

# **Golden Fetters, Paper Fetters, and the Rationale for Eliminating the Effective Lower Bound**

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***Note: The views represented here are solely those  
of the authors and not intended to represent  
the views of any other person or institution.***

# The Classical Gold Standard

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- The shortcomings of the gold standard were highlighted by Jevons (1875), Marshall (1877), Wicksell (1898), Fisher (1913 ff.), and others.
- The distributional impact of the gold standard was a heated issue in many political campaigns, e.g., W.J. Bryan's "*cross of gold speech*" in 1896.
- Nonetheless, the gold standard prevailed until the catastrophic onset of the Great Depression.
- No country has ever returned to the gold standard, and very few modern economists have advocated it.

# **The Effective Lower Bound (ELB) on Nominal Interest Rates**

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- **The ELB arises from the fact that paper currency accrues no interest.**
- **The BOJ began facing this constraint in the late 1990s, while other central banks spent many years at the ELB in the wake of the global financial crisis.**
- **A huge research literature has analyzed the design of monetary tools (such as forward guidance and quantitative easing) for mitigating the ELB.**
- **By contrast, remarkably little attention has been given to the possibility of eliminating the ELB.**

# Our Objectives

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- **Historical Analysis:** Identify parallels between the gold standard (*“golden fetters”*) and the ELB (*“paper fetters”*).
- **DSGE Analysis:** Formulate a novel model that combines two strands of the New Keynesian literature (bounded rationality and heterogeneous agents), and use this model to analyze the disparate effects of monetary policy at the ELB.
- **Practical Analysis:** Consider design features of digital cash (CBDC) that could eliminate the ELB without abolishing paper cash or imposing fees on ordinary households and small businesses.

# Origins of the Gold Standard

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- ***Late Medieval/Renaissance***: bimetallic standard with silver coins for low-value transactions and gold coins for high-value transactions.
- ***1717***: Sir Isaac Newton (U.K. Master of the Mint) raises nominal gold/silver price ratio, causing a rapid shift to gold as the *de facto* unit of account.
- ***1816***: U.K. Parliament adopts *de jure* gold standard.
- ***1830s***: U.S. Congress raises gold/silver price ratio, causing shift to gold as the *de facto* unit of account.
- ***1870s***: Germany and France adopt the gold standard.
- ***1900***: U.S. Congress establishes *de jure* gold standard.

# Origins of the ELB

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- **Impracticalities** of paying interest on paper cash:
  - small denominations used for ordinary transactions
  - bearer transfers do not involve any ledger entry
  - bills typically circulate over extended time periods
- This limitation was **irrelevant** under the gold standard, because paper notes were redeemable in gold, and the real rate of return on gold was broadly aligned to growth in real GDP per capita.
- Shortcomings of non-interest-bearing paper money have been evident in the modern era of **fiat money**, in periods of elevated inflation or protracted slumps.

# Constraints of the Gold Standard

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- **Price Level:** During the 19<sup>th</sup> century, the general price level declined about 1% per year because major gold discoveries did not keep pace with real economic growth.
- **Financial System:** In the early 1930s, the gold standard constrained central banks from extending liquidity to the banking system, leading to widespread bank panics and economic collapse.
- **Political Turmoil:** In Germany, the banking crisis of 1931 was a key element in the collapse of the Weimar Republic and the Nazi takeover in 1933; cf. Strauman (2019).

# Is Monetary Policy Constrained by the ELB?

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- Landmark research has demonstrated that the efficacy of **forward guidance** is hampered by bounded rationality as well as imperfect credibility.
- Practical experience has shown that **quantitative easing** measures can be effective in alleviating financial strains but have only limited efficacy in providing monetary stimulus.
- Over the past decade, a number of central banks were constrained by the ELB and experienced **protracted economic recovery** along with **persistent inflation shortfalls**.

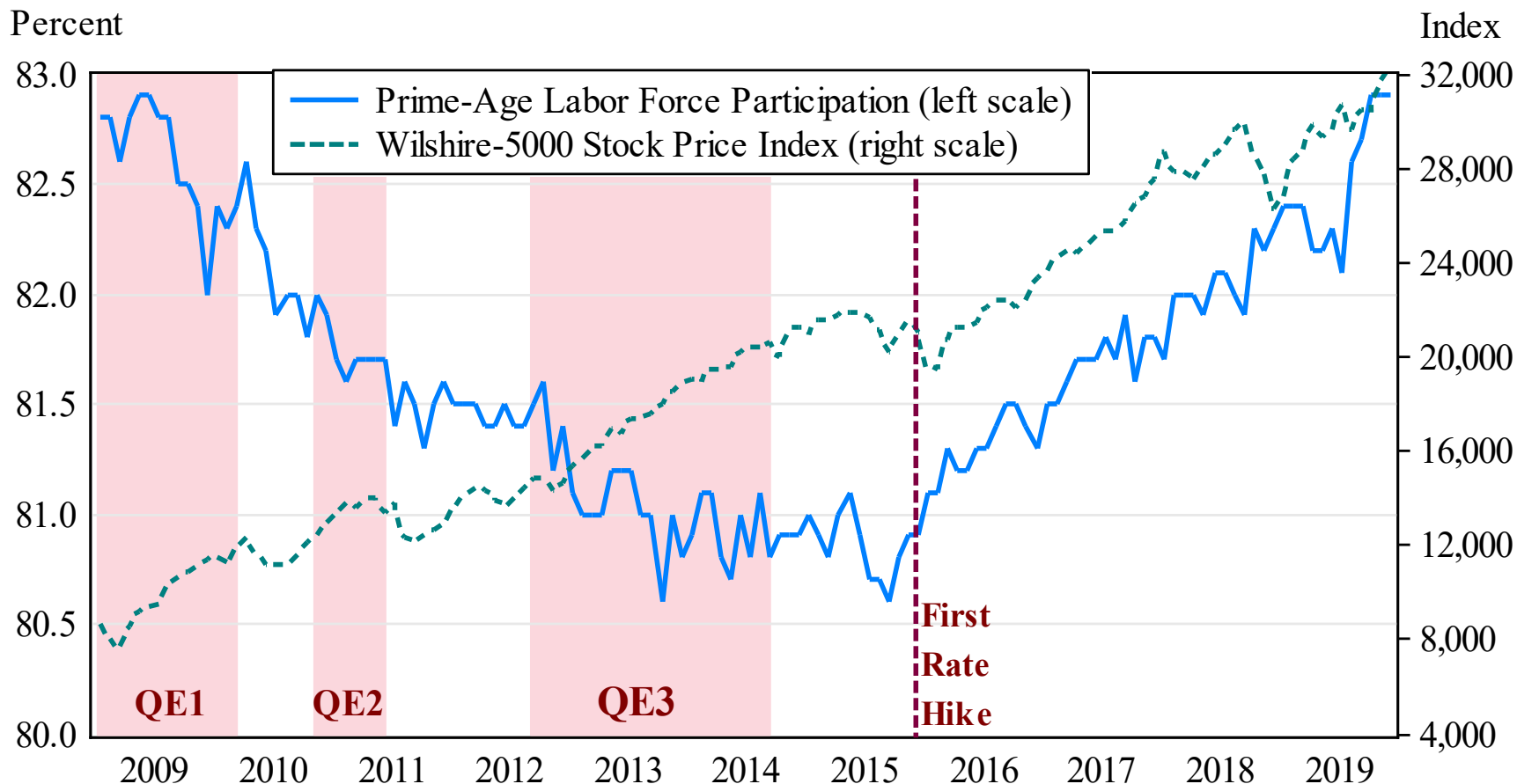


# **Distributional Effects of the Gold Standard and the ELB**

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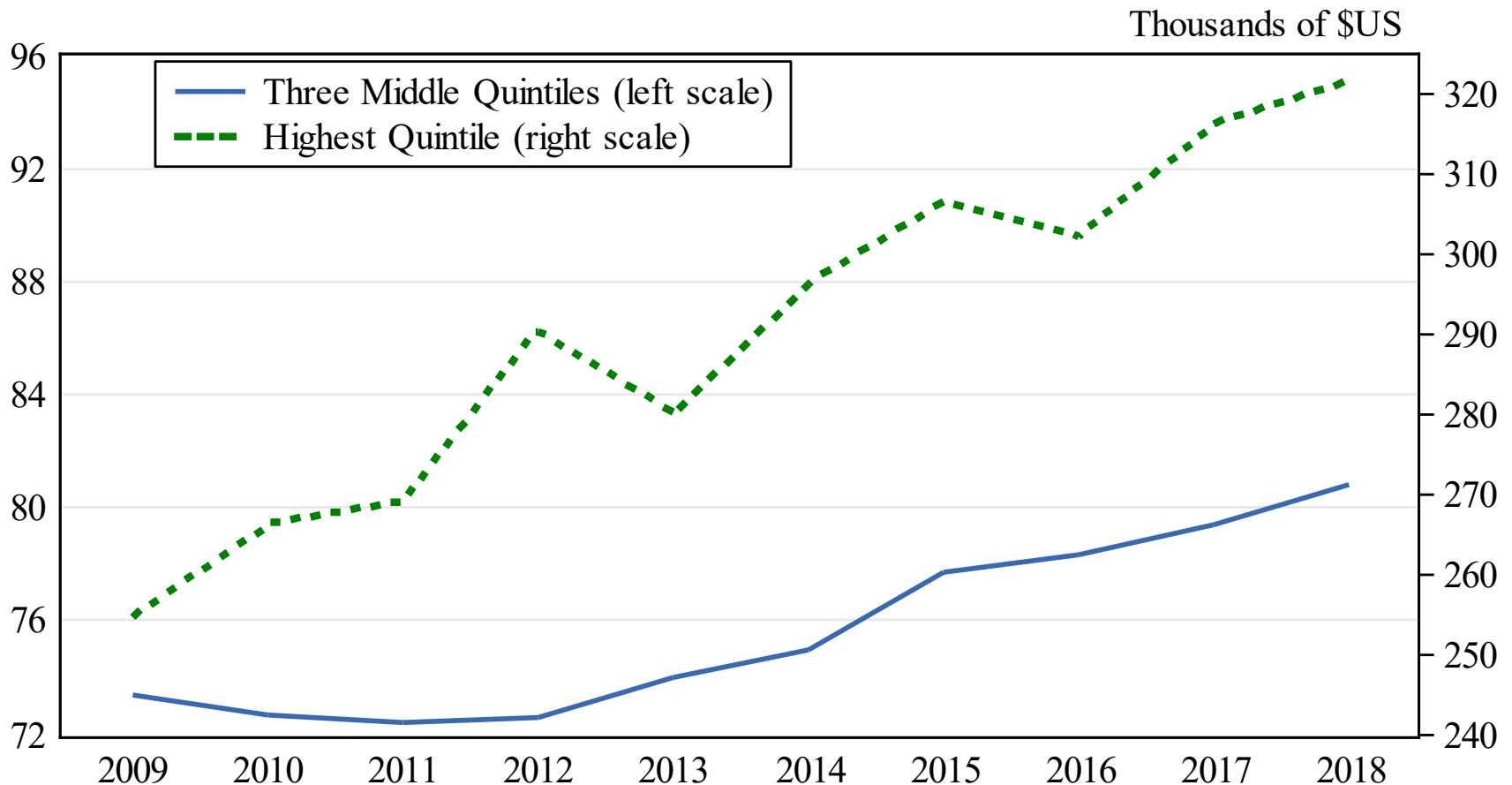
- **Debates about the gold standard were a source of U.S. political turmoil in the late 19<sup>th</sup> century, because bouts of deflation penalized borrowers (including farmers and many small businesses) and benefited creditors (capitalists and bankers).**
- **In the wake of the global financial crisis, some commentators have noted that “lower-for-longer” policies boosted asset prices (Wall Street) but had little effect on the real economy (Main Street).**
- **Nonetheless, there has been a dearth of quantitative analysis of the disparate effects of the ELB.**

# U.S. Labor Market Conditions and Asset Prices, 2009-2019



Sources: U.S. Bureau of Labor Statistics, Federal Reserve Bank of St. Louis

# U.S. Pre-Tax Income, 2009-2018



Source: U.S. Congressional Budget Office (2021)

# DSGE Model Analysis

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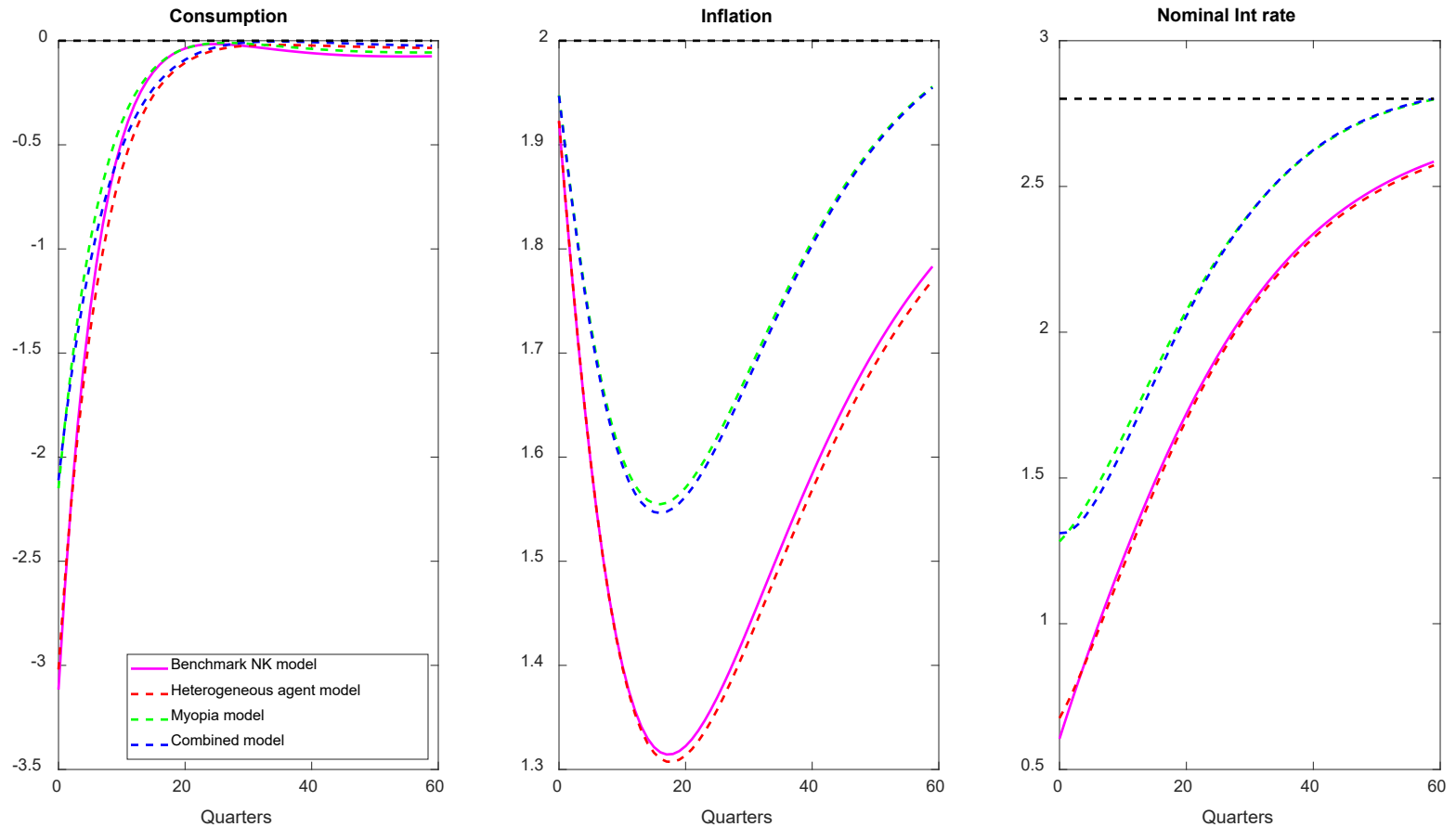
- **Benchmark New Keynesian Model**  
*(Fernandez-Villaverde & Rubio-Ramirez 2006)*
  - **Intertemporally-optimizing consumers**
  - **Endogenous capital accumulation with adjustment costs of investment changes**
  - **Monopolistic competition in goods & labor**
  - **Calvo-style nominal wage & price contracts**
  - **Full indexation to realized inflation**
- **Some households have no assets and simply consume their current labor income** *(Bilbiie et al. 2021)*
- **Myopic expectations of asset-holding households**  
*(Gabaix 2020)*

# Model Simulations

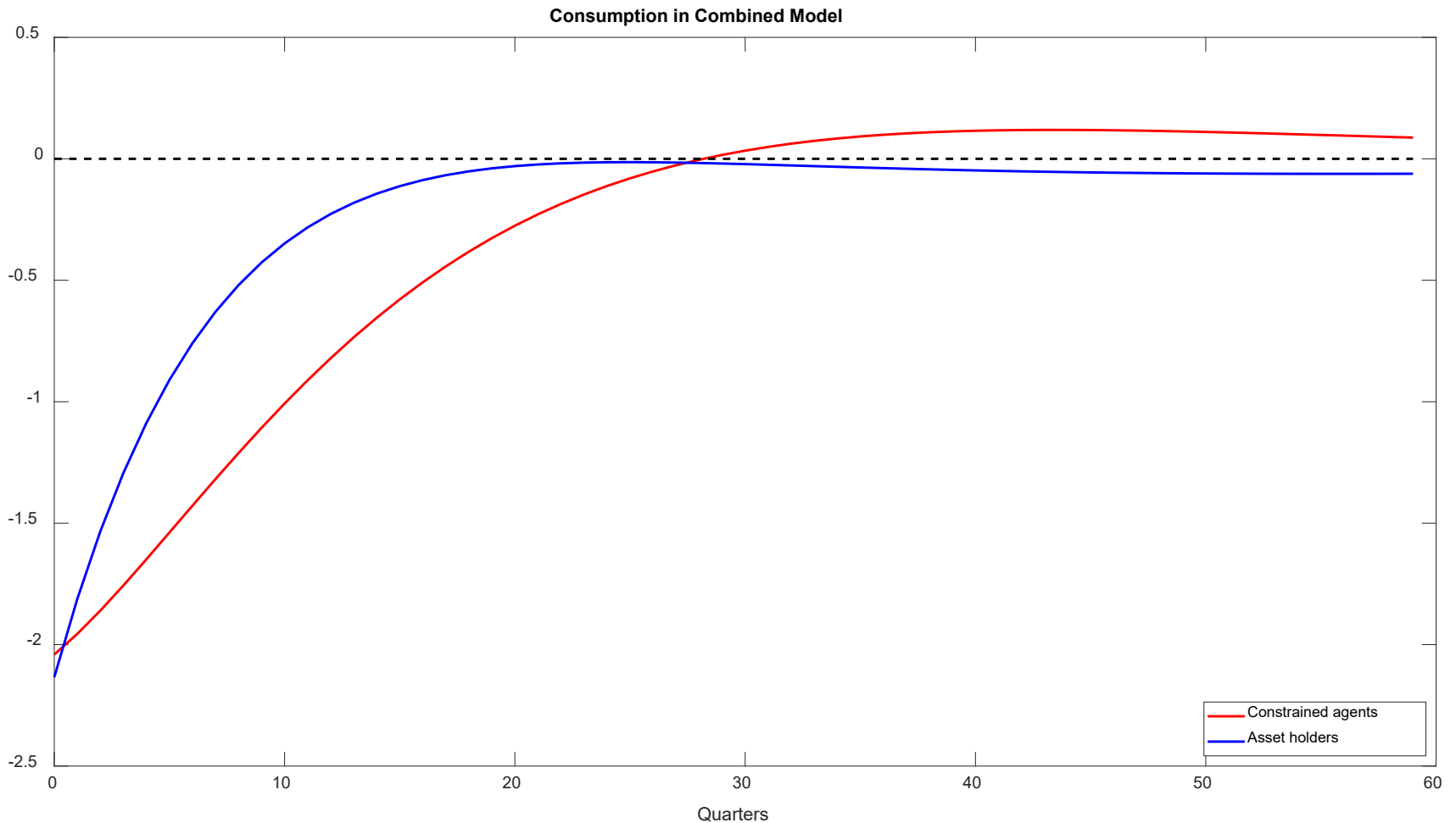
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- **Consumption demand is reduced by a persistent intertemporal preference shock.**
- **Under a Taylor-style rule, the nominal interest rate responds to the current inflation rate and the output growth rate, with moderate policy inertia**
- **An alternative rule follows Kiley & Roberts (2020) in tracking the cumulative value of a “shadow rate” when the actual interest rate is constrained by the ELB, and postponing liftoff until the cumulative value returns to zero.**
- **This alternative rule generates overshooting of inflation and thereby mitigates the ELB.**

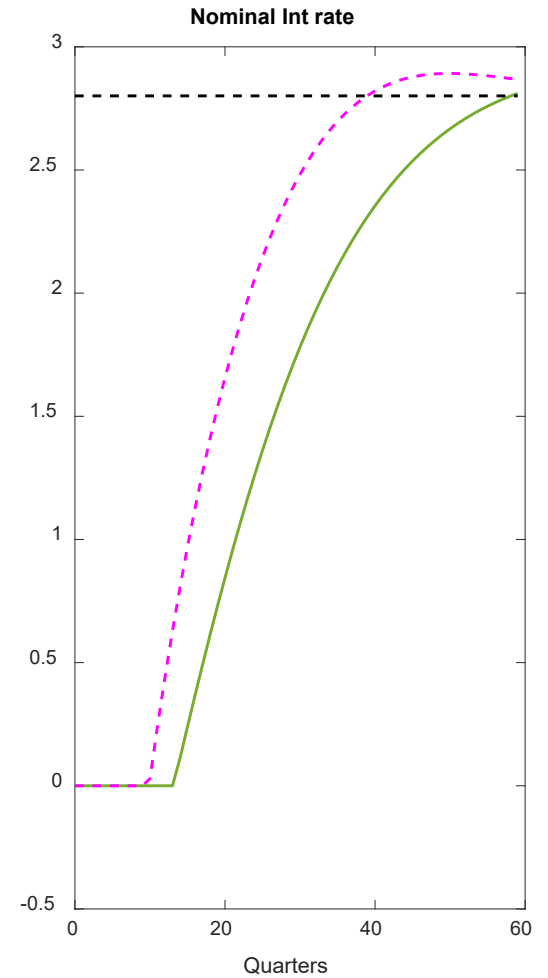
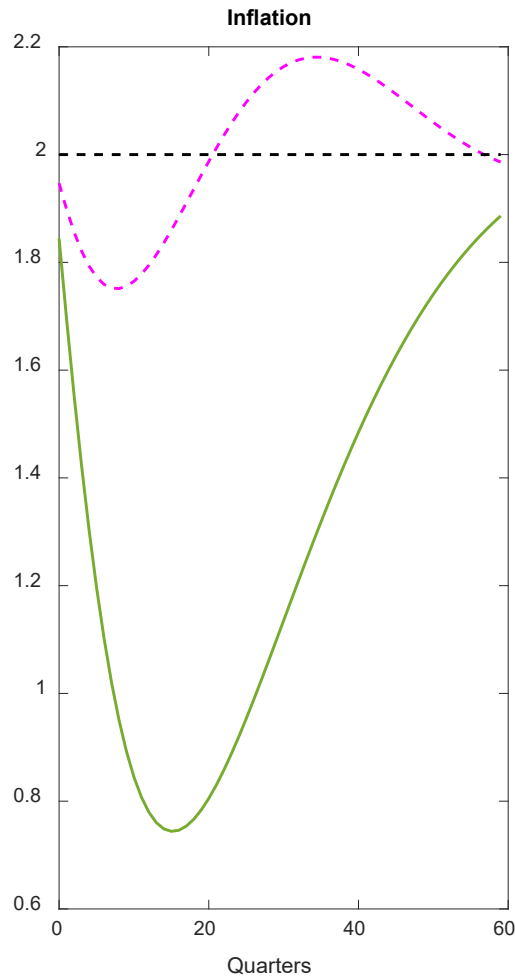
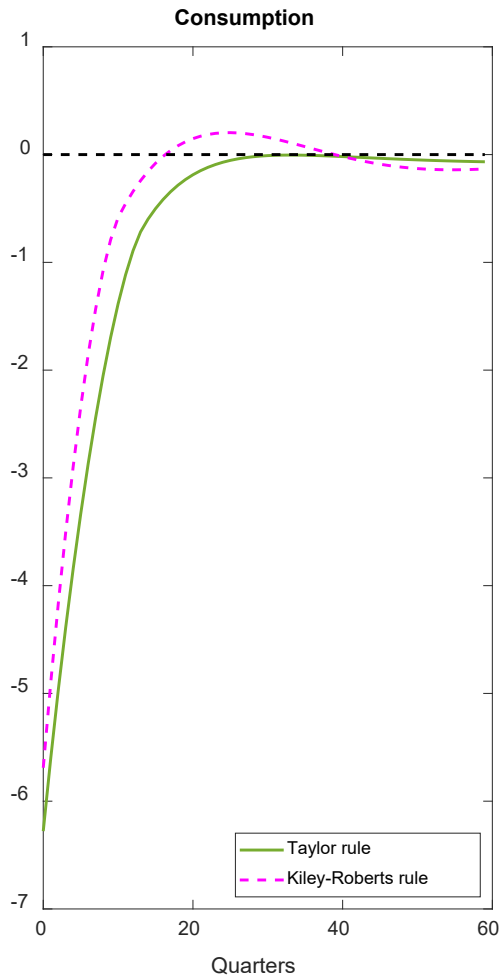
# The Impact of a Moderate Shock under Alternative Model Specifications



# The Impact of a Moderate Shock on Heterogenous Households

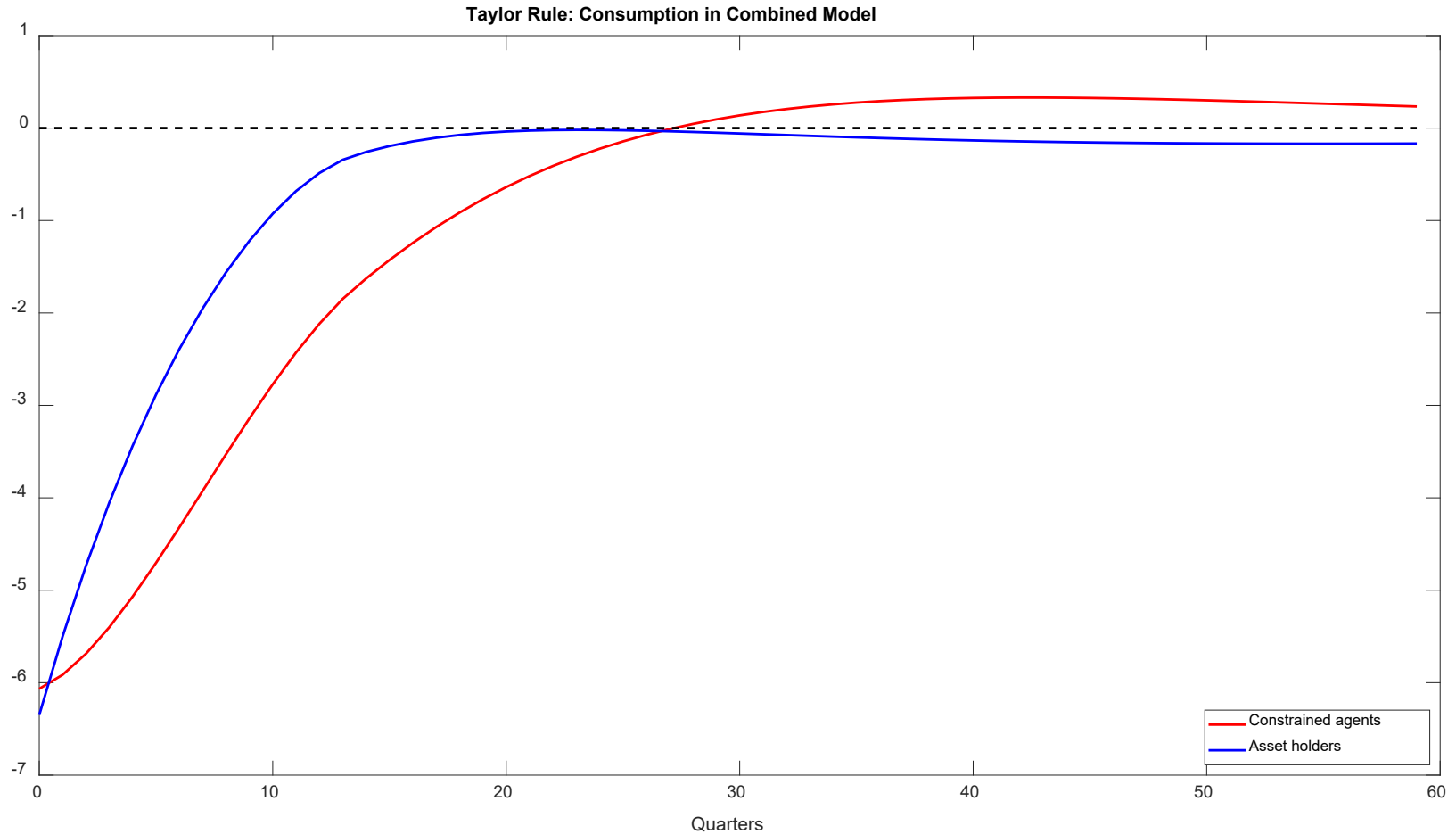


# The Impact of a Large Shock under Alternative Policy Rules

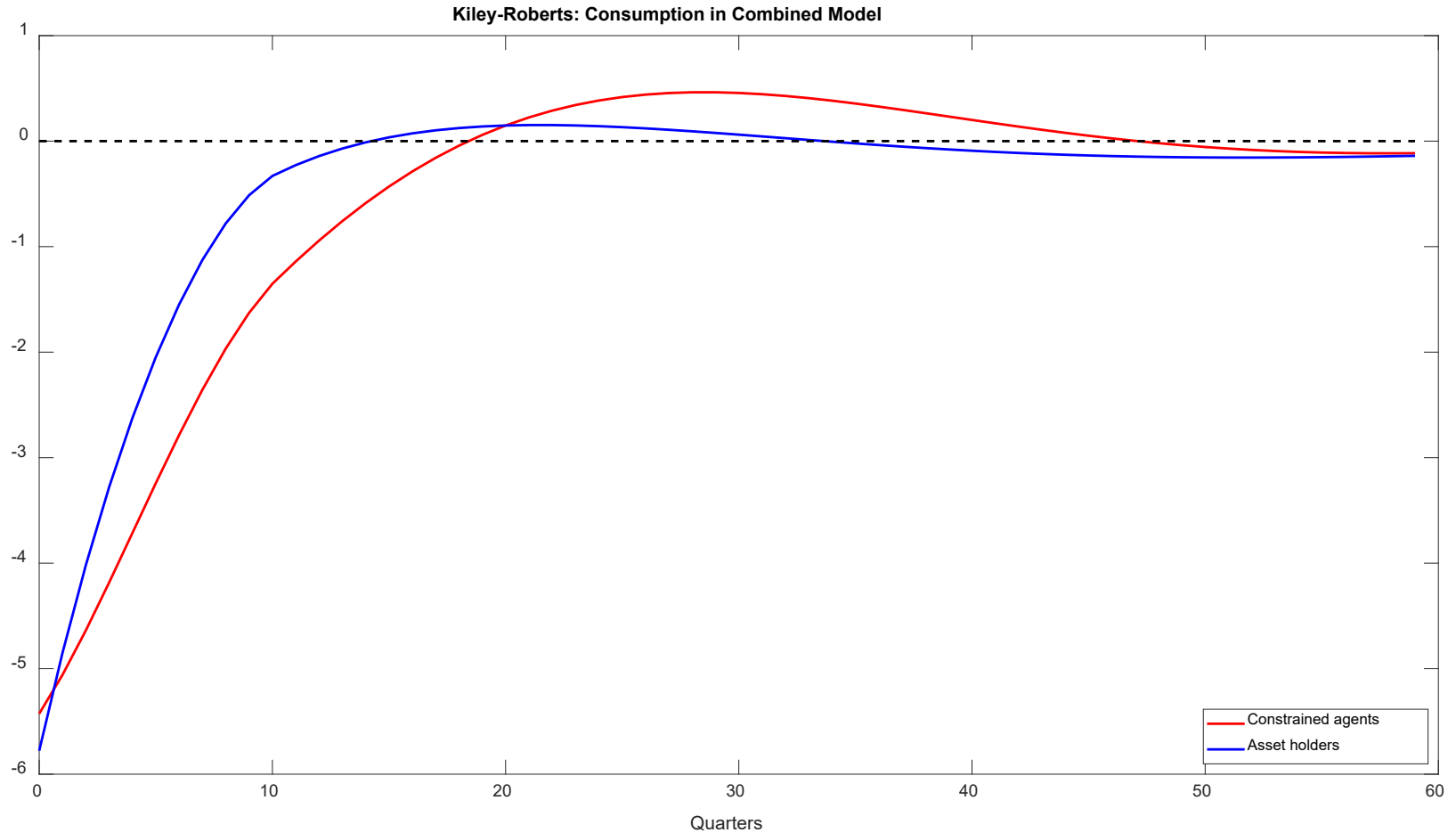




# The Impact of a Large Shock on Heterogeneous Households



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# Limitations of Our DSGE Analysis

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- **Marginal Utility of Consumption:** lump-sum transfers equate steady-state consumption of all households.
- **Skilled vs. Unskilled Labor:** asset holders and constrained households have identical labor income, i.e., no heterogeneity in labor types.
- **Employment:** all fluctuations in labor hours occur at the intensive margin, with no unemployment or changes in labor force participation.
- **Bounded Rationality:** Our model only has myopia in asset holders' consumption/savings decisions.
- **Fiscal Policy:** no distortionary taxes, transfers, or real government spending.

# Basic Design Principles for CBDC

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- **Public-Private Partnerships:** digital cash wallets provided by financial institutions, which hold those funds in reserve accounts at the central bank.
  - *Fosters efficiency, security, and convenience*
  - *Protects privacy of individual transactions*
  - *Facilitates appropriate law enforcement*
- **Legal Tender:** usable for all public and private payment transactions at practically zero cost.
  - **Consumers & businesses remain free to use other payments (credit cards, online services).**
  - **Paper cash remains in circulation, but its use is likely to diminish rapidly.**

# CBDC Design Principles

## *(contd.)*

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- **Store of Value:** digital cash bears the same rate of return as other risk-free assets such as treasury securities, thereby eliminating the opportunity cost of holding money.
- **Monetary Policy:** the interest rate on digital cash becomes the central bank's primary instrument for conducting monetary policy.

# Eliminating the ELB

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- **Fees on Very Large Balances:** only applied to digital cash balances above a very high threshold (e.g., \$250K for households, \$1M for businesses).
  - Discourage asset holders from “fire sales” of private assets during times of financial stress
  - Preferable to quotas or rationing of digital cash
  - Analogous to safe deposit box fees
- **Paper/Digital Transfer Fees:** only applied to very large transfers between digital cash & paper cash (e.g., transfers exceeding \$100K/day).
  - Discourages asset holders from holding huge quantities of paper cash
  - Analogous to ATM/cash machine fees

# Conclusions

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- **Historical Analysis:** reviewing the gold standard era underscores the rationale for eliminating the ELB promptly rather than waiting for a global crisis.
- **DSGE Analysis:** “lower-for-longer” policies may mitigate the ELB for large asset holders but not for most other households.
- **Practical Analysis:** CBDC provides a crucial opportunity to eliminate the ELB without imposing any new restrictions or fees on consumers or small businesses.

*Many thanks to our discussant, and we welcome comments from everyone!*