**US Monetary Policy, Housing, Stock Markets, and Business Cycle**

Helen Zheng

Since 1960, United States monetary policy has evolved significantly, adapting to an array of economic challenges and shifts. Each decade brought new issues—from inflation and unemployment to financial crises—that shifted the United States monetary policy, housing markets and financial markets. This part traces these changes, exploring how the Federal Reserve's responses have shaped the economic landscape of the nation, and how it affected housing market and stock market and hence affected the business cycle.

After the Gold Standard was abandoned in 1971, the United States entered a period of high inflation, with rates escalating from 4% in 1960 to nearly 16% by 1980. In response to this, Paul Volcker, who became the Chairman of the Federal Reserve in 1979, implemented a series of stringent monetary policies aimed at curbing inflation. These measures included significantly higher interest rates. By 1993, the adoption of the Taylor Rule further refined the Fed's approach, introducing more structured guidelines for adjusting interest rates based on economic conditions. This change marked a shift toward greater transparency in monetary policy. Subsequently, the economy experienced a phase of stable growth accompanied by low inflation rates.

To evaluate the effectiveness of the tightening monetary policies of the 1980s and the inflation targeting strategies of the 1990s, a straightforward model has been introduced. In this model, represents a dummy variable that distinguishes between the pre-policy and post-policy periods.

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | -0.24 | 1.95 |
|  | 0.86\*\*\* | 0.51\*\*\* |
|  | -1.80\* | -1.17 |

(1) Paul Volcker’s monetary policy and monetary control act:(1960-1979),(1979-1993)

(2) Inflation targeting: (1980-1993),(1993-2002)

INF: GDP deflator inflation rate at time t

FFD: fed fund rate at time t

Bracket: t-statistics

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

A graph of a graph of a financial graph

Description automatically generated with medium confidence

Source: FRED

Source: FRED

Since the 1990s, various policy rules including the Taylor Rule, Balanced Approach, Inertial Rule, and First Difference Rule, have offered theoretical guidelines for determining the path of interest rates. Throughout much of the 1980s and 1990s, the Taylor Rule closely mirrors the actual rate, suggesting its potential utility in guiding policy to manage inflation and economic activity effectively. However, the divergence of all the rules from the observed rate after the 2001 Internet crisis and 2008 financial crisis highlights the Fed's shift to unconventional policy measures in response to extraordinary economic circumstances. While these rules can inform policy under normal conditions, their applicability may be limited in times of severe economic stress when rates approach the zero lower bound.

**A graph with colorful lines and dots

Description automatically generated**

Source: FRED

Monetary policy impacts mortgage rates and consumer confidence, influencing short-run demand and the house prices in the US housing market. When the Federal Reserve adjusts interest rates, it directly affects home prices and buying activity by altering borrowing costs. For example, during the early 1980s and early 1990s, sharp increases in interest rates coincided with stagnation or declines in property prices, illustrating the effect of tight monetary policies during high inflation periods. Conversely, following the 2007-2008 financial crisis, the Federal Reserve cut the federal funds rate to nearly zero to stimulate economic recovery, making mortgages cheaper and boosting home purchases.

Another factor that strongly influences short-term US housing market demand is credit availability. When credit growth is high, more buyers can enter the market, pushing up property prices. Historical data shows that spikes in credit growth typically precede significant increases in property prices, such as before the 2006 peak and during the post-2008 recovery. Conversely, downturns in the early 1980s, early 1990s, and late 2000s saw simultaneous declines in both property prices and credit growth.

Supply-side factors like construction delays and limited land availability can push up short-term U.S. housing prices. These constraints hinder timely housing starts, fueling price increases when demand outpaces supply. Despite fluctuations, housing prices have trended upward since the early 2000s, aside from a significant dip during the 2008 financial crisis.

In the long run, the U.S. housing market is mainly driven by income growth and demographic changes. Although disposable income has increased steadily since 1970, the housing market is more volatile and sensitive to economic cycles. This results in a general upward trend in property prices, but with significant fluctuations that impact affordability and real estate investment dynamics.

The long-term supply of the U.S. housing market is often constrained by regulatory factors such as zoning laws, land use restrictions, and building codes. These regulations can limit housing development, leading to shortages in desirable areas and prolonging construction timelines. Additionally, macroprudential policies like mortgage lending restrictions, including Loan-to-Value (LTV) and Debt-to-Income (DTI) ratios, and bank capital requirements significantly shape the housing market. These policies ensure the stability of the financial system but may limit mortgage access for some buyers.

**A graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of a graph of

Description automatically generated**

Source: FRED, BIS

This cross-sectional and panel regression model further explores the relationships between interest rates, household credit, working-age population growth, and per capita GDP with house price growth, comparing these dynamics in inflation-targeting countries such as Australia, Canada, and the UK.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Country | Constant | STIR | Credit | Working Age Population | Per Capita Real GDP | Lagged House Prices Growth |
| USA | -0.50 | -0.42\* | 0.43 | -0.10 | 0.82\* | 0.52\*\*\* |
| AUS | 4.75 | -0.04\* | 0.17\*\* | -3.07 | 0.51 | 0.20\* |
| CAN | 3.70 | -0.60 | 0.97\*\*\* | -9.24\*\*\* | 0.43 | 0.23 |
| UK | -0.44 | 0.10 | 0.10 | 1.69 | 0.82\*\* | 0.40\* |
| Panel | 0.96 | -0.47 | 0.15 | -0.94 | 0.74\* | 0.30 |

Dependent Variable: Change in Log House Prices at time t.

STIR: Changes in Log STIR at time t.

Credit: Changes in Credit to households at time t.

Working Age Population: Changes in working age population at time t.

Per Capita Real GDP: Per Capita Real GDP Growth Rate at time t.

Lagged House Prices Growth: Change in Log House Prices at time t-1.

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

A group of graphs with different colored lines

Description automatically generated with medium confidence

It turns out that short-term interest rates do have a pronounced effect on the US housing market, where a 1% decrease in interest rates tends to increase house price growth by 0.4%. In Australia, the UK, and Canada, however, the effect is either minor or insignificant. Credit availability to the household sector also robustly influences house prices, especially in the US and Canada, both showing significant positive impacts, proving the short-run driving effect of credit on the housing market in these two countries.

Economic growth, as measured by per capita GDP, also correlates positively with house prices, showing a significant coefficient of 0.82 in the US and the UK, and an insignificant coefficient of 0.51 and 0.43 in Australia and Canada, respectively. This suggests that stronger economic growth in the long run tends to drive up house prices in these countries. It is noticeable that, except for the UK, growth in the working-age population generally has a negative impact on house price growth, especially in Canada. The regression also controlled for historical momentum in housing prices by adding a lag term of house price growth, with the US showing strong continuity in price growth.

This raises another question: Does housing remain a key indicator of the business cycle in the U.S.? What other elements could predict the business cycle? This section will delve deeper into these queries, starting with a simple Granger causality test between GDP growth and residential investment growth. A VAR model is introduced to test the relationship between residential investment, consumption, government spending, nonresidential investment and output growth. A F-test is used to test whether all coefficients of are jointly different from zero (). If they are jointly different from zero, granger cause .

= GDP growth

:

= Residential Investment Growth

= Consumption growth

= Government Expenditure Growth

= Non Residential Investment Growth

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | -0.158\*  (-2.33) | -0.233  (-1.78) |
|  | 0.012  (0.17) | -0.290\*  (-2.25) |
|  | 0.972\*\*\*  (3.96) | -0.01\*  (-0.27) |
|  | 0.03  (1.57) | 0.110\*\*\*  (4.36) |

|  |  |  |
| --- | --- | --- |
|  | (1) | (2) |
|  | 0.266\*\*\*  (-5.40) | -0.642\*\*\*  (-5.80) |
|  | 0.055  (-1.07) | -0.124  (0.96) |
|  | 0.094\*\*\*  (6.56) | 0.099\*\*\*  (4.24) |
|  | 0.027  (1.79) | 0.035  (1.44) |
|  | 0.039  (0.83) | 0.160  (1.31) |
|  | -0.029  (-0.65) | -0.005  (-0.05) |

(1) 1970-2023 (2) 2002 -2023

Bracket: t-ststistics, \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

In a longer period (1970-2023), residential investment granger cause GDP growth, however, in a shorter period (2002-2023), no evidence shows the residential investment granger cause GDP, suggesting that housing prices may not be no longer reliable indicators in today's economy.

In both time periods, consumption and government spending appear to granger cause GDP growth. However, the effects of consumption on GDP are inconsistent; it positively impacts long-term GDP growth but can negatively affect it in the short term, indicating varying dynamics across different periods. Government spending, on the other hand, consistently boosts GDP growth. Conversely, non-residential investment growth shows no significant impact on GDP, indicating its limited predictive power in business cycle.

In recently studies, the yield curve's ability to forecast output and recessions has gained attention. A simple model assessed the yield spread's predictive power using quarterly data from 1985 to 2014 for in sample estimation and out of sample predictions up to 2022.

The regression results suggest that the yield spread has no significant relationship with GDP growth. It is even less effective than an AR(1) model in predicting the US’s output.

|  |  |
| --- | --- |
|  | 0.70 |
|  | -0.02 |

: GDP growth rate

: ten-year treasury yield minus three-month treasury yield

A graph of a graph of a graph

Description automatically generated with medium confidence

Bonds and stocks are two critical sources of returns in the financial market. Understanding the relationship between them is key to grasping their impact on economic growth and inflation. To examine this, a 10-year window rolling regression has been developed to regress both returns against growth and inflation shocks. These shocks are calculated by subtracting the predicted values from the actual values of GDP growth rate and inflation rate, based on an AR(1) model.

10-year rolling correlation between stock and bond returns, fluctuating significantly across the years, while the 10-year rolling correlation between growth shock and inflation shock indicates mostly negative values and a trend of increasing correlation in recent years. The coefficients indicate that stocks and bonds responded differently to inflation and growth shocks. Before the 2008 crisis, the coefficients of stocks and bonds relative to inflation moved in the same direction. However, this trend was not observed with growth shocks.

A group of graphs showing different types of growth

Description automatically generated with medium confidence