

Economics Group

Special Commentary

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Higher Interest Rates and Real Growth: Will This Time Be Different?

As we prepare to turn the page and transition into 2015, one big change on the horizon is the expected start to the normalization of monetary policy in the middle of next year. Therefore, one of the major risks to our outlook for the year ahead is the potential for higher interest rates to adversely affect the rate of economic growth. In this report we analyze the relationship between real economic activity and interest rates since the late 1980s. We then extend our analysis further to determine how responsive the real economy has been to interest rate changes during prior Fed tightening cycles. Finally, we conclude with a discussion of how the upcoming Fed tightening cycle may be different in light of credit conditions today.

Our Expectations for Interest Rates Next Year: The Baseline

Our expectation next year is for the Federal Reserve to begin normalizing monetary policy in June by increasing the target fed funds rate (Figure 1). In advance of the Fed's rate hike, we expect interest rates, particularly at the shorter end of the yield curve, to gradually migrate higher while longer-term interest rates should remain relatively anchored. Thus, our expectation is that the yield curve will become flatter in the coming year (Figure 2). By the end of next year, we see the fed funds rate sitting at 1.00 percent, leading to a prime rate, which is used as a benchmark for many consumer loans, at 4.00 percent. We see the conventional mortgage rate at 4.62 percent. For an example of how flat we expect the yield curve to look next year, we are forecasting the 10-year rate by the end of this year to only rise to 2.86 percent. The changing interest rate environment next year brings to the forefront the question of how the economy will respond to a higher interest rate environment.

Our expectation is that the yield curve will become flatter in the coming year.

Figure 1

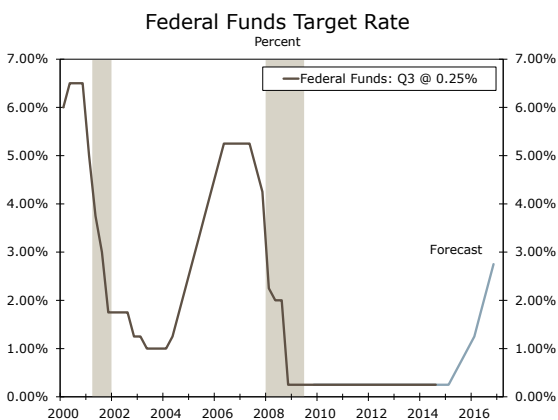
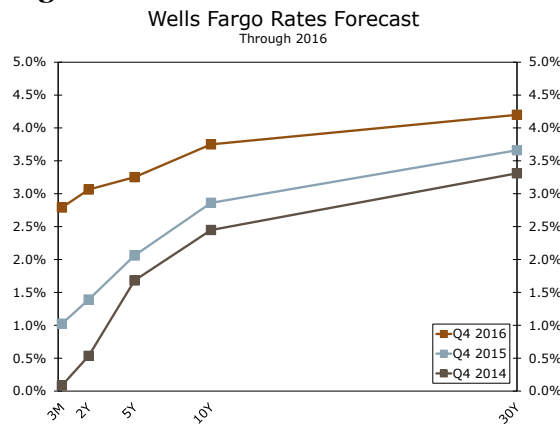


Figure 2



Source: Federal Reserve Board, Bloomberg LP and Wells Fargo Securities, LLC



These elasticity calculations estimate how responsive real growth has been to changes in interest rates.

Rising Rates and the Real Economy

To determine the extent to which higher interest rates have influenced economic growth in the past, we calculate the elasticity between real economic growth and nominal interest rates.¹ These elasticity calculations provide us with a rough estimate of how responsive real growth in various sectors of the economy has been to changes in interest rates.

We began our analysis with a look at elasticities over two separate time periods: the first period of interest is the full time period from 1986 to present. The second period includes the same year range, but restricts the sample to Fed tightening cycles (Table 1).² This allows us to develop an idea of how the relationship may change when the Fed starts tightening, next year.

Table 1

Interest Rate Elasticities (1986-2014)		
	Full Period	Tightening Cycles
Real PCE vs. Conventional Mortgage Rate [†]	-0.760*	-1.100*
Real GDP vs. Effective Fed Funds Rate	-0.104*	-0.267*
Real BFI vs. 2-Year Treasury	-0.214*	-0.659*
Real Residential Construction vs. Conventional Mortgage Rate	-0.001	-0.986*
Real Government Spending vs. 5-Year Treasury	-0.171*	-0.373*

*Significant at $\alpha = 0.01$

[†] We use the mortgage rate as a proxy for credit card interest rates ($\rho=0.81$)

Source: U.S. Department of Commerce, Federal Reserve Board and Wells Fargo Securities, LLC

An oft-mentioned sector of the economy where rising rates may play a key role is the housing market, where the current recovery is still struggling to find its footing. One of the primary factors holding housing back has been the absence of the first-time buyer, saddled with lingering student loan debt and increasingly preferring to rent rather than buy. With mortgage rates set to rise in the coming years as the Fed prepares to tighten policy, the first-time home buyer may become increasingly absent from the housing picture. To nail down a specific quantitative measure of how sensitive residential housing activity is to changes in mortgage rates, we calculate the elasticity of real residential construction, a component of the real GDP investment accounts, with respect to the conventional 30-year mortgage rate.

Our calculations suggest that the elasticity of real residential construction growth with respect to conventional mortgage rates is -0.001 , indicating a relatively inelastic relationship. In other words, as mortgage rates rise by 1 percent, real residential construction will decline by just 0.001 percent. Although this is an insignificant relationship, both statistically and in terms of magnitude, the elasticity becomes far more significant when the time period is restricted to tightening cycles, jumping from -0.001 to -0.986 (the statistical significance or p-value also jumps from 0.99 to 0.00, indicating a highly significant result).

One possible explanation for the insignificant elasticity during the full time period is that the propensity to speculate in the housing market was largely independent of changes in mortgage rates throughout the years of the housing boom. As shown in Figure 3, real residential construction increased almost indiscriminately from 1990 to 2006, while mortgage rates bounced around considerably over the same period. When the housing boom turned into a bust, residential construction completely collapsed, and while mortgage rates also saw precipitous declines, the timing of the decline was off due to the Fed holding off on loose monetary policy until well after

¹ For the purposes of our analysis, we used nominal interest rates compared to real spending consistent with Wilcox, J.A. (1990). "Nominal Interest Rate Effects on Real Consumer Spending." *Business Economics*. We find similar results using real interest rates.

² We define a tightening cycle as the period during which the Federal Reserve raises the fed funds target rate (starting with first hike, ending with last hike).

the collapse. To be sure, the correlation between the two series over the entire time period is -0.14, but increases to -0.92 when restricted to the tightening cycles. This indicates that residential construction becomes more sensitive to mortgage rates in times of monetary tightening and may pose some downside risk to the housing recovery during the next tightening cycle.

Another component of growth that could take a hit from rising rates is business fixed investment (BFI), a component of total investment in the real GDP accounts. The weighted average maturity of a commercial and industrial (C&I) loan, or a loan extended to a business or corporation, is roughly 2 years.³ Thus, we use the 2-year Treasury rate as a proxy for borrowing costs for BFI.⁴ Over the entire time period from 1986 to 2014, the elasticity of BFI with respect to the 2-year Treasury rate is -0.214, suggesting a 0.214 percent drop in BFI for every 1 percent increase in the 2-year Treasury rate. Although this suggests a fairly inelastic relationship between the two, the relationship becomes more elastic when we restrict the time period to just include tightening cycles; specifically, the elasticity increases in magnitude to -0.659, indicating BFI will decrease by 0.659 percent for every 1 percent increase in the 2-year Treasury rate. Thus, BFI seems to be another component of growth that becomes more sensitive to interest rates in times of monetary tightening.

Our findings show that residential construction becomes more sensitive to mortgage rates in times of monetary tightening.

Figure 3

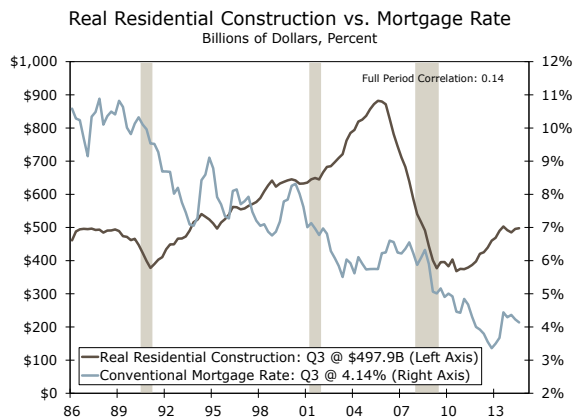
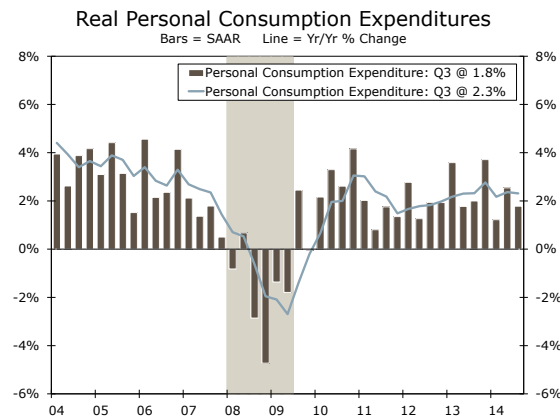


Figure 4



Source: U.S. Department of Commerce, Federal Reserve Board and Wells Fargo Securities, LLC

The largest component of U.S. real GDP, consumer spending, is another sector in which rising rates could play a key role. Real personal consumption expenditures (PCE), which account for roughly 70 percent of U.S. real GDP, increased at just a 1.8 percent annualized pace in Q3, raising some concern about the momentum behind the consumer recovery (Figure 4). Although a number of interest rates have a direct impact on consumer spending, our view is that interest rates on credit cards are a good way to capture the effects of interest rates on real consumer spending, given the ubiquitous nature of credit cards. Our calculations indicate that the elasticity of real PCE growth with respect to credit card rates is -1.286 percent, indicating that when credit card rates increase by 1 percent, real PCE should decrease by roughly 1.286 percent. Given the limited availability of credit card data during past tightening cycles, we used mortgage rates as a proxy to understand how the elasticity of real consumer spending with respect to interest rates has changed during past cycles.⁵ Consistent with other sectors of the economy, we find that the elasticity of real consumer spending with respect to mortgage rates increases during tightening

³ Federal Reserve Board. (2014). E.2 Survey of Terms of Business Lending.

⁴ The average C&I loan interest rate series is only available back to 1997, so we use the 2-year Treasury.

⁵ Mortgage rates were selected based on a correlation analysis over our time period of study. Credit card interest rates had the highest correlation with real consumer spending at -0.92 with mortgage rates a close second at -0.90.

cycles. Specifically, the elasticity increases to -1.1 from -0.76, indicating that consumer spending activity becomes more sensitive to interest rates in times of monetary policy tightening.

Looking beyond the private sector, interest rates also play a key role in real government spending. As of the end of federal fiscal year 2014, the U.S. government had \$17.8 trillion in total outstanding debt, which suggests that even a slight marginal increase in interest rates would have a drastic impact on federal government borrowing costs. While the expected rise in interest rates would have a plethora of impacts on the public sector, particularly the Fed's portfolio of debt securities, we focus our attention in this analysis on interest rates' impact on real government expenditures.

Although the government issues debt at a wide range of maturities, anywhere from 4 weeks to 30 years, the weighted average maturity of outstanding Treasuries is roughly 5 years.⁶ Thus, the interest rate we use in our elasticity calculations is the 5-year Treasury rate. Our analysis indicates that the elasticity of real government spending growth with respect to the 5-year Treasury rate is -0.171, indicating a 0.171 percent drop in real government expenditures for every 1 percent rise in yields. In times of monetary tightening, the relationship between the two becomes more elastic, with a value of -0.373. This marks yet another sector in which rates have more of an impact on activity in times of monetary tightening relative to the time period as a whole.

As a final means of analyzing the relationship between interest rates and real growth, we look at the highest level measure of real growth available: real GDP growth. Although there are numerous rates that have a direct impact on real GDP growth, we decided the fed funds rate was the most influential. For one, the Fed targets this rate as its primary means of implementing monetary policy, which speaks to its importance in the general economy. Furthermore, it is the benchmark off which many interest rates are calculated in the economy, making it an important determinant of borrowing costs for a wide variety of counterparties. Our findings indicate that the elasticity of real GDP growth with respect to the fed funds rate is -0.104. In prior tightening cycles, this figure increases in magnitude to -0.267, suggesting that for every 1 percent increase in the fed funds rate, there is on average a 0.267 percent decline in real GDP growth.

Will This Tightening Cycle Be Different?

Now that we have a sense of how past tightening cycles have influenced real growth across sectors of the economy, we turn to a discussion of what we can expect in the next tightening cycle. There are two potential ways in which the higher interest rate environment could influence growth next year. On one hand, the slow disposable income growth environment could result in higher interest rates having a greater influence on consumer spending and thus real growth than they have had historically. Conversely, the limited use of credit following the last economic downturn could result in consumers and businesses becoming less responsive to interest rates. To determine the potential effects of higher interest rates in today's environment, we separate our analysis of the historical elasticity between growth in consumer and business activity and interest rates into two time periods: the full period, from 1986 to present, and the post-recession time period, which extends from Q3-2009 to present. While the magnitude of these results may not accurately represent the elasticity during the next tightening cycle, a structural change in elasticities would tell us something about how responsive these two segments of the economy will be relative to the historical trend.

As we have discussed above, historically, real consumer spending has been quite responsive to changes in interest rates. In other words, when the cost of credit rises, consumers have typically responded by spending less. However, there is reason to believe that this time around real consumer spending will not be affected as dramatically by an increase in interest rates. Our analysis of the elasticity or responsiveness of real consumer spending to a rise in credit card interest rates shows that since 1994, the elasticity between these two factors has been -1.29, meaning that for every 1 percent increase in credit card rates, real consumer spending is reduced

⁶ U.S. Department of the Treasury. (2014). Treasury Presentation to TBAC: Fiscal Year 2014 Q4 Report. Office of Debt Management, U.S. Department of the Treasury.

Reduced credit usage could result in consumers and businesses becoming less responsive to interest rates.

by 1.29 percent. Just looking at the same elasticity since the end of the recession in 2009, the elasticity has come down to just -0.44. A separate study by the Federal Reserve Bank of Kansas City corroborates this finding, as it shows that consumer spending on durable goods has become less responsive to changes in interest rates.⁷ Thus, we expect that changes in monetary policy are not likely to have as large of an effect on the pace of consumer spending next year as they have in the past. Given that roughly two-thirds of the economy has become less responsive to interest rate changes, this would suggest that top-line GDP growth will not be dramatically affected compared to the past.

Table 2

Interest Rate Elasticities (1986-2014)		
	Full Period	Post-recession
Real PCE vs. Credit Card Rate [†]	-1.286*	-0.441*
Real BFI vs. 2-Year Treasury	-0.214*	-0.150*

*Significant at $\alpha = 0.01$

[†]This series begins in 1994, so this calculation uses a truncated series

Source: U.S. Department of Commerce, Federal Reserve Board and Wells Fargo Securities, LLC

Why the Change in Responsiveness?

There are several factors that have led to the reduced responsiveness of consumer spending to interest rates. To begin with, credit availability and usage, particularly for revolving credit, remain lower relative to prior expansions. A majority of the increase in credit outstanding has come from non-revolving credit in the form of student and auto loans. The reduction in credit availability could be cyclical in that economic uncertainty has been a key factor holding back the loosening of credit standards. Conversely, the current credit environment could be the by-product of financial reforms, thus creating a structural shift in credit markets that have permanently reduced access to credit. Regardless of the cause, we see the overall access to credit changing only marginally next year given our forecast for continued modest real disposable income growth in the 2.5 percent range. Coupled with our estimate for real consumer spending, our outlook implies a lower saving rate now that real per capita wealth has returned to its pre-recession level. While a higher interest rate environment may incentivize saving behavior, we expect interest rates next year to still be too low to make much of a significant difference in overall saving behavior, another support to consumer spending growth.

We expect interest rates next year to still be too low to make a significant difference in overall saving behavior.

⁷ Van Zandweghe, W. and Braxton, J.C. (2013). "Has Durable Goods Spending Become Less Sensitive to Interest Rates?" Federal Reserve Bank of Kansas City.

Figure 5

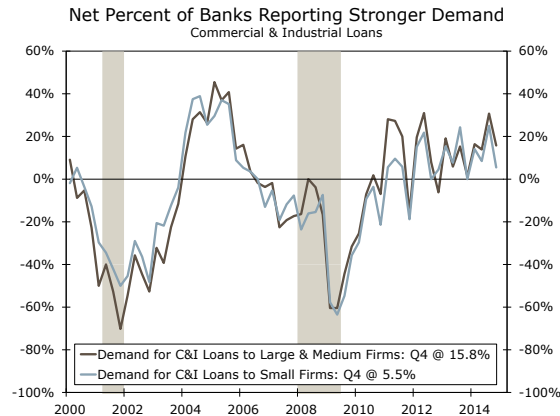
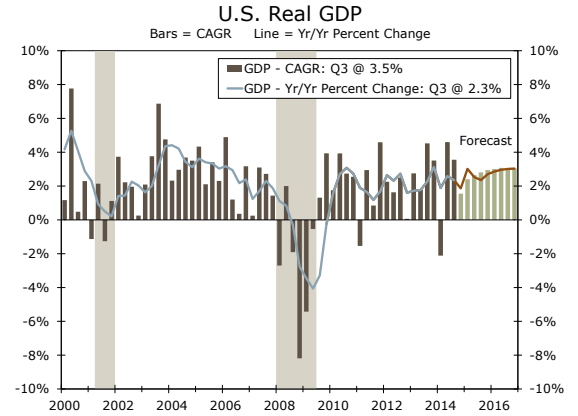


Figure 6



Source: Federal Reserve Board, U.S. Department of Commerce and Wells Fargo Securities, LLC

For the business sector, we calculated elasticity over the same two periods and found similar results. Over the entire period, the elasticity was -0.21 compared to the post-recession elasticity of -0.15. On the business side of the equation, the major factor has been the absence of demand for loans.⁸ Companies remain flush with cash, and thus demand for loans has remained modest, even in the current low interest rate environment (Figure 5).

Given the reduced sensitivity of real growth to increases in interest rates that we expect in the upcoming tightening cycle, our view is that there will not be a dramatic direct effect on overall economic activity related to Federal Reserve tightening, as can be seen in our current forecast for GDP growth next year (Figure 6). There is, however, the potential for indirect effects related to a stronger U.S. dollar as monetary policy among the G-7 nations continues to diverge into next year. The resulting stronger dollar could play a role in reducing U.S. export activity in the year ahead. Outside of the effects on the U.S. dollar, if monetary policy has less of an effect in keeping a lid on economic growth in the years ahead, there could be some challenges for the Federal Reserve to keep the domestic economy from overheating.

Our view is that Fed tightening will not have a dramatic direct effect on overall economic activity.

⁸ Dunkelberg, W.C. and Wade, H. (2014). "NFIB Small Business Economic Trends." National Federation of Independent Business.

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