Economic Trends

In This Issue:

FEDERAL RESERVE BANK
of CLEVELAND

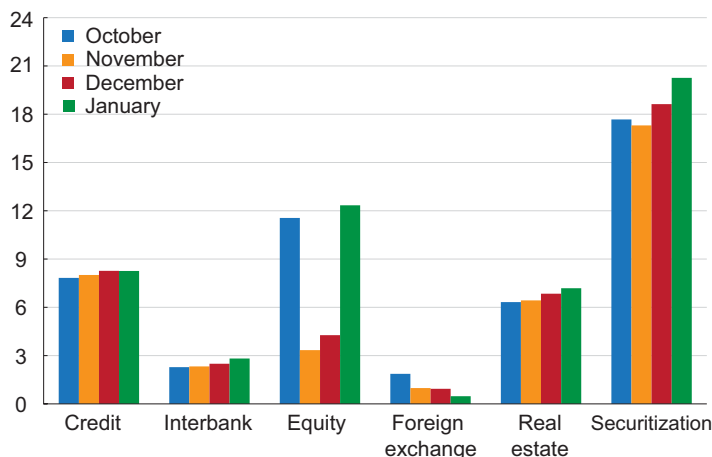# Tracking Recent Levels of Financial Stress

Cleveland Financial Stress Index

Standard deviation

Note: Dotted lines indicate CFSI grade changes.
Source: Oet, Bianco, Gramlich, and Ong, 2012. "A Lens for Supervising the Financial System," Federal Reserve Bank of Cleveland working paper no. 1237.

Average Stress-Level Contributions of Component Markets to CFSI

Note: These contributions refer to levels of stress, where a value of 0 indicates the least possible stress and a value of 100 indicates the most possible stress. The sum of these contributions is the level of the actual CFSI, which is computed as the standardized distance from the mean, or the Z-score.
Source: Oet, Bianco, Gramlich, and Ong, 2012. "A Lens for Supervising the Financial System," Federal Reserve Bank of Cleveland working paper no. 1237.

02.06.2015
by John Dooley

During most of the fourth quarter of 2014, the Cleveland Financial Stress Index (CFSI) remained in Grade 2 (a historically normal stress range). From November 6 to November 15 and again from December 3 to December 8, the CFSI dipped into Grade 1 (historically low stress range). However, since the beginning of 2015, the daily CFSI reading has consistently trended up, moving into Grade 3 on January 19, 2015. As of February 2, the index remains in Grade 3 and stands at 0.6874, almost midway between the historical high of December 2008 (2.544 standard deviations below) and the historical low of January 2014 (2.794 standard deviations above). The CFSI is elevated 1.321 standard deviations by comparison with the stress index one year ago.

Since October 2014, stress in the credit, funding, real estate, and securitization markets increased gradually. Meanwhile, stress in the foreign exchange market, despite a slight rise in October, returned to the relatively low levels reached in this market during 2014:Q3. In the equity market, stress rose moderately from its historically low level, as stock prices fell in October. Stress waned in November and December, as stock prices increased. The January 2015 stock price declines corresponded to growing equity market stress.

The Cleveland Financial Stress Index and all of its accompanying data are posted to the Federal Reserve Bank of Cleveland's website at 3 p.m. daily. We also provide a brief overview of the index construction, stress components, and a comparison to other stress measures. The CFSI and its components are also available on FRED (Federal Reserve Economic Data), a service of the Federal Reserve Bank of St. Louis.

The Behavior of Consumption in Recoveries

02.12.2015
by Daniel Carroll and Amy Higgins

Consumption represents approximately 70 percent of GDP as measured by the National Income and Product Accounts, so unsurprisingly it closely follows the overall trend of GDP during business cycles. Still, the two series are not identical; consumption is typically less volatile than GDP, falling by less in downturns and rising by less in recoveries. To understand why, it helps to see how the three main components of consumption—durables, nondurables, and services—have behaved over recent recoveries.

Durables consumption has a long-lived feature that makes it somewhat similar to investment. Just as an investment pays returns over multiple periods, durable goods can be used over and over, returning utility over time. Also like investment, durables consumption is more volatile than the other consumption components. During recessions, consumers tend to limit large and costly purchases due to declines in income or to the increased risk of a decline in income, causing a sharp downturn in durables sales; during recoveries, they come back strongly. Looking at the 1982 recovery, durables growth initially was subdued, growing only at the same pace as GDP in the first quarter. Over the next seven quarters however, durables consumption grew rapidly so that while GDP grew approximately 14 percent over the two years, durables grew by 25 percent. One recent recovery was an exception: During the 2001 to 2007 period, durables growth remained subdued.

Nondurable goods represent a larger share of aggregate consumption than durables, but the share has been falling over time. In 1982 approximately 33 percent of aggregate consumption came from nondurables whereas today it's only 22 percent. Typically, nondurable consumption rebounds more slowly than durables during recoveries. In the 1991-1996 recovery, nondurables did not experience growth until about four quarters after the trough of the recession. While nondurables con-
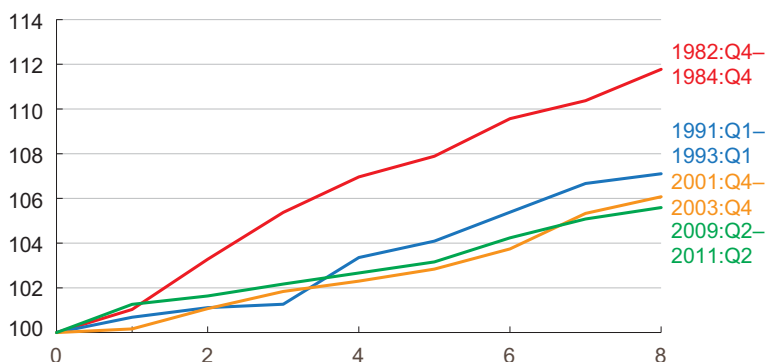
Real GDP During Recoveries

Index: end of the recession = 100
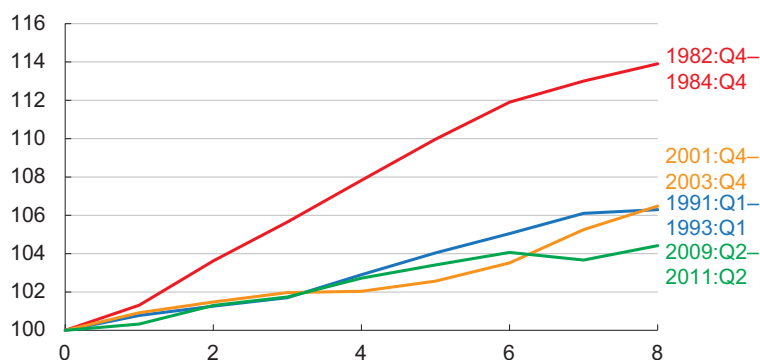
Sources: Bureau of Economic Analysis; Haver Analytics.

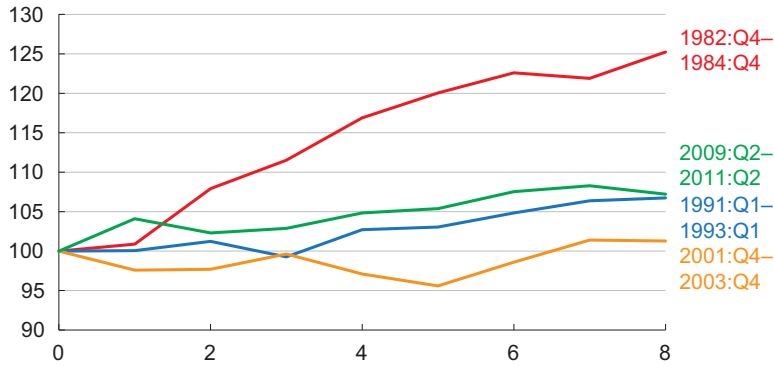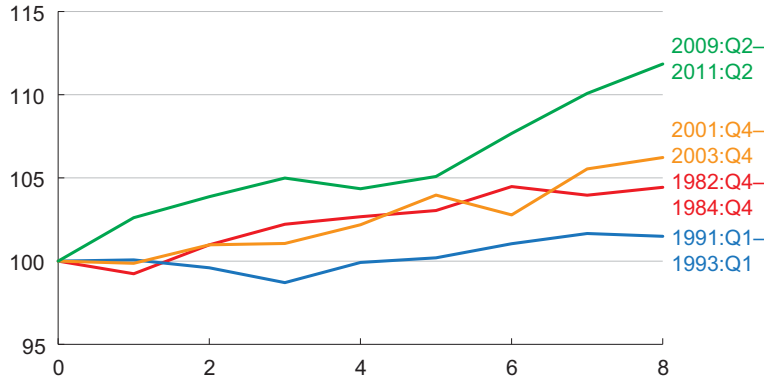## Real Consumption During Recoveries

Index: end of the recession = 100

Sources: Bureau of Economic Analysis; Haver Analytics.

Real Durables During Recoveries

Index: end of the recession = 100

1982:Q4–
1984:Q4

2009:Q2–
2011:Q2

1991:Q1–
1993:Q1

2001:Q4–
2003:Q4

Sources: Bureau of Economic Analysis; Haver Analytics.

Real Nondurables During Recoveries

Index: end of the recession = 100

2009:Q2–
2011:Q2

2001:Q4–
2003:Q4

1982:Q4–
1984:Q4

1991:Q1–
1993:Q1

Sources: Bureau of Economic Analysis; Haver Analytics.

Real Services During Recoveries

Index: end of the recession = 100

1982:Q4–
1984:Q4

1991:Q1–
1993:Q1

2001:Q4–
2003:Q4

2009:Q2–
2011:Q2
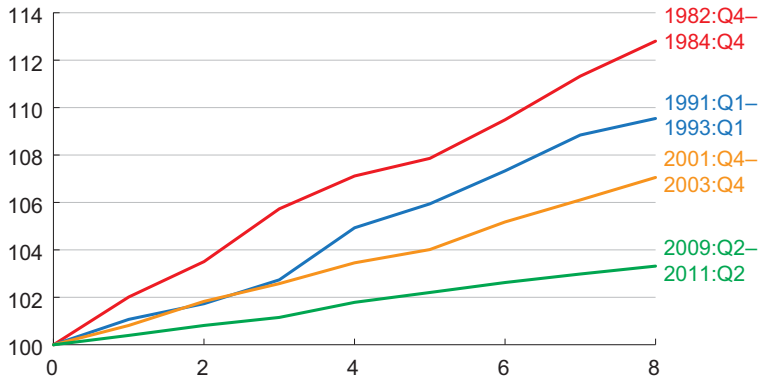
Sources: Bureau of Economic Analysis; Haver Analytics.

sumption did grow more in the two most recent recoveries than in previous expansionary periods, the magnitude of growth has not been large enough, when coupled with the decreasing share of nondurables in aggregate consumption, to have had more than a minimal impact.

Services make up the largest share of aggregate consumption—roughly two-thirds today—and consequently services play a much larger role in determining the level of overall consumption. However, services also tend to be less volatile than GDP. During economic downturns, services are generally much less responsive and remain at prerecession levels. During expansionary periods, services usually follow the increasing trend of GDP very closely. For this reason, services usually explain less of the change in consumption from quarter to quarter. Coming out of the last recession, services consumption has risen a bit more sluggishly than it did in previous recoveries.

Even when durables and nondurables consumption growth is strong, the large share that services now comprise of aggregate consumption means that services largely determine the path for the level of aggregate consumption.

Cleveland Fed Estimates of Inflation Expectations, February 2015

News Release: February 26, 2015

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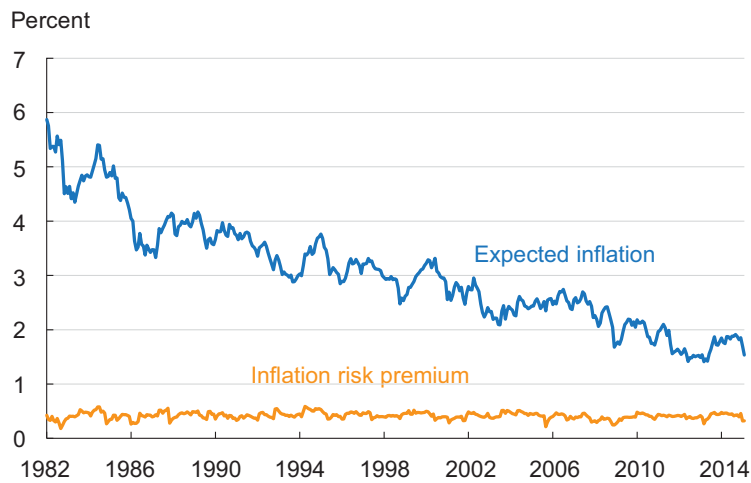
Percent

Source: Haubrich, Pennacchi, Ritchken (2012).

The latest estimate of 10-year expected inflation is 1.53 percent according to the Federal Reserve Bank of Cleveland. In other words, the public currently expects the inflation rate to be less than 2 percent on average over the next decade.

The Cleveland Fed's estimate of inflation expectations is based on a model that combines information from a number of sources to address the shortcomings of other, commonly used measures, such as the "break-even" rate derived from Treasury inflation protected securities (TIPS) or survey-based estimates. The Cleveland Fed model can produce estimates for many time horizons, and it isolates not only inflation expectations, but several other interesting variables, such as the real interest rate and the inflation risk premium.

Real Interest Rate

Percent
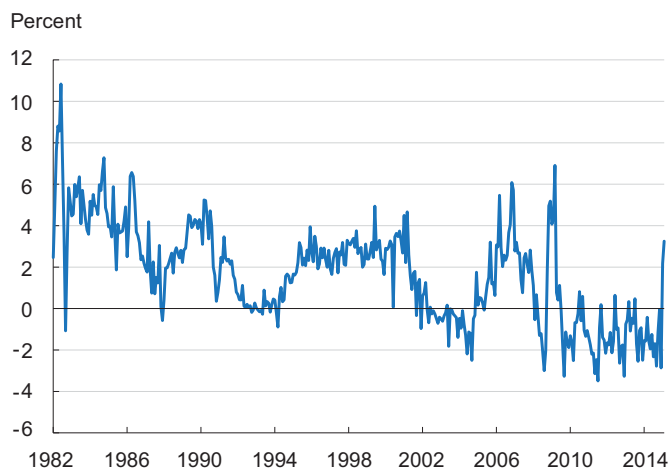
Source: Haubrich, Pennacchi, Ritchken (2012).

Expected Inflation Yield Curve

Percent

Horizon (years)
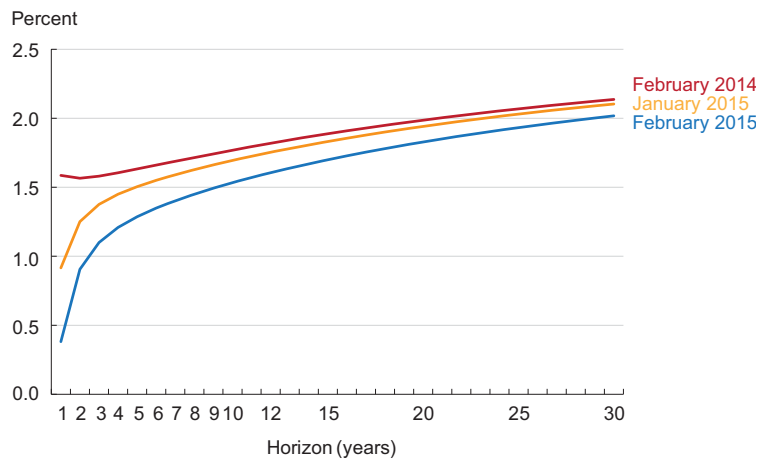
Source: Haubrich, Pennacchi, Ritchken (2012).

# Uncovering the Demand for Housing Using Internet Search Volume

by Rawley Heimer, Daniel Kolliner, and Timothy Stehulak

One challenge in evaluating the demand for goods and services is the timing of data releases. With most data series, there generally is some lag between the current time and the most recent data available. This is particularly true in the housing market, where supply is potentially constrained and can be slow to respond to increased demand. As an alternative, we attempt to gauge housing demand by using data on the volume of searches done on words and phrases in Google.

Data on search volume is available through Google Trends, and it indicates the popularity of the words used in Google's search engine. One advantage of this data over other sources is that it is instantaneous, so it can provide a measure of current demand. Another advantage is that because we can see specifically which terms people are searching for, we can gain additional insight beyond what prices and transactions can tell us. For instance, popular search terms could say something about specific market segments, which current price or sales volume cannot.

The first Google Trends term we consider is "real estate agent." We reason that people searching for a real estate agent are those who are interested in purchasing a home. We argue that the search-volume index for this term is a good indicator of housing demand because it closely tracks the Case-Shiller Home Price Index from 2007-2013, where it appears that supply and demand are balanced. A look at the periods in which the series diverge may provide additional insight into the housing market. In 2004, for example, prior to the housing crisis, the search-volume index for "real estate agent" drastically exceeded the home-price index. Moving forward in time, the discrepancy narrowed, showing that it took a few years for prices to fully catch up to the demand implied by the search

S&P/Case-Shiller Home Price Index and Google Trends Search-Volume Data
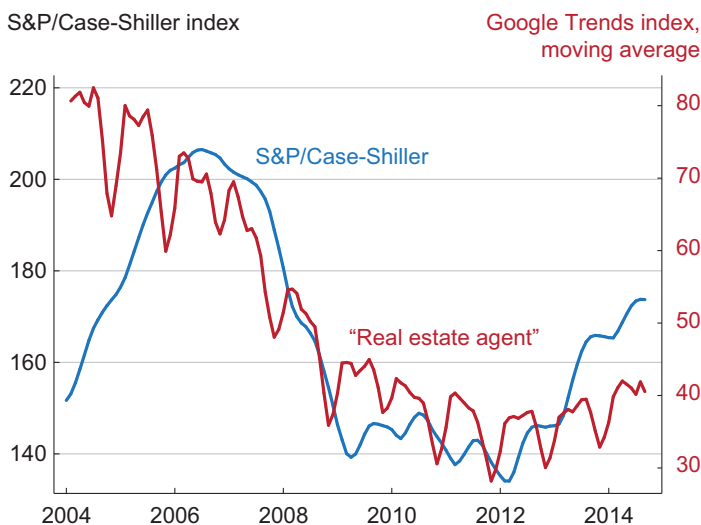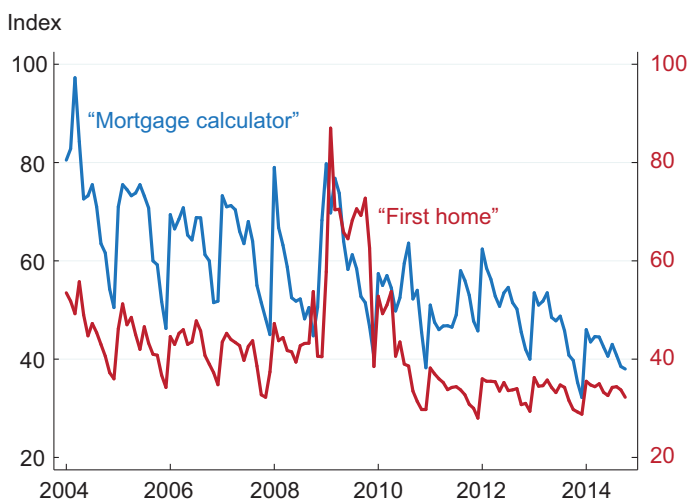

Sources: Standard & Poor's / Haver Analytics; Google Trends.

Existing Home Sales and Google Trends Search-Volume Data

Home sales, thousands   Google Trends index
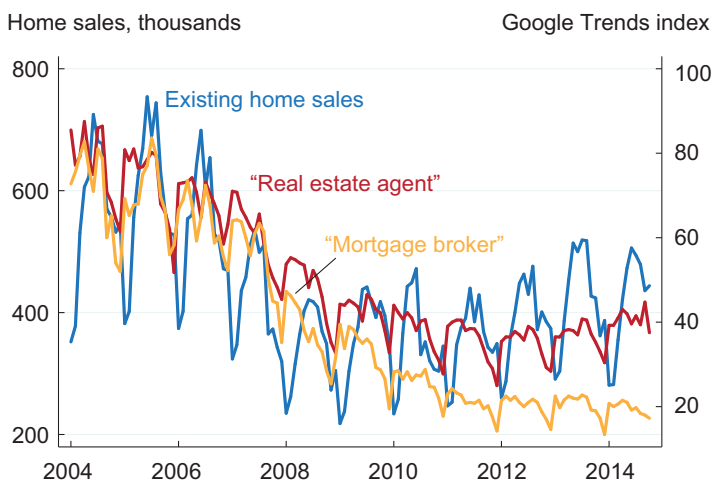
Note: Existing home sales are not seasonally adjusted.
Sources: National Association of Realtors / Haver Analytics; Google Trends.

Google Trends Search-Volume Data

Index

Source: Google Trends.

volume. From then, the two indexes trended closely until around 2014 when the gap widened again. Although both indexes have been trending upward, growth in demand has been lagging behind the Case-Shiller index. This gap between demand and home prices may imply that home prices are currently overvalued.

Another term we consider is "mortgage broker." Search volume for this term appears to be a good measure of housing demand because it does a nice job of capturing the seasonality in the demand for homes, as measured by existing home sales. Note that search volume for "real estate agent" does as well. All three data series decline at the same time each year. Again search volumes provide additional insight beyond the standard transactions data. Consider the similarities and differences in the search volumes for "real estate agent" and "mortgage broker." While the two appear to have a narrow gap before the recession, "mortgage broker" appears to diverge from "real estate agent" following the recession. This drop in searches for "mortgage broker" could indicate that income-constrained home buyers are going to constitute a smaller fraction of home sales going forward. We reason that income-constrained borrowers, who are more sensitive to the size of their mortgage payments and need the lowest mortgage payment possible, are those more likely to use a mortgage broker.

Another subgroup that can also be teased out of the Google Trends data is first-time home buyers. General concerns have been expressed recently over the difficulty young people are having finding affordable housing in areas with better upward social mobility (Chetty et al. (2014)). Potentially worrisome for youth and the housing market going forward is a possible decline in first-time home buyers, reflected in search volumes for the terms "first home" and "mortgage calculator." While the reasoning for "first home" is clear, we also looked at "mortgage calculator" because first-time home buyers may be credit constrained and therefore likely to use a mortgage calculator. Searches for these terms

are currently much lower than they were before the crisis, suggesting a possible decline in first-time home purchases.

"Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States" (2014) Raj Chetty, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez, working paper.

Job Polarization and Labor Market Transitions

02.19.2015
by Muart Tasci and Jessica Ice

Job polarization has been an important feature of the US labor market for some time. The term refers to the shift in the types of jobs that are available in the labor market, where, owing to the disappearance of occupations that handle routine tasks, the types of jobs remaining are manual labor jobs at one end of the spectrum and jobs requiring abstract skills at the other. Discussion about job polarization generally tends to center around the notion that technological change has replaced workers who primarily engage in routine work and has effectively "hollowed out" the pool of available jobs. In contrast, occupations that predominantly require abstract skills have gained ground, as they are less susceptible to technological change. Moreover, these trends have been exacerbated by recent business cycles (see Job Polarization and the Great Recession).

In this post, we want to shed some light on the unemployment experience of workers with different occupational skills and their transitions into different states of employment or unemployment. The broad trends we described above might be masking some of the dynamics experienced by workers with different occupational skills.

We divide the pool of unemployed workers into three groups based on the skillset required in the last job they held: abstract, routine, and manual workers following previous work by David Autor and David Dorn. For each of these groups we look at the length of time they typically have spent in unemployment, the shares of each that have transitioned out of the workforce, and the shares of each that have moved from one type of job to another.

Mean Duration of Unemployment by Skill

Weeks, seasonally adjusted

Note: Shaded bars indicate recessions.
Sources: Autor and Dorn (2013); Bureau of the Census; Bureau of Labor Statistics.

Average unemployment durations show some variation across these groups. The average number of weeks spent unemployed between January 2000 and December 2013 was

- 23.2 for abstract workers

- 20.9 for routine workers

- 19.2 for manual workers.

Because there were two jobless recovery episodes in this sample period, average unemployment duration, even within a group, changed quite a bit. From November 2001 until December of 2007, the average number of weeks spent unemployed was

- 18.8 for abstract workers

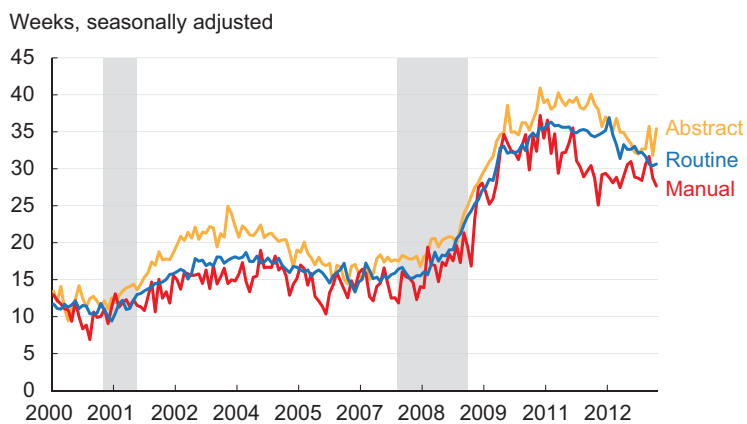- 16.1 for routine workers

- 14.5 for manual workers.

Since the Great Recession, the average unemployment duration has soared. The average number of weeks spent unemployed from January 2009 to December 2013 was

- 35.3 for abstract workers

- 32.7 for routine workers

- 30 for manual workers.

The longer average duration of unemployment for abstract workers is probably not due to a lack of jobs for this type. The share of employment for this group has steadily increased in the US over time: from 28 percent in 1976 to more than 40 percent by the end of 2013. Maybe it suggests that these workers are more selective.

However, longer unemployment duration is not enough in itself to indicate that abstract workers are more selective than their counterparts with different skills. For instance, we have no way of knowing whether these workers declined some job offers while they were unemployed. On the other hand, we can look at the percentages of unemployed workers who decide to leave the labor force altogether. If someone deems the odds of finding a job relatively small, he or she might choose to leave the labor force to retire, to enroll in school, etc.

Probability of Transition into Nonparticipation by Skill Type

Six-month moving average percent, seasonally adjusted

Note: Shaded bars indicate recessions.
Sources: Autor and Dorn (2013); Bureau of the Census; Bureau of Labor Statistics.

Comparing transition rates from unemployment to nonparticipation across different types of workers should give us an idea of how attached each is to the labor force when they experience difficulty finding a job.

On this dimension, it looks like manual and routine workers have a higher propensity to leave the labor force when they are unemployed, relative to their counterparts with previous experience in jobs with abstract skills.

On average, the rate at which unemployed workers left the labor force each month between January 2000 and December 2013 was

- 22 percent for manual or routine workers

- 18 percent for abstract workers.

The discrepancy between the different types might be indicative of the different prospects workers are facing. If unemployed workers with abstract skills expect strong demand for those skills going forward, they might be less inclined to stop looking for work entirely. On the other hand, their relatively longer average duration of unemployment suggests that they might be looking for a particular job match.
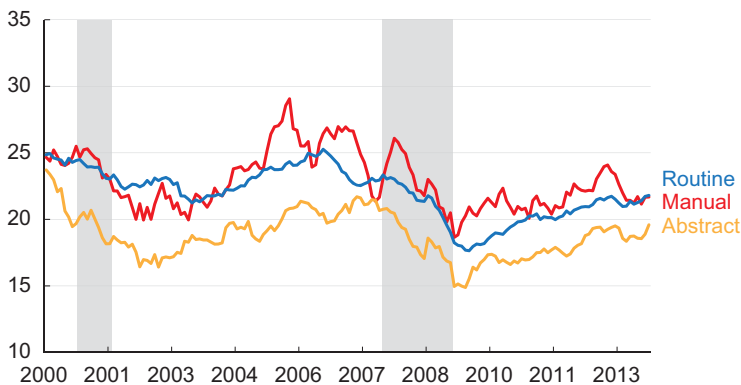
For all of the different types of workers, there is a clear cyclical dimension to this particular transition. Since recessions are times when disproportionately more workers with stronger attachment to the labor force become unemployed, transition rates into nonparticipation go down. As the economy normalizes, this rate climbs up.

Our discussion has implicitly assumed that workers will look for a job in occupations similar to their previous one. However, the reality might be a little more complicated. Even though the majority of unemployed workers end up employed in similar occupations, they sometimes change occupation types.

Below we report the average transition probabilities between different skill types for unemployed workers who found a job while in our sample. We observe a certain fraction of workers for multiple months in the data. So whenever they make a tran-
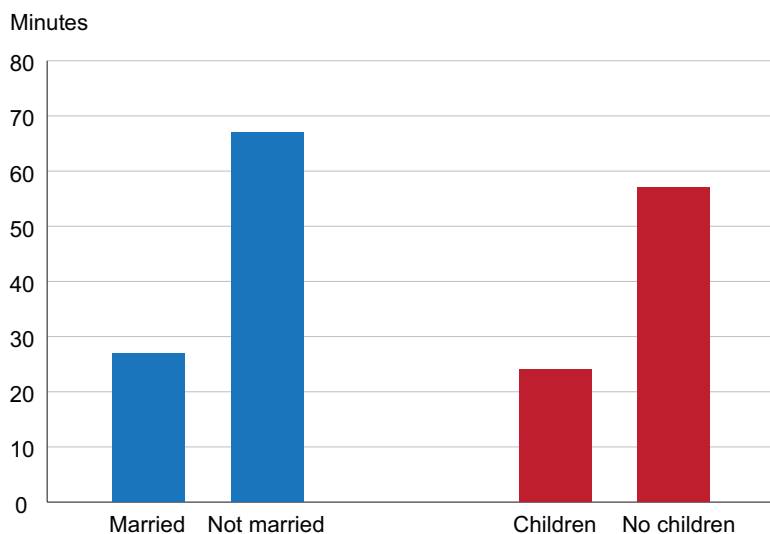
sition from unemployment into a new job when they are in the sample, we can keep track of their new occupation characteristics and compare it to the prior one before unemployment. The diagonal gives the fraction of those who end up in a new job that is of the same type as their previous one.

# Recent Evidence on the Job Search Effort of Unemployed Females

Average Job Search Time of Unemployed Females with Bachelor's Degree or More by Demographic Characteristics

Minutes

Sources: American Time Use Survey, Bureau of Labor Statistics; authors' calculations.

Average Job Search Time of Unemployed Females with Bachelor's Degree or More by Marital Status and Time Period
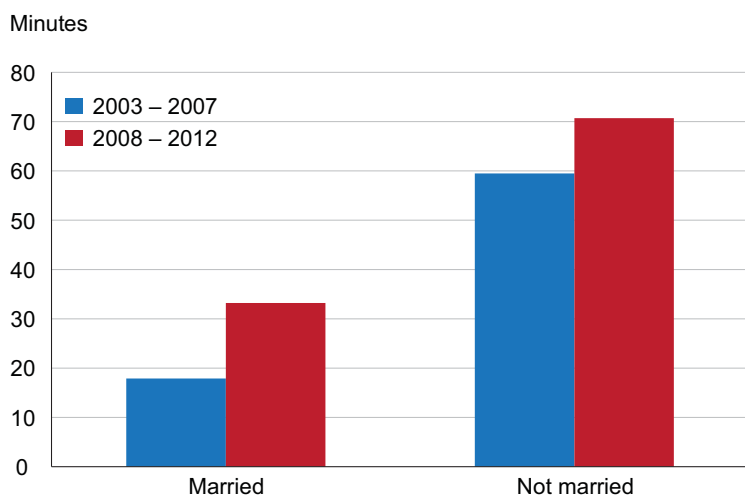
Minutes

Sources: American Time Use Survey, Bureau of Labor Statistics; authors' calculations.

02.19.2015
by Dionissi Aliprantis and Christopher Vecchio

In looking for causes of the high unemployment rate that followed the Great Recession, economists focused a lot of attention on the decision-making behaviors of the unemployed, particularly the amount of effort they spent searching for a job. Job search effort is often measured by the amount of time the unemployed spend searching. In recent work, we found that females with at least a bachelor's degree spent much less time searching for a job than males with the same level of education. In this article we examine some of the factors that determine the amount of time that unemployed females spend on job search and whether these factors have changed since the Great Recession.

Data on job search time come from the American Time Use Survey (ATUS). The ATUS asks respondents how much time they spent on various activities in the previous day. Activities classified as job search include sending out resumes, conducting interviews, commuting to interviews, asking for information, and looking for information on the internet or in the newspaper. We combine these activities to get the total time unemployed women with at least a bachelor's degree "typically" spent searching for a job.
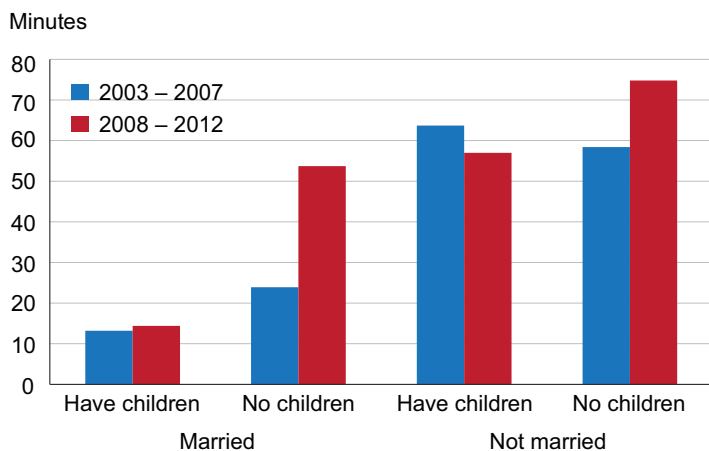
We considered whether there might be differences in job search times based on females' marital status or whether they had children. For example, since women in households with young children spend more time on childcare than the men in those households (article), we might suspect that women with children have to trade off time spent searching for a job in favor of time spent on child care. Looking at subgroups of unemployed women defined according to these characteristics, we find large differences in average job search time between married and unmarried women, as well as between women who have children and women who do not.

Average Job Search Time of Unemployed Females with Bachelor's Degree or More by Child Status and Time Period
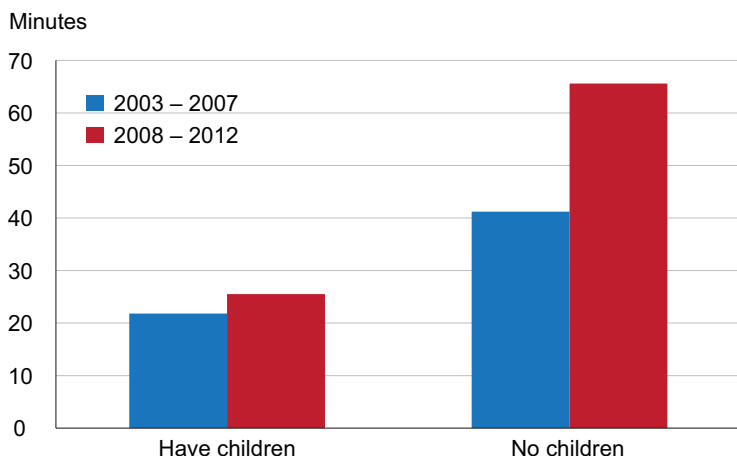
Minutes

Legend:
- 2003 – 2007
- 2008 – 2012

Categories: Have children, No children

Sources: American Time Use Survey, Bureau of Labor Statistics; authors' calculations.

Average Job Search Time of Unemployed Females with Bachelor's Degree or More by Demographic Characteristics and Time Period

Minutes

Legend:
- 2003 – 2007
- 2008 – 2012

Categories: Married (Have children, No children), Not married (Have children, No children)

Sources: American Time Use Survey, Bureau of Labor Statistics; authors' calculations.

When we look at job search time before and after the Great Recession, we can see that while marital status is still related to the amount of time spent searching for a job, both married and unmarried women's job search time increased. This is less true for women by child status. Unemployed women with no children increased their time spent searching for a job after the onset of the Great Recession, while unemployed women with children did not respond as much.

If we drill farther down, we see that among women with no children, those who are married increased their job search time even more than the unmarried with no children. For unemployed women with children, the key driver of job search time seems to be their marital status. Unemployed women with children who are also married spend much less time searching for a job than any other group. While the composition of these groups of women may have changed over the time period under consideration, these changes most likely represent a response to the Great Recession.

The result of these recent trends is that the Great Recession has made search time much closer to equal for all groups of unemployed women with at least a bachelor's degree, except married women with children. All other groups of women with this level of education now spend, on average, relatively similar amounts of time searching for a job. This differs from the pre-recession period, when marital status alone seemed to be the key determinant of the time unemployed women with this level of education searched for a job.

Our findings show that historical patterns in the job search behavior of the unemployed have changed for some groups since the Great Recession. Taking these changes into account could help our thinking about the relative importance of factors contributing to unemployment, such as changes in labor demand, labor supply, or unemployment insurance policies.

Yield Curve and Predicted GDP Growth, February 2015

Covering January 24, 2015–February 20, 2015
by Joseph G. Haubrich and Sara Millington

Highlights

	February	January	December
Three-month Treasury bill rate (percent)	0.02	0.03	0.03
Ten-year Treasury bond rate (percent)	2.11	1.85	2.24
Yield curve slope (basis points)	209	182	221
Prediction for GDP growth (percent)	2.1	2.1	1.8
Probability of recession in one year (percent)	4.12	5.97	3.49

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

Ten-Year Expected Inflation and Real and Nominal Risk Premia

Percent

Source: Haubrich, Pennacchi, Ritchken (2012).

Real Interest Rate

Percent

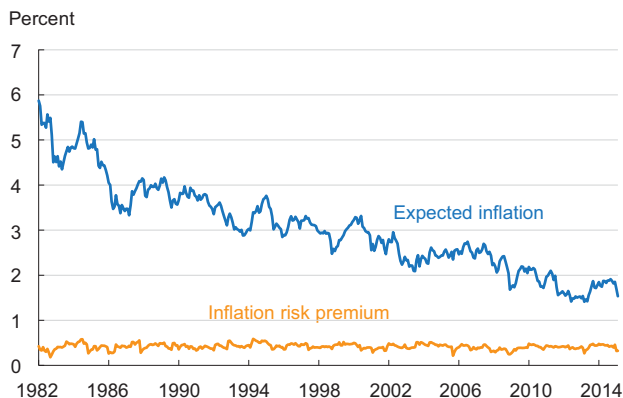Source: Haubrich, Pennacchi, Ritchken (2012).

Overview of the Latest Yield Curve Figures

The cold of February has put a bit of a bounce into interest rates, as longer rates rose from the lows of January, resulting in a steeper yield curve. The action was mainly at the long end while the short end inched downward, with the three-month (constant maturity) Treasury bill rate dropping to 0.02 percent (for the week of ending February 20), down from January's already very low 0.03 percent. The ten-year rate (also constant maturity) rose 26 basis points to 2.11 percent, up from January's 1.85 percent, but still down from December's 2.24 percent. The slope increased to 209 basis points, up from January's 182 basis points, but below December's 221 basis points.

The steeper slope did not have a large impact on predicted real GDP growth; the expected growth stayed constant. Using past values of the spread and GDP growth suggests that real GDP will grow at about a 2.1 percent rate over the next year, the same as last month's rate and up a bit from the 1.8 percent rate seen in November. The influence of the past recession continues to push towards relatively low growth rates, but recent stronger growth is counteracting that push. Although the time horizons do not match exactly, the forecast is slightly more pessimistic than some other predictions, but like them, it does show moderate growth for the year.
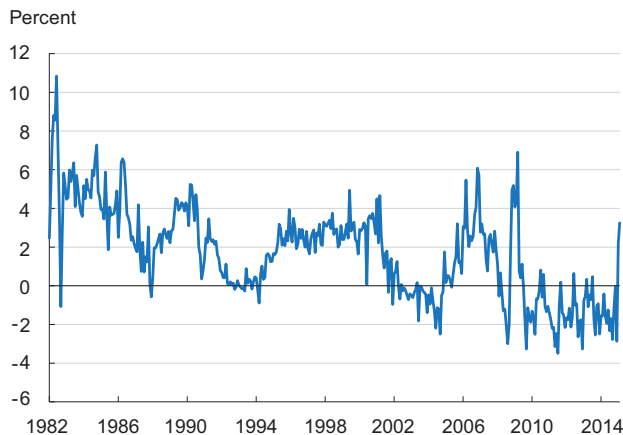
The steeper slope, however, had the usual affect on the probability of a recession, which decreased slightly. Using the yield curve to predict whether or not the economy will be in recession in the future, we estimate that the expected chance of the economy being in a recession next February at 4.12 percent, down from the January figure of 5.97 percent, but up from December's 3.49 percent. So although our approach is somewhat pessimistic with regard to the level of growth over the next year, it is quite optimistic about the recovery continuing

Expected Inflation Yield Curve

Percent

Source: Haubrich, Pennacchi, Ritchken (2012).

Yield Spread and Lagged Real GDP Growth

Percent

GDP growth
(year-over-year change)

Ten-year minus
three-month yield spread

Note: Shaded bars indicate recessions.

The Yield Curve as a Predictor of Economic Growth

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

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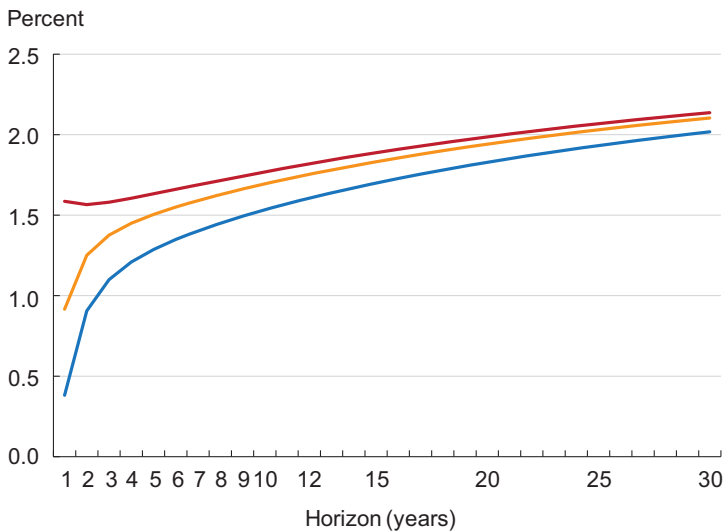
Predicting GDP Growth

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

Predicting the Probability of Recession

While we can use the yield curve to predict whether future GDP growth will be above or below average, it does not do so well in predicting an actual number, especially in the case of recessions. Alternatively, we can employ features of the yield curve to predict whether or not the economy will be in a recession at a given point in the future. Typically, we calculate and post the probability of recession one year forward.
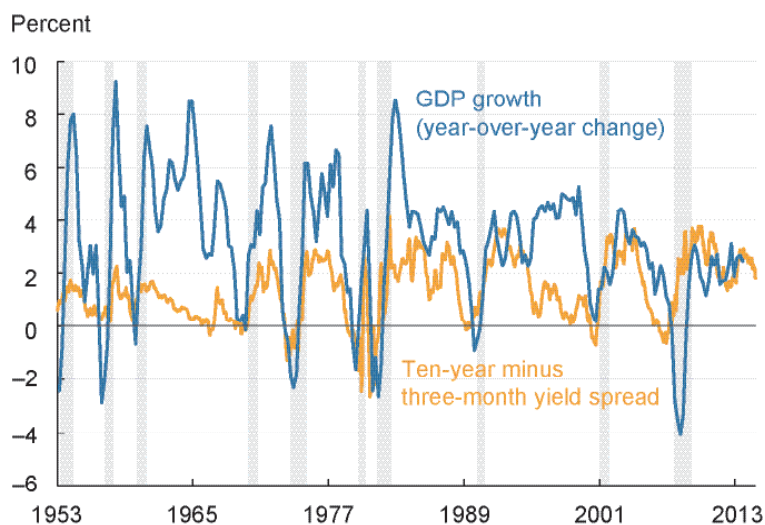
Of course, it might not be advisable to take these numbers quite so literally, for two reasons. First, this probability is itself subject to error, as is the case with all statistical estimates. Second, other researchers have postulated that the underlying determinants of the yield spread today are materi-

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