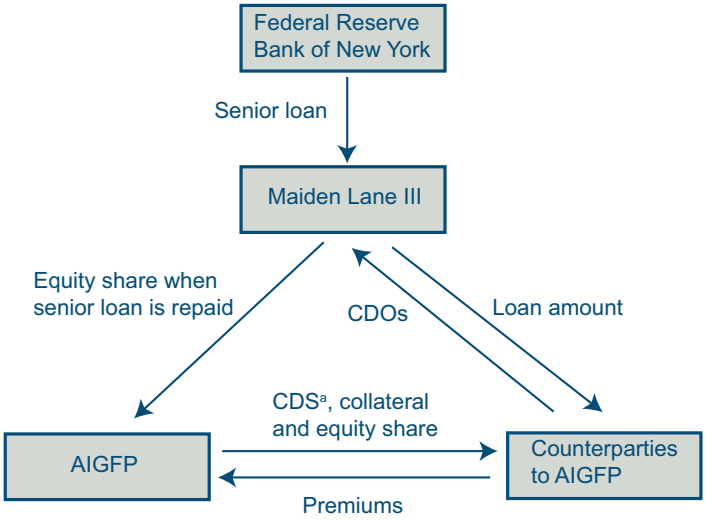
The Federal Reserve could not buy the RMBSs or CDOs directly because of statutory restrictions on the types of securities it is allowed to buy and the institutions to which it is allowed to lend. According the Federal Reserve Act, the Fed may only conduct open market operations (which means purchase or sell securities) with Treasury debt or securities that have the backing of a government agency. The securities in question were neither of those types. To remedy this situation, the Federal Reserve referred to Section 13(3) of the same Act, by which the Fed could lend to any financial institution in unusual and exigent circumstances. With this alternative available, the special purpose vehicles (SPVs) of Maiden Lane II and Maiden

Structure of Maiden Lane II



Source: Federal Reserve Bank of New York.

Structure of Maiden Lane III



a. CDS contracts eliminated with Maiden Lane III.
Source: Federal Reserve Bank of New York.

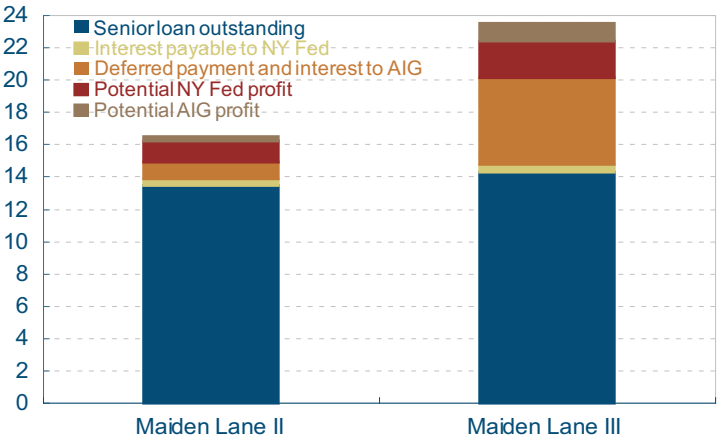
Lane III were created so that the Fed could make loans to those institutions. The Maiden Lanes are off-balance sheet institutions, in this case limited liability companies, with a loose affiliation to the New York Fed, their parent institution.

The structure of the loans to the SPVs was designed so that the value of the portfolios acquired by the Maiden Lanes could be maximized by a hired portfolio manager. Maiden Lane II received a six-year loan from the New York Fed for $19.5 billion to purchase RMBS with a fair market value of $20.8 billion from AIG subsidiaries. According to the agreement, proceeds between the time of the agreement and the time of the transaction made up for $0.3 billion of the difference, and the remaining $1 billion was deferred by the subsidiaries until the loan was repaid. Maiden Lane III received a six-year loan for $24.3 billion so that it could purchase CDOs with a fair market value of $29.6 billion from counterparties to AIGFP. Again, proceeds from the securities to the counterparties accounted for $0.3 billion of the difference as well as a $5 billion equity contribution from AIG. In both cases, the Maiden Lane vehicles purchased the securities at well-below par value, which happened to be $39.3 billion for Maiden Lane II and $62.1 billion for Maiden Lane III.

Estimates of the current net portfolio value can be inferred from the terms of the loan. The value of the Maiden Lane II portfolio sits at $16.47 billion, $13.45 billion of which is the remainder of the outstanding loan. On top of that is accrued interest, payable to the New York Fed in the value of $421 million, and then $1.065 billion in deferred payments and interest for AIG subsidiaries. Outside of some small management fees, the red and brown

Maiden Lane II and III Composition

Billions of dollars



Source: Federal Reserve Board.

sections of the chart below illustrate potential profits for both the New York Fed and AIG subsidiaries. As of this writing, the New York Fed stands to gain almost $1.3 billion from its Maiden Lane II investment.

Similarly, the Maiden Lane III portfolio is now worth $23.53 billion. The outstanding balance on the loan from the New York Fed is about $14.3 billion, accrued interest for the New York Fed is $513 million, and another $5.335 billion is owed to AIG for its equity share and interest payments. That leaves $3.4 billion for the New York Fed and AIG to split in profits, with $2.3 of that amount scheduled to be distributed to the New York Fed.

These profit numbers are only approximations, though, and will be subject to future variations in asset values. Profits for the portfolios rest on the performance and profitability of the underlying RMBS and CDOs of the two vehicles. Over the course of the past year, the values have risen fairly steadily and increased after each quarterly revaluation. But these values are a product of the streams of payments that the securities provide, which could decline in the event of an increase in delinquencies, foreclosures, or prepayments. With mortgage rates and home values dropping or leveling off, these portfolios could struggle. It is also worthy of note that there are still four years left for these loans to be repaid, leaving plenty of time for the portfolios to fluctuate in positive and negative directions. While the results may look promising now, the portfolios should be viewed as a longer-term investment, even in the midst of a larger exit plan taking shape this winter.

Foreclosures in Ohio

10.21.10
by O. Emre Ergungor and Beth Mowry

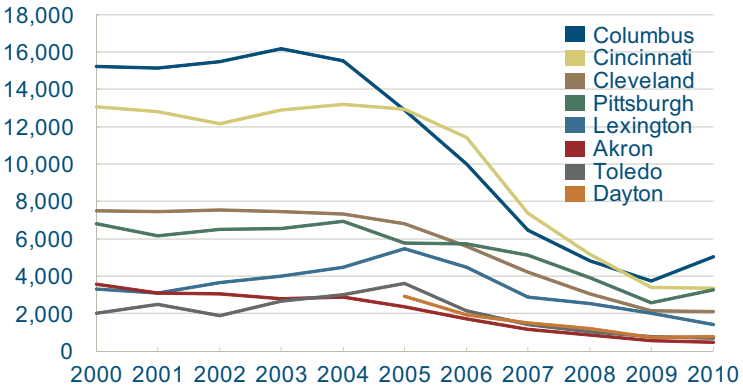
The number of new foreclosures across the United States ticked up mildly in the first and second quarters of 2010, according to the Mortgage Bankers Association's National Delinquency Survey. Nationally, 1.17 percent of all outstanding loans went into foreclosure in the second quarter (April-June), a figure unchanged from the first quarter but down from 1.47 percent a year ago. All in all, 4.57 percent of all mortgages in the U.S. are currently in foreclosure. The decrease in the number of loans entering foreclosure over the past year was predominantly driven by a decline in problem adjustable rate mortgages (ARMs) of all major loan types, particularly subprime (high-risk) loans.

When the housing bust was just setting in back in 2006, Ohio's foreclosure rate was the highest of any state in the nation (3.38 percent) and about three times as high as the national average (then 1.19 percent). Now—four years later—Ohio has the sixth highest percentage, with 4.82 percent of all mortgage loans in foreclosure, and the national average has nearly caught up. What hasn't changed, however, is that Ohio still easily leads the other states in the Fourth District (Kentucky, Pennsylvania, and West Virginia) in foreclosure rates.

Foreclosures are correlated with delinquencies, or loans past due, but not perfectly. This is because not all delinquencies wind up as foreclosures. With 10.3 percent of all loans past due, Ohio has the eleventh highest delinquency percentage of all U.S. states, as of the second quarter of 2010. This marks a slight drop from the series' first-quarter peak of 10.5 percent but an increase from 10.3 percent a year earlier.

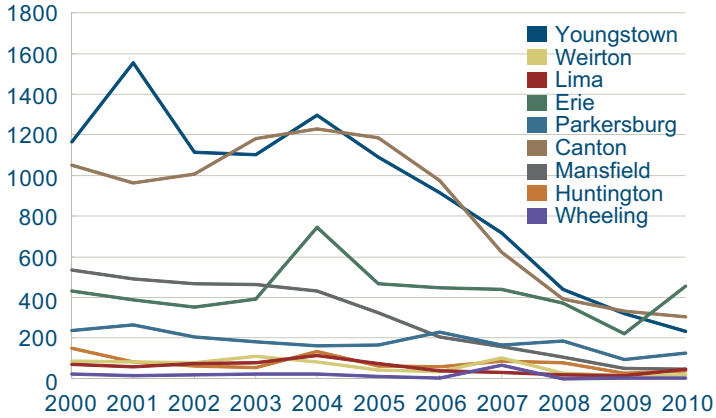
In the mid-1990s, Ohio had a smaller percentage of loans past due relative to the U.S. as a whole and most of the other states in the Fourth District. Currently, however, the percentage of delinquent loans in Ohio is higher than in any other Fourth District state. It is interesting to note, though, that

Permits Issued for Residential Units



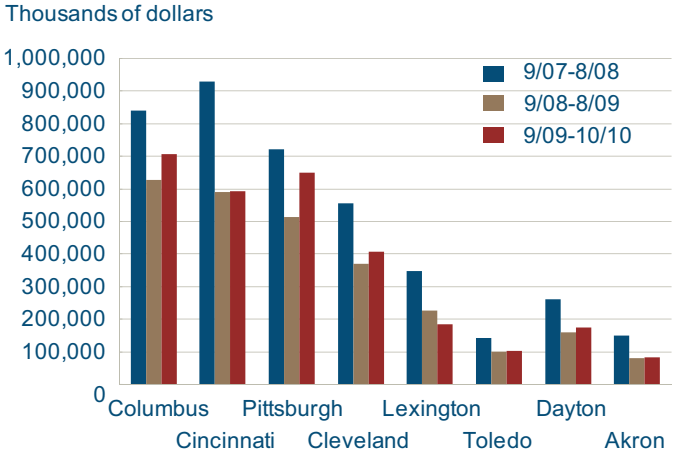
Notes: Data for the Dayton metro area is only available starting in 2004. The figures are 12-month sums ending in August of the year indicated.
Sources: U.S. Census Bureau, Haver Analytics.

Permits Issued for Residential Units



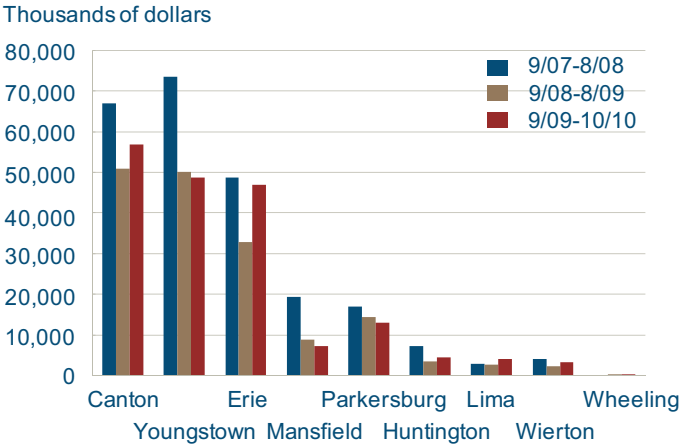
Note: The figures are 12-month sums ending in August of the year indicated.
Sources: U.S. Census Bureau, Haver Analytics.

Total Value of Permits Issued for Residential Units



Note: Figures are adjusted for inflation
Sources: U.S. Census Bureau, Haver Analytics.

Total Value of Permits Issued for Residential Units



Note: Figures are adjusted for inflation
Sources: U.S. Census Bureau, Haver Analytics.

Delinquencies and Foreclosures, 2010 and 2006

		Loans past due (percent)		All loans in foreclosure (percent)	
		Ohio	U.S.	Ohio	U.S.
Prime ARM	2010	9.8	13.0	7.1	10.3
	2006	5.0	3.7	2.9	0.9
Prime FRM	2010	5.7	5.6	2.9	2.3
	2006	3.7	3.5	1.3	0.4
Subprime ARM	2010	28.7	28.2	19.8	23.8
	2006	18.9	15.5	14.1	5.6
Subprime FRM	2010	24.2	24.0	9.5	9.0
	2006	13.1	10.8	9.0	3.2

Source: Mortgage Bankers Association.

while most states' foreclosure rates tend to follow a similar trajectory as their delinquency rates, West Virginia has done fairly well at bucking this trend. West Virginia's delinquency rate has risen side-by-side with Ohio's since 2006, soundly above other District states, and yet its foreclosure rate sits considerably below the group. This is mainly because West Virginia is a nonjudicial-foreclosure state. As a result, foreclosed properties move more easily, relatively, from "foreclosed" to "real estate owned" status, that is, when the property is owned by the lender.

As foreclosures have risen rapidly over the last four years, much attention has been centered on the subprime market. Being riskier than other types of loans, these mortgages are more likely to be delinquent and go into foreclosure. Subprime loans as a category are also more likely to be adversely affected if interest rates increase, because a higher percentage of subprime loans have adjustable rates—39 percent of subprime loans have adjustable rates, compared to 14 percent for prime loans.

Generally speaking, states' shares of subprime mortgages still being serviced (not written-off) have been gradually declining over the last few years. Ohio's current share of subprime loans (12.1 percent) is roughly four percentage points lower than its share in 2006 but still the fourth highest in the U.S., behind only Florida, Mississippi, and Nevada. Given the state's 12.1 percent share, though, subprime loans are responsible for a disproportionate percentage of foreclosures in Ohio (30.2 percent). However, in 2006 Ohio's subprime loans accounted for half of all foreclosures in the state, illustrating how foreclosures have hit other loan types hard in recent years as well.

The deterioration in the credit quality of all mortgage categories is evident in the next table. In 2006, at the start of the housing downturn, Ohio had higher delinquencies and foreclosures in every loan category (prime, subprime, adjustable, fixed) compared to the U.S. as a whole. Now, while Ohio's loans are still performing more poorly in several categories, it is evident how the U.S. has managed to come within arm's length of Ohio's foreclosure rate. The U.S. has a higher percentage of foreclosures in prime ARMs and subprime ARMs, and has just slightly lower rates in other loan categories.

Theoretically, How Long Is This Recovery Supposed to Take Anyway?

11.09.10
by Pedro Amaral

The first estimate for GDP and its components in the third quarter of 2010 is out and it is not a very encouraging one, at least as far as the recovery goes. The positive contributions from personal consumption expenditures and from changes in private inventories were attenuated by strong import growth and a further decline in residential investment. In all, GDP is estimated to have grown at an annual pace of 2 percent in the third quarter. To put things in perspective, just to keep up with its trend, GDP should be growing at an annual rate slightly above 3 percent, but since we are recovering from a recession it should actually be growing at an even faster pace.

It is no wonder then that people are throwing out words like subpar or anemic to describe the current recovery. But compared to what? One way to establish a point of reference is to look at past recoveries. This is what I did in a previous Trends article, in which I argued that yes, compared to other recoveries the current one looks pretty weak, but no worse than the recovery from the "Tech Bubble" in the early 2000s. My colleague Ken Beauchemin took a different route in a recent Commentary and instead of looking only at the behavior of GDP during recoveries he used data on other variables, like the unemployment rate, the inflation rate, and the federal funds rate, from 1959 on and concluded that the current recovery is just slightly below what a vector auto-regressive (VAR) forecast would predict. In fact, if one uses only data after 1983 in this exercise, the current recovery would be slightly stronger than the VAR forecast.

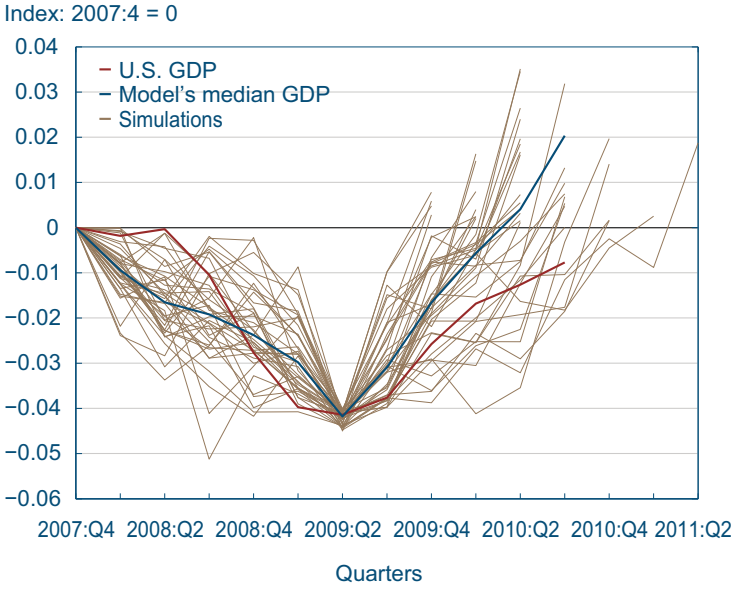
What these two approaches have in common is that they are solely predicated on data and lack a theory of how the economy works. Actually, a VAR has an underlying theory, just not a very deep one. It assumes that the values of the current variables depend on past (or forecast) values of all variables in a linear way.

Economists have developed "deeper" models of how the economy works, by making assumptions about how individuals and firms that are constrained by their current resources and information behave when facing an uncertain future. One class of models known as Real Business Cycle (RBC) models sees the economy as being constantly buffeted by random shocks to firms' production opportunities. Given the last shock and their current wealth, consumers form expectations about future shocks and use them in choosing how much to consume, work, and save, with the ultimate goal being to maximize their well-being. Their future income is uncertain, as it depends on the wages and interest income they obtain from renting their labor and capital to firms, whose opportunities for production are subject to the random shocks. These shocks and other parameters in the model are then constrained so that the model economy replicates some properties of the real U.S. economy, like how much GDP varies, how long people work, how income breaks down between labor and capital, and so on.

One of the problems economists struggle with when putting this recovery in perspective is that, except for the Great Depression, there is no other recession of this magnitude to compare it to. This is where we can use the theoretical model to our advantage. By simulating a series of shocks hitting the economy, we can create our own (simulated) data. I simulated 20,000 runs of the model economy, each lasting about 60 years. It's like looking at 20,000 possible paths for GDP, given different levels of the kinds of shocks that can occur, hitting at various times. I then looked at the instances where GDP fell between 4 percent and 4.5 percent in 6 quarters (U.S. GDP actually fell 4.1 percent from the fourth quarter of 2007 to the second quarter of 2009). Finally, I looked at what the recoveries from these episodes looked like. The results are in the figure below. The grey lines represent each individual simulation, the blue line is the median of all simulations and the red line is the actual behavior of U.S. GDP.

First, it should be noted that this simple RBC model has some trouble generating recessions of this magnitude. Out of the 20,000 simulations, only 39 produced episodes comparable to the latest reces

Actual and Simulated Recoveries



sion, and more severe recessions were even rarer. But more importantly, this experiment tells us that, at least when seen through the lens of the RBC model, our current recovery is a bit on the slow side. The median time it takes the model economy to get back to the level we had back in the fourth quarter of 2007 is four quarters. By that yardstick we will be at least half a year late.

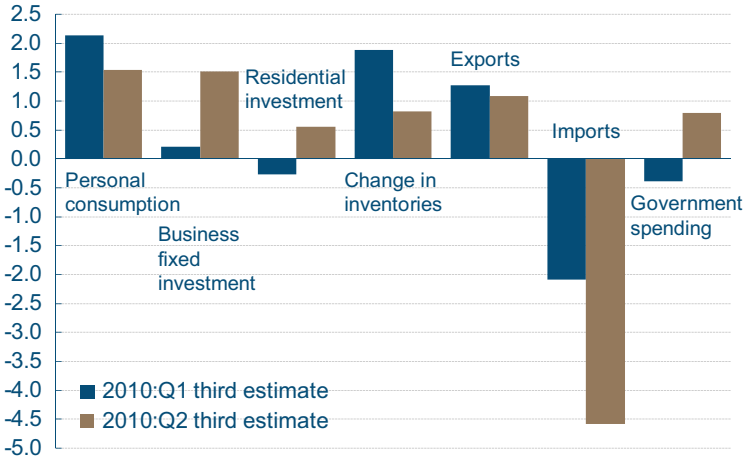
This is, of course, just what a standard, no-frills, RBC model implies. In particular, it lacks a lot of features some economists have deemed crucial in shaping the current recession and subsequent recovery. For example, it is missing both a financial intermediation sector and a housing sector, so it is, by definition, unable to capture any frictions in these markets. It is nevertheless a benchmark that is informed by theory, although what that means regarding its usefulness ultimately depends on how good the theory is.

The 2000s: A Slow Start to the 21st Century

10.20.10
by Kenneth Beauchemin and John Lindner

Contribution to Percent Change in Real GDP

Percentage points



Source: Bureau of Economic Analysis.

Delinquencies and Foreclosures, 2010 and 2006

	July	August	September	October
2010:Q3 consensus	2.7	2.4	1.8	1.9
Top-10 average	3.4	3.3	2.4	2.6
Bottom-10 average	1.8	1.6	0.9	1.3
2010:Q4 consensus	2.8	2.7	2.3	2.3
Top-10 average	3.7	3.5	1.3	0.4
Bottom-10 average	1.8	1.7	1.2	1.5
2011:Q1 consensus	2.8	2.8	2.5	2.5
Top-10 average	3.8	3.8	3.3	3.2
Bottom-10 average	1.9	1.8	1.7	1.6
2011:Q2 consensus	3.0	2.9	2.8	2.7
Top-10 average	4.1	4.0	3.7	3.6
Bottom-10 average	1.9	1.9	1.9	1.9
2011:Q3 consensus	3.1	3.1	3.0	3.0
Top-10 average	3.9	4.1	3.9	3.9
Bottom-10 average	2.3	2.3	2.0	2.1
2011:Q4 consensus	3.2	3.2	3.2	3.2
Top-10 average	4.0	4.1	4.2	4.2
Bottom-10 average	2.4	2.3	2.3	2.3

Source: Mortgage Bankers Association.

Second-quarter GDP growth was revised up from 1.6 percent to 1.7 percent in the third and final estimate—at least until the July benchmark revisions next year. The overall picture remained virtually unchanged, with upward revisions to private consumption expenditures and inventories countered by a higher import flow than previously recorded. The upward revision pales in comparison to the initial revision that took GDP growth down from the 2.4 percent rate initially reported in July to 1.6 percent last month.

Personal consumption growth slowed during the second quarter, contributing 0.6 percentage point less to output growth. Nonresidential fixed investment picked up during the quarter, but that growth continues to be concentrated in equipment and software while investment in structures continues to decline. Residential investment turned sharply as the temporary homebuyers' tax credit pulled in home sales from the future; contributions from housing will likely turn negative again in the second half of the year. Foreign trade was the biggest drag on growth in the second quarter, as imports jumped 33.5 percent and export growth continued to slow. In all, foreign trade subtracted 3.5 percentage points from second-quarter GDP growth.

The decline in GDP from the first quarter to the second quarter, a two percentage point drop from 3.7 percent to 1.7 percent, is particularly worrisome for many observers, as it may be signaling a loss of momentum in the recovery. Adding to the pessimism is an array of rather weak third-quarter indicators that point to further slowing. Private forecasts have been marked down accordingly, with the Blue Chip consensus forecast of GDP growth falling in each of the past three months. Third-quarter growth is now expected to come in just below 2 percent, as even the most optimistic forecasts (the ten highest) average to just a bit above 2½ percent. The consensus also calls for subtrend growth in the fourth quarter and for the first half of 2011.

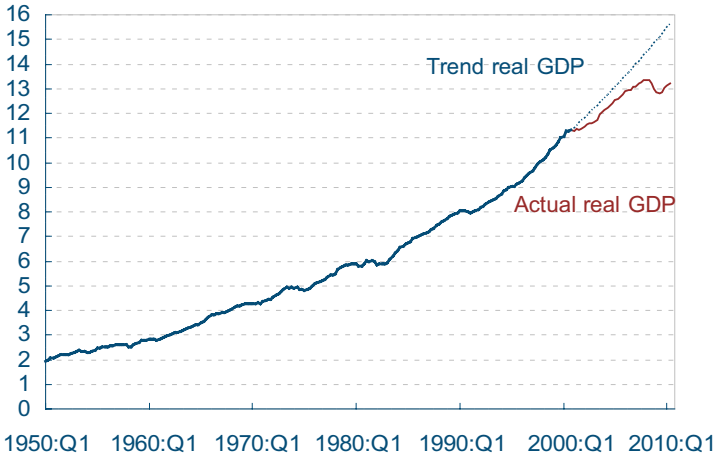
GDP Growth by Decade

Decade	Real GDP growth, compound annualized rate
1950:Q4–1960:Q4	3.0
1960:Q4–1970:Q4	4.3
1970:Q4–1980:Q4	3.3
1980:Q4–1990:Q4	3.1
1990:Q4–2000:Q4	3.6
2000:Q4–2010:Q4[a]	1.6

a. Assumes 2 percent annual growth for the second half of 2010.
Source: Mortgage Bankers Association.

Real GDP Compared to Trend

Trillions of dollars



Sources: Bureau of Economic Analysis; authors' calculation.

These expectations make for a fitting end to the growth disaster that was the decade of the 2000s. If growth over the next two quarters were to average 2 percent—close to that expected by private forecasters—real GDP growth will have averaged a mere 1.6 percent in the past 10 years. It will mark the first decade in the post-WWII period in which average annual growth will have fallen short of 3 percent. Even in the 1930s, a decade notorious for the Great Depression, GDP growth fared better, much better, averaging an annual rate of 2.7 percent.

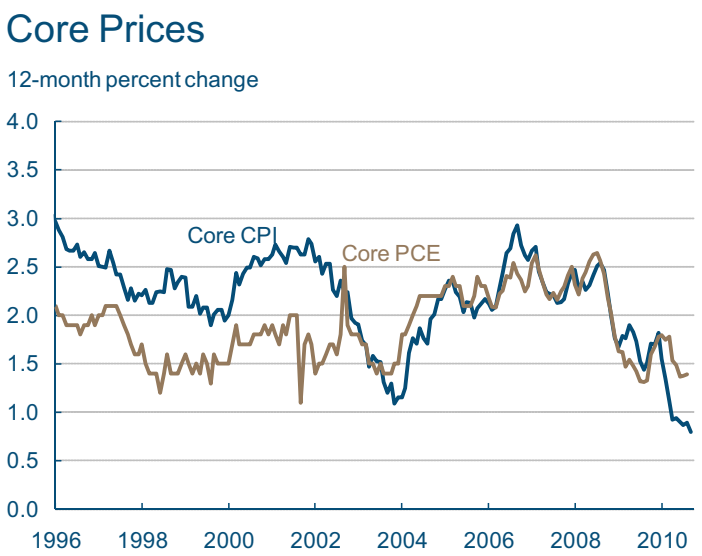
Where does that leave us? The following chart puts the dismal decade in a different perspective. Over the second half of the twentieth century, real GDP growth averaged 3.4 percent per year. The dashed line in the figure shows the level of real GDP that would have been attained had the economy grown at that historical trend rate for all of the present decade. By that metric, actual GDP currently falls 18.5 percent short of trend GDP—almost one-fourth the present size of the U.S. economy!

The Great Recession is a big part of the story here, but far from all of it. The economy missed the starting gun, beginning the decade with a mild recession in 2001 that left it 3 percent below trend by the end of 2001. Not so bad, but what followed is truly troubling. During the subsequent recovery, growth largely remained at subtrend levels, so that rather than closing the gap, the economy continued to lose ground. By the onset of the recession in the fourth quarter of 2007, the gap had swelled to 7.5 percent. The Great Recession, of course, subsequently delivers the knock-out blow.

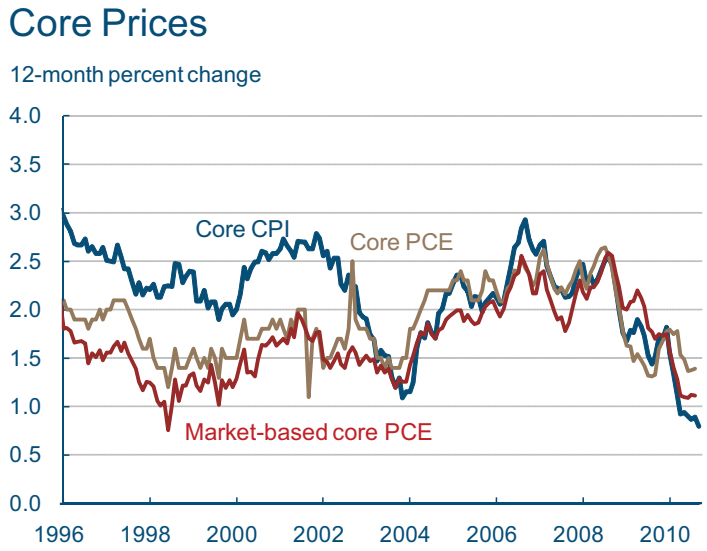
One has to wonder whether the first tremors of the Great Recession were being felt much earlier than widely acknowledged.

What's Up with the Gap between the Core PCE and the Core CPI?

11.02.10
by Brent Meyer



Source: Bureau of Economic Analysis, Bureau of Labor Statistics.



Source: Bureau of Economic Analysis, Bureau of Labor Statistics.

As of August, there was a somewhat sizeable gap (0.5 percentage point) between the 12-month growth rate in the core PCE and the core CPI, which stood at 1.4 percent and 0.9 percent, respectively. Normally, this isn't much of an issue. However, this time the direction of the gap is reversed relative to historical norms (with the core CPI currently trending below the core PCE), and measured inflation rates are hovering just above zero. A quick look into the differences between these two series may clear up this mystery.

The first and perhaps the most obvious difference between these two series is their scope. The Consumer Price index (CPI) measures the out-of-pocket expenses of the urban consumer. Meanwhile, the Personal Consumption Expenditures (PCE) price index takes a somewhat broader approach, not only attempting to measure spending by households, but also by nonprofit institutions serving households. This amounts to the inclusion a variety of nonmarket, imputed prices such as financial services furnished without payment, insurance premiums, and social assistance services. For example, the PCE price index accounts for government and employer-paid medical care services, where the CPI only incorporates out-of-pocket medical care expenses.

The Bureau of Economic Analysis (BEA) publishes a "market-based" PCE price index (and a corresponding market-based "core" PCE price index), which excludes all imputed nonmarket prices (except for housing rents). This series serves as a rough control for the differences in scope between the core CPI and the core PCE. After excluding nonmarket-based prices, the core PCE is up 1.1 percent, accounting for about 0.3 percentage point of the gap between the core PCE and core CPI.

The PCE and CPI are also distinguished by two other aspects of their construction. First, the CPI and PCE are calculated using different formulas. The CPI is calculated using a Laspeyres index, while

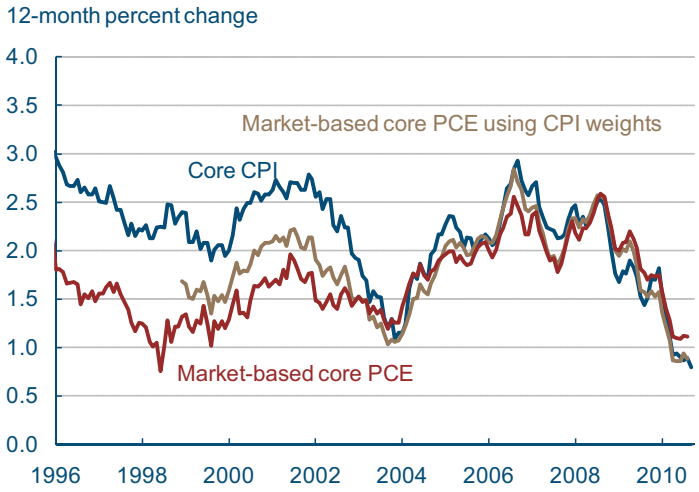
the PCE uses a Fisher-ideal index. Without getting into the mathematics, use of the Laspeyres index makes the CPI a "fixed-weight" price index, with the relative importance (or weight) of each item in the consumer market basket being adjusted for expenditure changes only every two years. On the other hand, the PCE is continuously updated for expenditure changes. This, in effect, is like the CPI asking the question, "What does it cost to maintain this fixed basket of goods and services?" while the PCE asks, "What does it cost to maintain this given level of satisfaction?" Because the CPI updates the expenditure weightings only every few years, it doesn't allow for substitution effects. For example, if the price of coffee suddenly doubles, people may start to drink more tea. Thus, the CPI may tend to overstate the aggregate price level during periods of volatile relative price swings.

The last difference between the two series is called the "weight" effect. Due to the differences in the scope of the measures and in the source data for some items, the PCE and CPI have different weights on similar items. The largest difference comes from the shelter (housing) components, which in the CPI carry a relative importance value of roughly 32 percent, while in the PCE it is a little less than half of that. Such a huge difference in weights means that housing prices exert much more of an influence over the trajectory of the CPI than that of the PCE, leading to differences in their growth rates over time.

In a crude attempt to account for weight and formula effects, I've reweighted the items in the market-based core PCE using CPI expenditure weights. In the picture below, the black line is the market-based core PCE, reweighted with CPI relative importance values, and as you can see, it is trending right on top of the core CPI at the moment.

Another interesting question that arose during this exercise was whether or not those imputed nonmarket-based items were useful predictors of future core PCE inflation. That is, are these prices just noise or is there a signal of future inflation embedded in them that would make them worth paying attention to? To test this, I ran some simple

Core Prices



Source: Bureau of Economic Analysis, Bureau of Labor Statistics.

forecasting models that tried to predict core PCE inflation 12, 24, and 36 months ahead using lags (or past values) of either the core PCE or the market-based core PCE. These regressions were estimated between January 1987 and August 2000, with the number of lags set to 12 for each regression using revised data. I then tested the forecast accuracy using a commonly used statistic called root-mean-squared-error (RMSE). Like in golf, a lower score is better; hence, a lower RMSE indicates better forecasting performance. I examined the accuracy of forecasts for the period September 2000 to December 2005.

The table below shows that including the nonmarket imputed prices doesn't seem to help forecasting accuracy. In fact, they seem to impair it a bit: Lags of the market-based core PCE do a better job of forecasting future core PCE than do lags of the core PCE itself. This tentative evidence suggests that there isn't much information in the nonmarket prices that are included in the core PCE.

With the release of September's data, the 12-month trend in the core PCE slowed to 1.2 percent. Part of this slowing was due to a flat reading on the core PCE in September, the other part was due to downward revisions to past data. The 12-month growth rate in the market-based core PCE also slowed--from 1.1 percent in August to 0.9 percent in September. The gap between the core PCE and core CPI did narrow slightly upon revision (from 0.5 percentage point to 0.4 percentage point), but the core PCE is still hanging above the core CPI at the moment. However, after excluding nonmarket imputed prices, that gap shrinks to roughly 0.1 percentage point.

Forecasting Accuracy: Core PCE versus Market-based Core PCE

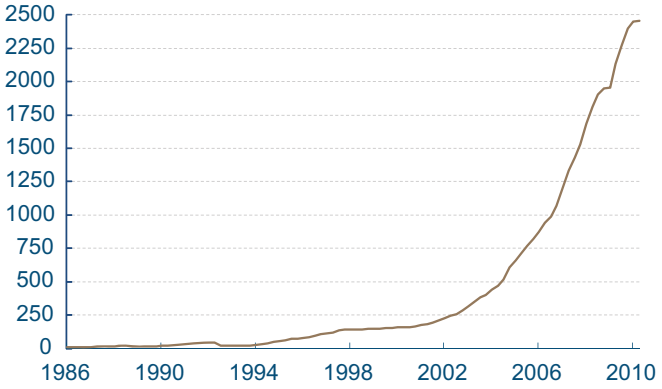
RMSE of core PCE forecasts	12 months ahead	24 months ahead	36 months ahead
Using 12 monthly lags of core PCE	0.44	0.52	0.54
Using 12 monthly lags of market-based core PCE	.40	.48	.53

Note: Equations estimated from 1987m1–2000m8; Pseudo-out-of-sample forecast 2000m9–2005m12.

Out of Whack—the Renminbi

China's Official Reserves

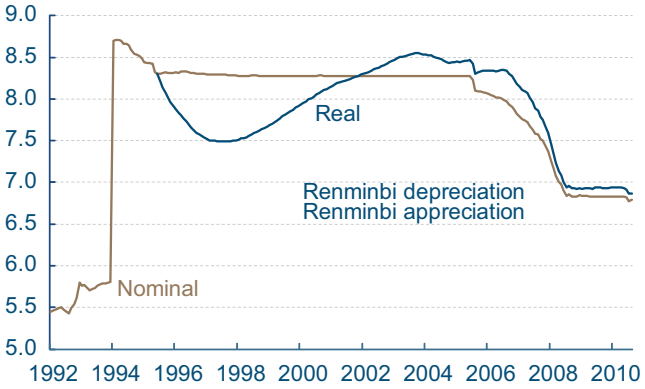
Billions of dollars, end of quarter



Sources: International Monetary Fund, *International Financial Statistics*.

Renminbi Dollar Exchange Rates

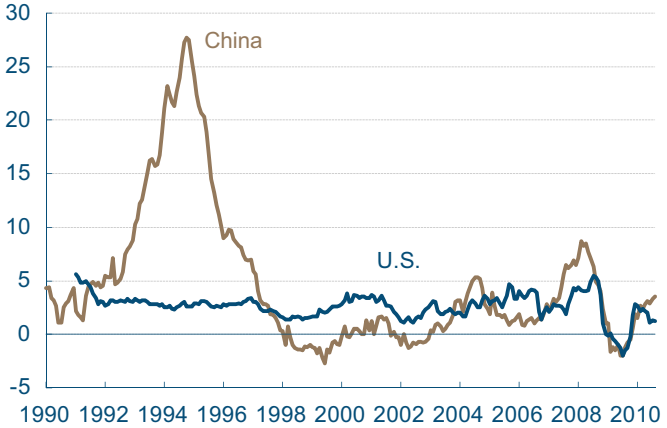
Renminbi per U.S. dollar



Sources: International Monetary Fund, *International Financial Statistics*.

Inflation Rates

12-month percent change in CPI



Sources: International Monetary Fund, *International Financial Statistics*.

10.25.10
by Owen F. Humpage and Beth Mowry

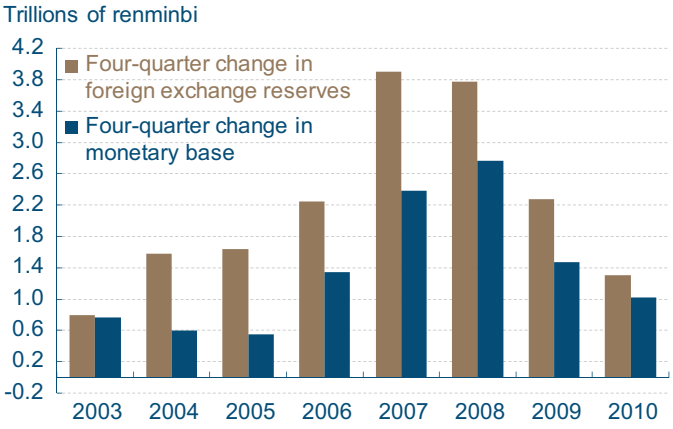
China's foreign exchange reserves, currently near $2.7 trillion and mostly in dollar-denominated assets, have increased fivefold since 2004. This rapid, persistent increase suggests that China's exchange-rate arrangements have, quite simply, been out of whack.

Many in the United States, however, incorrectly complain that China obtains an unfair trade advantage and gains on foreign investments because the People's Bank of China systematically undervalues the renminbi relative to the dollar. Yet, when all is said and done, the nominal exchange rate—the one people commonly quote—doesn't matter much for international commerce. What matters instead is the real—or inflation adjusted—exchange rate, and its unresponsiveness to international economic pressures seems the true underlying problem. The real exchange rate should appreciate even if China keeps the nominal exchange rate artificially low.

The route from an undervalued exchange rate to inflation is pretty straightforward: If China keeps the renminbi artificially low relative to the dollar, demand for Chinese goods and investments will rise, and dollars in search of Chinese goods and assets will flow into that country. This inflow will create incipient pressures for the renminbi to appreciate against the dollar.

To neutralize these pressures and to maintain the peg at an artificially low level, the People's Bank of China must buy dollars with renminbi. Chinese official dollar reserve holdings will skyrocket, as they have, but so then should the Chinese monetary base, the country's overall money stock, and, eventually, its inflation rate. The inflation that follows should create a real appreciation of the renminbi that is substantially greater than any controlled nominal appreciation and should dull China's competitive edge. Frustratingly, this has not happened. Since 2004, the real and nominal renminbi-dollar

Sterilization of Reserve Flow



Sources: International Monetary Fund, *International Financial Statistics*.

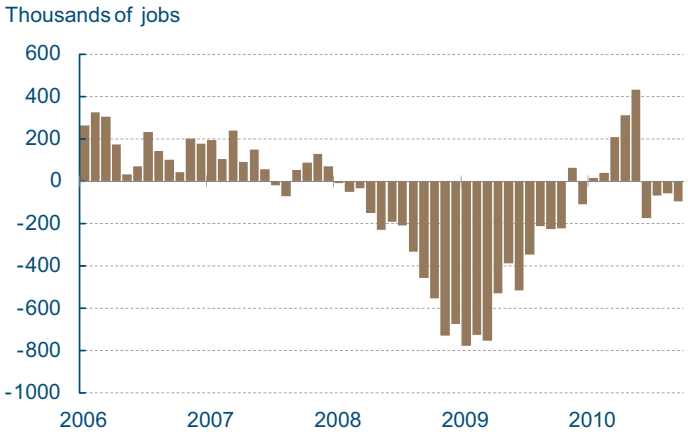
exchange rates have pretty much moved in unison. This is the real exchange-rate problem in China.

China avoids the inflation and real appreciation of the renminbi that should naturally accompany its massive accumulation of foreign-exchange reserves by continuously offsetting their impact on the monetary base. Since 2003, the People's Bank of China has stopped nearly 40 percent of the reserve inflows from sloshing into the monetary base. It does this by foisting renminbi sterilization bonds on Chinese commercial banks, and if constraining monetary base growth is not sufficient to prevent inflation, by raising reserve requirements. Reserve requirements limit the amount of bank loans that a given change in the monetary base can support. These instruments represent a significant tax on commercial banks. Under a more market-driven environment, these instruments would eventually impair the banking system, but China, despite reforms, still closely controls its banking sector. Therein lies its exchange-rate advantage.

The Employment Report and Displaced Workers

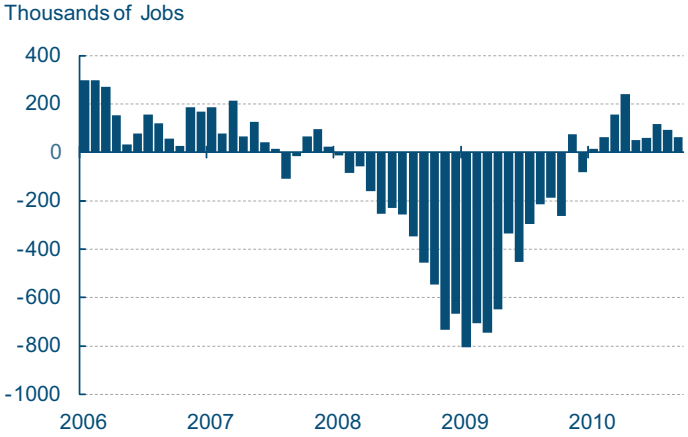
10.15.10
by Tim Dunne and Kyle Fee

Monthly Nonfarm Payroll Employment Change



Source: Bureau of Labor Statistics.

Monthly Private Nonfarm Payroll Employment Change



Source: Bureau of Labor Statistics.

September's employment report showed continued anemic employment growth for the U.S. economy. Employment fell in September by 95,000 jobs, as the government sector contracted due to reduced Census activity and job loss at state and local governments. On the household side, the unemployment rate remained at 9.6 percent, with the employment-to-population ratio hovering at decadal lows.

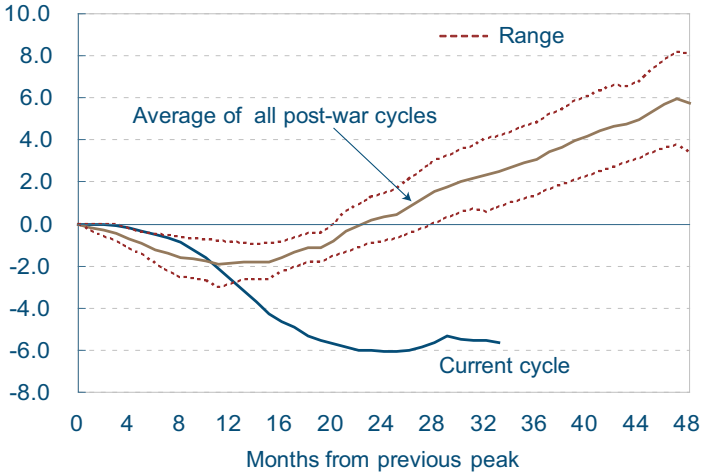
The private sector showed some net job creation, but 64,000 additional payroll jobs, on a monthly basis, is insufficient to bring down unemployment. Employment in goods-producing industries declined (–22,000) after gains in the last six monthly reports, while the service sector showed a moderate rise of 86,000 jobs.

From the peak of employment in December 2007, the U.S. economy remains down 7.75 million jobs after almost three years (33 months). The depth of the recession, the length of the recession, and the shallowness of the recovery make this cycle particularly striking in comparison to previous recession-recovery periods, and the severity of the cycle is reflected in the large number of workers (6.1 million) who are currently unemployed and have been out of work for more than 27 weeks.

Every two years, the Bureau of Labor Statistics surveys individuals about displacement from the workforce as part of the Current Population Survey. The Displaced Workers Survey asks workers, 20 years of age and older, about the nature and cause of any job displacement they have experienced in the last three years. For example, the January 2010 survey asks workers about job losses that occurred between January 2007 and December 2009, so the survey covers the most recent recession in its entirety. We compare the latest results to those of the 2002 survey, which included the 2001 recession, and the 2008 survey, which covers the three years prior to the current recession.

Nonfarm Payroll Employment

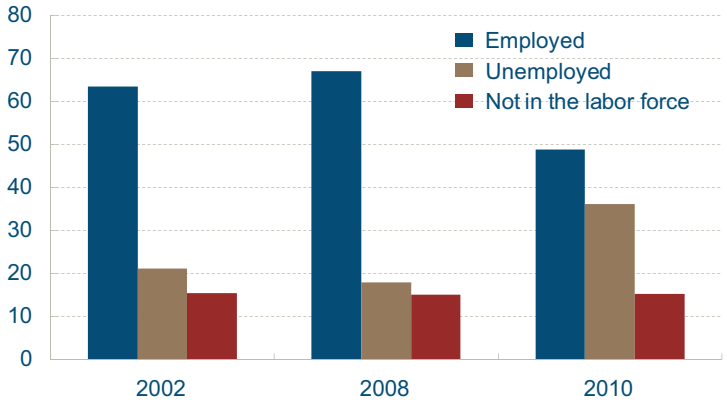
Percent change from previous peak



Source: Bureau of Labor Statistics.

Employment Status of Displaced Workers

Percent



Note: Persons with three or more years of tenure and lost job in preceding three-year period.
Source: Bureau of Labor Statistics.

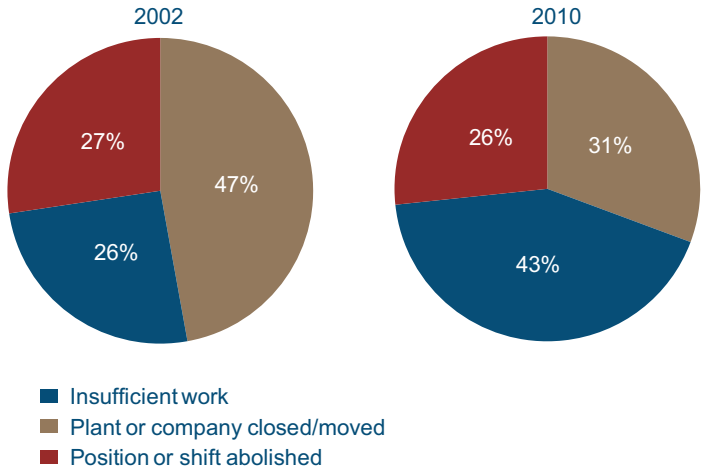
The survey reports focus on long-tenured workers—individuals who held their positions for three or more years prior to displacement. There were roughly 4 million long-tenured displaced workers in the 2002 survey, 3.6 million in the 2008 survey, and 6.9 million in the 2010 survey, reflecting the relative severity of the last recession. The long-tenured workers represent about 40 percent to 45 percent of all displaced workers in the three survey years.

In the January 2010 survey, re-employment rates averaged 48.8 percent, meaning that a little less than half of all long-tenured workers who experienced displacement over the 2007–2009 period are currently employed. Not surprisingly, these re-employment rates are well below the rates observed in the 2002 or 2008 surveys, where they were 63.4 percent and 67.1 percent, respectively. Moreover, since the proportion of workers that ended up out of the labor force is roughly the same in all three survey years, this means the proportion of displaced workers that are unemployed in 2010 is significantly higher than in the earlier surveys.

The Displaced Worker Survey also asks about the reason for the worker's displacement, and in fact, only workers who respond that their plant or company closed or moved, that there was insufficient work, or that their position or shift was abolished are considered as displaced workers. During the last two recessions, there were marked differences in the reasons cited for displacement. In 2010, the most frequent response is insufficient work, whereas in 2002 it was the closing or moving of the plant or company. Responses from the 2008 survey (along with other recent nonrecession years) look similar to 2002. These different responses between 2010 and other survey years likely reflect the widespread nature of the aggregate shock that hit the economy in 2008 and 2009.

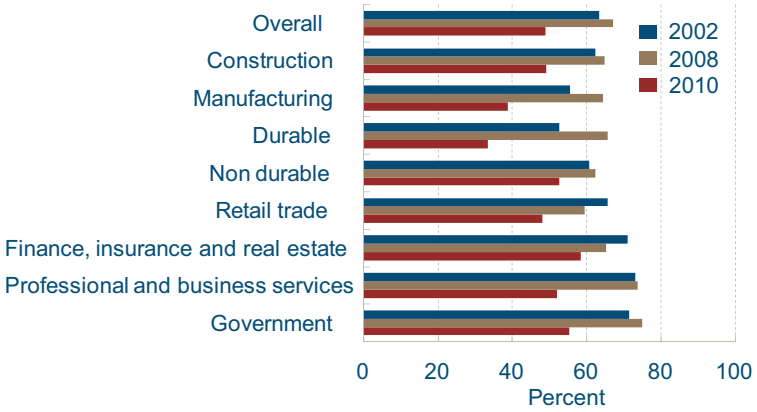
It may be tempting to interpret the data on reasons for displacement as evidence that cyclical effects, as opposed to structural effects, are primarily driving unemployment; however, we would be cautious in making that inference. The survey is asking workers about the reason for their displacement but not about impediments to finding a new position. Thus, the low re-employment rates could be driven by

Reason for Job Loss: Displaced Workers in the Last Two Recessions



Note: Persons with three or more years of tenure and lost job in preceding three-year period.
Source: Bureau of Labor Statistics.

Reemployment Rates: Industry of Lost Job



Source: Bureau of Labor Statistics.

weak current demand, by structural factors in the labor market, or by a combination of the two.

Structural unemployment is often described by a skill-mismatch story—firms have vacancies and there are unemployed workers, but hiring is slow because the skills of the unemployed workers do not match well the requirements of the open positions. One potential source of skill mismatch is industry mismatch—unemployed workers have skills tied to the industry they lost their jobs in, while job openings exist in an industry to which their skills are not transferable. For example, in the current recession-recovery cycle, one might be concerned that workers in industries such as construction, durable goods manufacturing, and finance may be susceptible to such mismatch possibilities, as these industries experienced particularly large negative shocks, and workers might be forced to search in different industries for employment opportunities. This could result in lower than average re-employment probabilities for workers who lost positions from such hard-hit industries or sectors.

While re-employment rates are, unsurprisingly, lower in 2010 than in prior years across all industries, a closer look at the results from the 2010 survey shows that individuals who were displaced from the finance, insurance, and real estate industries actually have relatively high re-employment rates. Note that re-employment here measures employment in any industry and not necessarily re-employment in the industry where the job loss occurred.

Construction workers, on the other hand, have re-employment rates of 49.1 percent, similar to the overall average of 48.8 percent. Alternatively, workers who lost jobs in durable-goods industries have very low re-employment rates at this point—33.4 percent. Given the large restructuring that is occurring in the domestic auto industry, perhaps this low re-employment rate does reflect some structural aspect to unemployment. Still, while there is some evidence of increased variability in re-employment rates across industries in 2010 compared to early years, the overwhelming pattern is that re-employment rates have shifted sharply down across a broad range of industries.

Recessions, Housing Market Disruptions, and the Mobility of Workers

11.09.10
by Daniel Hartley

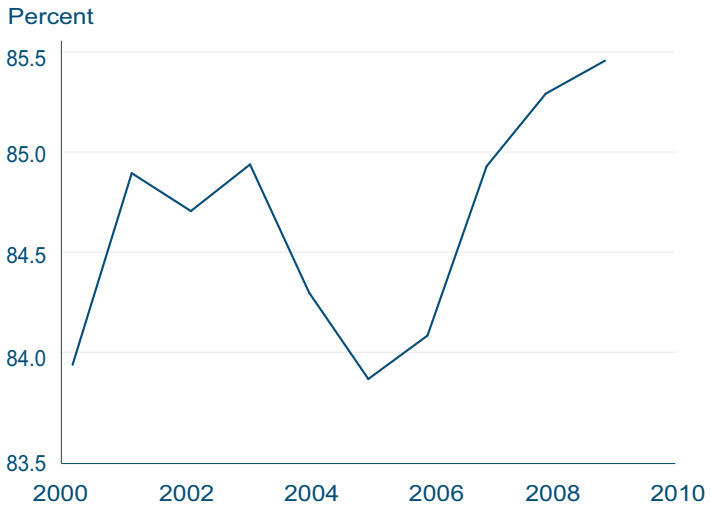
At the end of September 2010, the United States Census Bureau released the 2009 data from the American Community Survey (ACS). One of the questions that participants are asked in this survey is where they were living one year ago. The answer to this question is of particular interest to labor economists since it is one way to assess the degree to which workers are moving around the country to pursue jobs or educational opportunities. Data from the past 10 years of surveys reveal that the fraction of the population living in the same house as they were one year ago has fluctuated between 83.5 percent and 85.5 percent.

The fraction of the population living in the same house as a year ago appears to vary with the business cycle, rising with recessions. The fraction hit a high during the recession of 2001 and remained high for several years before falling to a low in 2005. It rose again during the recent recession of 2007 to 2009.

One might expect labor mobility to look very different in those two recessions, since housing market problems were such an integral part of one and not the other. Home prices fell sharply and foreclosure rates rose steeply during the most recent recession, but not during the 2001 recession.

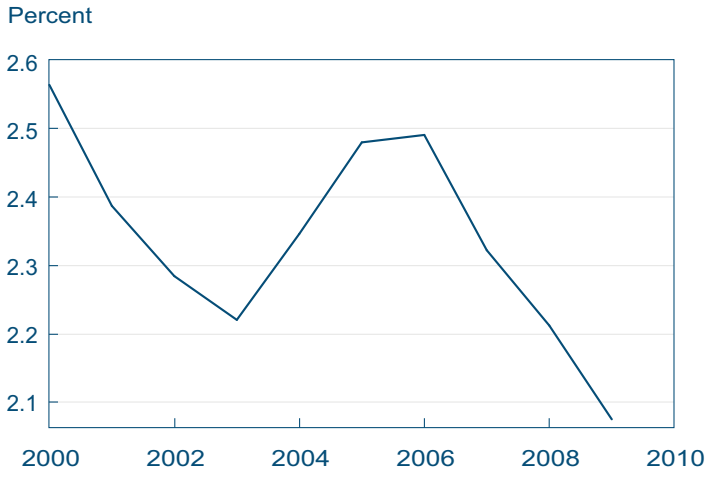
However, while related, housing-price declines and foreclosures can have countervailing effects on mobility. A foreclosure makes it less likely that people will be living in the same house that they were living in a year ago. On the other hand, if housing prices fall so much that homeowners are left owing more to the bank than their home is worth, they are more likely to stay in their home. In order to move, they will either need to sell the house for less than the remaining balance on the loan, come up with the difference, and bring it to the closing, or they will need to default on the loan and let the bank foreclose. To the extent that a homeowner is unable to come up with enough money to pay off

Percentage of the Population Who Lived in the Same House One Year Ago



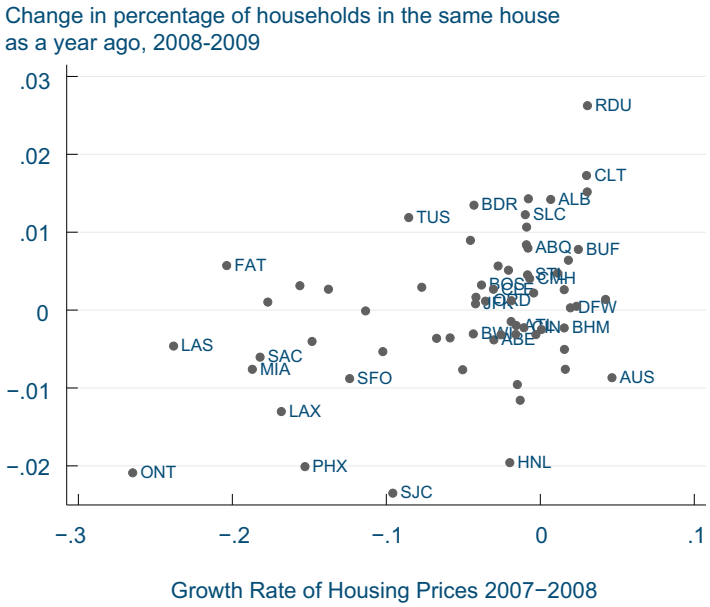
Note: Note: Data from 2006–2009 are adjusted upward by 0.9 percent to account for the fact that the ACS expanded its sample to cover individuals living in group quarters in 2006 and afterward. The data in the figure represent the population not living in group quarters. The adjustment term was calcaulted using the ACS microdata from IPUMS for 2006–2008.
Source: Census Bureau, American Community Survey, 2000–2009 data.

Percentage of the Population Who Lived in a Different State One Year Ago



Note: Data from 2006–2009 are adjusted downward by 0.2 percent to account for the fact that the ACS expanded its sample to cover individuals living in group quarters in 2006 and afterward. The data in the figure represent the population not living in group quarters. The adjustment term was calcaulted using the ACS microdata from IPUMS for 2006–2008.
Source: Census Bureau, American Community Survey, 2000–2009 data.

House Prices and Changes in Mobility



Source: Census Bureau, American Community Survey, 2009 data.

the difference and unwilling to default and suffer the damage to their credit history, they may be less likely to move than they otherwise would be. Economists refer to this phenomenon as, "spatial lock-in." Some observers have expressed concern that it may prevent workers from moving to cities where employment opportunities may be better than where they are currently living.

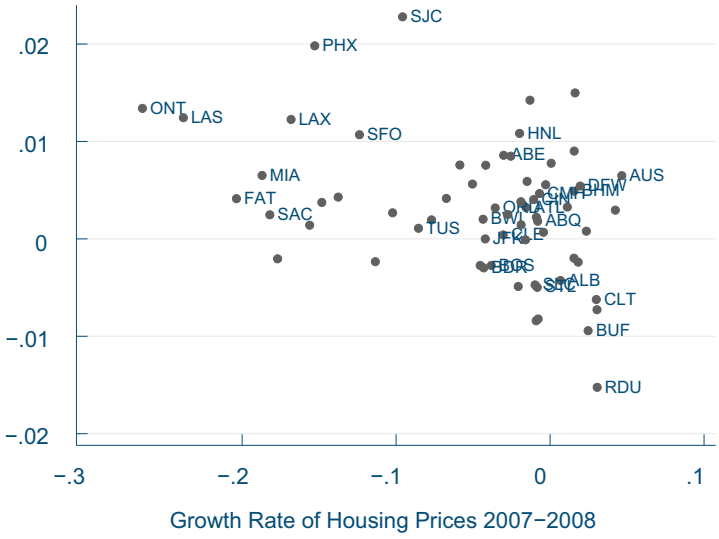
Data from the ACS show that the fraction of the population living in a different state from one year ago also fluctuates with the business cycle. This rate fell during the 2001 recession and in the following two years to below 2.3 percent. After peaking near 2.5 percent in 2006, it is below its 2003 level. On net, a smaller fraction of households moved to a different state during 2009 than did during 2003. This seems to imply that if even if foreclosures are causing some people to move, "spatial lock-in" is keeping enough households from moving so that the current interstate mobility rate has fallen to its lowest level in the past 10 years.

ACS data from 2009 are also available broken down by Metropolitan Statistical Area (MSA). The figure below plots the change in the fraction of the population that was in the same house as one year ago from 2008 to 2009 against the growth rate of MSA housing prices from 2007 to 2008, as measured by the Federal Housing Finance Aurhority's (FHFA) repeat sales index. Each MSA is labelled with the code of the nearest major airport. This plot shows that, on average, MSAs that saw the largest drop in prices from 2007 to 2008 also saw the biggest decline in the fraction of the population that was living in the same house as it was one year earlier. For example, the Riverside-San Bernardino, California, MSA, for which the nearest major airport is Ontario (ONT), saw about a 25 percent drop in house prices from 2007 to 2008 and about a 2 percent drop in the fraction of the population that was living in the same house as it was one year earlier from 2008 to 2009.

However, if we look at people who move but who don't go very far, we find the opposite. The figure below shows the change in the fraction of the population that is still in the same county as a year ago but not in the same house. Here the pattern

House Prices and Changes in Mobility

Change in percentage of households that moved within the same county, 2008-2009



Source: Census Bureau, American Community Survey, 2009 data.

is reversed; MSAs where prices fell the most from 2007 to 2008 seem to show the biggest increase in the fraction of people who moved.

Taken together, the last two figures suggest that MSAs that experienced large price declines experienced a drop in the fraction of the population that stayed in the same house, but that drop was driven by people who moved but stayed in the same county. This pattern seems to be consistent with a higher rate of foreclosure-induced moves in places where prices fell the most. However, as shown in the first figure, the fraction of the population that stayed in the same house over the past year has increased by more than 1 percentage point since 2006.

New Residential Construction Activity in Fourth District Metro Areas

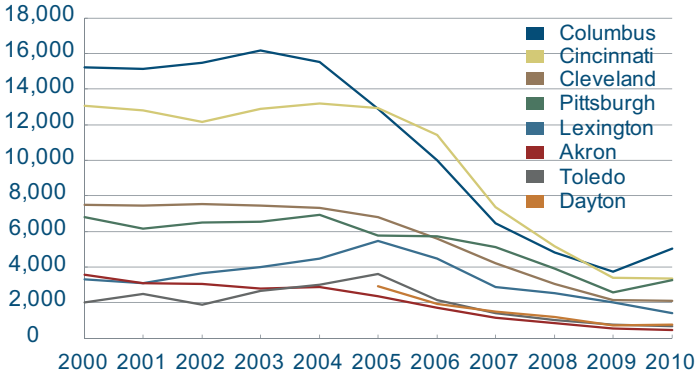
10.25.10
by Stephan Whitaker

The number and value of building permits in the Fourth District show the glimmer of an upturn in local housing markets. This trend is worth watching both for the employment and economic activity it represents, and as an indicator of consumer confidence. From 2000 to 2005, each metropolitan statistical area (MSA) in the Fourth District had a steady or moderately growing annual count of new residential units, and the total value of those units was rising. From 2006 to 2009, both of these metrics plummeted across the region, in step with the national construction slowdown and the economy-wide recession. An upturn in new construction represents consumers' and builders' sense that the regional economy is improving enough to support new houses, condos, and apartments.

The Census Bureau collects counts and valuations of new construction permits issued each month. The data are collected from every municipality that has a permitting process, and they are aggregated at the metropolitan level. The figures reported here cover all residential units, including those intended for rental. The most recent data available are from August 2010. When I refer to a year's data below, it is the sum for the 12 months ending in August of that year.

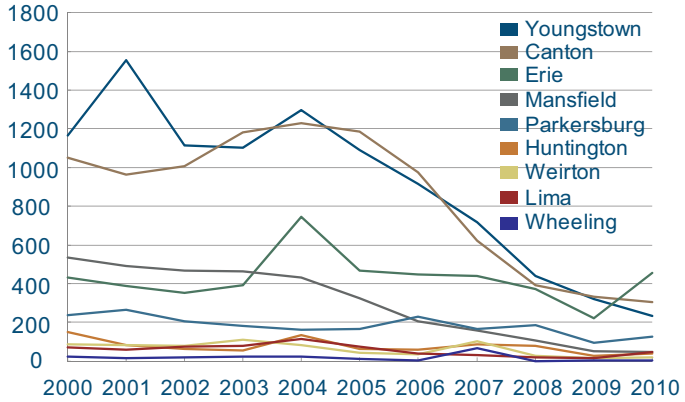
To put the recent figures in perspective, we can review the past decade's data in detail. From 2000 to 2005, the growing regions of Columbus and Cincinnati issued permits for an average of 14,915 and 12,779 new units annually. The permit requests began to decline before the recession, dropping in both metropolitan areas to below 4,000 units in 2009. The Cleveland and Pittsburgh metropolitan areas, which have similar-sized populations but no population growth, averaged 7,249 and 6,399 units, respectively, between 2000 and 2005. Cleveland experienced a decline of 72 percent and Pittsburgh a decline of 66 percent in their 2009 levels. Permits issued in Akron and Toledo in 2009 were less than one-fifth of the 2000-2005 average,

Permits Issued for Residential Units



Notes: Data for the Dayton metro area is only available starting in 2004. The figures are 12-month sums ending in August of the year indicated.
Sources: U.S. Census Bureau, Haver Analytics.

Permits Issued for Residential Units



Notes: Data for the Dayton metro area is only available starting in 2004. The figures are 12-month sums ending in August of the year indicated.
Sources: U.S. Census Bureau, Haver Analytics.

Permits Issued for Residential Units

Metro area	9/2008–8/2009	9/2009–8/2010	Change (percent)
Columbus	3752	5017	34
CIncinnati	3394	3374	-1
Cleveland	2149	2116	-2
Pittsburgh	2580	3264	27
Lexington	2008	1408	-30
Akron	549	476	-13
Toledo	776	665	-14
Dayton	733	778	6
Youngstown	320	233	-27
Canton	334	306	-8
Erie	220	456	107
Mansfield	51	46	-10
Parkersburg	95	125	32
Huntington	28	37	32
Weirton	16	19	19
Lima	14	47	236
Wheeling	2	3	50

Source: Mortgage Bankers Association.

while Lexington managed to reach 40 percent of its earlier level.

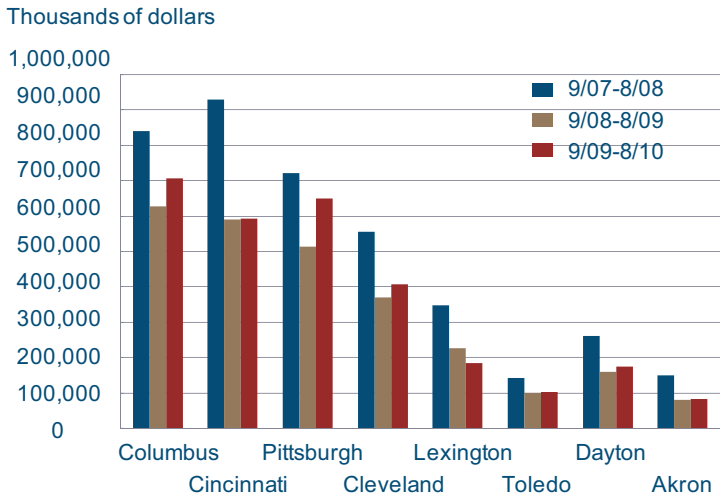
In the smaller metro areas, the trends are very similar albeit at lower levels. Youngstown and Canton averaged over 1,200 and 1,100 permits during the early part of the past decade. Their permit numbers in 2009 were down to 17 percent and 29 percent of these averages respectively. Wheeling, Lima, Huntington, Parkersburg, Mansfield, and Erie all issued permits for less than 100 units in 2009. This represents declines between 26 percent, for Erie, and 94 percent, for Wheeling.

Focusing on the 2010 data, we can look for an upturn. Columbus, Pittsburgh, Erie, Parkersburg, Huntington, Weirton, and Wheeling all increased their permits 19 percent or more in the most recent 12 months of data. Numbers in Cincinnati, Cleveland, Toledo, Dayton, Canton, and Mansfield were steady at their low levels. In Lexington and Youngstown, new construction appears to continue to decline, with the most recent 12-month total (September 2009–August 2010) being less than 75 percent of the previous 12-month total (September 2008–August 2009).

At least as important as the number of units permitted for construction is the value of those units. Obviously, there is a wide range of types of housing, with higher-value homes demanding more labor and materials, and allowing larger margins. The number of permits issued for units in most Fourth District cities did not display a run-up in the mid-2000s. However, the total value claimed on the permits increased dramatically if we compare 2004-2005 to 2000-2001. In just a few years, inflation-adjusted permit values for Columbus and Cincinnati were both up 22 percent. Pittsburgh's and Canton's total values increased more than 15 percent. Toledo and Lexington did see a rise in total units, and the permit values tracked these, increasing 42 percent and 63 percent, respectively. Of course, all Fourth District metro areas are now below their 2000-2001 baseline, with most down by more than 60 percent.

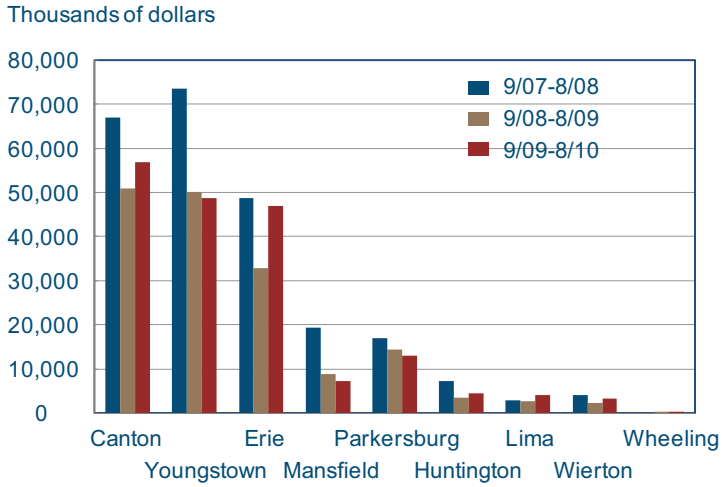
Comparing values in the most recent, distressed years gives some reason for optimism. Among the large metro areas, total values for permits issued

Total Value of Permits Issued for Residential Units



Note: Figures are adjusted for inflation.
Sources: U.S. Census Bureau and Haver Analytics.

Total Value of Permits Issued for Residential Units



Note: Figures are adjusted for inflation.
Sources: U.S. Census Bureau and Haver Analytics.

are up in every metro area except Lexington. In the smaller metro areas, six of the nine display higher total permit values in the last 12 months, relative to the 12 months just preceding.

Every recovery must start somewhere. In the Fourth District, it appears residential construction is starting to climb out of the deep trough it entered during the recession. Those who rely on the industry directly or indirectly, and those who look to it as an indicator, all hope to see an accelerating upward trend and a return to normal, pre-recession levels.

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