

# Economic Trends

March 2011 (February 8, 2011-March 8, 2011)

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# Yield Curve and Predicted GDP Growth, February 2011

## Highlights

	February	January	December
3-month Treasury bill rate (percent)	0.11	0.15	0.14
10-year Treasury bond rate (percent)	3.60	3.36	3.18
Yield curve slope (basis points)	349	321	304
Prediction for GDP growth (percent)	1.0	1.0	1.0
Probability of recession in 1 year (percent)	0.7	1.2	1.5

Covering January 15, 2011–February 25, 2011  
by Joseph G. Haubrich and Timothy Bianco

## Overview of the Latest Yield Curve Figures

The yield curve twisted steeper over the past month, as long rates once again increased substantially, moving up nearly one quarter of a percentage point, while short rates edged down. The three-month Treasury bill rate moved down to 0.11 percent, below January’s 0.15 percent and December’s 0.14 percent. The ten-year rate rose to 3.60 percent, up from January’s 3.36 percent, which itself was up sharply from December’s 3.18 percent. The slope rose by 28 basis points, staying above 300, and remains a full 45 basis points above December’s 304.

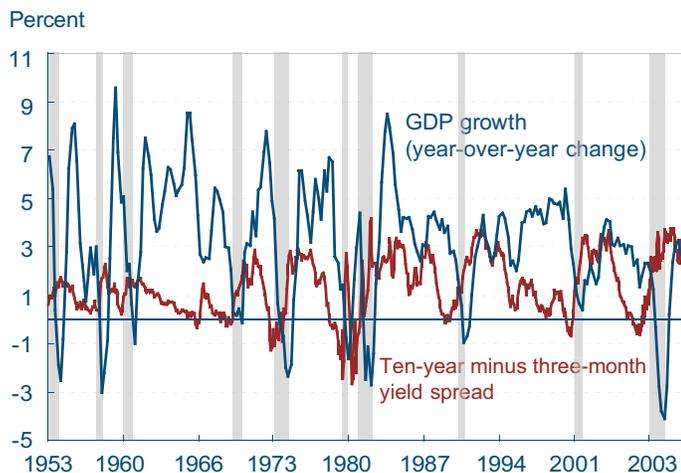
Projecting forward using past values of the spread and GDP growth suggests that real GDP will grow at about a 1.0 percent rate over the next year, the same numbers as November and December. Although the time horizons do not match exactly, this comes in on the more pessimistic side of other forecasts,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

Using the yield curve to predict whether or not the economy will be in recession in the future, we estimate that the expected chance of the economy being in a recession next February is at 0.7 percent, slightly down from both January’s at 1.2 percent and December’s 1.5 percent.

## The Yield Curve as a Predictor of Economic Growth

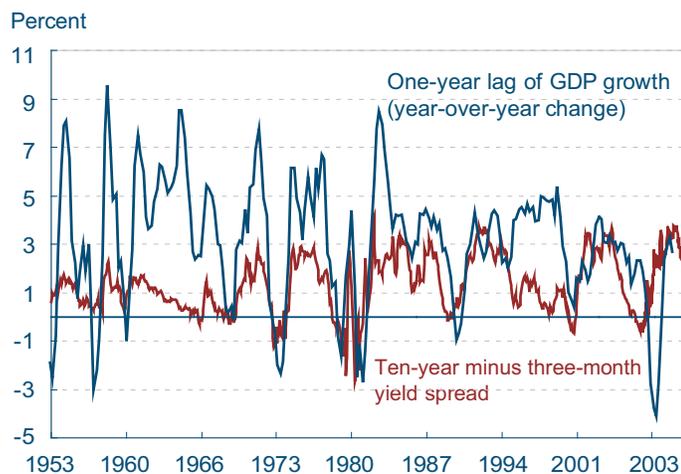
The slope of the yield curve—the difference between the yields on short- and long-term maturity bonds—has achieved some notoriety as a simple forecaster of economic growth. The rule of thumb is that an inverted yield curve (short rates above long rates) indicates a recession in about a year, and yield 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

## Yield Curve Spread and Real GDP Growth



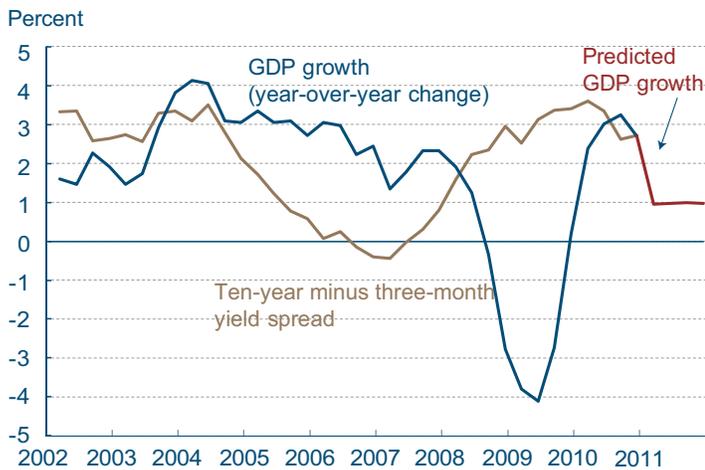
Note: Shaded bars indicate recessions.  
Source: Bureau of Economic Analysis, Federal Reserve Board.

## Yield Spread and Lagged Real GDP Growth



Sources: Bureau of Economic Analysis, Federal Reserve Board.

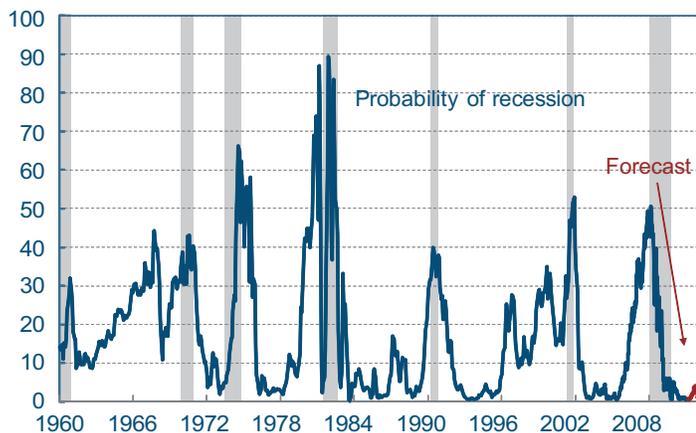
## Yield Curve Predicted GDP Growth



Sources: 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.

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

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

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 their own estimate of recession probabilities.

# Economic Projections from the January FOMC Meeting

02.17.11

by Brent Meyer

Economic forecasting at the Fed isn't as simple as trying to predict where the economy might be heading. It also involves estimating how monetary policy actions the Fed is considering will likely affect the economy in ways that encourage full employment and stable prices. Here, in layman's terms, is how and why forecasting is conducted at the Fed. See all the Drawing Board videos

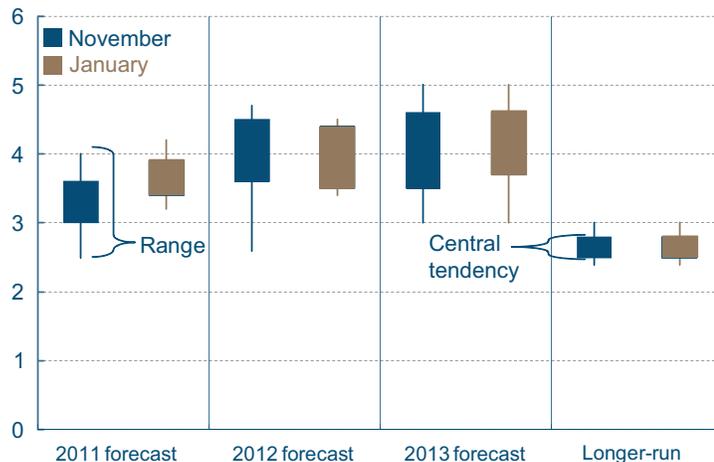
Four times a year, we get a glimpse of the Federal Open Market Committee's (FOMCs) forecasts for economic growth, unemployment, and inflation. The projections take into account all the available data at the time, assumptions about key economic factors, and each participant's view of the appropriate monetary policy that will satisfy the Fed's dual mandate (maximum sustainable employment and price stability).

The newest forecasts were released with the minutes of the January FOMC meeting. At the time of that meeting, incoming data hinted that growth was on firmer footing than had been previously suspected. Notably, data on consumption and industrial production came in stronger than expected. As a result, the Committee shaded up its forecasts for near-term output growth relative to the November meeting, with the central tendency for 2011 real GDP growth rising to a range of 3.4 percent—3.9 percent from November's estimate of 3.0 percent—3.6 percent. However, forecasts for the medium term were largely unchanged, as Committee members still expect solid above-trend growth for 2012 and 2013.

Despite slightly stronger expectations for near-term growth, the Committee's 2011 unemployment rate forecasts improved only narrowly—with the central tendency ticking down just 0.1 percentage point from a range of 8.9 percent—9.1 percent in November to 8.8 percent—9.0 percent in January. The unemployment rate projections for 2013 now range from 6.8 percent to 7.2 percent, well above the

## FOMC Projections: Real GDP

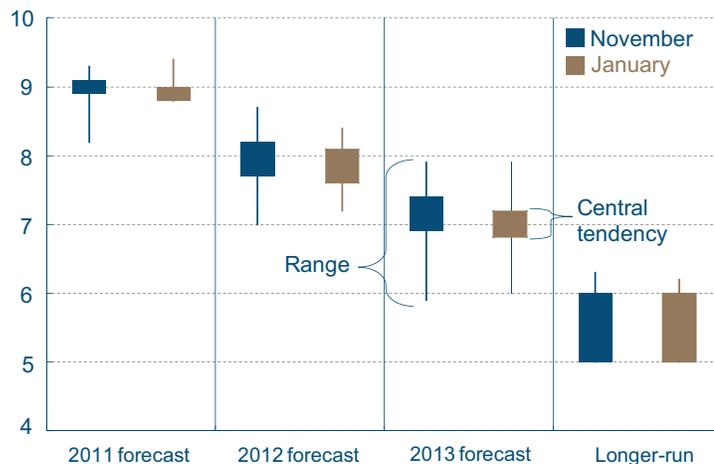
Annualized percent change



Source: Federal Reserve Board.

## FOMC Projections: Unemployment Rate

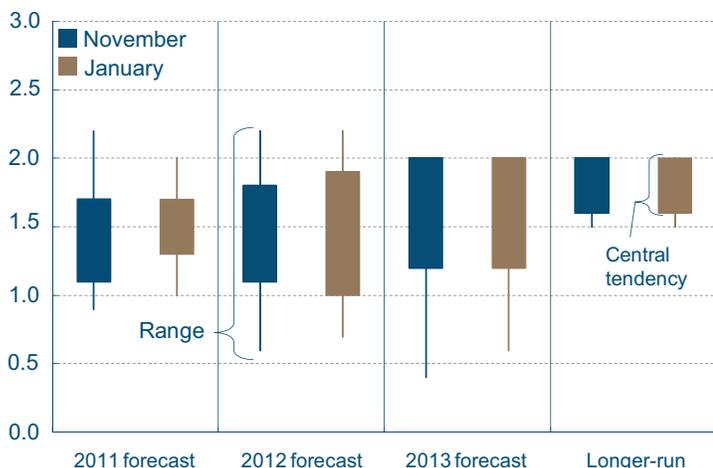
Annualized percent change



Source: Federal Reserve Board.

## FOMC Projections: PCE Inflation

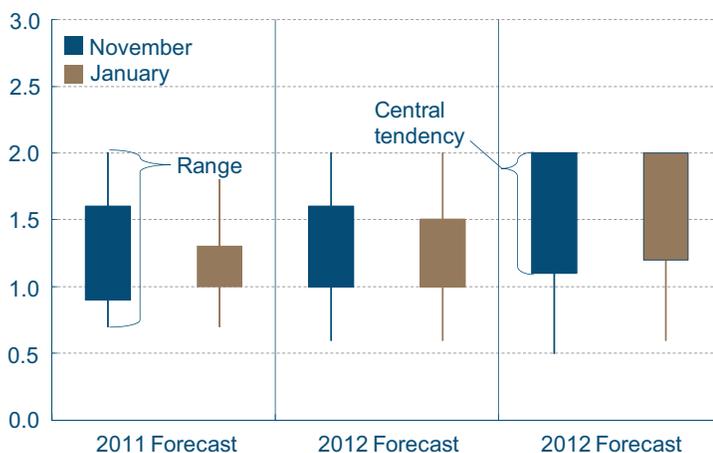
Annualized percent change



Source: Federal Reserve Board.

## FOMC Projections: Core PCE Inflation

Annualized percent change



Source: Federal Reserve Board.

Committee’s longer-run “sustainable rate” projections. Many participants noted that the ongoing (and gradual) labor market recovery may be further restrained by “uneven recovery across sectors” leading to a mismatch between workers and jobs, and relatively strong productivity gains (dampening the need for robust hiring to fuel growth).

Committee members continue to expect that inflation will remain at or below their longer-run projections, as readings on underlying inflation continue to come in soft. For example, the Federal Reserve Bank of Cleveland’s Median CPI is up just 0.6 percent on a year-over-year basis. The release noted that many participants expect that high levels of resource slack should continue to apply downward pressure on prices. Moving toward the longer-term outlook, “appropriate monetary policy” combined with well-anchored inflation expectations will likely result in modest inflation rates. Still, the range of forecasts for both headline and core PCE prices over the medium term is little changed from November and remains relatively wide.

Most participants continued to judge the uncertainty accompanying their projections for all forecasted variables as “elevated” when compared to historical norms. However, the Committee did change its assessment of the risks to its growth and inflation projections. The majority of Committee members now judge the risks to be “balanced,” whereas in November the majority weighted risks to the “downside.” On the upside for growth, some of the participants noted that the recent strength in aggregate spending data might be evidence that a sharper recovery was taking shape (one typical of those that usually follow a deep recession). On the downside, other Committee members noted the continued fragility of the housing market may still adversely affect household spending patterns and bank lending. As for the inflation risks, several participants put a lower probability on further disinflation or outright deflation outcomes, leading to their view of a more balanced distribution of risks.

This article was released in conjunction with The Drawing Board video on forecasting. To watch the video, please visit <http://www.clevelandfed.org/research/trends/2011/0311/01monpol.cfm>.

## Mortgage Originations—A Mixed Bag

02.28.11

by Yuliya Demyanyk and Matthew Koepke

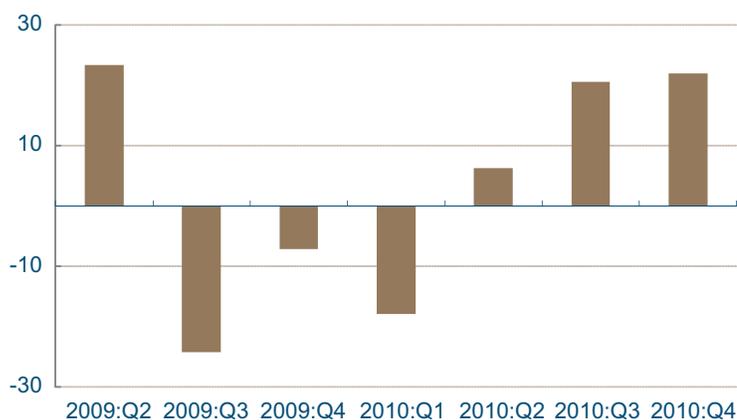
The mortgage market ended 2010 on a high note, with mortgage originations increasing for the third consecutive quarter and reversing a trend of three consecutive quarterly declines. According to the January 28 issue of *Inside Mortgage Finance*, fourth-quarter mortgage originations rose 22.0 percent to \$500 billion, representing the highest level of originations since the second quarter of 2009. Additionally, the increase represents the first consecutive double-digit quarterly percentage increase since the second quarter of 2009.

Despite the improvement in mortgage originations, the number of total mortgages serviced continued to fall. According to the February 4 issue of *Inside Mortgage Finance*, total mortgages serviced by the top mortgage servicers declined 2.0 percent in 2010, falling from \$10.7 trillion in the first quarter to \$10.5 trillion in the fourth quarter. While mortgage originations were up, the majority of the new originations were for mortgage refinances, where existing loans are converted into new loans at different rates or maturities, and not for new home purchases. Consequently, few new loans have been added to mortgage servicers' portfolios. Additionally, the level of foreclosed homes has risen dramatically, which reduces the total number of mortgages serviced. The combination of the high level of refinancing activity and the increase in home foreclosures is likely causing total mortgages serviced to decline despite the increase in mortgage originations.

Refinancings have constituted the majority of mortgage originations since December 2008. Driven by the low-interest-rate environment, refinancings have averaged 68 percent of all originations since March 2009, and by the fourth quarter of 2010 they had grown to 78 percent of all mortgages originated. Such high proportions of refinancing mean that banks are not creating many new loans.

### Total Mortgage Originations

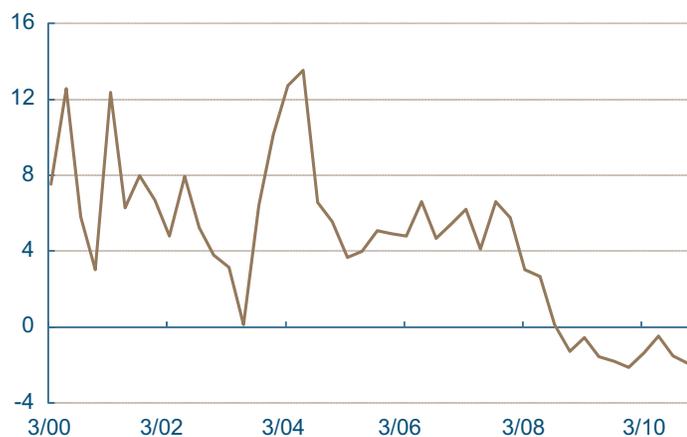
Quarterly Percentage Change



Source: Inside Mortgage Finance.

### Total Mortgages Serviced

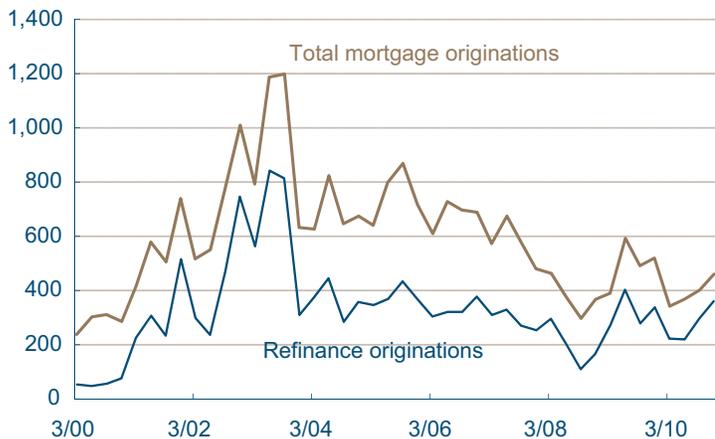
Year-over-year percent change



Source: Inside Mortgage Finance.

## Total Mortgage Originations

Dollars in billions



Source: Mortgage Bankers Association.

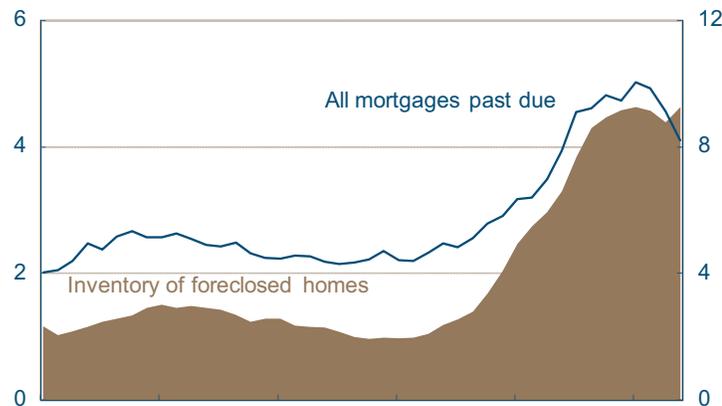
Foreclosures are playing a big role in reducing the number of mortgages serviced because they have risen to such high levels. From 2000-2007, the average number of foreclosed homes was 1.26 million, but since 2008, that number has ballooned to 3.91 million. Given that foreclosures and delinquencies remain at an all-time high, it is unlikely that the number of mortgages serviced will rise without an increase in purchase originations.

Mortgage originations may have improved in 2010, but the improvement has done little to raise the number of mortgages serviced. Though activity has picked up, high levels of refinancing originations and foreclosures have made it difficult for the increased activity to fully offset the declines in servicers' existing portfolios. Looking ahead, total mortgages serviced will continue to decline if low demand for purchase originations persists or if home foreclosures rise.

## Homes in Foreclosure and Distress Mortgages

Number of homes in millions

Number of mortgages in millions



Source: Mortgage Bankers Association.

## Some Prices Are Up, but Is That Inflation?

03.01.11

by Brent Meyer

The headline Consumer Price Index jumped up at an annualized rate of 4.9 percent in January, following a 5.3 percent increase in December. The 12-month growth rate is now 1.6 percent. Energy, commodity, and food prices have been exerting significant upward price pressure lately—increases in those items were responsible for roughly two-thirds of the measure’s overall increase in January, according to the BLS. Food prices spiked in January (the food at home index jumped up 9.3 percent—its largest increase since July 2008—as all six major food groupings posting increases). The price of motor fuel has risen at an annualized rate of 54 percent over the past three months.

But are these recent price increases simply relative price movements brought about by changes in supply and demand conditions, or are the increases symptomatic of a monetary impulse working its way through prices in general?

Headline inflation measures, such as the CPI, are subject to short-term volatility brought about by mismeasurement, the treatment of seasonal factors, and relative price changes that have little or nothing to do with inflation. These transitory price fluctuations may cause the CPI to give a misleading monthly signal of the inflation trend.

Price statistics that attempt to distinguish the inflation signal from noise are often called core or underlying measures of inflation. One well-known core inflation statistic excludes food and energy prices from the CPI, a statistic most economists refer to as the “core CPI.” Food and energy prices tend to be the most volatile components and they regularly cause fluctuations in the CPI that are not characteristic of the inflation trend. However, the “ex-food and energy” approach does not address transitory price fluctuations in other components of the retail market basket that is used to construct the CPI. Such fluctuations can be caused by mismeasurement and idiosyncratic shocks (like excise taxes,

### Consumer Price Index

12-month percent change



Source: U.S. Department of Labor, Bureau of Labor Statistics.

inclement weather, government programs to stimulate demand for certain items, and so on).

A couple of measures of underlying inflation produced by the Federal Reserve Bank of Cleveland—the median CPI and 16 percent trimmed-mean CPI—attempt to “amplify” the inflation signal by eliminating the most volatile monthly price swings (hence, decreasing the noise). What have these measures been telling us lately?

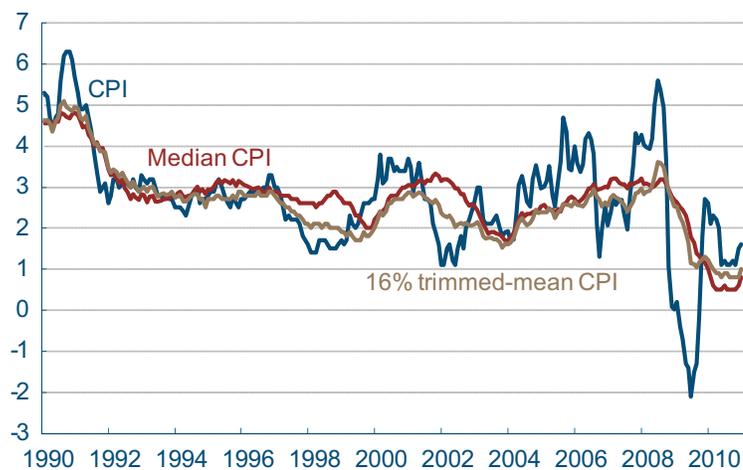
Well, the median CPI rose 2.0 percent in January, while the 16 percent trimmed-mean CPI increased 2.7 percent. These increases are roughly in line with the statistics’ longer-run (5-year) averages of about 2.0 percent. The latest numbers are somewhat of an uptick compared to recent months, however. Over the past 12 months, the median and trimmed-mean measures are hovering just above series lows set back in 1968—up just 0.8 percent and 1.0 percent, respectively.

Another way to analyze the incoming data is to look at where the price increases are coming from. Bryan and Meyer (2010) separate the consumer market basket into “flexible” and “sticky” prices. Flexible-priced items (like gasoline) are free to adjust quickly to changing market conditions, while sticky-priced items (like prices at the laundromat) are subject to some impediment or cost that causes them to change prices infrequently. As their research shows, sticky prices appear to have an embedded inflation expectations component that is useful in forecasting future inflation.

As is evident in the figure below, the flexible price series is definitely more volatile, and does appear to vary with changing economic conditions. The sticky price series has been relatively stable since 1983, usually hovering between 2.0 percent and 3.0 percent. However, over the past two years the sticky CPI has experienced a sizeable disinflation—slowing from a year-over-year growth rate of 2.8 percent in December 2007 to a low of 0.7 percent in September 2010. Since then, the sticky CPI has edged back up slightly and is now trending at a 12-month growth rate of 1.0 percent. The flexible CPI, which fell to a year-over-year growth rate of -10 percent

## Consumer Price Index

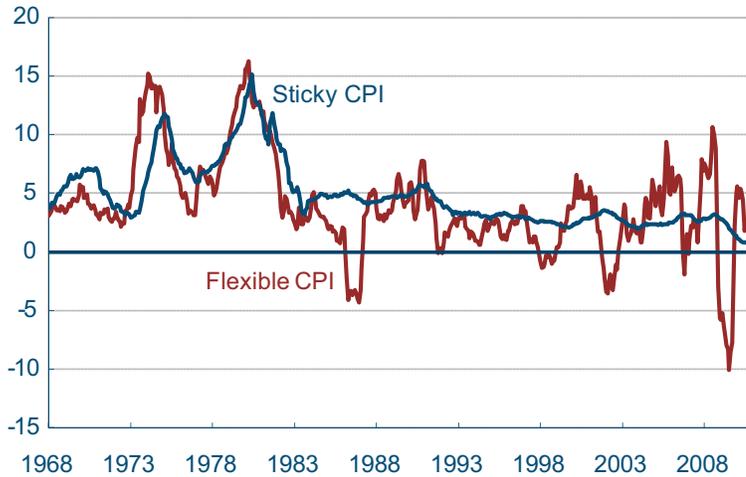
12-month percent change



Sources: Bureau of Labor Statistics and Federal Reserve Bank of Cleveland.

## Disaggregated CPI

12-month percent change



Sources: Bureau of Labor Statistics; Bryan and Meyer (2010).

during the depths of the last recession, has popped back up to a 12-month growth rate of 3.4 percent through January.

The flexible CPI is intriguing in that, by design, it is likely to show evidence of pricing pressure ahead of the sticky CPI. However, the series is very volatile relative to its sticky-price counterpart and likely dominated by relative price changes. As a result, inflation forecasts based on the flexible CPI perform rather poorly.

While rapid price increases in a few categories seem to have pushed up the headline CPI lately, underlying measures of inflation are relatively low and have only ticked up slightly in the past few months.

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"Are Some Prices in the CPI More Forward Looking than Others? We Think So." Michael F. Bryan and Brent Meyer. Economic Commentary, May 19, 2010. <http://www.clevelandfed.org/Research/commentary/2010/2010-2.pdf>

## Educational Attainment and Employment

03.02.11

by Dionissi Aliprantis and Mary Zenker

Labor market experiences can be highly varied for individuals with different levels of educational attainment. Higher levels of educational attainment tend to be associated with higher wages, and there is evidence that the benefits of a degree have been increasing in recent decades in the United States. For example, the wages of high school dropouts have dropped since the early 1970s, while the wages of college graduates relative to high school graduates have increased. Empirical facts like these make it unsurprising that a great deal of attention has recently been focused on the relative performance of American students in terms of both educational attainment and achievement.

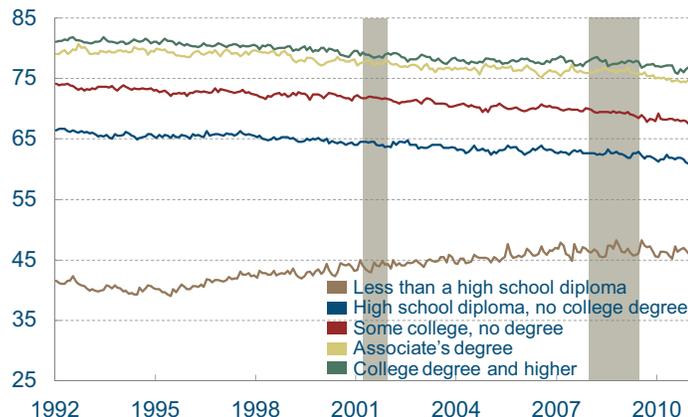
Given this changing wage structure, a natural issue to investigate is whether other employment outcomes have also changed by education levels over time. A look at labor force participation rates and unemployment patterns using data from the Bureau of Labor Statistics shows they have.

First we see that high school dropouts have actually increased their labor force participation slightly since the early nineties, despite their decreasing wages. This contrasts with all other education groups, which all experienced gradual decreases in labor force participation rates. What may be most striking about this picture is the huge gap between high school dropouts and all other groups, which is very gradually closing.

Once individuals decide to participate in the labor market, how do their experiences differ by educational attainment? We see the expected differences in unemployment rate: Those with a college degree or higher have the lowest unemployment rates over time, and the unemployment rate increases as attainment decreases. The unemployment rate approximately doubled for each group during the recent recession. Since those with low educational attainment already started out with higher unemployment rates, this doubling translates into larger

### Labor Force Participation by Educational Attainment

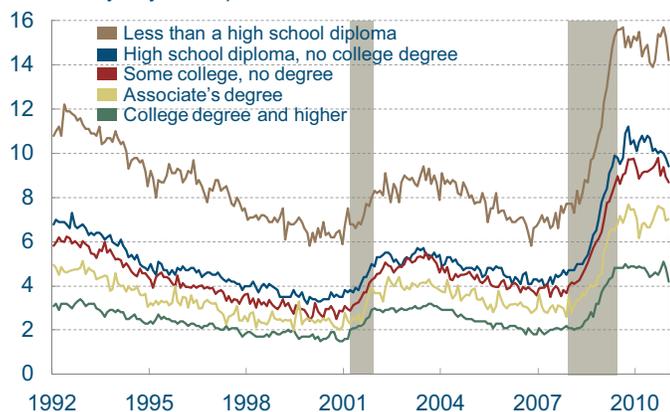
Seasonally adjusted, percent



Note: Age 25 years and older.  
Source: Bureau of Labor Statistics.

## Unemployment Rates by Educational Attainment

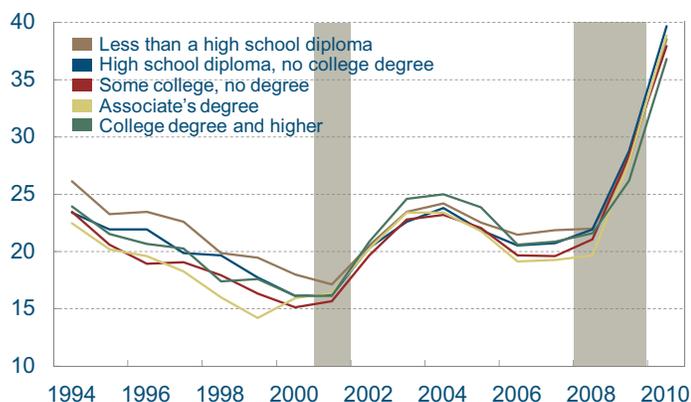
Seasonally adjusted, percent



Notes: Age 25 years and older.  
Source: Bureau of Labor Statistics.

## Unemployment Duration by Educational Attainment

Average number of weeks unemployed



Note: Age 25 years and older.  
Source: Bureau of Labor Statistics.

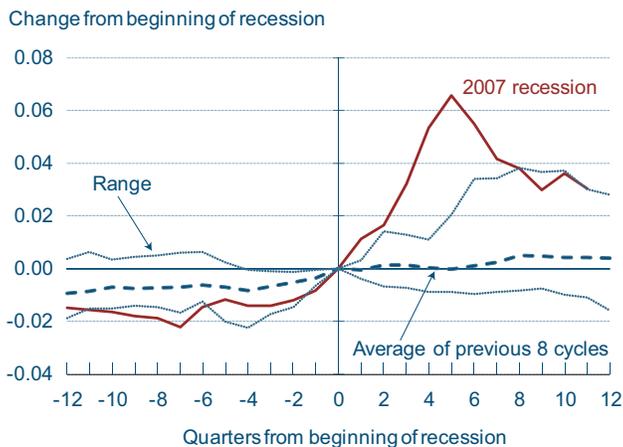
absolute changes for these attainment groups. That is, while we see similar patterns for all groups, higher educational attainment is associated with smaller changes in unemployment.

The story of unemployment duration is quite different. The recent recession caused a very large spike in the length of time workers remain unemployed, and spells of unemployment are now similar for workers at all levels of educational attainment. It is interesting that the differences in labor force participation and unemployment rates do not translate into differences for duration.

Many factors influence the labor market, and thus it is difficult to conclude that educational attainment alone drives labor market outcomes. Nevertheless, the evidence examined here suggests important relationships between educational attainment and labor market outcomes.

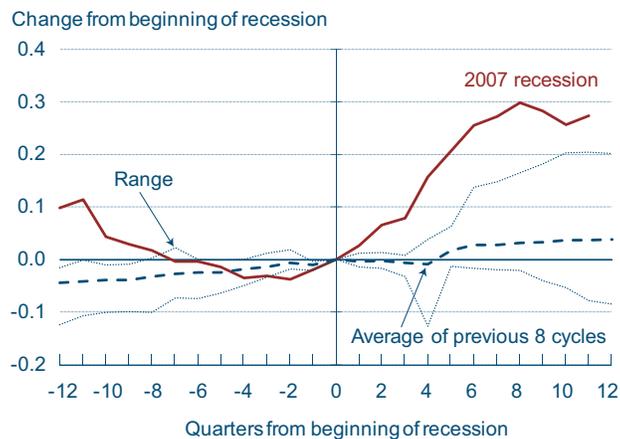
# Household and Corporate Balance Sheets

## Household Leverage



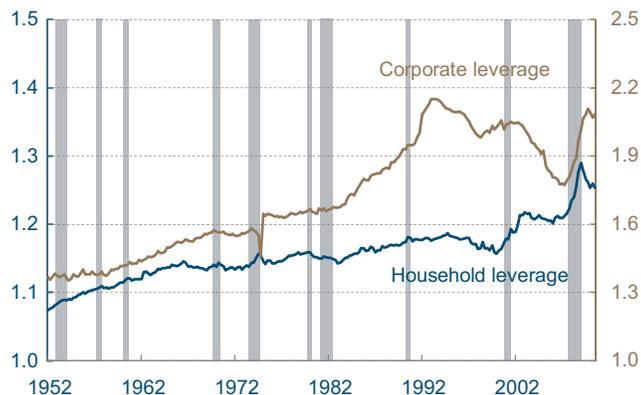
Note: Range refers to the minimum or maximum values over the 8 previous cycles. Sources: Board of Governors of the Federal Reserve System, Flow of Funds Accounts of the United States and authors' calculations.

## Corporate Leverage



Notes: Range refers to the minimum and maximum values over the previous 8 cycles. Data are for nonfarm nonfinancial corporate businesses. Sources: Board of Governors of the Federal Reserve System, Flow of Funds Accounts of the United States; authors' calculations.

## Household and Corporate Leverage



Notes: Shaded bars indicate recessions. Data for the corporate sector are for nonfarm nonfinancial corporate businesses. Source: Board of Governors of the Federal Reserve System, Flow of Funds Accounts of the United States; authors' calculations.

03.07.11

by Tim Bianco and Filippo Occhino

One reason for the striking severity of the last recession is the double whammy that struck household and corporate balance sheets. Balance sheets deteriorated sharply when the values of both financial and real estate assets plunged. The resulting increase in leverage (the ratio of assets to net worth) was much larger than in any of the previous eight recessions. Weak balance sheets depress real activity in a number of ways: they raise the cost of credit, they reduce its availability, and they constrain consumption and investment demand.

Household leverage reached record high levels, and corporate leverage hit near-high levels. Leverage ratios in both sectors have since decreased but remain close to their peaks, and this is likely one factor slowing the current recovery down.

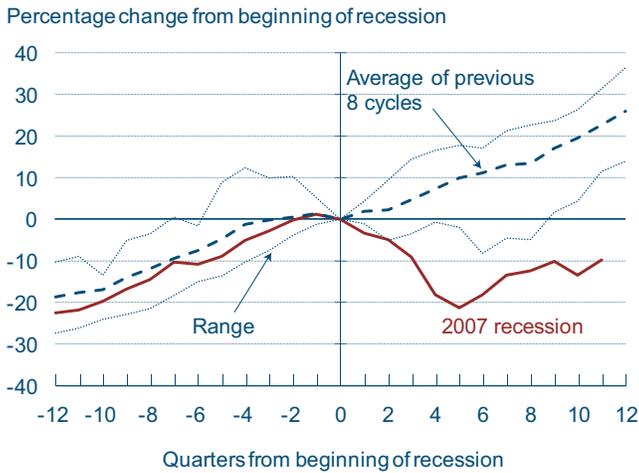
A closer look at the balance sheets of the two sectors reveals some interesting differences. Households have been reducing their liabilities in the past two years, lowering the large home mortgage and consumer credit components. During the same period, however, firms have steadily accumulated liabilities, especially by raising the corporate bond component.

Each sector suffered a substantial loss of assets during the recession. Both financial assets and real estate assets experienced their largest percentage drop on record. Moreover, the contractionary effects of the losses on leverage and real activity were compounded by the simultaneous drops in the two kinds of assets. Financial asset values have since rebounded, and assets for both sectors recovered as a result, but the recovery has been only partial.

Household financial assets were hit harder by the crisis than corporate financial assets, which suggests that households were relatively more exposed to the type of financial shock that hit the economy. While corporate financial assets decreased by 6 percent, household financial assets decreased by 22 percent. After the recession, corporate financial assets have

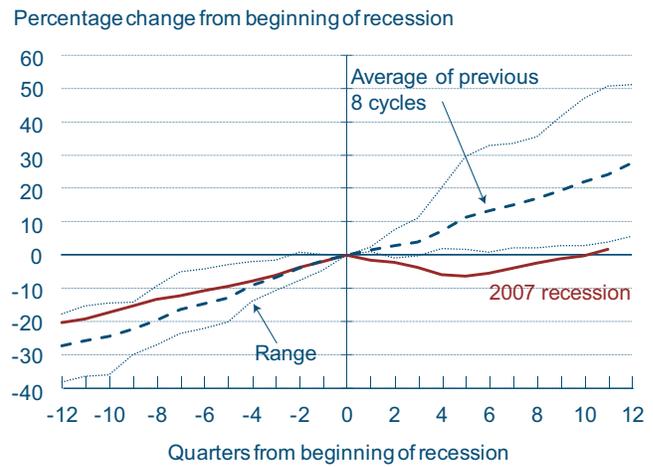
fully recovered and surpassed the previous peak, but household financial assets are still well below their pre-crisis levels.

## Household Financial Assets



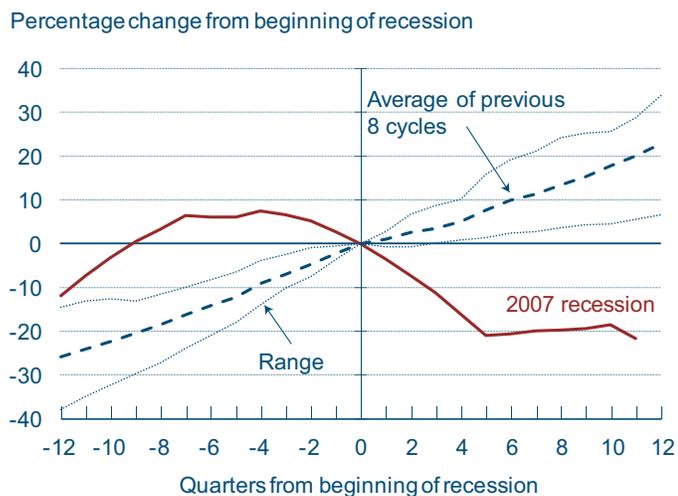
Note: Range refers to the minimum and maximum values over the previous 8 cycles.  
Source: Board of Governors of the Federal Reserve System, Flow of Funds Accounts of the United States; authors' calculations.

## Corporate Financial Assets



Notes: Range refers to the minimum and maximum values over the previous 8 cycles. Data are for nonfarm nonfinancial corporate businesses.  
Source: Board of Governors of the Federal Reserve System, Flow of Funds Accounts of the United States; authors' calculations.

## Household Real Estate



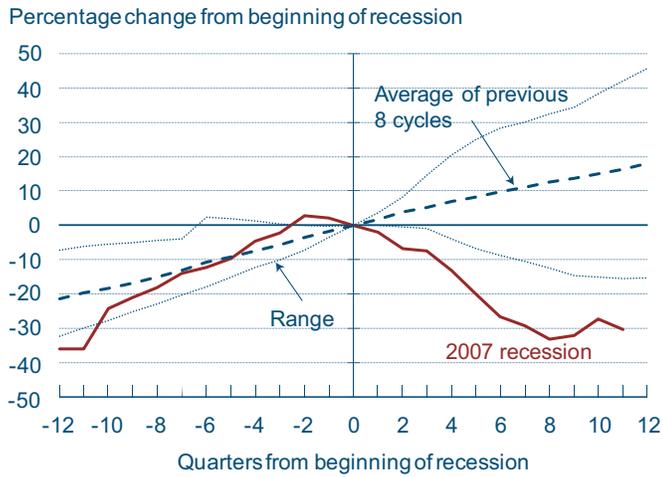
Note: Range refers to the minimum and maximum values over the previous 8 cycles.  
Source: Board of Governors of the Federal Reserve System, Flow of Funds Accounts of the United States; authors' calculations.

Household and corporate real estate assets began to fall, respectively, four and two quarters prior to the beginning of the 2007 recession. When the recession started, they had already decreased by 7 percent and 3 percent, respectively. The overall percentage drop in real estate assets was by far the largest on record for both sectors, -27 percent for households and -35 percent for corporations. For both sectors, real estate assets are currently close to their post-crisis lows.

One reason the corporate sector experienced a larger percentage decrease in real estate assets is that it was relatively more exposed to commercial real estate prices than residential real estate prices. The percentage drop in commercial real estate prices was larger than in residential real estate prices. Depending on the price index considered, commercial real estate prices dropped by between 40 percent and 45 percent, while residential real estate prices dropped by between 11 percent and 32 percent.

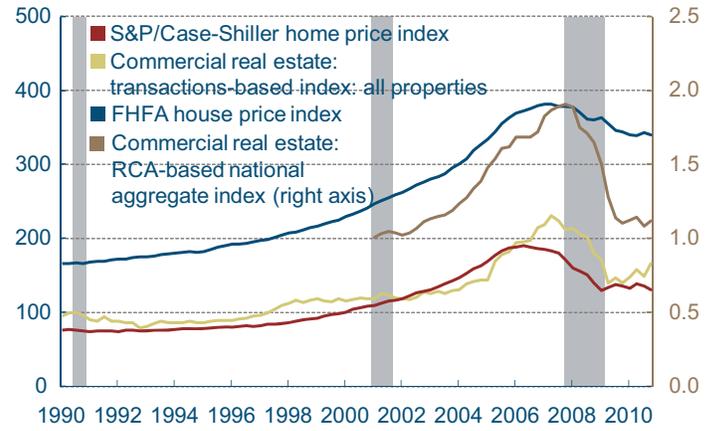
Although real estate prices seem to have bottomed out, they are not showing any clear sign of recovery yet. Consequently, leverage in both sectors continues to be high and close to peak, likely weighing on the current recovery.

## Corporate Real Estate



Notes: Range refers to the minimum and maximum values over the previous 8 cycles. Data are for nonfarm nonfinancial corporate businesses. Sources: Board of Governors of the Federal Reserve System, Flow of Funds Accounts of the United States; authors' calculations.

## Real Estate Price Indexes



Note: Shaded bars indicate recessions.

Sources: S&P, Fiserv, and Macroeconomics LLC; FHFA; Moody's, MIT Center for Real Estate.

# The U.S. Labor Market Experience in a Global Context

03.07.11

by Murat Tasci and Mary Zenker

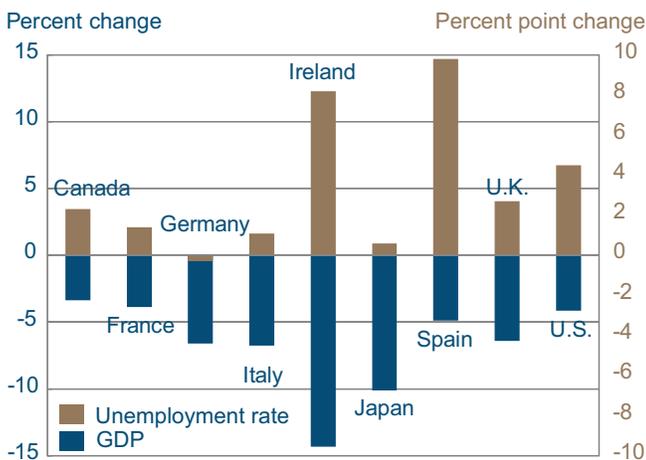
The recent recession was felt around the globe. Most advanced economies and some developing countries experienced a significant contraction in real output sometime after 2007, and this widespread slowdown translated into exceptionally bad performance in world output. According to the IMF, after growing at a rate of 4.2 percent every year between 2000 and 2007, world output grew only 2.8 percent in 2008 and contracted by 0.5 percent in 2009. This might be the first time since World War II that the world economy actually shrank.

While the major industrialized countries led this decline with sizeable contractions in their GDP, the effects of the downturn on labor markets differed across countries. When we looked at a set of developed countries that experienced similarly sized shocks to GDP—about 5 percent on average from peak to trough—along with Ireland and Japan, which saw much larger declines, we found a wide range of unemployment responses across countries. For example, GDP fell about as much in the United States as it did in Spain, but the unemployment rate increase in Spain was double that of the U.S.

Germany is unusual in that its 7 percent decline in GDP was accompanied by a decrease in its unemployment rate! It's impossible to tell from the unemployment rate alone, however, what else might be happening in the labor market to explain such data. It could be that in Germany the unemployment rate declined but those who are employed worked less. That response would not be captured explicitly in the unemployment rate and unfortunately, we lack data robust enough to allow us to compare hours worked across countries.

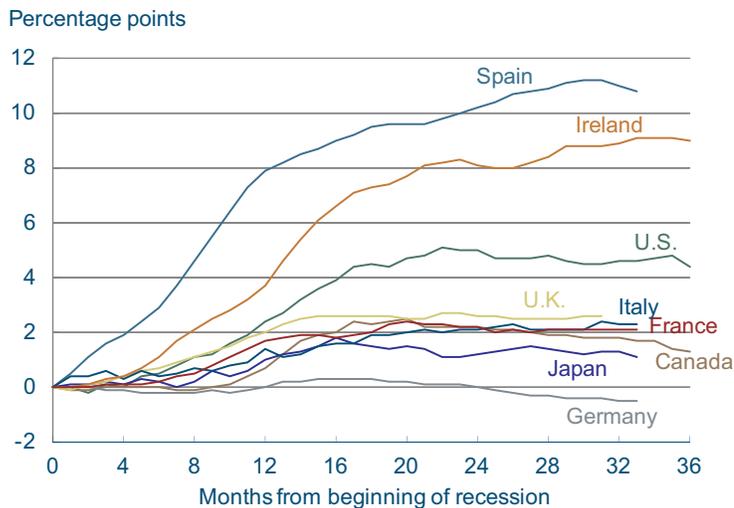
While the extent of the increase in unemployment varied across countries, the underlying pattern of unemployment over the course of the recession was remarkably uniform. Looking at the unemployment rate increases starting from the beginning

## Changes in GDP and Unemployment



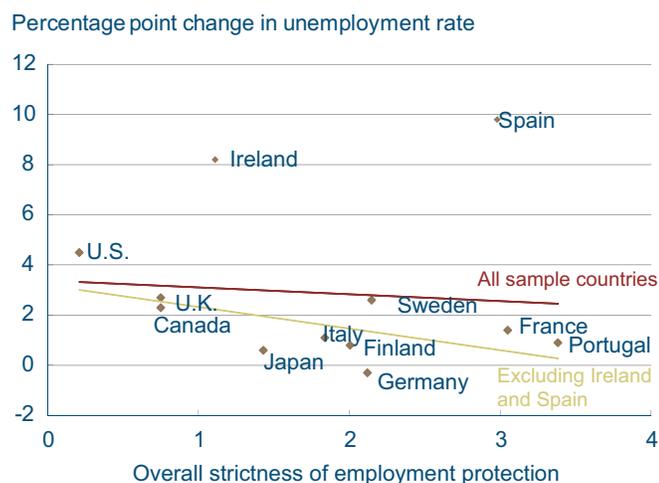
Notes: GDP is measured from country-specific peak to country-specific trough; unemployment is measured over the same period as GDP.  
Source: International Monetary Fund; Bureau of Labor Statistics.

## Increase in Unemployment Rate



Note: The beginning of the recession is the country-specific GDP peak.  
Source: Bureau of Labor Statistics.

## Employment Protection and Unemployment



Notes: Unemployment is measured over country-specific GDP peaks and troughs. Strictness (x axis) refers to the average protection level in 2005-2008.  
Sources: Bureau of Labor Statistics; OECD.

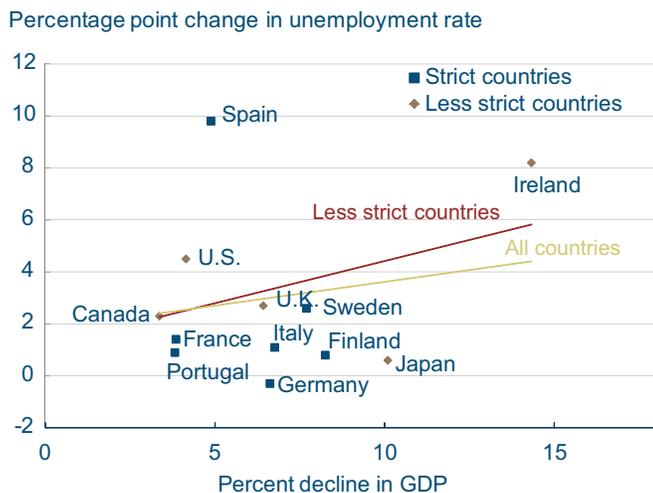
of the contraction in real output, we see that the response was gradual and persistent almost everywhere. Unemployment started to show significant signs of an upward trend a couple of months after the start of the recession in each country, and it stayed elevated long after GDP began to pick up. In the case of Ireland and Spain, peak unemployment rate levels were observed only recently. Again, Germany is the exception.

So far, we have assumed that labor markets respond to aggregate economic activity, with higher unemployment rates following contractions in real output. But all economies might not respond to aggregate conditions in the same way. One potential reason is that labor market institutions differ across countries. For instance, continental European countries have very strict laws against firing employees and hiring temporary workers. It is conceivable that employers in those countries might not have as much flexibility as they would like to adjust their workforces in the face of a recession. Anticipating the restriction, firms might be hesitant to hire in the first place, even when times are good. Such conditions would imply muted change in the unemployment rate as it responds to business cycles fluctuations.

We can explore this issue with an index computed by the OECD. The Overall Strictness of Employment Protection index provides a measure of the overall strictness of the labor market in a country with respect to the processes and costs involved when firing workers or hiring temporary employees. The measure can help us determine whether rigid labor markets (economies with strict employment protection) responded differently than more flexible labor markets during the Great Recession. In a sense, employment protection handicaps the ability of the labor market to adjust at the extensive margin as output falls. Plotting the unemployment rate change over the recession and the overall strictness indicator in the figure below shows us how the relationship plays out.

Even though all of the countries in this extended sample are among the major advanced economies, they range widely in the strictness of their employment protections, with values between 0.2 and

## Changes in GDP and Unemployment

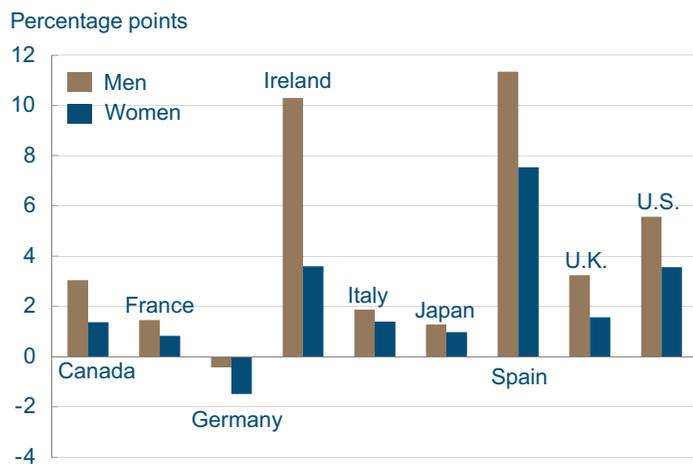


Notes: GDP is measured from country-specific peaks to country-specific troughs; unemployment is measured over the same period as GDP.  
Source: International Monetary Fund; Bureau of Labor Statistics.

3.4 (the OECD average is 1.9). The United States has the lowest employment protection score of the countries in the sample. Correspondingly, the unemployment rate response in the U.S. labor market was one of the strongest we see on the chart. Spain and Ireland stand out as major outliers in terms of their unemployment rate response, and they blur the relationship between employment protection and rising unemployment. Indeed if one ignores these two outliers, the trend line suggests a somewhat significant negative relationship: as employment protection increases, the unemployment rate response becomes increasingly muted. However, this relationship ignores the variance in the severity of the recession across countries.

To understand how the severity of the recession interacted with the degree of employment protection, we split countries into a “less strict” group and a “strict” group. The strict group includes Spain, France, Portugal, Sweden, Italy, Germany, and Finland, while the less strict group consists of the United States, the United Kingdom, Canada, Ireland, and Japan. The less strict countries exhibit a labor market whose response varies with the depth of the GDP decline. Deeper recessions are associated with larger increases in the observed unemployment rate. In the strict countries, even as the declines in GDP increase in severity, the labor market does not calibrate accordingly. Spain’s outsized increase in unemployment influences this relationship for the group of strict countries and makes the relationship relatively insignificant.

## Unemployment Rate Change 2007 to 2009



Source: OECD.

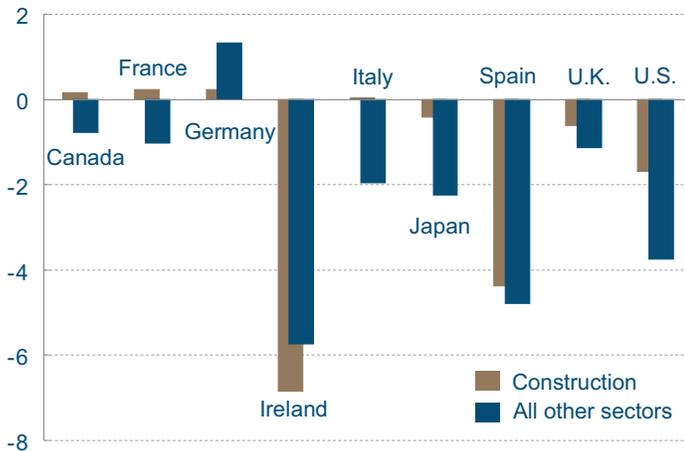
One needs to exercise caution when interpreting these results, as our very small sample for one particular episode may not necessarily generalize. Nevertheless, this casual correlation suggests that increasingly large declines in GDP fail to yield additional changes in the labor market on the extensive margin in countries with relatively strict employment protection.

Another pattern shared across countries concerned the unemployment experiences of men and women. In all of the countries in our sample, women fared better than men throughout the recession.

The different experiences of men and women make sense considering male-dominated industries

## Importance of Housing Downturns

Contribution to change in total employment 2007:Q4 to 2009:Q4



Source: OECD.

like construction and finance were hit hard by the recent recession. Housing downturns were an important factor in the recessions of about half of the countries in our sample. Construction was an especially large contributor to employment declines in Ireland and Spain, as in the United States. Correspondingly, males experienced dramatic increases in unemployment in those countries.

The U.S. experience in the Great Recession has been characterized by persistently high unemployment despite a modest recovery in GDP. Looking at that experience in a global context, we see that while the shock experienced by some of the major industrialized countries was relatively uniform in size, the labor market responses of the group exhibited a lot of variation as well as some similarities. Countries with less strict employment protection and those with significant housing market problems experienced larger increases in their unemployment rate when the recession hit. Among almost all of them, however, unemployment rate increases were gradual and persistent, and they disproportionately affected men.

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