

# THE REGIONAL ECONOMIST

*A Quarterly Review  
of Business and  
Economic Conditions*

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THE FEDERAL RESERVE BANK OF ST. LOUIS  
CENTRAL TO AMERICA'S ECONOMY®

Oil Prices  
Calculating the Role  
Played by Speculators

Credit Default Swaps  
The ABCs of CDS  
and Their Impact in Europe



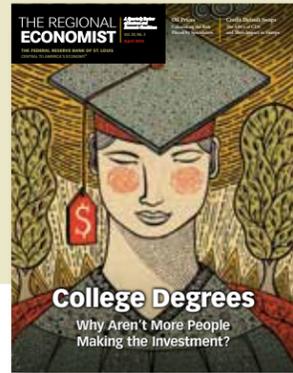
# College Degrees

## Why Aren't More People Making the Investment?

# 4 College Degrees

By Maria E. Canon and Charles S. Gascon

The benefits of a college diploma are many, including higher pay, lower unemployment, maybe even better health. Yet many high school graduates still do not pursue a college degree. This article examines several key reasons why more people aren't making this investment in themselves.



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## Recent Actions Increase the Fed's Transparency

At the January 2012 meeting, the Federal Open Market Committee (FOMC) took steps to further increase the Fed's transparency regarding monetary policy decisions and strategy. For one, the FOMC named an explicit, numerical inflation target. With this action, the Fed joined many other central banks—including the Bank of England, the European Central Bank and the Reserve Bank of New Zealand—in adopting an inflation target. Also in January, the FOMC released its forecasts of the target federal funds rate. Several other central banks publish forecasts of their policy rate as well.

The FOMC set an inflation target of 2 percent, as measured by the annual change in the overall personal consumption expenditures (PCE) price index. To clarify, this does not mean inflation must be 2 percent in the short term; rather, monetary policy should be set so that inflation moves toward the target over time and, in the absence of unpredictable changes in either supply or demand, would reach 2 percent in the medium term. The FOMC will target the headline inflation rate as opposed to any other measure (e.g., core inflation, which excludes food and energy prices) because it makes sense to focus on the prices that U.S. households actually have to pay.<sup>1</sup> To illustrate, headline PCE inflation (measured from one year earlier) has been higher than core PCE inflation for more than three-fourths of the months since January 2000. This implies that the changes in prices excluded from the core measure are not simply temporary fluctuations, especially those for energy. Headline inflation is, therefore, the appropriate measure to target.

Inflation targeting emphasizes control over inflation as the key long-term goal of monetary policy. Although the FOMC did not set an employment target in addition to the inflation target, the January decision is still consistent with the Fed's dual mandate to promote maximum sustainable employment and price stability. Keeping inflation low

and stable helps the market economy allocate resources optimally, which then leads to the best possible employment outcomes. This interpretation of how to pursue the dual mandate resulted, in part, from lessons of the 1970s.

During the 1960s, economists thought there was a permanent trade-off between unemployment and inflation—that is, lower unemployment would be accompanied by higher inflation and vice versa. This belief was shattered in the 1970s, when the U.S. had both high inflation and high unemployment. In addition, the real side of the economy was very volatile, and the U.S. suffered through four recessions from 1970 to 1982. From this experience, the FOMC and other policymakers around the world learned that high inflation is very damaging and does nothing to address fundamental macroeconomic issues. Afterward, the FOMC achieved low and stable inflation, and the U.S. experienced a long period of good economic performance compared with the 1970s.<sup>2</sup>

Having an inflation target helps to reduce uncertainty about future inflation rates and, thus, helps to avoid the 1970s experience. Even with an inflation target, though, the FOMC will continue to have differences of opinion among its members as to how to respond to current and expected economic conditions. For instance, a so-called hawk may place more weight on deviations of inflation from the target, whereas a so-called dove may place more weight on unemployment. As a result, their monetary policy recommendations may be different, despite both targeting the same inflation rate. One interpretation is that while the inflation target provides a nominal anchor for the economy, policymakers can debate about the appropriate way to adjust policy to move to that target.

As for the other step taken in January, the FOMC released the 17 participants' forecasts of when the federal funds rate target would

first move above its current level and of the appropriate policy rate path. This "first" increase is noteworthy because the federal funds rate target has been in the 0-0.25 percent range since December 2008. While releasing these forecasts was a move toward more transparency, a better way in my view to give a basic overview and our perspective on the key economic issues would be to release a quarterly report on the economy, similar to what the Bank of England publishes.

One advantage of having a quarterly report on the economy is that it provides policymakers the opportunity to comment on many different issues and subtleties that are affecting the economy. For instance, the report could include a discussion about the foreign exchange situation, special seasonal factors, certain market disruptions and any other relevant topics. Such a report would also provide a chance for the FOMC to link its forecasts of gross domestic product growth, the unemployment rate, PCE inflation, core PCE inflation and the fed funds rate and, therefore, to tell a coherent narrative. Now, these forecasts are "disconnected": We release summaries across FOMC participants for each variable. A quarterly report would likely provide a valuable public service in the U.S. and might be something for the FOMC to strive for as we continue to seek ways to become more transparent. 

#### ENDNOTES

<sup>1</sup> For more on headline vs. core inflation, see my speech on May 18, 2011, "Measuring Inflation: The Core Is Rotten." [http://research.stlouisfed.org/econ/bullard/pdf/Measuring\\_Inflation\\_May\\_18\\_2011\\_FINAL.pdf](http://research.stlouisfed.org/econ/bullard/pdf/Measuring_Inflation_May_18_2011_FINAL.pdf)

<sup>2</sup> See also my message in the St. Louis Fed's 2010 annual report, "The Fed's Dual Mandate: Lessons of the 1970s." [http://www.stlouisfed.org/publications/ar/2010/pages/ar10\\_1.cfm](http://www.stlouisfed.org/publications/ar/2010/pages/ar10_1.cfm)

### ONLINE EXTRA

#### Earnings Growth over a Lifetime: Not What It Used To Be

By Yu-Chien Kong and B. Ravikumar

A typical worker's earnings grow over his lifetime. The generation of workers born in the 1910s experienced more growth than the generation born in the 1940s. See [www.stlouisfed.org/publications/re](http://www.stlouisfed.org/publications/re)



# College Degrees

## Why Aren't More People Making the Investment?

*By Maria E. Canon and Charles S. Gascon*

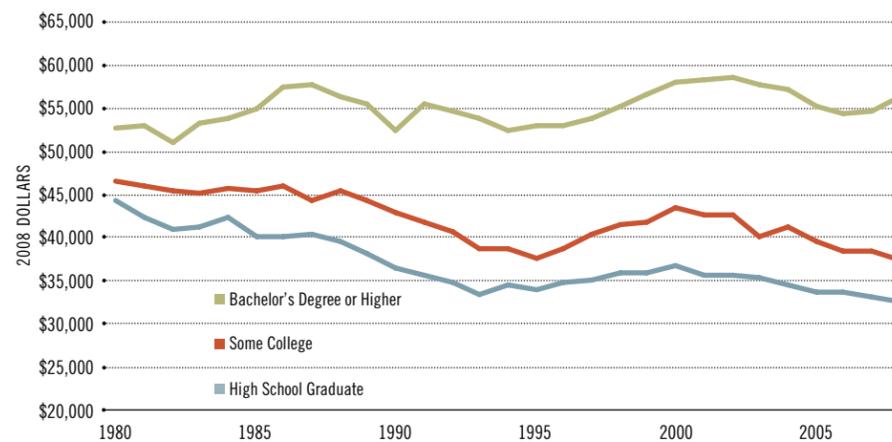
Over the past 30 years, some of the benefits of furthering one's education have become more pronounced, specifically, higher earnings and lower unemployment. Some studies have even found a positive relationship between higher education and better health.<sup>1</sup> Surprisingly, over the same period, high school dropout rates have declined only modestly, and close to one-third of all high school graduates still do not enroll in any form of college. Even though a greater percentage of high school graduates enter college today than 30 years ago, this rise has not been met by a proportional increase in completion rates. In the past few years, college graduation rates actually have fallen as a consequence of increasing college dropout rates. This begs the question: If the benefits to education appear to be so high, why don't more people seek a college degree?

Economists and policymakers have been particularly interested in trying to explain this phenomenon. Some possible factors that have been considered are: higher tuition costs, changes in assistance programs, fear of failure, earnings risk and, more recently, the recession and financial crisis. This article will pay special attention to failure and earnings risk, as these forces are particularly useful in understanding why one individual may choose college but another may not.

### Measuring the Benefits of College

The skill premium measures the difference in the average earnings of four-year college graduates and that of nongraduates

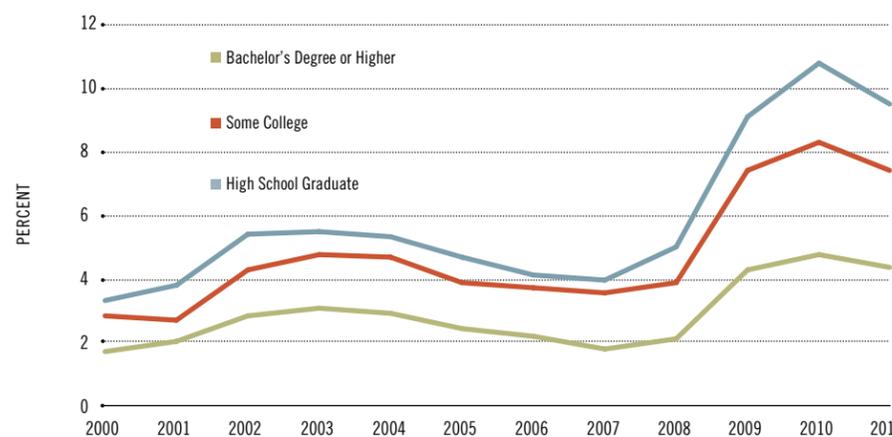
**FIGURE 1**  
**Real Median Earnings for Men by Education Level**



SOURCES: College Board Advocacy and Policy Center and authors' calculations.

Some college includes associate degrees. It is common to use male earnings due to female labor force selection bias and changes in labor force participation. Women with the potential for high earnings tend to enter the labor force, while women with the potential for low earnings elect to stay home.

**FIGURE 2**  
**Unemployment Rate by Education Level, Men and Women**



SOURCE: Bureau of Labor Statistics, Table A-4. Some college includes associate degrees.

(i.e., dropouts and those who didn't enroll).<sup>2</sup> Recent estimates suggest the skill premium is between 65 and 75 percent, but estimates vary depending on the data source.<sup>3</sup> This skill premium implies that, on average, a college graduate earns between 65 and 75 percent more than a high school graduate.

The skill premium exists due to differences in the supply and demand for different types of workers. Over time, the demand for college graduates (driven by factors such as better technology) has increased faster than the supply of graduates; at the same time, the demand for less-educated workers has declined. As a result, earnings have diverged: Figure 1 plots real median annual earnings of males from 1980 to 2008 by education level. The difference between each of the lines is a measurement of the skill premium.

The skill premium between college graduates and the other two groups has continued to increase. This is primarily due to a decline in real earnings of those without a college degree. Between 1980 and 2008, the college wage premium between male college graduates and those with some college increased by 26 percent. The gap between college and high school graduates grew even more: 33 percent.

The impact of further education on income is even more pronounced when the skill premium is compounded over time. Recent college graduates who completely finance their education with student loans will "catch up" to the total lifetime earnings of a high school graduate by their mid-30s. (See sidebar on facing page.)

In addition to the difference in higher lifetime earnings, higher education is accompanied by a significantly lower rate of unemployment. (See Figure 2.) Between 2000 and 2007, the average unemployment rate for workers with a high school degree was 4.6 percent, while the rate for workers with a college degree was only 2.4 percent. The gap was especially pronounced during the recent recession, with a difference of six percentage points in the unemployment rates between the two groups.

### What Drives College Participation Rates?

A 2010 study by economist Gonzalo Castex analyzed the changes in the college

*continued on Page 8*

## Lifetime Earnings and the Return to College

Many factors influence a high school graduate's decision to enter college. One of the main elements is the college wage premium, which allows a college graduate to catch up to a high school graduate upon degree completion. Although circumstances vary, reasonable estimates indicate that college graduates funding their entire cost of education with student loans will be able to surpass the lifetime earnings of a high school graduate by the time the former are in their mid-30s. Figure 3 is a simple depiction of how this will occur. The horizontal axis is the age of the individual, and the vertical axis shows present value of lifetime earnings (in thousands of dollars). Present values are used to account for the fact that the value of a dollar today is greater than a dollar in the future.

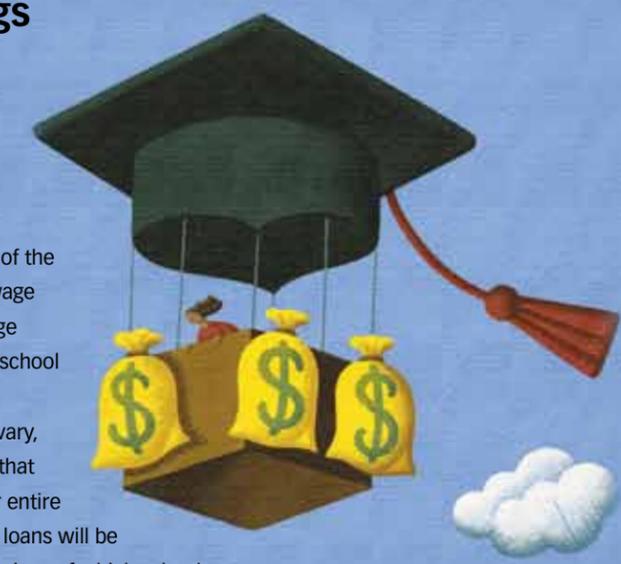
Assuming the average cost of attending college (including room and board) is approximately \$26,500 per year (\$16,000 for public and \$37,000 for private), students who completely finance their four years of education with loans will accumulate just over \$100,000 in debt. If we assume such students pay off their debt (and interest) and earn a premium of 74 percent after graduation, they will surpass the lifetime earnings of the high school graduate by the time they reach 34 years of age.

### The Role of Risk

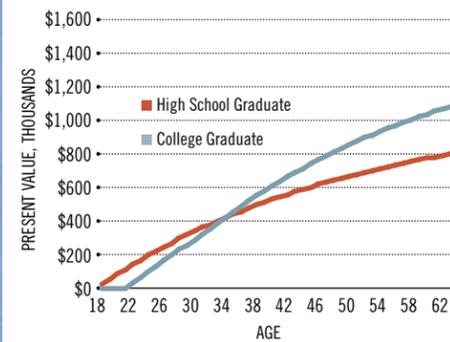
If this income path were guaranteed, every high school student would certainly decide to pursue higher education. However, the chance of failure or of graduating and being unable to find a high-paying job is a real concern for most.

Following the framework laid out above, failure can be easily depicted by assuming the same student drops out of college after two years (accumulating \$50,000 in debt) and enters the labor force with a much lower skill premium. In this case, the student is saddled with student loan debt but earns only 15 percent more than a high school graduate. (See Figure 4.) As a result, lifetime earnings remain below that of the high school graduate until well beyond retirement.

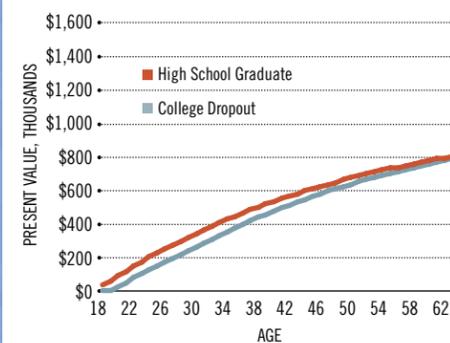
The role of earnings risk is slightly more complicated because many things could happen after college graduation (e.g., low pay or inability to find a job) that would discourage possible entrants. These factors are no different from those afflicting any entrant into the labor force, but carrying \$100,000 in student loans could make the situation much less desirable. A simple graphical portrayal of earnings risk can be accomplished by adjusting the wage premium. In Figure 5, the shaded band shows the present value of lifetime earnings of a college graduate earning a wage premium between 125 percent (\$73,125 per year) and 25 percent (\$40,625). The variation in the time it takes to catch up is significant. In the optimistic scenario, the college graduate surpasses the lifetime earnings of the high school counterpart by the age of 27. In the pessimistic scenario, the college graduate will not catch up unless he or she works well beyond a normal retirement age.



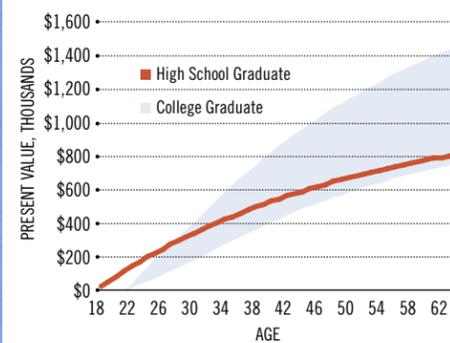
**FIGURE 3**  
**Lifetime Earnings: High School vs. College**



**FIGURE 4**  
**Lifetime Earnings: High School vs. Dropout**



**FIGURE 5**  
**Earnings Risk: High School vs. College**



The shaded band shows the present value of lifetime earnings of a college graduate earning a wage premium between 125 percent (\$73,125 per year) and 25 percent (\$40,625 per year). The former follows the path of the top of the band, and the latter follows the path of the bottom of the band. Earnings data for the calculations are the 2008 observations in Figure 1; the costs of college are from College Board Advocacy and Policy Center, "Trends in College Pricing" 2010, p. 15. All calculations assume a 5 percent interest rate on student loan debt and a 3 percent discount rate.

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participation rate between 1980 and 2000. Using data from the National Longitudinal Survey of Youth (NLSY), Castex found that the college enrollment rate increased from 41 percent in 1980 to 68 percent in 2000. More important, he found that the increase in enrollment rates was not the same for all groups of people. Variation was due to differences in cognitive ability and financial status.<sup>4</sup> The increase in enrollment was more pronounced for students of high ability or from a high-income family. For example, the gap in college participation rates between students from the lowest-ability quartile and the highest-ability quartile was more than 60 percentage points.

Aiming to explain this change in enrollment rates and differences across groups, Castex used a decision-choice model. This type of model simplifies real-world decisions by identifying the important factors influencing a particular decision; the model assumes individuals make rational choices based on the information they have. In the model, there are four driving forces that can explain enrollment rates: increases in college wage premium, increased availability of merit-based aid for college, increases in tuition costs, and shifts in both the distribution of family income and individual ability.

A higher college wage premium increases the payoff of completing college and, hence, should have a positive effect on college enrollment. The model confirms this hypothesis: Increases in the college wage premium are the most influential factor affecting college participation among the four driving forces.

The increased availability of merit-based grants and scholarships reduces the cost of college education, making college more desirable. According to Castex, the number of recipients also increased. Between 1980 and 2000, the ratio of grants awarded to *high-ability* students (in dollars) to cost of education increased by 70 percent for low-income students and by 50 percent for high-income students. This ratio changed little for students in the low-ability groups. In the model, the redistribution of college subsidies accounts for 6 percent of the aggregate increase in college enrollment, and not surprisingly, it has a larger effect for students of high ability.

Tuition costs are another factor influencing the decision to attend college; this has been well-documented by economists.<sup>5</sup> The average college tuition increased by about 150 percent between 1980 and 2000: from \$9,000 to \$23,000.<sup>6</sup> Higher tuition should make college less desirable because it lowers the return on the investment and because the high price tag may put college out of reach for some families. However, higher tuition costs can be offset by more borrowing. As a result, the impact of higher tuition is smaller than one might expect. In the model, increases in tuition reduced the overall college participation rate by only 3 percent (by 7 percent for low-ability students).

The interaction between students' ability and their family income is also an important determinant of college participation. Holding ability constant, students in low- and middle-income families have greater access to need-based grants and scholarships, which reduce the cost of education. Since 1980, there has been significant change in the relationship between student ability and family income. Castex's findings suggest that more high-ability students now belong to middle-income families than did in 1980. This implies more grants for middle-income students and, therefore, an increase in college participation.

Using the same data set as Castex, but a different skill measure, Joseph Altonji and co-authors found that the skill premium provides even less motivation for individuals to acquire additional skills than Castex found.<sup>7</sup> Specifically, only about 1.5 percent of the increase in skills can be explained by the higher skill premium (after controlling for factors such as race, gender, family structure and parental education).

In the past, economists used self-selection (i.e., college may not be for some people) to explain the high return of college education but lower participation. However, college is a risky, irreversible investment, which makes some students hesitant to commit. Two recent papers, one by Castex and another by economists Kartik Athreya and Janice Eberly, explain this in terms of *failure risk* and *earnings risk*. Failure risk refers to the possibility that a student will not complete college. Earnings risk relates to a college graduate not being guaranteed

anything in terms of future earnings or employment.

### Failure Risk

It is important that one's ability to earn a college degree be taken into consideration when deciding about college. A 2009 study by economists John Bound, Michael Loevenheim and Sarah Turner found college failure rates close to 50 percent at four-year public colleges. The authors also found that increases in the rate of college enrollment had been accompanied by a decrease in completion rates. The costs of failure can be very high because uncertainty over eventual completion is not quickly resolved; generally, students who drop out do so after about two years. Those two years of tuition expenses and forgone earnings may deliver no return.<sup>8</sup> Economists Fabian Lange and Robert Topel argued that many dropouts failed to earn *any* wage premium because most learning takes place in the later years of college.

In another part of his paper, Castex examined a sample of workers from the 1979 NLSY. He found that students who dropped out of college at the beginning of the 1980s owed financial and educational institutions \$9,350 on average; 15 percent of this group owed more than \$24,000. The average wage when joining the labor force for those students who dropped out and owed more than \$15,000 was about \$28,000, a wage comparable to that of a high school graduate. Therefore, incorporating the probability of failure into the decision to attend college could change an individual's decision.

### Earnings Risk

Even the young adults who earn college degrees are not given any guarantees. Uncertainty about future employment and earnings even exists on graduation day. A May 2011 article in *The New York Times* reported that in 2009 slightly over half of college graduates under the age of 25 were working on jobs that required a college degree. Moreover, 22 percent of this same group was not working at all, and the remaining 22 percent was underemployed.

Even though part of this underemployment may be due to the state of the economy, some graduates are unable to earn the wage premium they had invested in. This can be due to various factors, such as school performance,

degree choice or quality of life issues. This implies that it is possible for relatively young college graduates to immediately earn less than they expected. These events substantially lower their present and future stream of earnings and, consequently, the present value of their remaining lifetime income.

### Impact of the Recession

Traditionally, economic slowdowns have not been associated with declining college enrollment rates. This is because, during bad economic times, people are less likely to find a good job and, thus, choose to go to school instead. However, the experience during the last recession was different: College enrollment rates declined. The housing crash and financial crisis may explain the difference. Declining home prices and stock market wealth placed some families in a situation where college may have become unaffordable. In addition, college endowments lost significant value, which may have resulted in fewer scholarships. Compounding this problem, the financial crisis made it more difficult for households to borrow. In fact, part of the Federal Reserve's response during the financial crisis involved creating programs to improve the student loan market.<sup>9</sup>

Earnings risk likely has played a role, too. Since the recession, the unemployment rate for college graduates has more than doubled, from under 2 percent in 2007 to a peak of 5 percent at the end of 2010, and roughly one-quarter of recent graduates were underemployed. Making things even worse, the economy has experienced a jobless recovery, and four years after the recession began, the unemployment rate is still elevated. These factors have increased the aggregate risk of pursuing a college degree. In this new environment, even attaining a college degree may not result in the skill premium desired. Therefore, even though the skill premium may have gone up during the recession, the increase in unemployment rates for college graduates can certainly be an important factor explaining the slow growth in college enrollment rates and the elevated college dropout rates. <sup>Q</sup>

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### END NOTES

- <sup>1</sup> See Hernández-Murillo and Martinek.
- <sup>2</sup> The skill premium will differ based on factors such as school choice, major, occupational choice and geographic location, among others.
- <sup>3</sup> Sixty-five percent is from Goldin and Katz and controls for multiple factors. Back-of-the-envelope calculations using the data in Figure 1 put the premium over 70 percent.
- <sup>4</sup> Castex measures cognitive ability by standardized test (AFQT) score.
- <sup>5</sup> For example, see Garriga and Keightley.
- <sup>6</sup> In 2007 dollars, according to the College Board.
- <sup>7</sup> The authors measure skills using a skill index based on wages and employment after 10 years of employment.
- <sup>8</sup> Hungerford and Solon find that the return of partial completion of college is low.
- <sup>9</sup> Specifically, the Fed created the Term Asset-Backed Securities Loan Facility (TALF), which supported the issuance of asset-backed securities collateralized by student loans (as well as auto and credit card loans).

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# A Look at Credit Default Swaps and Their Impact on the European Debt Crisis

By Bryan Noeth and Rajdeep Sengupta



Credit default swaps (CDS) are financial derivative contracts that are conceptually similar to insurance contracts. A CDS purchaser (the insured) pays fees to the seller (the insurer) and is compensated on the occurrence of a specified credit event. Typically, such a credit event is the default or bankruptcy of a corporate or sovereign borrower (also known as the *reference entity*). The difference between traditional insurance and CDS is that CDS purchasers need not have any financial stake in the reference entity. Therefore, buying a CDS can be analogous to an individual insuring his neighbor's car and getting paid if the neighbor is involved in a car accident. Just like in an insurance contract, the individual pays a periodic premium to a CDS seller in return for compensation should the credit event (accident) occur. Importantly, the individual is compensated even though he may have no financial stake in his neighbor's car.

## The Origins of CDS

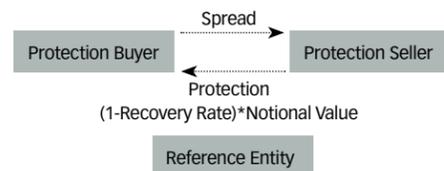
CDS were introduced in the mid-1990s as a means to hedge risk against a credit event. Initially, commercial banks used CDS to hedge the credit risk associated with large corporate loans. The attractiveness of a CDS contract emerges from the fact that these are made over the counter and generally adhere to the International Swaps and Derivatives Association's (ISDA) master agreement.<sup>1</sup> As a result, they allow transacting parties to avoid regulatory requirements imposed by more-formal insurance arrangements. With the evolution of this market, CDS contracts were written on a variety of sovereign, corporate and municipal bonds, as well as on more-complex financial instruments, such as mortgage-backed securities and

collateralized debt obligations. Unlike with insurance arrangements, sellers of CDS were not subject to significant regulation and were not required to hold reserves against CDS in case of default. It is widely believed that this exacerbated the recent financial crisis by allowing financial firms to sell insurance on various securities backed by residential mortgages and other assets.

## How Do They Work?

Typically, the CDS requires that the purchaser pay a spread (fee) quoted in percentage (basis points) of the amount insured. For example, the protection buyer of a CDS contract of an insured amount of \$20 million and a premium of 100 basis points pays a (quarterly) premium of \$50,000 to the CDS seller.<sup>2</sup> The premiums continue until the contract expires or the credit event occurs. Higher premiums indicate a greater likelihood of the credit event.

Settlement occurs in one of two ways: physical or cash. Physical settlement requires that the buyer of the protection deliver the insured bond to the seller, who pays the buyer the face value of the loan. The occurrence of the credit event would generally imply that the asset is trading well below par. Conversely, in a cash settlement agreement, the seller of the CDS simply pays the difference between the par value and the market price of the obligation of the reference entity.<sup>3</sup> Suppose that in our example, the recovery rate on the obligation of the reference entity is 40 percent on the occurrence of the credit event; then, the protection seller makes a one-time cash payment of \$12 million to the protection buyer as shown in the diagram at the top of the next column.



## CDS Spreads and the European Debt Crisis

CDS spreads are an important metric of default risk—a higher spread on the CDS implies a greater risk of default by the reference entity. This feature can provide useful information as to how financial markets perceive the risk of default on corporate and sovereign debt. To illustrate this phenomenon, we study changes in the CDS spreads on the debt of European nations over the past few years. Figure 1 illustrates spreads on five-year CDS in Europe since 2005. Each series is an equally weighted index of country groupings where data are available—distressed countries in the eurozone (European Union members that use the euro as their currency), other countries in the eurozone, Western European countries that do not use the euro as currency and Eastern European countries that do not use the euro as currency.<sup>4</sup> Prior to the crisis, CDS spreads were low for all of the reference countries, showing that investors placed low probabilities on these countries defaulting on their debts.

The onset of the financial crisis in 2008 raised the CDS spreads for all of the sampled groups of countries, especially for those in Eastern Europe. At the time, it was believed that Eastern European countries relied heavily on foreign capital flows to roll over their debt obligations. The Russian default in the late 1990s had made investors wary of the ability of these countries to service their

debts in the face of a global downturn. In fact, many of the countries on the list solicited emergency loans from the International Monetary Fund.<sup>5</sup>

Since the crisis, it is clear that investors have become increasingly wary of the distressed eurozone countries. Their CDS spreads have continued to rise, reaching newer highs each quarter. These countries have relatively elevated debt levels, and investors have little faith in the countries' abilities to service their debt obligations. Although the CDS spread on these countries as a group was lower than that of their Eastern European peers initially, subsequent events have raised the spreads on the distressed countries' debt well beyond those for Eastern Europe.

Also notable is the fact that spreads on the nondistressed eurozone and Western European countries were initially elevated but then fell, reflecting that these countries were viewed after the crisis as fiscally sound. However, in the past few months, the fact that these spreads have continued to rise does not bode well for these countries in particular and the European region as a whole. More recently, although the spreads have receded from recent highs, investors' concerns about European debt continue to persist.  $\Omega$

*Rajdeep Sengupta is an economist and Bryan Noeth is a research associate, both at the Federal Reserve Bank of St. Louis. See <http://research.stlouisfed.org/econ/sengupta/> for more on Sengupta's work.*

FIGURE 1  
Five-Year Spreads on Credit Default Swaps

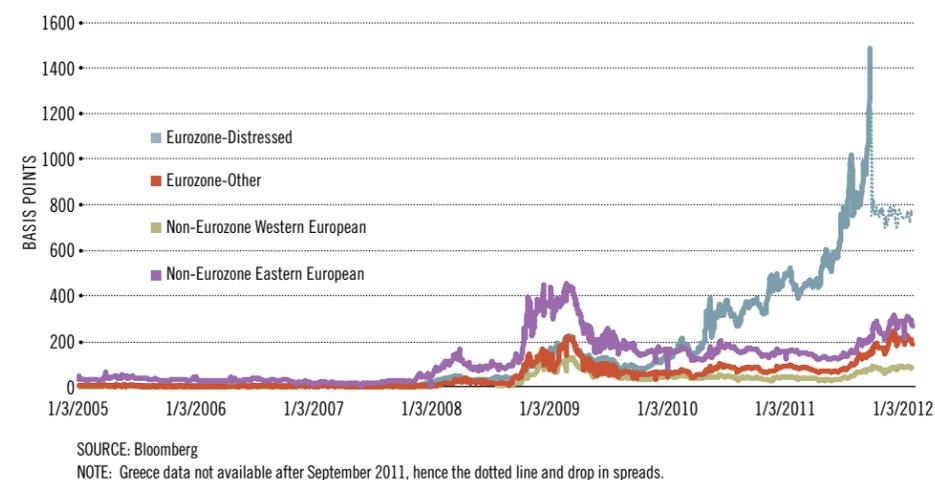


TABLE 1  
Country Listings

Eurozone-Distressed	Eurozone-Other	Non-Eurozone Western European	Non-Eurozone Eastern European
Portugal	Austria	UK	Poland
Italy	Belgium	Sweden	Hungary
Ireland	Estonia	Norway	Russia
Greece	Finland	Denmark	Latvia
Spain	France		Romania
Cyprus	Germany		Czech Republic
	Malta		Croatia
	Netherlands		Lithuania
	Slovak Republic		Bulgaria
	Slovenia		

The eurozone is made up of the 17 countries that are both members of the European Union and that use the euro as their currency. (The figure and table do not take into account eurozone member Luxembourg because of its small size.) Some of the non-eurozone countries in the table do not belong to the EU. The eurozone-distressed countries are viewed as having excessive debt burdens.

## Ecuador Was the First

Ecuador was the first country to trigger a CDS payment. It happened in November 2008 when Ecuador failed to make an interest payment. This was considered a trigger event and, in response, an auction was held Jan. 14, 2009. It was decided that the recovery rate was equal to 31.375 percent. This means that investors were paid 68.625 percent of the gross notional value of the CDS contracts that they had purchased.

## ENDNOTES

- <sup>1</sup> This is an agreement of the participants in the market for over-the-counter derivatives. For more on this agreement, see <http://www2.isda.org/>
- <sup>2</sup> Suppose the contract is for a notional amount of \$20 million of Greek sovereign debt. Note that neither the protection buyer nor the seller of the CDS needs to have any exposure to Greek bonds in order to engage in this CDS contract. This is the important difference between CDS and insurance contracts.
- <sup>3</sup> The market price is often determined by an auction. See Helwege et al. for details.
- <sup>4</sup> See Table 1 for a list of the countries included in each country grouping.
- <sup>5</sup> See Oakley.

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## When Oil Prices Jump, Is Speculation To Blame?

By Brett Fawley, Luciana Juvenal and Ivan Petrella



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Historically, the long-run primary driver of oil prices has been global demand.<sup>1</sup> An expanding global economy demands more raw inputs, including oil, and that increased demand pushes up their price.

However, the past decade (2000-09) saw a rapid proliferation in the financialization of commodities, i.e., the creation and trading of financial instruments indexed to commodity prices. Estimates indicate that assets allocated to commodity index trading rose from \$13 billion in 2004 to \$260 billion in March 2008. Many people, including policymakers and economists, have posited that because this rapid and unprecedented growth in commodity index trading coincided with a boom in commodity prices, speculation by financial traders—and not supply and demand—drove the recent bubble in commodities.<sup>2</sup> (See Figure 1.)

Such charges are perhaps strongest in oil markets, where large investment banks, hedge funds and other investment funds have invested billions of dollars in oil futures contracts over the past decade. In our current research, we investigate these allegations.<sup>3</sup> Specifically, we disentangle the contribution of four factors to oil price movements. Successfully identifying the true drivers of oil prices over the past decade is critical for efficient resource allocation and policy design.

### First Contributor: Global Supply

Unanticipated changes in the availability of oil inversely affect the price of oil. For example, prices increase when the Organization of Petroleum Exporting Countries (OPEC) unexpectedly decides to cut oil production.

### Second Contributor: Global Demand

A booming world economy demands more industrial commodities, and at the top of that list is oil. For example, continuous growth in emerging countries such as China and India increases the aggregate world demand for oil and, consequently, its price.

### Third Contributor: Oil Inventory Demand

Expected future shortfalls in oil supply, relative to demand, motivate the storage of oil for future use. Either the possibility of a sudden shortage in production or of a new source of demand can create an expected shortfall. For example, uncertainty about future oil supply may arise from political instability in key oil-producing countries, such as Nigeria, Iraq, Venezuela, Libya or

Iran. Such uncertainty increases demand for storing oil, driving up the current price.

### Fourth Contributor: Speculation

Speculation is the act of purchasing something today with the anticipation of selling it at a higher price at a later date. Financial markets allow traders to speculate on oil prices in the following way: Traders buy a contract for oil to be delivered at a later date (a futures contract), sell the contract before the oil is due for delivery and use the proceeds to purchase another futures contract for delivery at a more distant date. Expectations that the price of oil will be higher in the future motivate investment funds to take positions in these contracts, and as demand for futures contracts increases, so does their price, which also moves the current oil price.

### Decomposing Oil Prices in the Past Decade

Figure 2 illustrates the degree to which oil price trends over various parts of 2000-09 are attributed in our model to each of the four elements discussed above. We identify periods by the beginning and end of distinctive trends, rather than by evenly spaced time intervals, in order to best capture the net contribution each factor made to each trend. (See shading in Figure 1.) The black line shows the modeled percent change in real oil prices during each time period, and the bars illustrate the percentage point contribution made by each of the four elements.<sup>4</sup> For example, factors related to global supply pushed modeled oil prices about seven percentage points higher between 2000 and 2004 than they would have been otherwise, while changes in global demand drove modeled oil

prices about seven percentage points lower over the same span than they would have been otherwise.

During the past decade, just as historically, global demand was the primary driver of oil prices: The blue bars representing the contribution of global demand are the largest and show the greatest co-movement with the total change in oil prices. Moreover, the decline in the real price of oil in the second half of 2008 can be traced predominantly to the sharp reversal in worldwide demand that resulted from the financial crisis and ensuing global recession.

Figure 2 also reveals, however, that speculative demand did materially contribute to the increase in oil prices from 2004 to mid-2008. In particular, the contribution from speculation to rising oil prices (red bar) exceeded the combined contribution of global supply and inventory demand (purple and green bars) from 2004 to mid-2006. Overall, we estimate that speculation accounted for about 15 percent of the measured rise in oil prices from 2004 to mid-2008.

It is noteworthy that this trend began in 2004, which is when significant investment from index funds started to flow into commodities markets. Interestingly, speculation played a much smaller role during the second phase of rising prices, from mid-2006 through mid-2008, underscoring that gains from speculation decrease as current oil prices increase. Higher oil prices require that speculators allocate more investment funds upfront to purchase the same quantity of contracts, yielding a lower return as a percent of investment for the same dollar increase in oil prices.

But in the second half of 2008, just as in 2004 to mid-2006, speculation was again the second most-important factor driving oil prices: Only the blue and red bars can significantly explain the decline in oil prices, or “popping” of the bubble, during the second half of 2008. Just as the recession that was caused by the financial crisis decreased global demand for oil, the financial crisis also hurt the risk appetite of financial investors for risky commodities in their portfolios, consequently pushing prices down.<sup>5</sup>

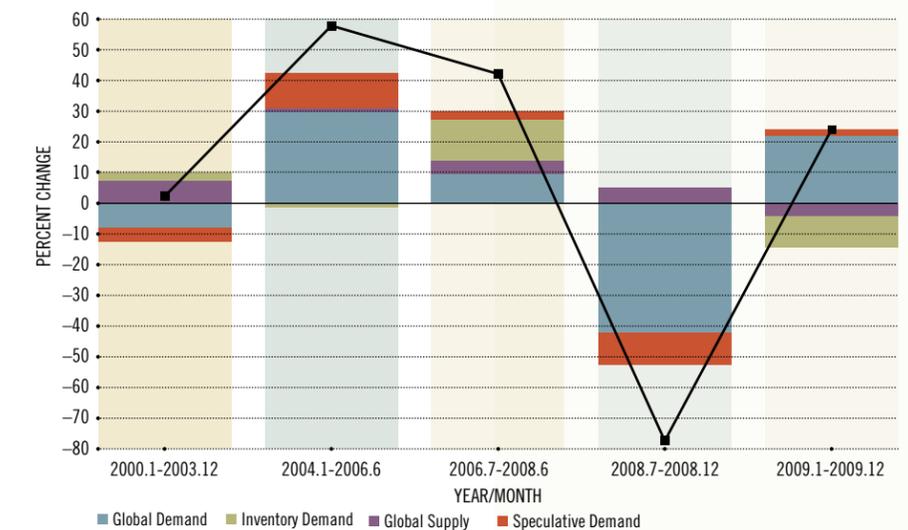
Looking to the other factors, oil inventory demand played only a marginal role in the oil price buildup from 2004 to mid-2006 but accounted for a large share of the spike from mid-2006 to mid-2008. (Note that the

green bar exceeds even the blue bar during the mid-2006 to mid-2008 period.) On the flip side, however, both oil inventory demand and global supply fail to explain much if any of the subsequent decline in oil prices in the second half of 2008. In total, oil supply contributed perhaps the least to both the boom and bust in oil prices, consistent with previous findings.

On balance, the evidence does not support the claim that a sudden explosion in commodity trading tectonically shifted historical precedent: Global demand remained the primary driver of oil prices from 2000 to 2009. That said, one cannot completely dismiss a role for speculation in the oil bubble of the past decade. Speculative demand can and did exacerbate the boom-bust cycle in commodity prices. Ultimately, however, fundamentals continue to account for the long-run trend in oil prices. [Q](#)

Luciana Juvenal is an economist and Brett Fawley is a senior research associate, both at the Federal Reserve Bank of St. Louis. Ivan Petrella is an assistant professor in the department of economics at Birkbeck College, University of London. For more on Juvenal's work, see <http://research.stlouisfed.org/econ/juvenal/>

FIGURE 2  
Decomposition of Percent Change in Oil Price



SOURCE: Authors' calculations. See Juvenal and Petrella.

NOTE: Square markers identify the total percent change in oil prices over the period identified on the x axis. Colored bars illustrate the percentage point contribution made by the four factors of interest. We identify periods by the beginning and end of distinctive trends. (See shading in Figure 1.)

### ENDNOTES

- 1 See Kilian.
- 2 See Tang and Xiong.
- 3 See Juvenal and Petrella.
- 4 While the four components discussed can account for the large majority of oil price changes, the model that we estimate does not require, or assume, that all factors important to oil prices are included. The allowance for omitted factors explains why summing the four individual contributions may not always equal the total change. Also note that because we are interested in comparing relative trends and not levels, we make the normalization of indexing all factors to the same baseline level in 2000.
- 5 See Tang and Xiong.

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# New Technology May Cause Stock Volatility

By Adrian Peralta-Alva



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The fact that the market value of firms traded in U.S. stock markets displays considerable fluctuations over short time periods is very well-known and receives a great deal of attention in the press. From the perspective of economic theory, this elevated level of short-run volatility in the stock market is very challenging to understand because fundamentals—i.e., variables that one would consider key determinants of market values, such as profits, dividends or output growth—do not fluctuate nearly as much.

## Should Investors Focus on the Long Run?

From a macroeconomic perspective, if stock market volatility were confined to short-term horizons, then it would not be of great concern because the volatility would wash out in the long run. However, the stock market displays pronounced movements that are also long-lived. The relevant data are summarized in the figure.

The stock market value of all publicly traded U.S. corporations increased at a very fast pace during the 1950s. During the 1960s, it slowed down substantially. Stock market values declined by 57 percent from their peak in 1972 to 1974 and did not start growing until the 1980s. From the mid-1980s to 2000, equity values rose steadily, more than tripling. From 2000 to 2010, in spite of large year-to-year fluctuations, equity values did not display any particular trend.

The welfare implications of such strong changes in market valuations may be profound. An individual considering retirement in early 1974, for example, would have seen her stock market wealth go down by 50 percent in that year. More important, the stock

market did not recover from this negative shock until well into the 1990s. Retirement prospects would look very different for somebody considering retirement in about 1990. By then, the stock market had recovered, and a twofold increase in valuations would take place during the following decade.

Historically, firms that are traded in the stock market tend to be well-established firms that are, therefore, more likely to use established technologies. As a result, the slowdown in productivity might have affected, in a particularly strong fashion, publicly traded firms and their market valuation.

## The Role of Technology

One of the possible explanations for the observed changes in the long-term trends in the stock market is changes in technology.<sup>1</sup> The production structure of the U.S. economy has been transformed at its most fundamental levels during the past four decades, and these changes are reflected in asset valuations.

First, the U.S. economy slowed down substantially about the mid-1970s as productivity growth was cut in half and stagnated for the next two decades. This is the famous productivity slowdown, which might also have signaled that existing technologies

and production methods could no longer continue to be the engines of growth.<sup>2</sup> Historically, firms that are traded in the stock market tend to be well-established firms that are, therefore, more likely to use established technologies. As a result, the slowdown in productivity might have affected, in a particularly strong fashion, publicly traded firms and their market valuation.

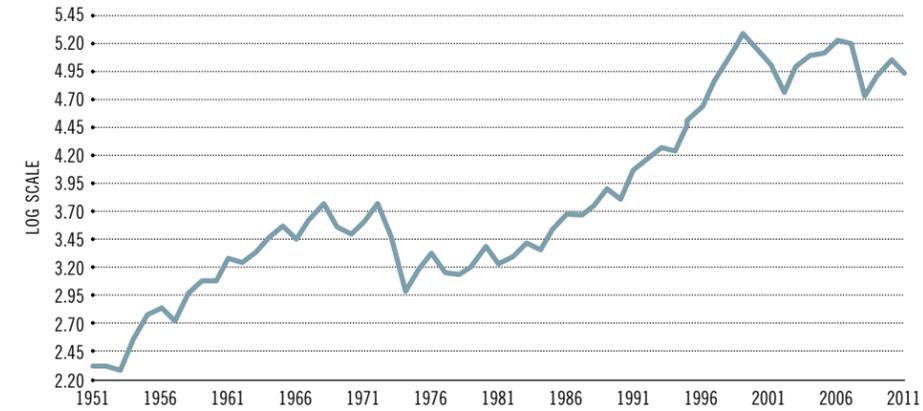
Interestingly enough, some small, incipient sectors of the economy were experiencing a productivity boom simultaneous with the productivity slowdown of the mid-1970s.<sup>3</sup> The 1970s, and most certainly the 1980s, signaled the beginning of the information technology (IT) revolution. Many of the major economic players of the 1990s, and even of today, were born in the middle of this revolution. However, most of the firms employing these new technologies would not go public until the late 1980s or early 1990s, and only then would stock markets start to recover.

## Using Theory to Account for the Facts

To better understand how the aforementioned technological shocks might translate into stock market fluctuations, it is useful to recall some basic economic principles. A key complication behind stock market valuations is that they are forward-looking by nature. Ownership of a share of equity entitles the holder to a fraction of the stream of future dividends distributed by the firm and to the expected capital gains (or losses) that may result from selling such a share. The value of shares must, therefore, equal the expected discounted value of dividends plus expected capital gains.

Using this basic theory, think about the possible impact of the mid-1970s slowdown

## Market Value of U.S. Corporations



Market value of U.S. corporations in real terms and in log scale. Each decimal point on the log scale represents approximately a 10 percent change.

SOURCE: Table L213 of the Flow of Funds of the U.S. (shares at market value) divided by the GDP deflator taken from the U.S. National Income and Product Accounts.

in existing technologies. Since the stock market had reached a period of relative stability during the 1960s, people might have thought that dividends would grow at a relatively stable rate for years to come. As a back-of-the-envelope calculation, consider a fictitious firm that pays an initial dividend distribution of \$100 and that the expected dividend growth rate is 3 percent per year (which corresponds to the average growth rate of the U.S. economy during the 1960s). If the interest rate is 5 percent (the average during the relevant period), then this firm is worth \$5,250.<sup>4</sup>

The productivity slowdown can be thought of as a sudden decline in the expected growth rate of the economy, from 3 percent to 1.5 percent. Let's further assume that this slowdown is perceived to be

The perception of a slowdown in the expected growth rate of dividends is enough to generate large changes in stock market prices.

long-lasting. According to the theory, the value of the firm is now updated to \$3,000.

These numbers imply that a sudden slowdown in the expected growth rate of the economy may translate into a drop in the stock market! It is important to notice that dividends do not have to fall for the stock

market to fall. The perception of a slowdown in the expected growth rate of dividends is enough to generate large changes in stock market prices.

Hence, basic economic theory seems to be useful to understand the stock market crash of the mid-1970s. What about its subsequent stagnation and eventual recovery? Microsoft, Cisco, Yahoo and the like are products of the information technology revolution. But IT firms did not start trading in the stock market immediately. Indeed, data show that firms take 20 years on average to go from main initial innovation to actual listing in the stock market.<sup>5</sup>

IT-producing firms were important forces driving the recovery of the stock market of the 1990s. But to move the stock market overall, it is necessary that a large number of firms and sectors recover in value. And this is another reason for the stagnation in the 1970s. New firms have the comparative advantage in adopting new technologies, and adoption of new technologies takes time. The recovery in the stock market, therefore, was delayed because the firms and technologies that would bring growth back did not enter in full force until decades later. 

Adrian Peralta-Alva is an economist at the Federal Reserve Bank of St. Louis. See <http://research.stlouisfed.org/econ/peralta-alva/> for more of his work.

## ENDNOTES

- <sup>1</sup> These ideas are explored in a fully blown general equilibrium model in Peralta-Alva.
- <sup>2</sup> See Griliches for a survey of the productivity slowdown literature.
- <sup>3</sup> Productivity decompositions by sector, with an emphasis on measuring the productivity of the information technology sector, can be found in Jorgenson.
- <sup>4</sup> The present value of a flow that starts at value  $X$  and grows at rate  $g$  discounted at rate  $r$  is  $(1+r)X/(r-g)$ .
- <sup>5</sup> See Jovanovic and Rousseau.

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## Related Reading on Stock Market Volatility



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## What Happened to the U.S. Stock Market? Accounting for the Past 50 Years

In this article in the November/December 2009 issue of our research journal, *Review*, Adrian Peralta-Alva and Michele Boldrin, a research fellow at the St. Louis Fed, raise questions about the widespread belief that, in the long run, the market reverts to well-established fundamentals. See <http://research.stlouisfed.org/publications/review/09/11/Boldrin.pdf>



# Burned by Loss of Manufacturing,

## Rural County Vows To Diversify

By Susan C. Thomson

Sometime this summer, a man-made, 1,000-acre recreational lake is due to open to the public in Carroll County, Tenn. The new lake is a \$22.5 million public investment in the tourism potential of a rural county that seeks economic development and diversification.

As recently as the mid-1990s, one of every five county jobs was in the apparel industry, says Brad Hurley, president of the Carroll County Chamber of Commerce, which doubles as the county's economic development arm. Factories making shirts, pajamas and jeans employed people by the hundreds. By 2000, after a cascade of plant closings, all of those jobs had vanished.

As the industry was folding, county leaders made a vow. "What we did was say: 'We never want that to happen again. We don't ever want to be dominated by one area of the economy,'" Hurley says.

The time was right for a hard new look at

a bold idea first floated in the 1970s: Dam a local creek to make a lake. A plan to do so had made it through the Tennessee House of Representatives in 1984 but failed to get necessary environmental approvals.

By 2000, the county had come up with a new, more environmentally sensitive plan for a different creek, and that year county voters narrowly approved a \$10-a-year vehicle tax to go toward lake construction. Then came years to secure all of the permits and to survey, buy and clear the land. In 2008, construction started, with the centerpiece—a 2,400-foot-long, 60-foot-high dam. By this past spring, the big hole had been pumped full of water and stocked with fish.

The lake is three miles south of Huntingdon, Carroll County's seat, where Dale Kelley is mayor. Widely viewed in the county as a visionary, he had long been the lake's No. 1 champion. Taking office in 1992, he

Work is almost done on the new man-made lake.

PHOTO © BRIAN MARSH



### Huntingdon/Carroll County, Tenn. by the numbers

	CITY	COUNTY
Population	3,985	28,518*
Labor Force	NA	13,448**
Unemployment Rate	NA	12%**
Per Capita Personal Income	NA	\$25,680***

\* U.S. Census Bureau, 2010 census  
 \*\* BLS/HAVER, December 2011, seasonally adjusted  
 \*\*\* BEA/HAVER, 2009

LARGEST EMPLOYERS	
Noranda USA Inc.	400 †
McKenzie Medical Center	300 †
Bethel University	300 ††
Baptist Memorial Hospital	230 †
Carroll County Government	192 ††
Republic Doors & Frames	150 †

† Self-reported  
 †† SOURCE: Carroll County Chamber of Commerce

turned his sights on a city downtown he describes as "dead on the vine" at the time. Characteristically, he proposed an imaginative remedy: a performing arts center.

To realize his dream, the city bought and tore down a strip of vacant buildings taking up one side of its courthouse square and in their place erected the Dixie Carter Performing Arts and Academic Enrichment Center. Opened in 2005, the center is named for the actress known for playing Julia Sugarbaker in television's "Designing Women" series. In Huntingdon, she's also known as a hometown-girl-made-good and a high school classmate of Kelley's. Carter supported the project, which includes a two-story, 471-seat theater named for her husband, actor Hal Holbrook, who helped design it.

The Dixie, as locals call it, presents professional performances nearly every other weekend. Highlights of the 2011-2012 season have included sold-out appearances by Pat Boone, an Eagles tribute band and country singer-songwriter "Whispering" Bill Anderson. The center is home to local theater groups and offers dance, pottery and music classes for children and adults.

The city got a \$1 million state grant toward the project's total cost of \$3 million. Additional contributions have reduced the city's debt to under \$1 million, and fund-raising continues, Kelley says. The city also makes up any deficit in the center's approximately \$1 million-a-year operating budget.

Yet, the center has already paid for itself, he says. "Its impact on downtown Huntingdon has been dramatic."

All of the courthouse square buildings are full now, their facades postcard-pretty, and business has perked up on the side streets, as well. The revitalized downtown, catalyzed by the Dixie, has enhanced the city's livability, image and sales tax revenue, Kelley says.

Michael E. Cary, president of Carroll Bank & Trust, counts the lake and the Dixie as major steps forward for a county where the unemployment rate spiked at 18 percent during the last recession. Although the rate has been trending down since, Cary says the area remains in a "semirecessed state," unemployment its biggest economic challenge.

Mike Taylor, president of Republic Doors & Frames, agrees. His company, maker of



**Top:** The Dixie, formally known as the Dixie Carter Performing Arts and Academic Enrichment Center, opened in 2005 and is given credit for reviving Huntingdon's downtown. The city got a \$1 million state grant for the \$3 million project, and fund-raising continues to pay for the rest. The city also makes up any deficit in the center's approximately \$1 million-a-year operating budget.

**Middle:** Before the Dixie, downtown was "dead on the vine," according to Mayor Dale Kelley. But the Dixie sparked a movement, and now all of the buildings on the courthouse square, as well as many on side streets, are occupied. Many have also been renovated, as were these on the left.

**Bottom:** At Republic Doors & Frames, Norman Burnham welds hardware reinforcements into a steel door frame. Employment at the company is down to 150 from 286 just three years ago. Mike Taylor, the company's president, has yet to see an upturn on the horizon. Unemployment in the area is down from 18 percent during the recession, but the rate is still high—12 percent.

PHOTOS BY SUSAN C. THOMSON

## Carroll County Voices



“The challenge ahead of us is bringing in more industry. We have a great foundation in Noranda. ... We need some good jobs. The greatest need here now is employment.”

—Fred Ward, pastor, First Baptist Church, Huntingdon



“I think at first the lake is going to be a challenge. But when it gets filled and everyone hears about it, you're going to get a boost for the area, not just this community.”

—Ryan Dyer, owner of Mallard's Restaurant, just off the square in Huntingdon



“Health care has really grown here. ... A lot of it is the aging of the population, and this is sort of a retirement area. I think it's nice to live in a community that people would want to retire in.”

—Rita Foster, director of home care, hospice, rehab, occupational health and community service, Baptist Memorial Hospital, Huntingdon



PHOTO © NORANDA ALUMINUM HOLDING CORP.

**Top: Noranda**, a nationwide aluminum company, is bucking the trend of a decline in manufacturing. It operates two plants in Huntingdon, employing a total of 400 people, making it the largest employer. The rolling mill (above) has the lowest conversion cost (excluding metal) for foil stock production in North and South America, according to the company.

**Bottom: Bethel University**, in nearby McKenzie, has seen a building boom in the past couple of years. The boost in students and employees has helped to counteract the decline of manufacturing in the area.

reinforced security doors for commercial and institutional uses, enjoyed its busiest and most profitable year in 2008, he says. A year later, when the market for the company's products dropped 40 percent, the company slashed its local workforce of 286; it's now down to 150. He is not yet foreseeing an upturn.

According to the Chamber of Commerce, more people leave than come to Carroll County for work. So, its unemployment rate is, to some extent, a function of a continuing series of plant closings in recent years in contiguous counties.

Amid the many shutdowns, Noranda remains the standout exception. The nationwide aluminum company gained a foothold in Huntingdon in 1979 when it bought an existing plant. In 2000, with assists from state grants, state tax credits and local property tax concessions, it opened a \$240 million, state-of-the-art plant on the same site.

The two-plant operation turns molten metal into thin, miles-long sheets and ships them out as rolls weighing tons. Late last year, the company announced that it was studying the feasibility of adding a \$40 million, 40,000-square-foot recycling center to the complex. It would create 30 jobs, company officials say.



PHOTO BY SUSAN C. THOMSON

As manufacturing has shrunk as a share of Carroll County's economy, some of the resulting employment slack has been taken up by health care and higher education. Enrollment at Bethel University, sponsored by the Cumberland Presbyterian Church, soared 128 percent to 2,975 students from 2004 to 2009, according to The Chronicle of Higher Education. The count includes students studying toward a growing array of online bachelor's and master's degrees, at the university's various other Tennessee locations and on its home campus in McKenzie, Carroll County's largest city, a dozen miles north of Huntingdon.

That campus, with 800 students now, includes a science building and three residence halls, all built in the last several years. A new 126,000-square-foot student center with a cafeteria, gymnasium and chapel is under construction.

The county's robust health-care sector is visible in dozens of medical offices, clinics and agencies, many clustered around its two hospitals, Baptist Memorial in Huntingdon and McKenzie Regional in McKenzie, both of which have been expanding services. The latter's neighbors include the McKenzie Medical Center, a one-stop primary care clinic with a pharmacy, labs and 30 providers, including physicians, nurse practitioners and physician assistants. A 40,000-square-foot addition that was finished last year more than doubled the center's space; the addition made room for more specialists and diagnostic services and includes a sleep lab, new administrative offices and an open-sided MRI.

Hurley says 1,450, or 12 percent, of county jobs are in health care today. The sector has grown significantly but not to a point of dominance, and the county's economy has grown more diversified than before, he says. He describes his job of making sure it stays that way as something of a juggling act.

“You need to take all of these balls and keep them up in the air,” he says. One of those is manufacturing. Hurley says his office is doing everything possible to attract tenants to the county's four industrial parks. Although the competition is tough, it's “a process that we have to continue because manufacturing jobs pay so well,” he says.

The lake is yet another ball.

With 22 miles of jagged shoreline and an average depth of 20 feet, it will be the largest man-made lake in western Tennessee. Its location—25 miles north of Interstate 40, a two-hour drive northeast from Memphis or west from Nashville—makes it “very marketable within 250 miles,” Hurley says.

The lake will open with two beaches and a boat launch. Fishing is expected to be a big draw, but that won't start until its stocks reach catchable size, next year at the earliest. Residential and commercial development is seen as following in good time, generating jobs and tax dollars.

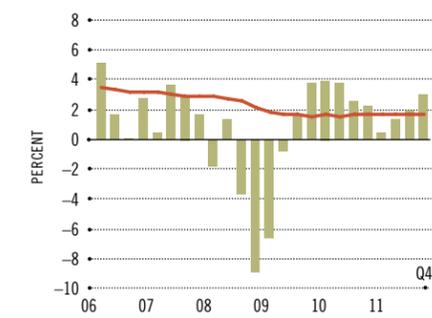
“At the end of five years, you'll be able to see firsthand the growth and real potential of the lake,” Hurley says.

Susan C. Thomson is a freelance writer and photographer.

## ECONOMY AT A GLANCE

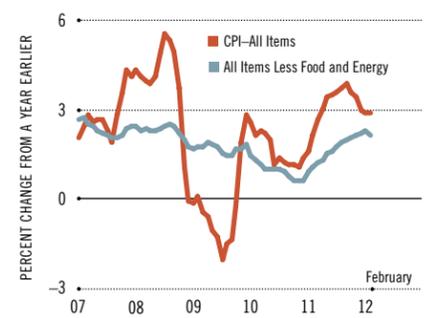
Eleven more charts are available on the web version of this issue. Among the areas they cover are agriculture, commercial banking, housing permits, income and jobs. Much of the data is specific to the Eighth District. To see these charts, go to [stlouisfed.org/economyataglance](http://stlouisfed.org/economyataglance)

### REAL GDP GROWTH

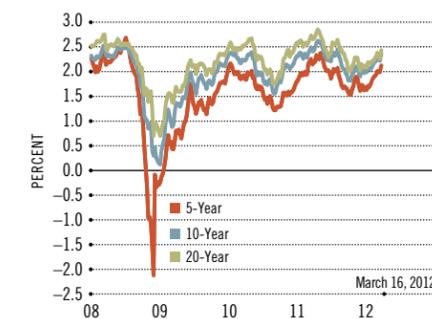


NOTE: Each bar is a one-quarter growth rate (annualized); the red line is the 10-year growth rate.

### CONSUMER PRICE INDEX

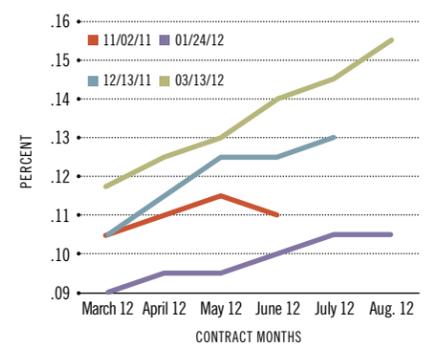


### INFLATION-INDEXED TREASURY YIELD SPREADS



NOTE: Weekly data.

### RATES ON FEDERAL FUNDS FUTURES ON SELECTED DATES



### CIVILIAN UNEMPLOYMENT RATE

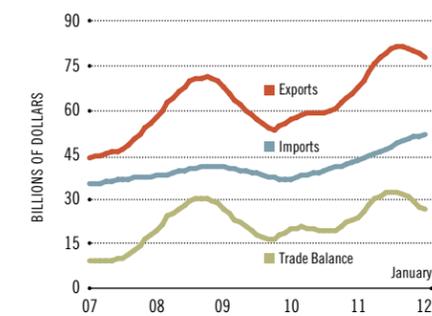


### INTEREST RATES



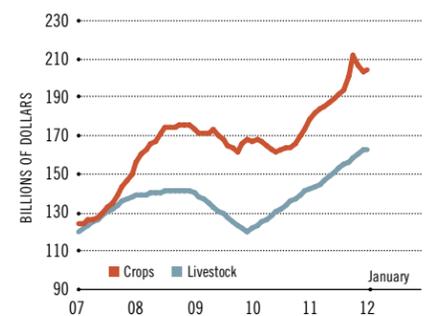
NOTE: On Dec. 16, 2008, the FOMC set a target range for the federal funds rate of 0 to 0.25 percent. The observations plotted since then are the midpoint of the range (0.125 percent).

### U.S. AGRICULTURAL TRADE



NOTE: Data are aggregated over the past 12 months.

### FARMING CASH RECEIPTS



NOTE: Data are aggregated over the past 12 months.

# Reallocation of Credit, a Measure of Financial Activity, Has Yet To Bounce Back

By Constanza S. Liborio and Juan M. Sánchez



Each year, while thousands of businesses grow and succeed, many others weaken and shut down. These dynamics, in turn, are reflected in the flow of factors of production (i.e., labor and capital) that are constantly being reallocated among businesses.

As stated by University of Maryland economics professor John Haltiwanger, the sorting of successful business endeavors from unsuccessful ones is a central and necessary part of our market economy, and it is essential that the public and policymakers understand this process.<sup>1</sup>

Our previous studies show that the reallocation of employment has been low in the current recovery compared with what happened in past recoveries.<sup>2</sup> Business Employment Dynamics data from the Bureau of Labor Statistics reveal that employment turnover was significantly lower following the Great Recession than following the former two recessions, in 2001 and 1990. The same trend appears in the creation of startups.<sup>3</sup> By the first quarter of 2010, business closings declined to prerecession levels for both the nation and the Eighth District, but business formations were slower to recover.

Although these studies analyze the behavior of the labor market and small firms (those entering and exiting), little is known about reallocation of resources among larger, more-established firms. This article concentrates on credit flows among publicly traded firms at the national level and also examines a sample of firms headquartered in the Eighth District. Studying the reallocation of financial resources (e.g., credit) is important: Economists Jith Jayaratne and Philip Strahan argued in their 1996 study that the intrastate branching reform in the United States played an important role in

economic growth by improving the allocation of capital.<sup>4</sup>

To understand the definition of credit reallocation, we need to introduce two related concepts: credit creation and destruction.<sup>5</sup> Credit creation is the sum of

**Credit creation is the sum of debt of firms with rising debt plus debt of newborn firms. Credit destruction is the sum of debt of firms with shrinking debt plus the debt of closing firms. Credit reallocation, instead, is the sum of credit creation and destruction.**

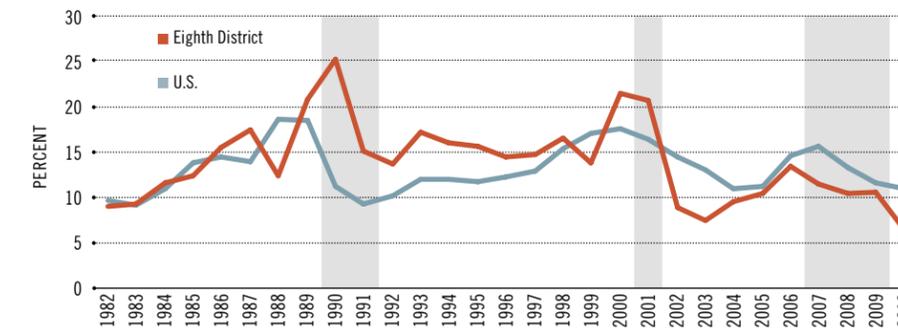
debt of firms with rising debt plus debt of newborn firms. Credit destruction is the sum of debt of firms with shrinking debt plus the debt of closing firms. Credit reallocation, instead, is the sum of credit creation and destruction. To illustrate, imagine an economy with only two firms. If one firm increases its debt from \$75 to \$125 and another firm decreases its debt from \$125 to \$75, the net change in total debt would be \$0. However, credit reallocation would be \$100 (or 50 percent when calculated as in Herrera et al.). The analysis hereafter will focus on the reallocation of total debt.

Credit reallocation is computed at the national and Eighth District levels using Standard and Poor's Compustat. The measure of debt considered, total debt, is defined as total liabilities. The sample size for the nation is 21,493 companies, including Wal-Mart, Exxon Mobil, Chevron, Conoco-Phillips, General Electric and General Motors. The sample for the District includes only 68 firms headquartered within the Eighth District boundaries. Among them are Wal-Mart, International Paper, FedEx, Emerson, Tyson Foods and Murphy Oil.

The strength of economic activity is usually reflected by high reallocation of credit. Figure 1 shows the evolution of reallocation during the past 30 years.<sup>6</sup> For each economic cycle since 1982, the maximum growth of reallocation is reached just before or shortly after the beginning of the recession. Specifically, credit reallocation peaked in the U.S. at rates of 19 percent, 17 percent and 16 percent in 1988, 2000 and 2007, respectively. The same pattern is depicted in the Eighth District, where credit reallocation rates reached 25 percent, 21 percent and 13 percent in 1990, 2000 and 2006, respectively.<sup>7</sup> During the latest economic downturn, the rate of credit reallocation in the nation decreased by roughly one-third, while for the District the drop was even higher, declining to half of the prerecession level. This pattern is similar to what happened around the previous two recessions.

Figure 2 decomposes reallocation into credit creation and destruction from 2006

FIGURE 1  
Credit Reallocation: Nation and District



SOURCE: Authors' calculations from Standard and Poor's Compustat data.  
NOTE: Time series were smoothed using a two-period moving average process. Shaded areas are years in which at least part of a recession was experienced, according to the National Bureau of Economic Research (NBER).

through 2010. The far left panel of the figure displays average annual levels of credit creation for three periods: 2006-2007 (the economic peak before the Great Recession), 2008-2009 (a period affected by the Great Recession) and 2010 (a period of economic recovery). Blue and red bars represent credit creation in the nation and the District, respectively. The middle and far right panels display the same information for credit destruction and credit reallocation.

The weakness of credit reallocation experienced since the latest recession started is evident in the nation and the District. At the national level, creation of credit increased in 2010 to 7 percent but was far from its prerecession level. In contrast, credit destruction appears to have experienced a declining trend: Destruction of credit was 8 percent in 2006 and 4 percent in 2010.

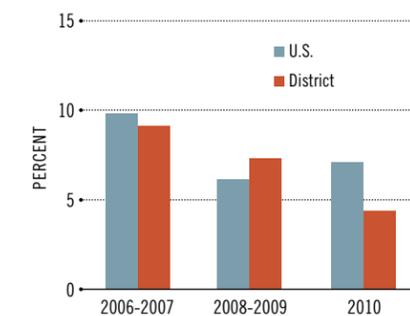
Firms headquartered in the Eighth District also experienced a negative trend in credit reallocation despite the increase in credit destruction during the recession. In 2010,

credit reallocation was significantly lower than in 2008-2009—a decrease of roughly 48 percent—due to very low levels of both credit creation and destruction. While credit creation decreased by 44 percent, credit destruction decreased by 55 percent in the District during this period.

The evidence above suggests that by the end of 2010 credit markets had not yet recovered to prerecession levels of dynamism, as measured by reallocation of credit among firms in the nation and the Eighth District. This trend, together with evidence of weak reallocation of employment and sluggish startup activity, seems to indicate that economic activity as of the end of 2010 had not yet recovered its previous strength. **Q**

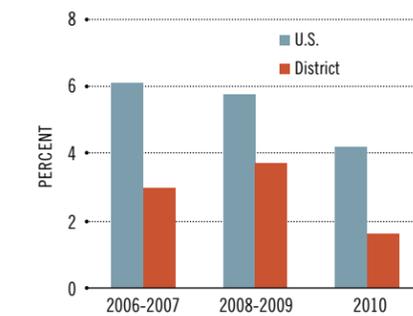
Juan M. Sánchez is an economist and Constanza S. Liborio is a research associate, both at the Federal Reserve Bank of St. Louis. See <http://research.stlouisfed.org/econ/sanchez/> for more on Sánchez's work.

FIGURE 2  
Average Annual Credit Creation

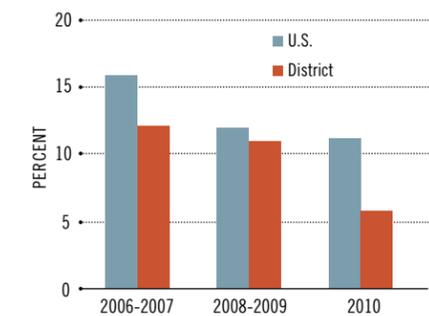


SOURCE: Authors' calculations from Standard and Poor's Compustat data.

Average Annual Credit Destruction



Average Annual Credit Reallocation



ENDNOTES

- 1 See Haltiwanger.
- 2 See Liborio and Sánchez, 2012a.
- 3 See Liborio and Sánchez, 2012b.
- 4 See Jayaratne and Strahan.
- 5 This article follows the methodology in Herrera et al.
- 6 The time series displayed was smoothed using a two-period moving average process.
- 7 District statistics display higher volatility due to their smaller sample size.

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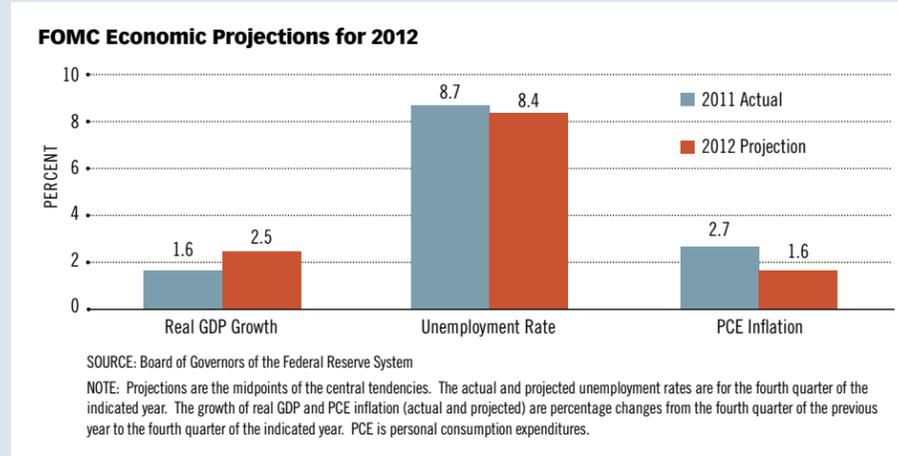
# The U.S. Economy Should Strengthen As Year Goes By

By Kevin L. Kliesen

The U.S. economy ended last year on a relatively strong note. Or did it? Although real GDP rose during the fourth quarter of 2011 at a 3 percent annual rate, which was the largest increase in a year and a half, nearly two percentage points of this growth stemmed from the production of final goods that were not sold—that is, the value of goods flowing into private nonfarm inventories (hereafter, inventory investment) rather than into the hands of households, businesses, the government or foreign purchasers.

Increases in inventory investment, particularly if unplanned, are sometimes viewed as a precursor to slower growth. If firms unwittingly produce too much relative to actual sales, they then have an incentive to curtail production until this excess inventory is eliminated. Indeed, forecasters expect firms to temper their production in the first quarter of 2012 to better match the demand for their product. Accordingly, the expected swing in the growth of real inventory investment from positive to negative from the fourth quarter of last year to the first quarter of this year is projected to account for about two-thirds of the expected slowing in real GDP growth in the first quarter (from a 3 percent rate to about a 2 percent rate).

The professional forecasting community believes that the economy will continue to grow at a relatively subdued pace beyond the first quarter of 2012. For example, the consensus of Blue Chip forecasters projects that real GDP growth will average 2.2 percent during the first half of this year and 2.5 percent during the second half. A similar survey, by the Federal Reserve Bank of Philadelphia (Survey of Professional Forecasters), shows slightly more optimism about the



second half: 2.9 percent. (In comparison, real GDP growth for 2011 was 1.6 percent.)

### Dueling Narratives

The consensus forecast is for continued modest, below-trend growth in 2012. (Although difficult to know for sure, many economists believe that the economy's trend rate of growth is about 2.75 percent.) The supporting narrative goes something like this: First, Europe's growth has slowed markedly in response to its sovereign debt and banking crisis; indeed, Europe might be in a recession today. The crisis has not only elevated volatility in U.S. financial markets, which often erodes investor and consumer confidence, but also will likely lead to weaker exports to Europe and countries elsewhere with important linkages to Europe. Second, the housing market remains relatively weak, foreclosures are high, and state and local governments are reducing their discretionary outlays in order to close budget deficits. Finally, with households apparently still determined to pay down debt and increase their saving rate, consumption spending—the largest component of real GDP—is likely to grow at exceedingly modest rates. With the unemployment rate expected to remain above 8 percent at the end of this year, inflation will slow to about 2 percent after measuring 3 percent last year.

There is a countervailing narrative, equally plausible, which points to stronger economic conditions this year than the consensus forecast. The first argument of this narrative is that the impact of any European recession on the U.S. has been overblown. This is because the volume of U.S. exports to Canada, Mexico and Asia is much larger

than the volume of exports to Europe—and growth in those first three markets is much faster than in Europe. Also, U.S. banks and money market funds have greatly reduced their exposure to Europe's banking and financial system. Second, the U.S. stock market is up strongly thus far in 2012, and measures of financial stress (e.g., the St. Louis Financial Stress Index) and economic uncertainty have fallen sharply. Third, the unemployment rate has fallen much faster than expected, and job growth is strengthening. From September 2011 to February 2012, private-sector job gains averaged nearly 215,000 per month. These developments, combined with a housing affordability index at record-high levels, should begin to trigger faster growth of home sales. Indeed, housing construction and homebuilder confidence are rebounding, and the declines in house prices have slowed. By some measures, house prices rose modestly over the second half of 2011.

### The Shadow of Rising Energy Prices

Admittedly, the risks to the outlook, while receding, still appear higher than normal. In this vein, one threat is rising energy and gasoline prices, which usually exert a drag on economic activity and raise inflation rates. As yet, though, most forecasters and financial market participants see little prospect of accelerating inflation over the near-term—despite an extremely accommodative monetary policy and large federal budget deficits. The FOMC governors and presidents expect inflation to average a little less than 2 percent in 2012.

Kevin L. Kliesen is an economist at the Federal Reserve Bank of St. Louis. For more on his work, see <http://research.stlouisfed.org/econ/kliesen/>

### ASK AN ECONOMIST

Richard G. Anderson is an economist in the Research division. He joined the Federal Reserve Board staff in Washington, D.C., in 1988. He transferred to the St. Louis Fed in late 1992. He is a native Minnesotan with a bachelor's degree from the University of Minnesota and a Ph.D. from MIT in Cambridge, Mass. He is also a visiting professor in the Management School at the University of Sheffield, Sheffield, U.K., and is a member of that school's international academic advisory committee. His research interests include applied econometrics, macroeconomics and financial markets. Beyond economics, he has extensive background and experience in information technology. For more on his work, see <http://research.stlouisfed.org/econ/anderson/>



**Q.** On Jan. 25, the Federal Open Market Committee issued a press release summarizing its “longer-run goals and monetary policy strategy.” Chairman Ben Bernanke, in his press conference on the same day, referred to 2 percent inflation as an “inflation target.” Why did the FOMC set an inflation target?

**A.** Setting a long-run inflation goal, or target, is an important element in achieving the Federal Reserve's mandate from Congress. Further, the FOMC has behaved for a number of years as if a 2 percent long-run inflation rate was its target. The announcement removes any remaining doubts.

Commentators sometimes incorrectly discuss the Federal Reserve as if it were an independent fourth branch of government, similar to Congress, the Supreme Court or the executive branch. It is not. The Federal Reserve was created by Congress in 1913, and Congress sets guidelines for the Federal Reserve's conduct of monetary policy.

Prior to World War II, the Federal Reserve's principal focus was on banking and financial market stability, including providing additional money and credit during economic expansions and assisting banks during financial panics. As the war ended, Congress feared that high unemployment would follow reductions in government spending and that inflation would follow the end of price controls. In the Employment Act of 1946, Congress charged the Federal Reserve with adopting policies to promote both maximum economic growth and stable prices—the so-called dual mandate.

Tension has often surrounded the dual mandate. The historical record suggests that policies to reduce unemployment may be ill-suited to periods of high inflation and that policies to reduce inflation tend to slow aggregate demand and increase unemployment. In its Jan. 25 announcement, the FOMC clarified that its monetary policy is the primary determinant of the economy's long-run inflation rate. Because uncertainty regarding long-run inflation harms long-run economic growth, a long-run inflation objective (or target) is an important aspect of fulfilling the FOMC's dual mandate from Congress.

For related reading, see the President's Message on Page 3.

Submit your question in a letter to the editor. (See instructions at right.) One question will be answered by the appropriate economist in each issue.

### LETTERS TO THE EDITOR

This is in response to the President's Message that appeared in the January 2012 issue. The message, by President James Bullard, was headlined “The Economic Recovery: America's Investment Problem.”

#### Dear Editor:

The “falsification of the truth” as highlighted in Mr. Bullard's letter is point-on. This type of testimony shows great leadership as we begin to establish the new “baseline” in our return to a normal state of economic principles. In my opinion, this housing bubble and its impact on the traditional banking industry have created a generation of borrowers whose psychology will take us a generation to transform. The admitting to what has caused these problems is a great first step in transforming our abilities to fix these housing issues. I applaud Mr. Bullard for addressing this, and now it is up to each head of the household to begin to get their “financial” house in order, and let's return to the basics of consumer finance and to the new norm.

Rick Ocheltree, banking executive in Richmond, Va.

This is in response to “Commodity Price Gains: Speculation vs. Fundamentals,” which appeared in the July 2011 issue.

#### Dear Editor:

This was a good and very useful article. I referenced it in an article I've written for *Business Economics*. (Mr. Synnott's article, “The Long Wave Revisited,” appears in the April issue of this National Association for Business Economics publication.) Thanks to the authors and *The Regional Economist*.

Thomas Synnott, adjunct professor of industrial engineering at The Cooper Union in New York City

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## NEXT ISSUE



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### “Where Did You Go to High School?” Is Not a Frivolous Question

Does the type of high school you went to affect your future wages? Economists generally agree that educational attainment affects people's wages. For example, a college degree usually leads to higher lifetime earnings than does a high school diploma. These studies, however, do not typically assess whether the type of institution matters. In the July issue of *The Regional Economist*, we discuss whether the type of high school you attended—public, private or parochial—affects your wages.

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## CURRENT REVIEW

### More Insight from Economists on Today's Headlines

Our sister publication, the *Review*, often covers topics straight from the news, too. In the latest issue, read:

- why fiscal policy is simply not the top tool to stabilize the economy,
- how a “60/40” home loan modification plan could save the housing sector,
- why the Fed has historically been reluctant to mention “full employment” as a separate policy objective (despite the dual mandate) and
- why any credible analysis of unemployment must first look at the many moving parts of the labor market.

To read these articles from the March/April issue online, go to <http://research.stlouisfed.org/publications/review/>