

Economic Trends

September 2012 (August 10, 2012-September 14, 2012)

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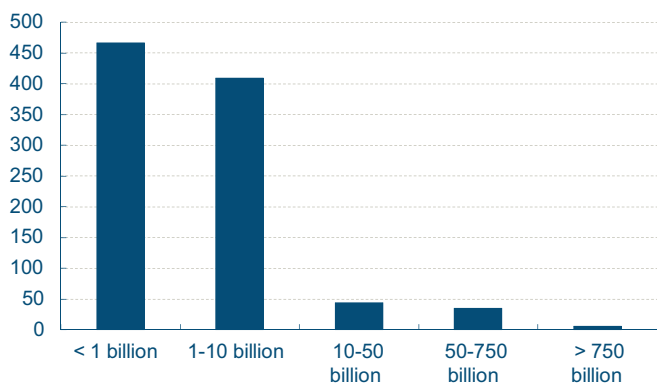
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FEDERAL RESERVE BANK
of CLEVELAND

Bank-Holding Companies in the Last Decade

Number of BHC by Total Assets

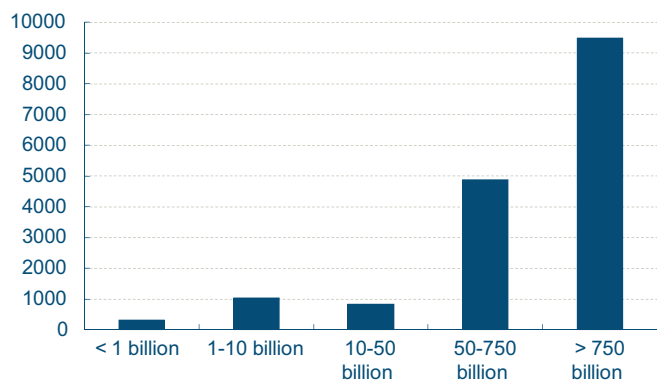
With over \$500 million in assets, as of last reporting period



Source: Call Reports.

BHC Distribution by Asset Size

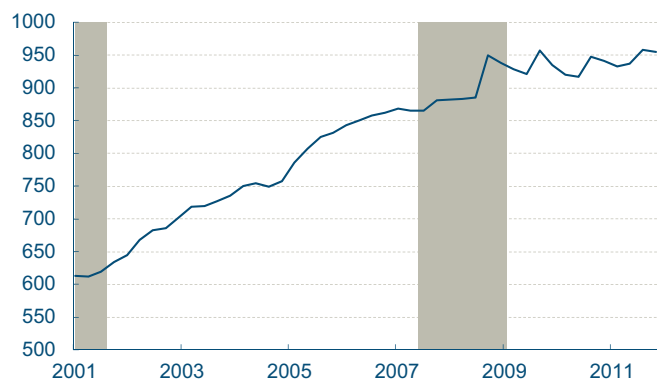
With over \$500 million in assets, as of last reporting period



Source: Call Reports.

Number of Bank Holding Companies With More Than \$500 Million in Assets

Thousands



Note: Shaded bars indicate recessions.
Source: Call Reports.

08.29.2012

by Mahmoud Elamin and Bill Bednar

Generally speaking, a bank-holding company (BHC) is a company that controls more than 25 percent of the voting securities of an FDIC-insured bank. One exception is if the company is holding the securities for trade. Such companies are not classified as BHCs. Below we discuss the condition of U.S. BHCs since 2001. We focus on those with assets of more than \$500 million.

BHCs have to file quarterly financial forms called “call reports” with their primary regulator, the Federal Reserve Board. These reports form the basis of our discussion. Note that we drop BHCs with assets below \$500 million from the sample, since the reporting regime changed slightly and these BHCs report differently before and after 2006.

We first look at the current number of BHCs distributed across five different categories of asset size. We see that the larger the asset size class, the fewer the banks there are in it. As of June 2012, there are only six BHCs with more than \$750 billion in assets and more than 450 that have between \$500 million and \$1 billion in assets.

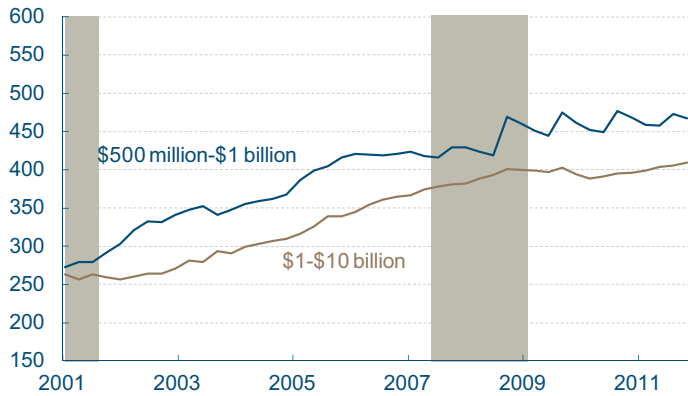
Next we look at how assets are distributed across these asset size classes. That is, we sum the total dollar amount of assets held by the BHCs in each of the size categories of the chart above. We find that almost 60 percent of total assets are held by the top 6 banks. It is no surprise that we hear constant talk about the importance of too-big-to-fail institutions.

The number of BHCs has risen steadily since 2001. Neither the recession after the dot-com bubble nor the Great Recession has discouraged new bank-holding company starts.

The increase in BHCs has been mainly driven by banks with assets below \$10 billion. The number of banks with assets between \$10 billion and \$750 billion has largely stagnated in the last decade or so. The Great Recession has not altered these trends.

Number of Small Bank Holding Companies

By asset size



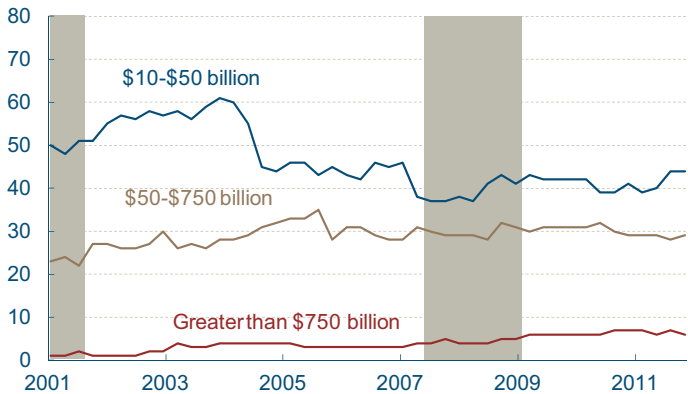
Note: Shaded bars indicate recessions.
Source: Call Reports.

We next look at the growth of assets in dollar amounts across the asset size classes. Assets held by the smaller BHCs have grown significantly.

The assets of banks with between \$10 billion and \$750 billion have largely stagnated in the last decade, with the Great Recession having no large effect on the dollar amount of assets they hold. The most spectacular growth is in the assets of banks with assets over \$750 billion—these have increased almost tenfold. Clearly, the Great Recession has continued the trend of concentrating assets in the largest banks.

Number of Large Bank Holding Companies

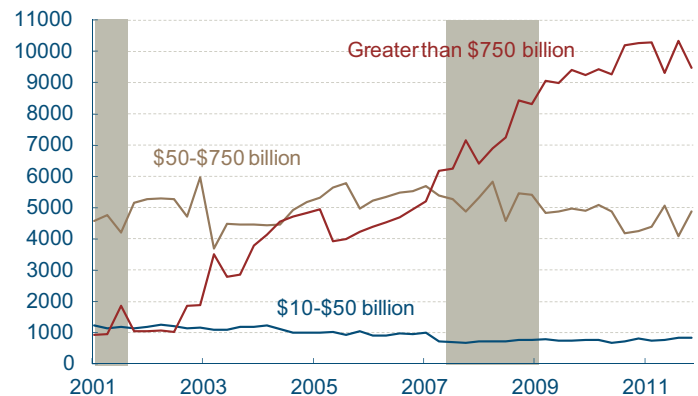
By asset size



Note: Shaded bars indicate recessions.
Source: Call Reports.

Assets of Large Bank Holding Companies

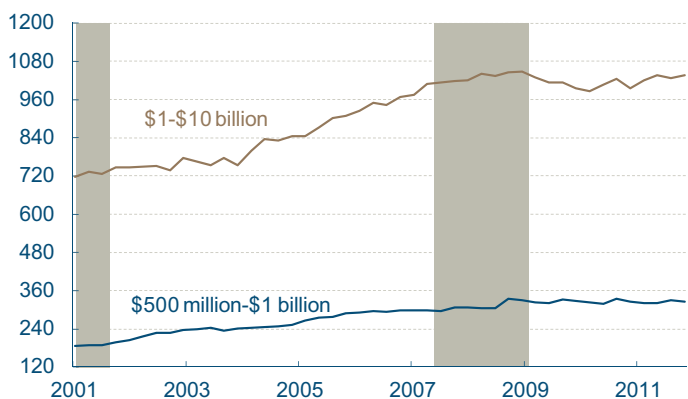
By asset size (billions of dollars)



Note: Shaded bars indicate recessions.
Source: Call Reports.

Assets of Small Bank Holding Companies

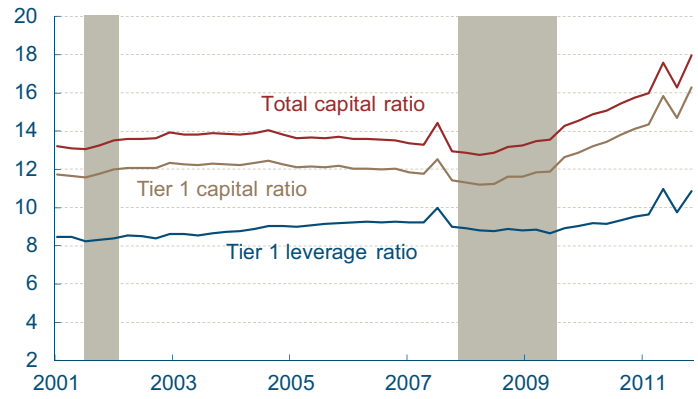
By asset size (billions of dollars)



Note: Shaded bars indicate recessions.
Source: Call Reports.

Average Bank Capitalization Ratios

All bank holding companies



Note: Shaded bars indicate recessions.
Source: Call Reports.

Finally, we look at the average bank capitalization ratios of BHCs. Generally speaking, capital is what remains when the value of liabilities is subtracted from the value of assets, but it can be measured in a number of ways. Tier 1 capital is the sum of common equity, noncumulative preferred stocks, and minority interests. The tier 1 capital ratio and the total capital ratio both dipped to their lowest point during the financial crisis and then reversed course and trended upwards. These ratios are, respectively, the ratio of tier 1 capital to total risk-weighted assets and the ratio of total capital to total risk-weighted assets. After the crisis, the tier 1 leverage ratio, the ratio of tier 1 capital to average total tangible assets, improved slightly.

Behind the Strength in Exports

08.31.2012

by Pedro Amaral and Margaret Jacobson

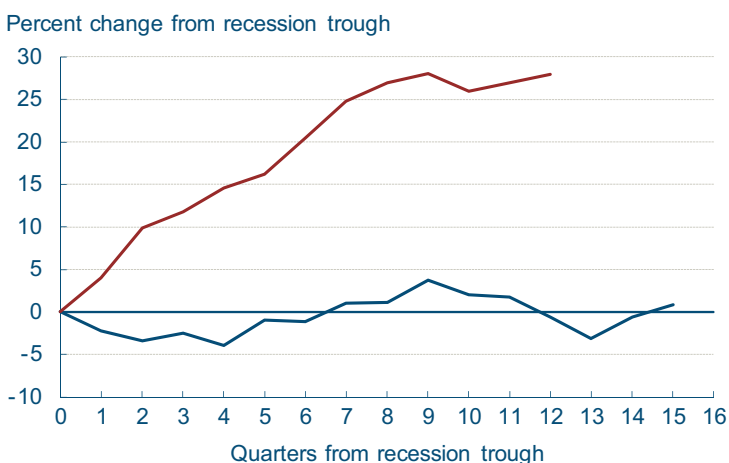
The Bureau of Economic Analysis estimates that GDP grew at an annualized rate of 1.7 percent in the second quarter. While this is an improvement over its advance estimate of 1.5 percent, it still means that GDP growth decelerated slightly from the first quarter, when it came in at 2 percent. Though Personal Consumption Expenditures slumped from a growth rate of 2.4 percent in the first quarter to 1.7 percent—as the production growth of goods practically stagnated—they were still the largest contributor to GDP growth along with exports, which accelerated to a 6 percent clip from 4.4 percent in the previous quarter.

In fact, despite the recovery's frustratingly slow growth, exports have averaged 8 percent yearly growth since the beginning of 2010 and continue to reach record levels in terms of total nominal and real dollars. The ratio of exports to GDP has been growing at a far faster rate in the current recovery than in an average one. Why are exports growing at an unprecedented pace while the rest of the economy remains sluggish?

This strength is even more puzzling when placed in the context of the global slowdown. With many European countries in or on the brink of recession, and fast-growing emerging countries posting below-average growth rates, we would expect to see some slowing in export activity. Exports have cooled from double-digit gains seen in 2010, but they are still averaging a 4.5 percent growth rate over the last four quarters, which is largely in line with previous expansions.

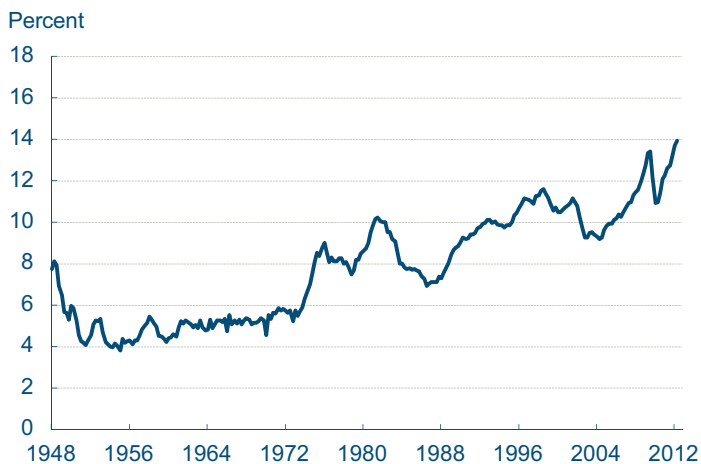
Although the recent global slowdown is likely weighing on foreign demand for American goods and services, U.S. exports have been steadily increasing since the mid-1970s. The forces of rapid growth, industrialization, and declining trade barriers have led to a growing demand for American goods and services that has spanned several decades. Looking at the ratio of exports to GDP we see that

Growth in Exports as a Percent of GDP



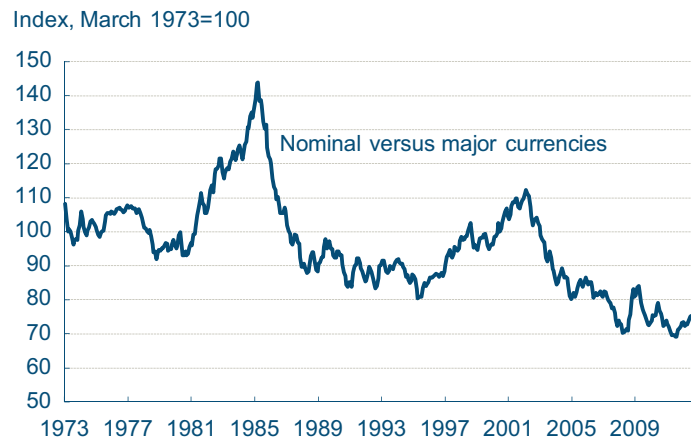
Source: Bureau of Economic Analysis.

Exports as a Percent of GDP



Source: Bureau of Economic Analysis.

Trade-Weighted Exchange Value of the U.S. Dollar



Source: Federal Reserve Board.

from the postwar period to the mid-1970s exports comprised about 5 percent of GDP. In the past decade they averaged roughly 11 percent of GDP and are currently quickly approaching 14 percent. Some of the strength in exports seen throughout the current recovery can therefore be attributed to this long-run trend.

In addition to foreign demand, another factor that determines the level of exports is the value of the dollar relative to other currencies. If the dollar is depreciating, we would expect to see exports increase since dollars become cheaper to foreigners, which in turn allows them to import a larger quantity of goods and services. The dollar has declined relative to major currencies throughout most of the last decade and has hit multidecade lows since the onset of the crisis and throughout the recovery. This depreciation has created favorable conditions for U.S. exports and has likely helped contribute to their strength as well.

In summary, the combination of long-term trends of rising foreign demand and a declining dollar likely account for how much better exports are doing, relative to GDP, in this recovery compared to previous ones. In the short term, though, if the global slowdown continues to take its toll, we will likely see some cooling down in exports.

The Great Recession's Impact on Hours Worked and Employment

08.29.2012

by Dionissi Aliprantis

Employers can respond to the economy by hiring, not hiring, or firing employees, as well as by choosing the hours worked by employees. It is not immediately obvious how these choices might be related over a given time period. In an economic downturn, for example, employers might decrease the number of workers they employ and increase the hours of their remaining employees so as to decrease their costs from benefits. Or employers might choose to decrease the hours their employees work to avoid laying off or firing employees. Or employers might decrease the number of workers and the hours of those remaining simultaneously.

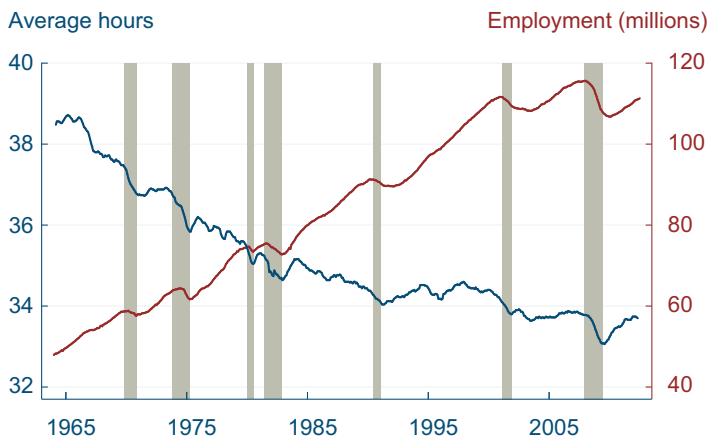
To investigate the impact of the Great Recession on hours worked I retrieved Current Employment Statistics (CES) survey data from the Bureau of Labor Statistics. I began by examining trends in both the level of total private payroll employment and the average weekly hours worked by production and nonsupervisory private employees. Those data show there was a major drop in both employment and average hours worked during the Great Recession.

However, the drop relative to long-term trends is different for each of these variables. While the drop in aggregate employment appears as a deviation from a positive long-run trend, the decrease in hours during the Great Recession only seems to be an acceleration of a long-run decrease in weekly hours worked.

Decomposing these series into sectors, we can see the well-documented growth of the U.S. service sector. Employment in the goods-producing sector has declined only relative to employment in the service-providing sector, not in the absolute number of jobs.

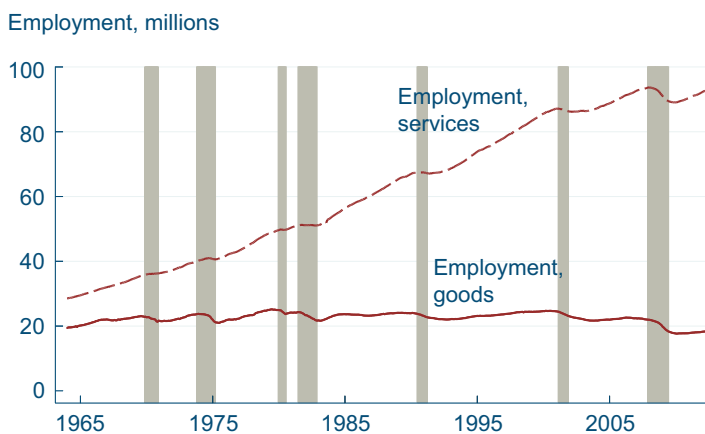
This means that, although there was a smaller absolute loss of jobs during the Great Recession in the goods sector relative to the service sector (3.6 million and 4.1 million jobs lost, respectively), the share of jobs lost was much greater in the goods-

Average Weekly Hours Worked and Employment (Total Private)



Note: Shaded bars indicate recessions.
Source: Current Employment Statistics/Bureau of Labor Statistics.

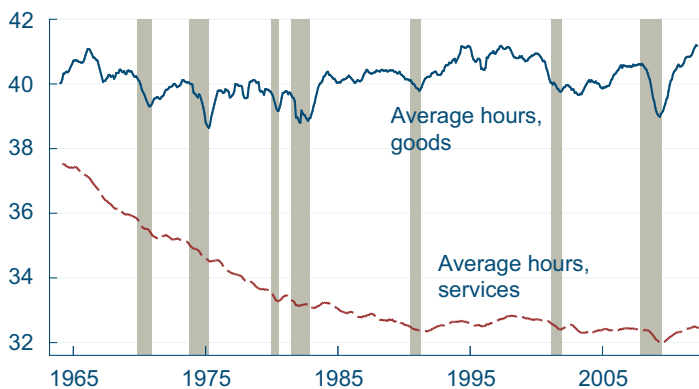
Employment, Goods and Service Sectors



Note: Shaded bars indicate recessions.
Source: Current Employment Statistics/Bureau of Labor Statistics.

Average Weekly Hours Worked, Goods and Service Sectors

Average hours



Note: Shaded bars indicate recessions.

Source: Current Employment Statistics/Bureau of Labor Statistics.

producing sector (16.2 percent versus 4.4 percent). This loss came after employment in the goods-producing sector had already declined from 24.6 million to 22.0 million between January 2000 and December 2007.

The long-run decrease in average hours worked can be better understood by examining the data on the average hours worked in each sector, together with data on the growth of the service sector. The increase in the share of employees working in the service sector, where employees typically work fewer hours, can account for much of the long-run decrease in hours. However, the shift to the service sector would have had a muted impact on hours if not for the decrease in hours in that sector over time. Between January 1964 and December 2007, average weekly hours in the service sector fell from 37.5 hours to 32.4, with most of the decrease occurring by 1990.

Focusing on the impact of the Great Recession, we see that the changes in average hours worked were larger in both absolute and relative magnitude for the goods-producing sector. Average hours for goods-producing employees fell by 1.6 hours between December 2007 and June 2009, a 3.9 percentage point drop. Meanwhile, average hours fell just 30 minutes over the same period for private service-providing employees, a 1.5 percentage point decrease.

Returning to the first chart, we see that average hours worked have returned to levels experienced prior to the Great Recession. Service-providing hours had returned to their December 2007 level by May 2012, and the recovery in goods-producing hours has been strong enough that the average weekly time worked in that sector actually increased by 24 minutes between December 2007 and May 2012. Since there is historically a positive correlation between the lagged change in average weekly hours and the current change in employment, this recovery in average hours could be a positive indicator for future employment.

Visualizing Disinflation...And No, We're Not There Yet

08.20.2012

by Brent Meyer

July Price Statistics

	Percent change, last					2010 average
	1mo. ^a	3mo. ^a	6mo. ^a	12mo.	5yr. ^a	
Consumer Price Index						
All items	0.6	-0.8	1.0	1.4	1.9	3.0
Excluding food and energy (core CPI)	1.0	2.0	2.2	2.1	2.8	2.2
Median ^b	2.5	1.8	1.9	2.3	1.9	2.3
16% trimmed mean ^b	1.3	1.4	1.7	2.0	2.0	2.6
Sticky CPI	1.8	2.1	2.1	2.3	2.0	2.1
Sticky CPI excluding shelter ^c	1.3	2.3	2.2	2.4	2.2	2.3

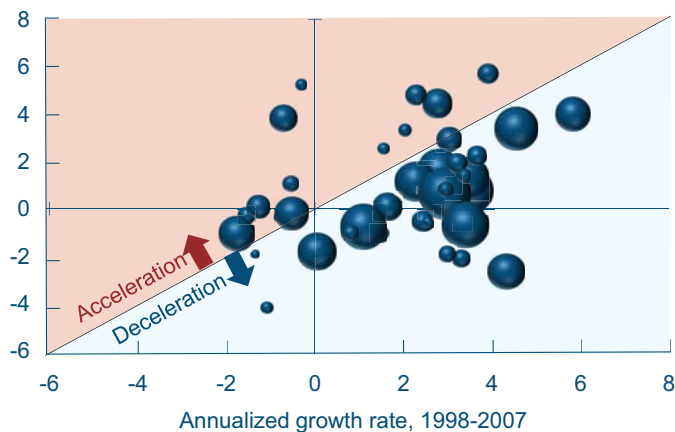
a. Annualized.
 b. Calculated by the Federal Reserve Bank of Cleveland.
 c. Author's calculations.
 Source: Bureau of Labor Statistics.

The Consumer Price Index (CPI) was virtually flat for the second consecutive month, rising at an annualized rate of just 0.6 percent in July, and is only up 1.1 percent over the past six months. While much of this softness has to do with declining energy prices, the core CPI (which excludes food and energy items) rose just 1.1 percent in July compared to its 12-month growth rate of 2.1 percent.

Measures of underlying inflation produced by the Federal Reserve Bank of Cleveland—the median CPI and 16 percent trimmed-mean CPI—disagreed on how soft July's data were. The median CPI rose 2.5 percent during the month, while the 16 percent trimmed-mean CPI increased just 1.3 percent. Rents were the primary cause of the disparity in July. In contrast to the softness elsewhere in the market basket, rents continued to increase. Rent of primary residence jumped up 3.8 percent in July and is up 2.8 percent over the past year. Owners' equivalent rent (OER) rose 2.1 percent during the month, compared to its growth rate over the previous three months of 1.5 percent.

Price-Change Distribution (Disinflation)

Annualized percent change, 2009-2010



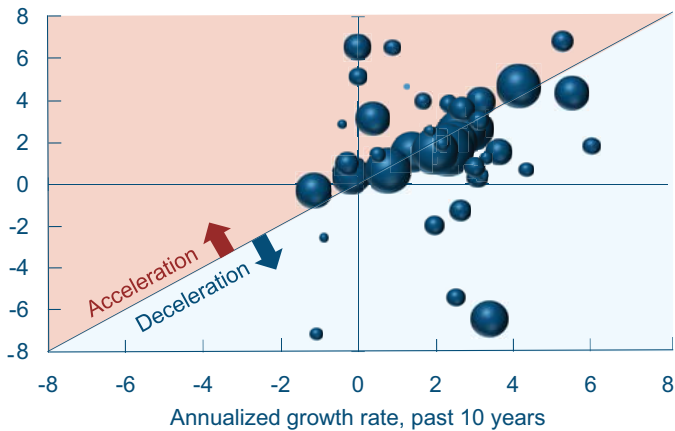
Source: Bureau of Labor Statistics.

Given the current environment of sluggish GDP growth and an elevated unemployment rate, unwanted disinflation—a slowing in the rate of inflation—may raise some concerns. To be clear, July's data are only one month's worth, and even after factoring them in, the recent (six-month) trend in many underlying inflation measures is still within a few percentage points of 2.0 percent.

We can use the component price-change distribution to gauge the breadth (or lack thereof) of the recent softness in retail prices. The following “bubble-plots” plot the 45 components of the retail market basket used in calculating the median CPI. The size of the bubble corresponds to the relative importance (or weight) that each component carries in the market basket. In all the pictures, the longer-run (10-year) annualized growth rate in each component is plotted along the horizontal

Price-Change Distribution, 2012:Q1-Q3

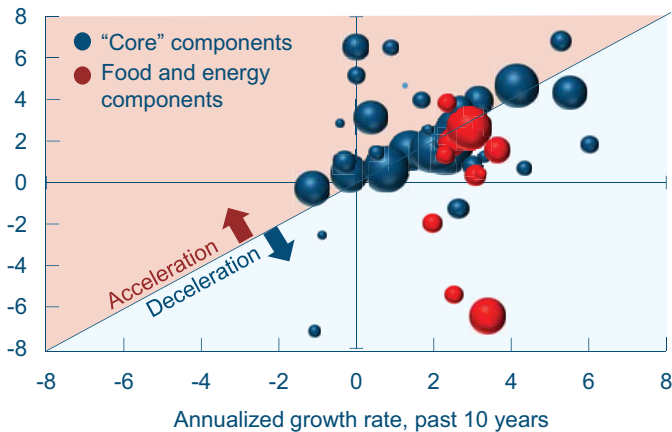
Annualized growth rate, past 6 months



Source: Bureau of Labor Statistics.

Price-Change Distribution for Core and Noncore Items, 2012:Q1-Q3

Annualized growth rate, past 6 months



Source: Bureau of Labor Statistics.

axis. And the component price change for the time period in question is plotted on the vertical axis. If the bubble lies below the 45 degree line, its growth rate is slower than its longer-run trend. If it's above, the growth rate is higher than trend.

The first bubble-plot is a clear example of disinflation. The 2009-2010 period was the closest the United States has come to deflation since the Great Depression. During this period, the median CPI averaged an increase of 0.9 percent and actually decreased in four of those 24 months. The bubble-plot reflects the fact that most components exhibited a sharp slowdown from their respective longer-run (10-year) trends (I omitted 2008 because the energy price shock would have exacerbated the slowdown). From 2009-10, 29 out of 45 components, or roughly 75 percent of the market basket by expenditure weight, increased at a rate at least 1.0 percentage point slower than their respective longer-run trends.

In contrast, over the past six months just 17 out of 45 components (comprising less than a quarter of the overall index by expenditure weight) are trending more than 1.0 percentage point slower than their respective longer-run trend.

For those that view food and energy price movements as entirely transitory, the lack of a disinflationary shift becomes more distinct. After excluding food and energy items, just 9 of the remaining 33 components (11 percent by expenditure weight) are trending more than a percentage point slower than their longer-run trend.

While the recent retail price data are coming in a little softer, it's just that...a little softer. The underlying price distribution doesn't reveal anything close to the broad-based deceleration in prices that we witnessed during 2009-2010.

Delaying Enrollment and College Completion

09.04.2012

by Jonathan James

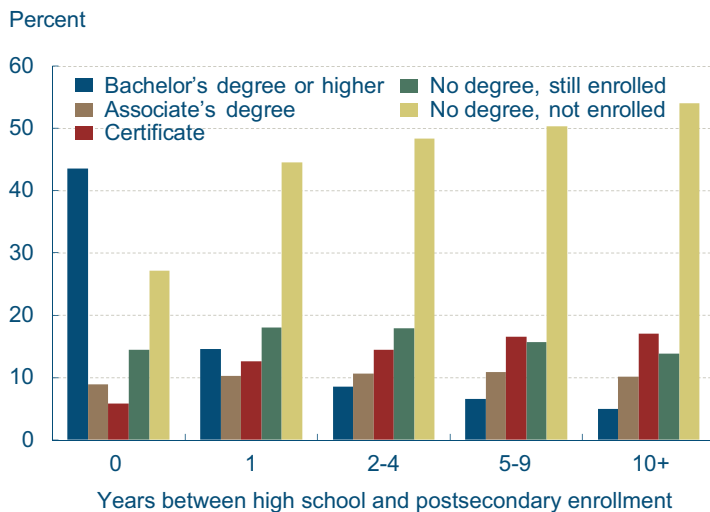
The effect of a postsecondary education on labor market outcomes has been a central focus for policymakers and researchers. One reason for the interest is that significant evidence suggests that workers with a postsecondary education, in particular a bachelor's degree, enjoy higher wages and higher job satisfaction. However, only about 30 percent of individuals who start a postsecondary education (including four-year, two-year, and less than two-year schools) will actually attain a bachelor's degree, even looking six years past their first date of enrollment.

One of the strongest correlates with bachelor degree completion is the timing of postsecondary education. About two-thirds of new postsecondary enrollees arrive immediately after completing their secondary education, while the other one-third experience a gap of one year or more between high school completion and beginning their postsecondary career. Between these two groups, those that delay postsecondary education are five times less likely to attain a bachelor's degree in six years than those who begin immediately from high school.

Even restricting the comparison to those who only delay their postsecondary education by one year, this group is still more than three times less likely to complete a bachelor's degree, with a completion rate of 14 percent, compared to 43 percent for immediate enrollers. In addition, although this group is more likely to earn other credentials from their postsecondary education, like associate's degrees and certificates, they are also significantly more likely to end their postsecondary education without receiving any degree or certificate at all, with 44 percent of those delaying college by one year dropping out altogether compared to 27 percent for immediate enrollers.

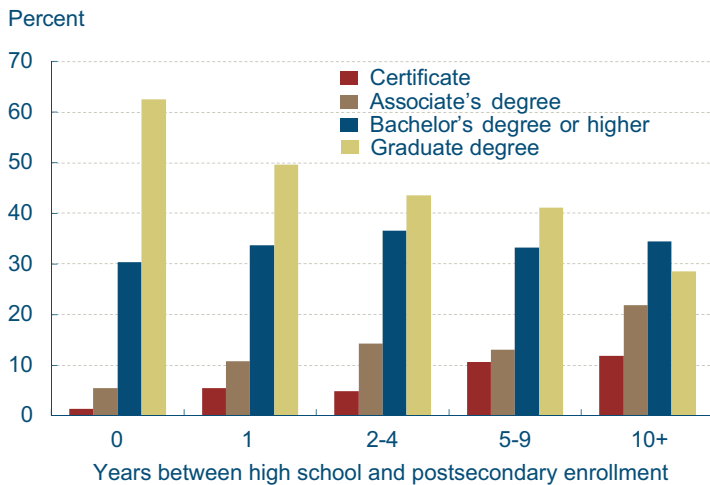
Remarkably, most first-time postsecondary enrollees report long-term educational aspirations of a bachelor's degree or higher. Those not delaying

Education Outcomes Six Years After First Enrollment



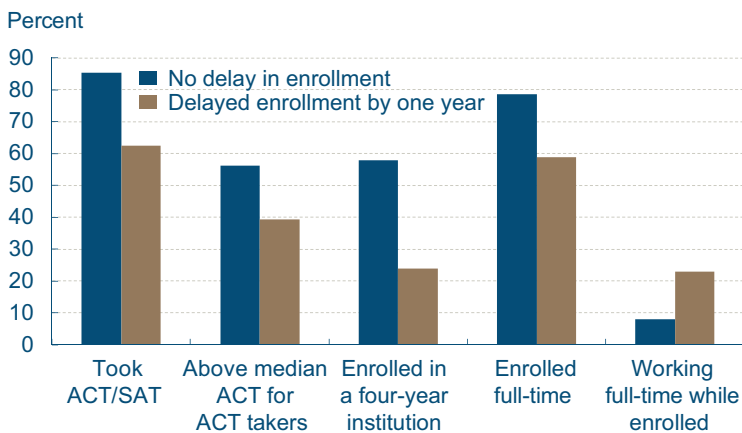
Sources: NCES, author's calculations.

Highest Degree Ever Expected



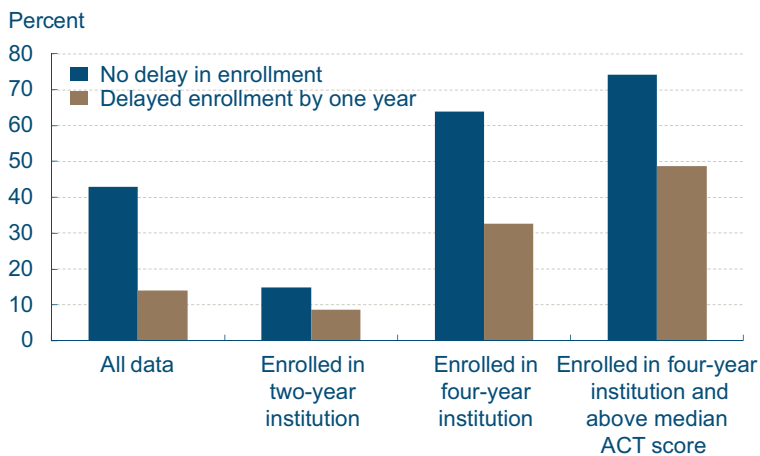
Sources: NCES, author's calculations.

Characteristics of Post Secondary Education In First Year



Sources: NCES, author's calculations.

Bachelor Completion Rates



Sources: NCES, author's calculations.

postsecondary education have the highest expectations, with more than 90 percent expecting a bachelor's degree or higher. Those delaying postsecondary education by one year have very similar expectations, at 83 percent. Perhaps more surprising, more than 50 percent of those first-time enrollees who have a 10-year gap or more since high school completion aspire to complete a bachelor's degree or higher.

How can we understand these large differences in outcomes despite very similar expectations? One explanation may be that these individuals, even those delaying postsecondary school by just one year, differ from those that do not delay in meaningful ways, and the differences affect their probability of completion. Four relevant factors would be academic preparation, the level of the institution initially enrolled in, the intensity of enrollment, and employment while enrolled.

Looking at these factors, we see noticeable differences for those delaying postsecondary education by one year. First, these individuals are less likely to have taken the ACT or SAT, and those who do take it have lower scores on average than those who begin their postsecondary education directly after high school. Second, only 24 percent of students delaying their enrollment begin their postsecondary education in a four-year institution, compared with 58 percent for immediate enrollers. While individuals are able to transfer to a four-year institution from a two-year school and complete their bachelor's degree, this occurs in about only 10 percent of cases.

Third, the majority of non-delayers, 78 percent, report being enrolled in school exclusively full-time, while for those delaying one year the proportion is 59 percent. Finally, highly related is the difference in employment responsibilities between the two groups. Those delaying college are twice as likely to be employed full-time during their first year of college compared to immediate enrollers.

Restricting the comparison to similarly situated students provides better insight into the relationship between these variables. Looking at just those individuals who start their postsecondary education in a two-year school, those coming directly from high

school are only 70 percent more likely to attain a bachelor's degree than those who delay, compared to three times more likely when we just compare all students who delay against those who don't.

Turning to first-time four-year enrollers, immediate enrollers are twice as likely to complete a bachelor's degree, at 64 percent versus 32 percent. If we condition this population even further and examine those enrolling in four-year schools with ACT scores above the median, the gap shrinks further, such that immediate enrollers are only 50 percent more likely to complete a bachelor's degree.

These results indicate that observable factors are important in explaining part of the disparity in completion rates. However, even after restricting the analysis to similar populations, large differences still remain. We cannot infer a causal relationship in these differences from such a simple analysis. Further study requires understanding the importance of unobserved factors influencing these patterns. For example, some individuals may be more committed to completing a bachelor's degree, and their level of commitment may be reflected in the fact that they choose to begin college immediately from high school. Alternatively, around 90 percent of those delaying school say that working was the reason for the delay. This may suggest that these individuals may be more income-constrained and may find a bachelor's degree too costly to complete.

One thing is clear. While policymakers espouse the benefits of higher education, encouraging individuals to begin a postsecondary education is one thing; getting them to complete it may be a completely different story.

Policy Rule Changes

08.31.2012

by Charles T. Carlstrom and Samuel Chapman

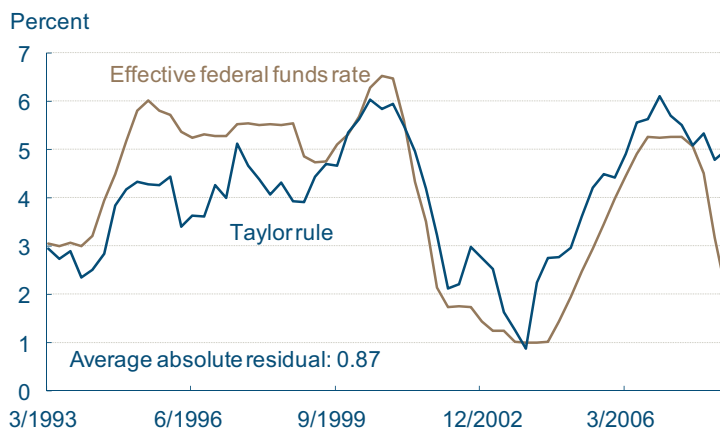
One area of active interest for both policymakers and market watchers is to find a simple rule (or rule of thumb) that approximates Fed policy on interest rates. John Taylor came up with the first such rule in 1993, and since then, a number of variations have been proposed. One variation suggests that the Fed responds positively to increases in inflation above target (currently 2 percent) and negatively when unemployment increases.

While this simple rule of thumb tracks broad movements in the federal funds rate, the average absolute value of the miss is 87 basis points. To put this another way, if we assumed that our best guess of today's funds rate was yesterday's funds rate, the average absolute miss would only be 32 basis points.

For this reason, it is frequently argued that the Fed responds not only to inflation and unemployment, but also to last quarter's funds rate. A rule incorporating all of these elements is known as a partial adjustment rule. In practice, this rule would mean that the central bank uses the Taylor rule as its intermediate target and only partially moves the level of the funds rate to this value at every meeting.

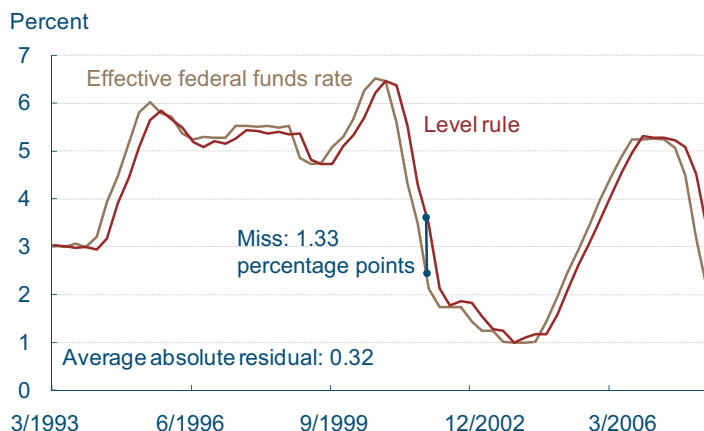
At first glance, this rule tracks the funds rate remarkably well. But looks can be deceiving. The deviation of the funds rate from its predicted value is given by the vertical distance in the chart below. Take the end of 2001, for example. The miss on that date was a whopping 133 basis points. Since the average absolute funds rate change is only 32 basis points, this 133 basis point miss is huge. Even more disconcerting is that it does not beat the naive rule, where the funds rate today is given by yesterday's funds rate and the average absolute miss is 32 basis points. As the chart shows, the partial adjustment rule is essentially a simple phase shift of the actual funds rate.

Taylor Rule Predictions



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

Partial Adjustment Level Rule



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

January Price Statistics

	Percent change, last					2010 average
	1mo. ^a	3mo. ^a	6mo. ^a	12mo.	5yr. ^a	
Consumer Price Index						
All items	2.5	1.2	1.8	2.9	2.3	3.0
Excluding food and energy (core CPI)	2.7	2.2	2.1	2.3	1.8	2.2
Median ^b	3.0	2.6	2.7	2.4	2.0	2.3
16% trimmed mean ^b	2.9	2.0	2.3	2.6	2.1	2.6
Sticky price ^c	3.0	2.7	2.6	2.2	2.0	2.1
Flexible price ^c	1.4	-1.8	0.0	4.8	3.0	5.5

a. Annualized.

b. Calculated by the Federal Reserve Bank of Cleveland.

c. Author's calculations.

Source: Bureau of Labor Statistics.

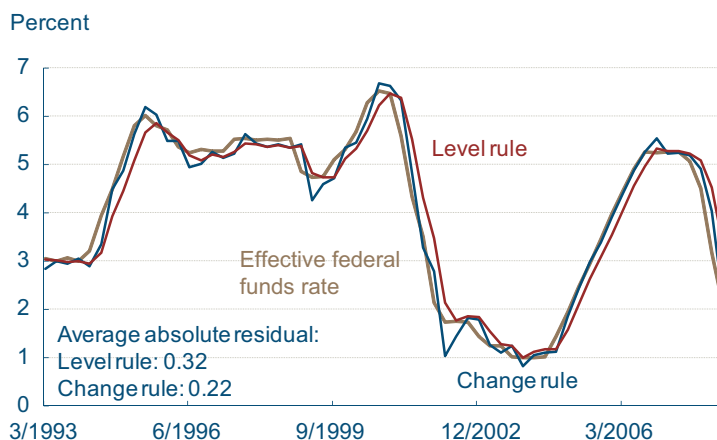
ity is that the rule assumes that the Fed is adjusting the level of the funds rate to the level of the Taylor rule. Implicit in this way of thinking is that no change in the funds rate translates to no policy change. But if the Federal Open Market Committee (FOMC) had been steadily reducing rates by 25 basis points over the past few meetings, keeping rates constant would probably be viewed by most as a change in the course of policy. This type of thinking focuses on changes in the funds rate and not the level of the funds rate.

Metaphorically, if a boat is traveling east toward the harbor at five knots, should we think of the constantly changing location as a change in the skipper's policy, or should we think of a change in the skipper's policy as a change in the boat's speed? With a level policy, the current speed is independent of the past speed and depends only on his current distance from his destination. But such a policy may imply a very sharp acceleration or deceleration, which could be uncomfortable for the passengers (markets). The change in policy we consider is one where the skipper considers both the distance from the destination and his recent speed. This implies a smoother path into the harbor.

We explore a description of monetary policy expressed in terms of funds rate changes, instead of the level of the funds rate. Here the change in the funds rate moves gradually toward an intermediate target. There is a subtle but important distinction between the traditional level rule and our change rule. Suppose that at the previous meeting the FOMC had increased the rate to 3.25 percent. Under the traditional level rule (a partial adjustment rule based on the level), the FOMC's choice today is independent of how the FOMC arrived at 3.25 percent at its last meeting. In contrast, under our change rule (a partial adjustment rule based on the change in the rate), the FOMC would also consider the rate changes that led it to 3.25 percent.

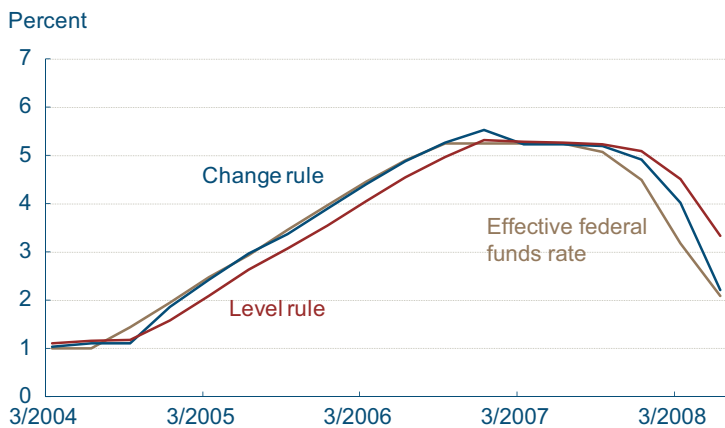
Our change rule expresses the change in the funds rate as a weighted average of yesterday's change in the funds rate and the deviation of yesterday's funds rate from a simple Taylor rule, or the "intermediate target."

Level and Change Rules



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

Level and Change Rules



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

Compared to the level rule, the improvement in fit with the change rule is substantial: a reduction of 10 basis points in the residual. This reduction is sizeable, given that the average rate change is 32 basis points. There is one problem with the change rule: It often overshoots the actual funds rate at the end of sustained policy movements. The change rule is trying to proxy for the idea that the FOMC does not like to change the course of policy abruptly. That is, other things equal, the FOMC would not want to decrease rates if there is a likelihood that it would need to increase rates in the near future.

Focusing on shorter subperiods highlights some of the differences between the level and change rules. The phase shift under the level rule is quite evident, while this shift is largely eliminated with the change rule. For example, during the sustained increase in rates starting in early 2005, the level rule is always a quarter behind, while the change rule is on target. There is also the overshooting under the change rule, overshooting at both the end of 2006, and the fall of 2008.

These two episodes are almost certainly a manifestation of the fact that the FOMC does not mechanically follow a simple policy rule but responds to unusual developments in the economy. The 2006 overshooting is likely a reflection of the FOMC's desire to limit funds rate increases in the wake of the substantial change in the behavior of house prices. As for the fall of 2008, almost certainly the FOMC moderated the funds rate decline (relative to the change rule) because of the near proximity of the zero bound (where the funds rate approached zero). This moderation may have derived from the FOMC's desire to save some policy ammunition for a later date. A similar argument likely applies for the change rule's overshooting in the spring of 2002. A review of FOMC minutes reveals that there was discussion of the zero bound at the January 2002 meeting.

Yield Curve and Predicted GDP Growth, August 2012

Covering July 28, 2012–August 23, 2012
by Joseph G. Haubrich and Patricia Waiwood

Highlights

	August	July	June
3-month Treasury bill rate (percent)	0.10	0.10	0.09
10-year Treasury bond rate (percent)	1.76	1.47	1.64
Yield curve slope (basis points)	166	137	155
Prediction for GDP growth (percent)	0.6	0.6	0.7
Probability of recession in 1 year (percent)	8.5	11.7	9.7

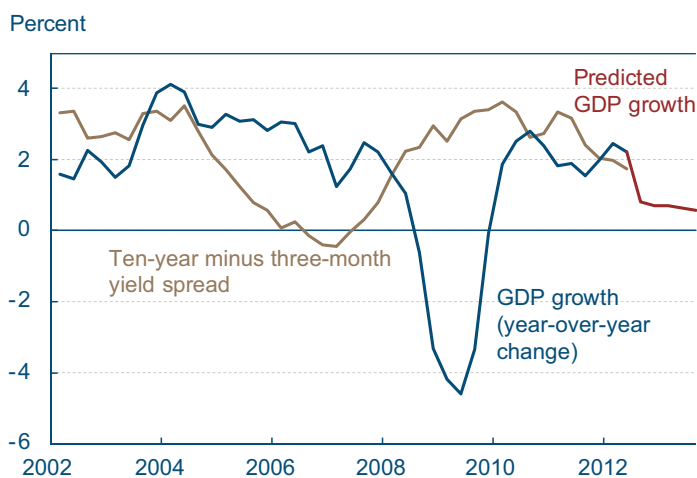
Overview of the Latest Yield Curve Figures

Over the past month, the yield curve has steepened, as short rates stayed even and long rates took a jump up. The three-month Treasury bill stayed at 0.10 percent (for the week ending August 17), which was even with July's figure and just above June's 0.09. The ten-year rate rose by more than a quarter point, coming in at 1.76 percent, up from July's 1.47 percent and from June's 1.64 percent. The twist increased the slope to 166 basis points, above the 137 basis points seen in July and the 155 basis points seen in June.

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

The steeper slope did lead to a more optimistic outlook on the recession front, however. 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 August is about 8.5 percent, down from July's 11.7 percent and June's 9.7 percent. So although our approach is somewhat pessimistic as regards the level of growth over the next year, it is quite optimistic about the recovery continuing.

Yield Curve Predicted GDP Growth



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

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.

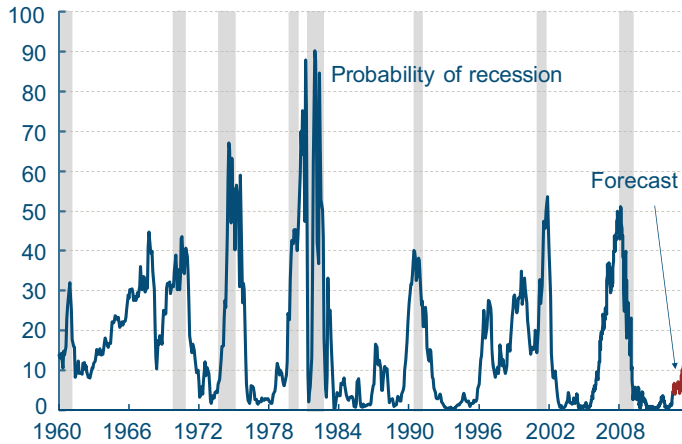
Predicting the Probability of Recession

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.

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 Probability from Yield Curve

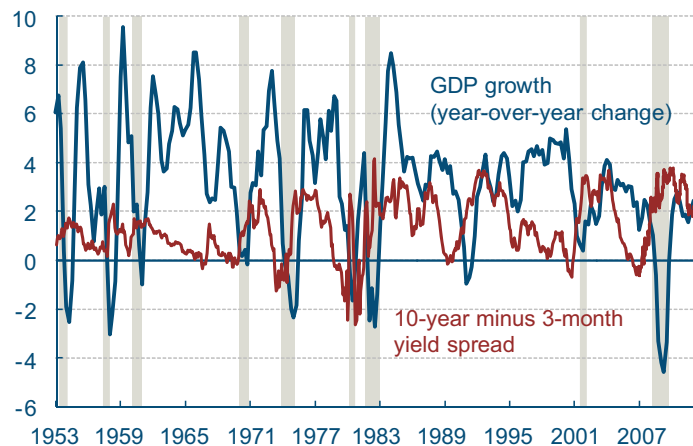
Percent probability, as predicted by a probit model



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

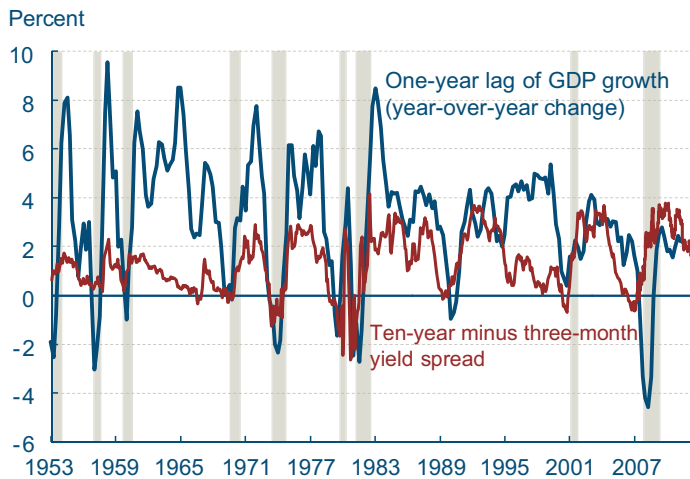
Yield Curve Spread and Real GDP Growth

Percent



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

Yield Spread and Lagged Real GDP Growth



Note: Shaded bars indicate recessions.

Sources: Bureau of Economic Analysis, Federal Reserve Board.

recession at a given point in the future. Typically, we calculate and post the probability of recession one year forward.

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

Long-Term Population Changes Within Cities

09.10.2012

by Daniel Hartley

How have population growth and population decline played out within cities over the past 30 years? Following up on some work on gentrification and urban decline (here and here) by Veronica Guerrieri, Erik Hurst, and me, I look at how the high- and low-priced neighborhoods of cities that were large in 1980 have grown and shrunk since then.

To conduct this analysis, I started by assembling the set of U.S. cities that had a population of 300,000 in 1980. Then I narrowed the set to cities in which at least 60 percent of the population lived in census tracts whose boundaries did not change between 1980 and 2000 (or they changed only slightly; specifically, the area changed by less than 40,000 square meters and the center moved by less than 100 meters). This leaves me with 29 cities.

I then ranked the cities based on the total population growth of these consistently defined neighborhood sets. Growth is calculated using data in the 1980 Census and the 2005–2009 American Community Survey. Growth rates range from a 43 percent drop in population in New Orleans to an increase in population of 30 percent in Phoenix.

Columns 1–10 show population growth rates for groups of neighborhoods split up by home prices in 1980. Column 1 shows population growth for the 10 percent of neighborhoods that had the lowest home prices in 1980, column 2 shows population growth for the 10 percent of neighborhoods that had the second lowest home prices in each city in 1980, while column 10 shows population growth for the 10 percent of neighborhoods that had the highest home prices within each city in 1980.

The first thing that is apparent in the table is that cities that shrank tended to shrink the most in neighborhoods that had low housing prices in 1980. This pattern holds roughly from New Orleans all the way through Chicago (which shrank only slightly). In fact, a similar pattern is evident in Oklahoma City and Charlotte (which grew).

On the other hand, cities such as San Francisco, Oakland, New York, and Seattle grew the most in neighborhoods that had low housing prices in 1980.

These two patterns are broadly consistent with changes in cities that one might term urban decline and gentrification. In the urban-decline pattern, as the population of a city shrinks, the least desirable neighborhoods are abandoned first. It is important to stress that this is a net population change, so it is not necessarily the case that lots of households leave. It may just be that fewer get replaced, and thus there is a net population loss. In the gentrification pattern, as growing cities expand, more people, on net, locate in what were formerly the least desirable neighborhoods. As a result, the population in those neighborhoods grows the most.

Population Growth and House Prices

City	Population growth	Population growth in house price deciles (percent)									
		1	2	3	4	5	6	7	8	9	10
New Orleans	-43	-65	-65	-44	-47	-30	-42	-43	-30	-33	-32
Cleveland	-27	-47	-43	-37	-44	-33	-34	-23	-20	-11	-9
Buffalo	-24	-40	-47	-48	-28	-28	-11	-9	-20	-12	-8
St. Louis	-22	-47	-41	-33	-39	-24	-18	-4	-9	-6	-6
Baltimore	-20	-41	-42	-33	-27	-25	-22	-13	-12	4	7
Detroit	-19	-36	-34	-27	-38	-15	-13	-7	-12	-4	1
Newark	-18	-14	-39	-42	1	-19	-18	-3	-29	0	-13
Cincinnati	-16	-2	-40	-16	-25	-27	-11	-17	-1	-1	10
Tulsa	-13	-33	-26	-15	-15	-2	-3	-10	-9	-15	4
Columbus	-12	-40	-35	-10	-18	-17	-10	-15	15	0	14
Kansas City	-11	-32	-36	-20	-26	-24	-15	-5	-5	2	38
Toledo	-11	-36	-41	-17	-13	-11	-8	-6	0	-1	9
Indianapolis	-10	-21	-34	-19	-16	-16	-19	-18	25	9	2
Philadelphia	-10	-34	-24	-14	-16	-16	-19	-18	25	9	2
Washington	-9	-27	-14	-22	-16	-10	-11	-8	6	9	4
Milwaukee	-7	-34	-30	-15	2	-5	4	-3	-1	1	-2
Chicago	-6	-23	-22	-28	-20	-7	-10	5	11	9	5
Oklahoma City	4	-13	-17	-19	1	-1	2	4	8	57	35
Denver	6	7	13	0	4	-5	4	7	-5	1	11
Boston	9	1	8	15	11	1	4	4	7	29	11
Charlotte	11	-40	-18	-33	-7	-4	43	23	40	63	18
Portland	13	1	14	1	6	10	20	3	25	8	56
San Francisco	15	33	33	24	21	14	10	6	4	1	1
Oakland	16	20	23	16	25	15	22	8	14	13	2
New York	17	17	22	22	21	21	15	21	21	11	8
Tucson	19	0	22	49	3	6	23	14	7	25	10
Seattle	20	24	25	20	19	21	16	20	27	11	14
Atlanta	21	-12	-14	-14	24	-2	-15	1	41	84	93
Phoenix	30	-4	24	54	61	52	24	22	20	26	3

Sources: Census Bureau, 1980 Census and 2005–2009 American Community Survey.

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