ゼロ金利制約に関する理論研究のこれまでと今後

2022年3月25日

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重要ポイント

- ゼロ金利制約に関する理論研究のこれまで
  - 1990年代の日本の経験を踏まえ、1990年代後半に理論的な研究が出始める
  - 2001年のアメリカでの景気後退を踏まえ、日本国外でも理論研究への関心が多少高まる
  - 2008年の世界金融危機を踏まえ、2010年代には多くの研究者が理論研究に参画

- 今後の展望
  - 自然利子率の低下
    - 景気が後退するたびに金利を下方制約まで下げる必要がある可能性
    - 景気が良い時でも、金利が下方制約に設定する必要がある可能性
  - 中央銀行がどのように下方制約に向き合うべきかに関しては、実務レベルでも研究レベルでも議論が継続すると考えられる

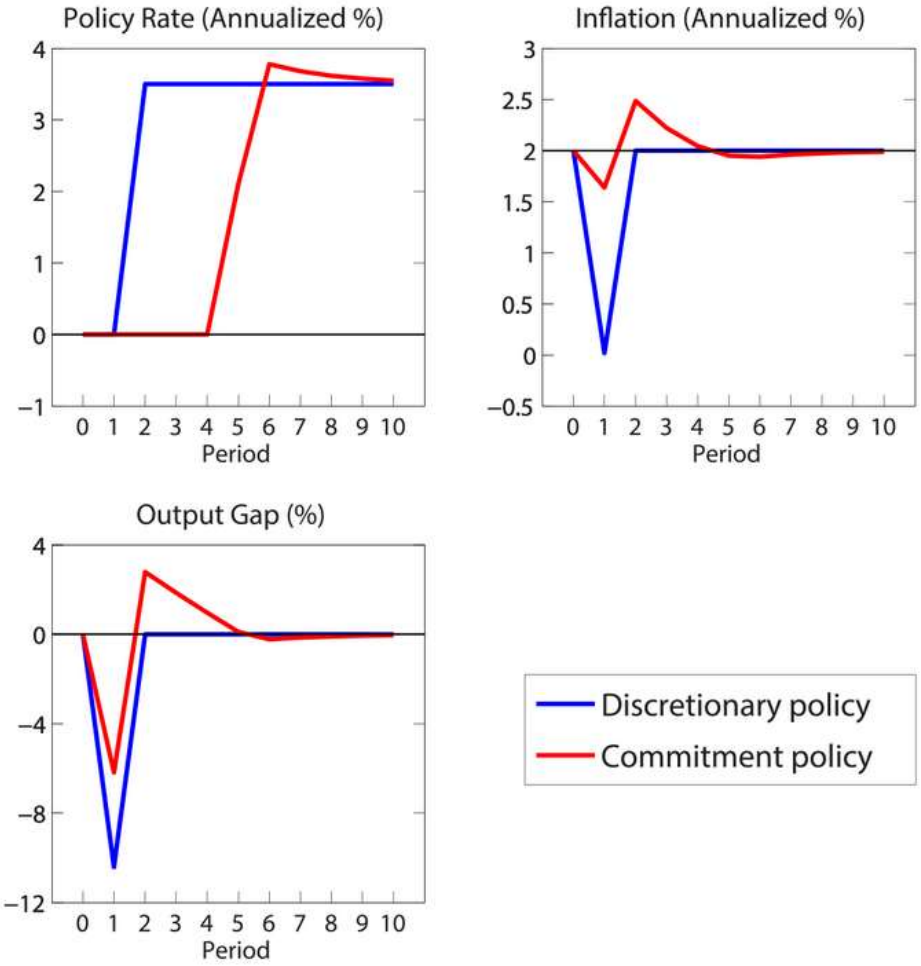
理論研究のこれまで

初期

- 初期のゼロ金利制約に関する理論研究（1990年代後半—2000年代前半）
  - Reifschneider and Williams (2000): Three Lessons for Monetary Policy in a Low Inflation Era
  - Eggertsson and Woodford (2003): The Zero Interest-Rate Bound and Optimal Monetary Policy
  - Jung, Teranishi, and Watanabe (2005): Optimal Monetary Policy at the Zero-Interest-Rate Bound
  - その他重要な貢献: Krugman (1998), Adam and Billi (2006 and 2007), Eggertsson (2004, 2006, and 2008), Benhabib et al. (2001 and 2002), Nakov (2008), among many others.

- これらの研究は、「将来の金利を低く設定することを約束すること」を通したゼロ金利制約下における追加的な金融緩和の可能性を示唆
  - 以下では、将来の金利設定に関する何かしらのコミュニケーションを「フォワードガイダンス（Forward Guidance）」と呼ぶ

Figure 1: The Value of Commitment in a Stylized Model



2008年金融危機後

- 金融危機後のゼロ金利制約に関する理論研究
  - 財政政策
  - 長期国債
  - フォワードガイダンス
  - 金融政策の枠組み
  - デフレ均衡（恒常的なゼロ金利環境）
  - 分析の数値計算ツール

実務との接点

- FRB内部では、初期の理論研究は2008年の金融危機以降の金融政策の議論に貢献

- FRB内部では、2010年代の理論研究は（初期の研究と共に）(I) 2008年から始まったゼロ金利政策の出口の模索, (ii) 2019-2020年の戦略レビュー, (iii) 戦略レビューに基づく2020年の「柔軟な平均インフレ目標」枠組みの導入に貢献

2008年金融危機

Home > Monetary Policy > Federal Open Market Committee > Meeting calendars and information > FOMC Memos By Year

Federal Open Market Committee

- About the FOMC
- Meeting calendars and information
- Transcripts and other historical materials
- FAQs

2008 Memos

April 30	Foreign Central Bank Approaches to Monetary Policy Implementation (PDF) Implementing Monetary Policy in the United States: the Policy Framework and Operating Procedures (PDF)
March 31	Summary of Central Bank Workshop on Monetary Policy Implementation (PDF)
April 1	Interest on Reserves: An Analytical Framework (PDF) Interest on Reserves: A Preliminary Analysis of Basic Options (PDF)
December 12	Notes on Issues Related to the Zero Lower Bound on Nominal Interest Rates (PDF)
December 12	Cover Memo: Summary [of Issues Related to the Zero Lower Bound on Nominal Interest Rates] (PDF) - Federal Reserve Experiences with Very Low Interest Rates: Lessons Learned (PDF) - Overview of Japan's Monetary Policy Responses to Deflation (PDF) - Japanese Money Markets During Periods of Low or Zero Interest Rates (PDF) - Effects of the Bank of Japan's Communication Strategy at the Zero Lower Bound (PDF) - Implications of the Health of the Japanese Banking Sector for the Effectiveness of Monetary Policy (PDF) - Effects of the Bank of Japan's Quantitative Easing Policy on Economic Activity (PDF) - Japanese Fiscal Policy: A Bridge to Nowhere? (PDF) - Effects of Very Low Policy Rates on Money Market Funds (PDF) - Effects of Very Low Policy Rates on the Profitability of Commercial Banks and Other Financial Institutions (PDF) - Treasury Market Functioning and the Zero Bound (PDF) - Potential Effects of Very Low Policy Rates on Federal Funds & Other Money Markets (PDF) - The Federal Funds Target Rate and Business and Household Borrowing Rates (PDF) - Assessing Inflation Expectations and the Risk of Deflation (PDF) - Purchases of Conventional SOMA Assets (PDF) - Purchases of Longer-Term Treasury Securities (PDF) - Purchases of Agency MBS and Debt (PDF) - Liquidity Facilities as Policy Tools at the Zero Bound (PDF) - Targeting Term Funding Conditions in U.S. Depository Institutions (PDF) - Communication and Commitment Strategies at Very Low Interest Rates (PDF) - Quantitative Analysis of Policy Alternatives Using the FRB/US Model (PDF)

https://www.federalreserve.gov/monetarypolicy/2008-fomc-memos.htm

December 5, 2008

20. Communication and Commitment Strategies at Very Low Interest Rates

Christopher Erceg, Michael Kiley, and Andrew Levin[1]

Executive Summary

In this note, we consider strategies for FOMC communications that could generate additional macroeconomic stimulus in a environment in which the degree of conventional policy easing is constrained by the zero bound on nominal interest rates. We begin by analyzing two potential enhancements in Federal Reserve communications that could be implemented without requiring significant changes to the existing policy framework:

- The FOMC could provide quantitative information regarding policymakers' assessments of the mandate-consistent inflation rate and thereby help ensure that long-run inflation expectations remain firmly anchored. This approach might be particularly helpful during a protracted period of high unemployment and very low inflation, in which a lack of clarity about the Committee's longer-run strategy could be misconstrued as "opportunistic disinflation" and hence contribute to a downward drift in longer-run inflation expectations.

- The FOMC could start providing in the Minutes quantitative information regarding the anticipated trajectory for the federal funds rate accompanied by fan charts or alternative scenarios to highlight the uncertainty and conditionality associated with these projections. This approach might be helpful in addressing potential misalignments between the expectations of policymakers and those of financial market participants and professional forecasters.

We then consider more substantial changes in the policy framework that would establish a conditional commitment to maintain a relatively accommodative stance of policy for some period once the setting of the federal funds rate is no longer constrained by the zero lower bound. If the commitment strategy were sufficiently transparent and credible, investors would anticipate a lower trajectory for future short-term interest rates, leading to a decline in current longer-term real interest rates and thereby providing near-term stimulus to the macroeconomy. We discuss two strategies along these lines:

- The FOMC could commit to following a nonlinear variant of the Taylor rule, in which the degree of extra policy stimulus in future periods would depend on the extent to which the zero lower bound had constrained the near-term setting of the funds rate.

- The FOMC could establish an explicit target for the price level at a fairly long horizon. In this case, if actual inflation over the next several years fell below the desired long-run average rate, then policymakers would be more accommodative in subsequent years until the price level returned to its target path.

[1] Erceg: Division of International Finance; Kiley: Division of Research and Statistics; Levin: Division of Monetary Affairs.

Authorized for public release by the FOMC Secretariat on 03/07/2014

December 5, 2008

21. Quantitative Analysis of Policy Alternatives Using the FRB/US Model

Christopher Erceg, Michael Kiley, and Andrew Levin[1]

Executive Summary

This note provides a quantitative assessment of the macroeconomic effects of various policy options. We examine the possible effects of alternative commitments to maintain the federal funds rate at (or near) zero for extended periods, quantitative easing in Treasury or agency securities, and fiscal actions, as well as the effects of a combination of various policies. In each case, we examine policy interventions of plausible magnitudes.

Based on model simulations, each policy intervention would provide a moderate degree of stimulus to economic activity and would prevent some of the decline in inflation projected in the October Greenbook. However, indicators of real activity and developments in financial markets—which have continued to deteriorate since the last FOMC meeting—point to persistently weak real activity and a substantial slowing in inflation over the next several years, and none of the policy options presented here would be sufficient, in isolation, to change this basic outlook. A combination of policy responses could yield appreciably more desirable outcomes for activity and inflation.

The degree of stimulus imparted by each policy option considered falls within a plausible range, but uncertainty about the size of these effects is considerable, with a number of factors suggesting that the effect of each policy examined may be larger or smaller than we present. All of the simulations use the FRB/US model, and other models would undoubtedly yield somewhat different estimates. This sensitivity is likely to be especially pronounced for the simulations that analyze the effects of conditional commitments to maintain a low path for the federal funds rate, as the degree of macro stimulus depends crucially on the importance of forward-looking behavior and on the perceived credibility of the commitments.

出口の模索

Authorized for Public Release

Class I FOMC – Restricted Controlled (FR)

Report to the FOMC on Economic Conditions and Monetary Policy

Book B

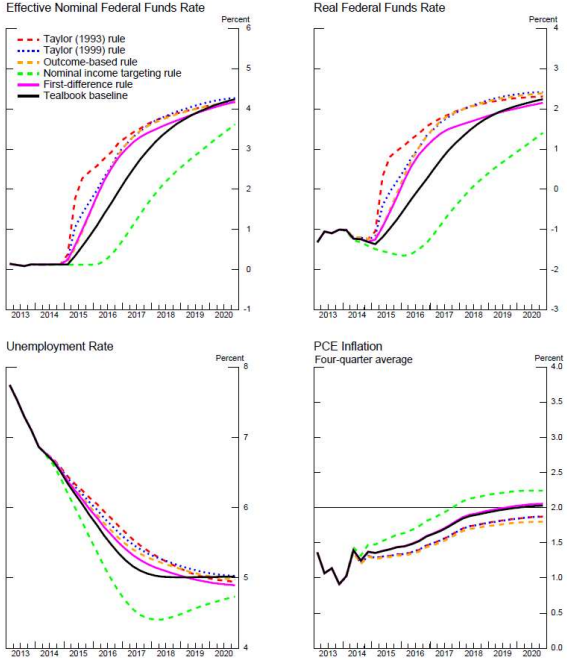
Monetary Policy:
Strategies and Alternatives

December 12, 2013

Prepared for the Federal Open Market Committee
by the staff of the Board of Governors of the Federal Reserve System

Strategies

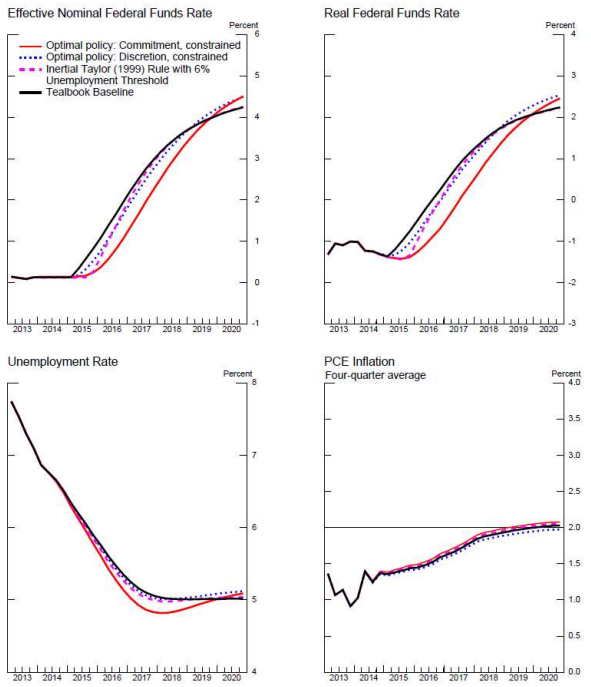
Policy Rule Simulations with Thresholds



Note: The policy rule simulations in this exhibit are based on rules that respond to core inflation. This choice of rule specification was made in light of the tendency for current and near-term core inflation rates to outperform headline inflation rates as predictors of the medium-term behavior of headline inflation.

Strategies

A Comparison of Optimal Control Policies and the Baseline Policy Rule under Alternative Unemployment Rate Thresholds



2019-2020年戦略レビュー

Home > Monetary Policy > Review of Monetary Policy Strategy, Tools, and Communications

Review of Monetary Policy Strategy, Tools, and Communications

- 2019-2020 Review: Overview
- 2020 Statement on Longer-Run Goals and Monetary Policy Strategy
- Guide to changes in the 2020 Statement on Longer-Run Goals and Monetary Policy Strategy
- Fed Listens
- System Analytical Work
- Q&As
- Related Speeches
- Background for Review
- Historical Statements on Longer-Run Goals and Monetary Policy Strategy

Background for Review

Timeline of Policy Actions

The links below contain timelines of the Federal Reserve's key monetary policy actions and communications from the eve of the Global Financial Crisis and Great Recession until the start of the 2019-2020 review. The dates in these timelines correspond to the days on which the public was informed of an action or a decision. For example, if the Federal Open Market Committee (FOMC) discussed a policy communication at a monetary policy meeting and conveyed the substance of its discussions to the public through its meeting minutes, then the timeline would report the day on which the FOMC minutes were released.

Statement on Longer-Run Goals and Monetary Policy Strategy

Forward Guidance about the Federal Funds Rate

Balance Sheet Policies

Policy Normalization Principles and Plans

Summary of Economic Projections

Federal Reserve Research at the Commencement of the 2019-2020 Review

This section lists research papers authored or co-authored by Federal Reserve staff that address topics of relevance to the Federal Reserve's review of its monetary policy strategy, tools, and communication practices. The papers are grouped into categories that correspond to the broad themes of the review. When a paper covers more than one category, the paper is included as a separate entry in each relevant category.

1. Overview Papers
2. Context
   a. *R-star: Short-Run Estimates*
   b. *R-star: Long-Run Estimates*
   c. *R-star: Long-Run Determinants*
   d. *Effective Lower Bound: Risks and Macroeconomic Implications*
3. Policy Strategies
4. Monetary Policy Tools
   a. *Balance Sheet Policies*
   b. *Forward Guidance*
   c. *Yield Curve Targeting*
5. Communication Practices

https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications-background-for-review.htm

d. Effective Lower Bound: Risks and Macroeconomic Implications

Arias, Jonas E., Christopher Erceg, and Mathias Trabandt (2016). "The Macroeconomic Risks of Undesirably Low Inflation," *European Economic Review*, vol. 88, pp. 88–107.

Armenter, Roc (2016). "The Perils of Nominal Targets," Working Papers 16–30, Federal Reserve Bank of Philadelphia.

Aruoba, S. Boragan, Pablo Cuba-Borda, and Frank Schorfheide (2016). "Macroeconomic Dynamics Near the ZLB: A Tale of Two Countries (PDF)," International Finance Discussion Papers 1163. Board of Governors of the Federal Reserve System.

Bernanke, Ben, Michael T. Kiley, and John M. Roberts (forthcoming). "Monetary Policy Strategies for a Low-Rate Environment," *American Economic Review – Papers and Proceedings*.

Bernanke, Ben, Vincent R. Reinhart, and Brian P. Sack (2004). "Monetary Policy Alternatives at the Zero Bound: An Empirical Assessment," *Brookings Papers on Economic Activity*, no. 2, pp. 1–78.

Bodenstein, Martin, Christopher J. Erceg, and Luca Guerrieri (2017). "The Effects of Foreign Shocks When Interest Rates are at Zero," *Canadian Journal of Economics*, vol. 50 (August), pp. 660–684.

Bodenstein, Martin, Luca Guerrieri, and Christopher J. Gust (2013). "Oil Shocks and the Zero Bound on Nominal Interest Rates," *Journal of International Money and Finance*, vol. 32 (February), pp. 941–967.

Bodenstein, Martin, James Hebden, and Ricardo Nunes (2012). "Imperfect Credibility and the Zero Lower Bound," *Journal of Monetary Economics*, vol. 59 (March), pp. 135–149

Carlstrom, Charles. T., Timothy. S. Fuerst, and Matthias Paustian (2014). "Fiscal Multipliers under an Interest Rate Peg of Deterministic versus Stochastic Duration," *Journal of Money, Credit and Banking*, vol. 46 (September), pp. 1293–1312.

Chung, Hess, Etienne Gagnon, Taisuke Nakata, Matthias Paustian, Bernd Schlusche, James Trevino, Diego Vilán, and Wei Zheng (2019). "Monetary Policy Options at the Effective Lower Bound: Assessing the Federal Reserve's Current Policy Toolkit," Finance and Economics Discussion Series 2019–003.

Chung, Hess, Jean-Philippe Laforte, David Reifschneider, and John C. Williams (2012). "Have We Underestimated the Likelihood and Severity of Zero Lower Bound Events?" *Journal of Money, Credit, and Banking*, vol. 44 (February), pp. 47–82.

Datta, Deepa, Benjamin K. Johannsen, Hannah Kwon, and Robert J. Vigfusson (2018). "Oil, Equities, and the Zero Lower Bound," Finance and Economics Discussion Series 2018-058. Board of Governors of the Federal Reserve System (U.S.).

Erceg, Christopher, James Hebden, M. Kiley, David López-Salido, and Robert Tetlow (2018). "Some Implications of Uncertainty and Misperception for Monetary Policy," Finance and Economics Discussion Series 2018–059.

Guerrieri, Luca, and Matteo Iacoviello (2017). "Collateral Constraints and Macroeconomic Asymmetries," *Journal of Monetary Economics*, vol. 90 (October), pp. 28–49.

Gust, Christopher, Edward Herbst, David López-Salido, and Matthew E. Smith (2017). "The Empirical Implications of the Interest-Rate Lower Bound," *American Economic Review*, vol. 107 (July), pp. 1971–2006.

Hebden, James, and David López-Salido (2018). "From Taylor's Rule to Bernanke's Temporary Price Level Targeting," Finance and Economics Discussion Series 2018–058.

Hills, Timothy S., Taisuke Nakata, and Sebastian Schmidt (2016). "The Risky Steady State and the Interest Rate Lower Bound," Finance and Economics Discussion Series 2016–009. Board of Governors of the Federal Reserve System (U.S.).

Hills, Timothy, Taisuke Nakata, and Sebastian Schmidt (2016). "The Risk of Returning to the Effective Lower Bound: An Implication for Inflation Dynamics After Lift-Off," FEDS Notes. Board of Governors of the Federal Reserve System, February 12.

Kiley, M., and J. M. Roberts (2017). "Monetary Policy in a Low Interest Rate World," *Brookings Papers on Economic Activity*, Spring, pp. 317–372.

Nakata, Taisuke (2017). "Model-Based Measures of ELB Risk," FEDS Notes. Board of Governors of the Federal Reserve System, August 23.

Nakata, Taisuke (2017). "Uncertainty at the Zero Lower Bound," *American Economic Journal: Macroeconomics*, vol. 9 (July), pp. 186–221.

Nakata, Taisuke, and Hiroatsu Tanaka (2016). "Equilibrium Yield Curves and the Interest Rate Lower Bound," Finance and Economics Discussion Series 2016–085. Board of Governors of the Federal Reserve System (U.S.).

Reifschneider, David L., and John C. Williams (2000). "Three Lessons for Monetary Policy in a Low-Inflation Era," *Journal of Money, Credit and Banking*, vol. 32 (November), pp. 936–66.

3. Policy Strategies

Armenter, Roc (2016). "The Perils of Nominal Targets," Working Papers 16–30, Federal Reserve Bank of Philadelphia.

Ajello, Andrea, Thomas Laubach, David López-Salido, and Taisuke Nakata (2019). "Financial Stability and Optimal Interest Rate Policy," *International Journal of Central Banking*, vol. 15 (March), pp. 279–326.

Bernanke, B., M. T. Kiley, and J. M. Roberts (forthcoming). "Monetary Policy Strategies for a Low-Rate Environment," *American Economic Review – Papers and Proceedings*.

Bernanke, Ben, Vincent R. Reinhart, and Brian P. Sack (2004). "Monetary Policy Alternatives at the Zero Bound: An Empirical Assessment," *Brookings Papers on Economic Activity*, no. 2, pp. 1–78.

Board of Governors of the Federal Reserve System (2018). "Challenges Associated with Using Rules to Make Monetary Policy," note on in "Monetary Policy Principles and Practice," Board of Governors of the Federal Reserve System.

Bodenstein, Martin, and Junzhu Zhao (2017). "On Targeting Frameworks and Optimal Monetary Policy (PDF)," Finance and Economics Discussion Series 2017-098. Board of Governors of the Federal Reserve System.

Chung, Hess, Etienne Gagnon, Taisuke Nakata, Matthias Paustian, Bernd Schlusche, James Trevino, David Vilán, and Wei Zheng (2019). "Monetary Policy Options at the Effective Lower Bound: Assessing the Federal Reserve's Current Policy Toolkit," Finance and Economics Discussion Series 2019–003.

Chung, Hess, Taisuke Nakata, and Matthias Paustian (2018). "Optimal Monetary Policy in a DSGE Model with Attenuated Forward Guidance Effects," FEDS Notes. Board of Governors of the Federal Reserve System, October 19.

Cúrdia, Vasco, Andrea Ferrero, Ging Cee Ng, and Andrea Tambalotti (2015). "Has U.S. Monetary Policy Tracked the Efficient Interest Rate?," *Journal of Monetary Economics*, vol. 70 (March), pp. 72–83.

Engen, Eric M., Thomas Laubach, and David Reifschneider (2015). "The Macroeconomic Effects of the Federal Reserve's Unconventional Monetary Policies," Finance and Economics Discussion Series 2015-005. Board of Governors of the Federal Reserve System (U.S.).

English, William B., David López-Salido, and Robert Tetlow (2015). "The Federal Reserve's Framework for Monetary Policy: Recent Changes and New Questions," *IMF Economic Review*, vol. 63 (May), pp. 22–70.

Erceg, Christopher, James Hebden, Michael Kiley, David López-Salido, and Robert Tetlow (2018). "Some Implications of Uncertainty and Misperception for Monetary Policy," Finance and Economics Discussion Series 2018–059. Washington: Board of Governors of the Federal Reserve System, August.

Gust, Christopher, Benjamin K. Johannsen, and J. David Lopez-Salido (2017). "Monetary Policy, Incomplete Information, and the Zero Lower Bound," *IMF Economic Review*, vol. 65 (April), pp. 37–70.

Hebden, James, and David López-Salido (2018). "From Taylor's Rule to Bernanke's Temporary Price Level Targeting," Finance and Economics Discussion Series 2018-051. Washington: Board of Governors of the Federal Reserve System, July.

Kahn, George (2009). "Beyond Inflation Targeting: Should Central Banks Target the Price Level?" *Federal Reserve Bank of Kansas City Economic Review*, vol. 94 (Third Quarter), pp. 37-67.

Mertens, Thomas M., and John C. Williams (2019). "Monetary Policy Frameworks and the Effective Lower Bound on Interest Rates (PDF)," Staff Reports 877, Federal Reserve Bank of New York.

Nakata, Taisuke (2015). "Credibility of Optimal Forward Guidance at the Interest Rate Lower Bound," FEDS Notes. Board of Governors of the Federal Reserve System, August 27.

Nakata, Taisuke (2016). "Optimal Fiscal and Monetary Policy with Occasionally Binding Zero Bound Constraints," *Journal of Economic Dynamics and Control*, vol. 73, pp. 220–240.

Nakata, Taisuke (2018). "Reputation and Liquidity Traps," *Review of Economic Dynamics*, vol. 28 (April), pp. 252–268.

Nakata, Taisuke, and Sebastian Schmidt (2016). "The Risk-Adjusted Monetary Policy Rule," Finance and Economics Discussion Series 2016–061. Board of Governors of the Federal Reserve System (U.S.).

Nakata, Taisuke, and Sebastian Schmidt (forthcoming). "Conservatism and Liquidity Traps," *Journal of Monetary Economics*.

Nakata, Taisuke, and Sebastian Schmidt (2019). "Gradualism and Liquidity Traps," *Review of Economic Dynamics*, vol. 31 (January), pp. 182–199.

Nakata, Taisuke, Sebastian Schmidt, and Paul Yoo (2018). "Speed Limit Policy and Liquidity Traps," Finance and Economics Discussion Series 2018–050. Board of Governors of the Federal Reserve System (U.S.).

Reifschneider, David (2016). "Gauging the Ability of the FOMC to Respond to Future Recessions," Finance

2019-2020年戦略レビュー

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Review of Monetary Policy Strategy, Tools, and Communications

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- System Analytical Work
- Q&As
- Related Speeches
- Background for Review
- Historical Statements on Longer-Run Goals and Monetary Policy Strategy

System Analytical Work

At five FOMC meetings between July 2019 and January 2020, the FOMC discussed aspects of its monetary policy framework. These discussions were informed by analytical work by research staff across the Federal Reserve System and reported in the FOMC meeting minutes. The FEDS Note, "The Federal Reserve's Review of its Monetary Policy Framework: A Roadmap," provides an introduction to the analytical work and a brief description of each FEDS Paper listed below. Thirteen memos were presented to the Committee in advance of their framework review discussions: the FEDS Note and the 11 FEDS Papers below, as well as a memo on the *Fed Listens* initiative, which is part of the *Fed Listens* report (PDF).

FEDS Note: "The Federal Reserve's Review of Its Monetary Policy Framework: A Roadmap"
David Altig, Federal Reserve Bank of Atlanta; Jeff Fuhrer, Federal Reserve Bank of Boston; Marc P. Giannoni, Federal Reserve Bank of Dallas; Thomas Laubach, Federal Reserve Board

FEDS Paper 2020-065: "Monetary Policy and Economic Performance since the Financial Crisis"
Dario Caldara, Federal Reserve Board; Etienne Gagnon, Federal Reserve Board; Enrique Martínez-García, Federal Reserve Bank of Dallas; and Christopher J. Neely, Federal Reserve Bank of St. Louis

FEDS Paper 2020-066: "Monetary Policy Tradeoffs and the Federal Reserve's Dual Mandate"
Andrea Ajello, Federal Reserve Board; Isabel Cairó, Federal Reserve Board; Vasco Cúrdia, Federal Reserve Bank of San Francisco; Thomas A. Lubik, Federal Reserve Bank of Richmond; and Albert Queralto, Federal Reserve Board

FEDS Paper 2020-067: "Strengthening the FOMC's Framework in View of the Effective Lower Bound and Some Considerations Related to Time-Inconsistent Strategies"
Fernando Duarte, Federal Reserve Bank of New York; Benjamin K. Johannsen, Federal Reserve Board; Leonardo Melosi, Federal Reserve Bank of Chicago; and Taisuke Nakata, Federal Reserve Board

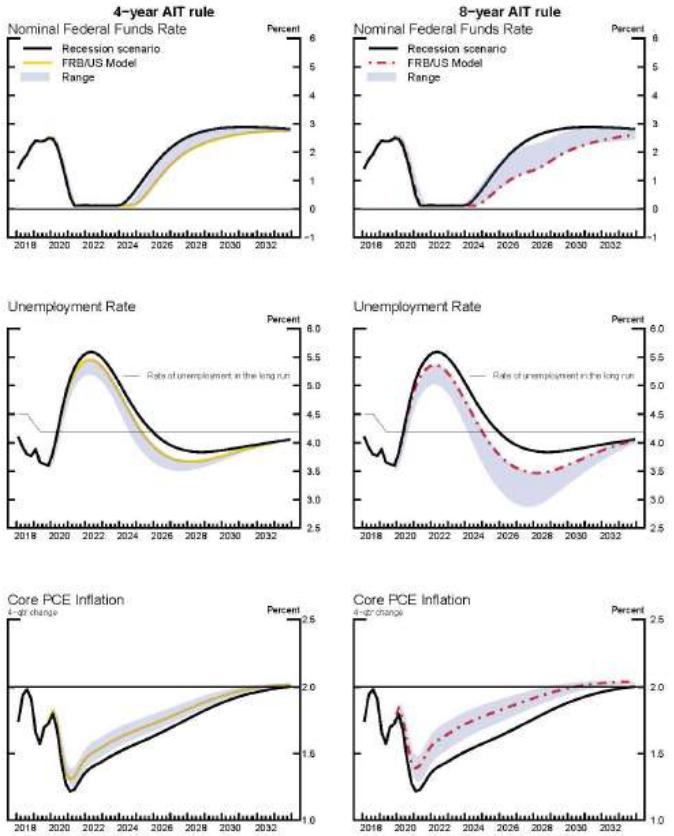
FEDS Paper 2020-068: "Alternative Strategies: How Do They Work? How Might They Help?"
Jonas Arias, Federal Reserve Bank, Philadelphia; Martin Bodenstein, Federal Reserve Board; Hess Chung, Federal Reserve Board; Thorsten Drautzburg, Federal Reserve Bank, Philadelphia; and Andrea Raffo, Federal Reserve Board

FEDS Paper 2020-069: "How Robust Are Makeup Strategies to Key Alternative Assumptions?"
James Hebden, Federal Reserve Board; Edward P. Herbst, Federal Reserve Board; Jenny Tang, Federal Reserve Bank of Boston; Giorgio Topa, Federal Reserve Bank of New York; and Fabian Winkler, Federal Reserve Board

FEDS Paper 2020-070: "Issues regarding the Use of the Policy Rate Tool"
Jeffrey Campbell, Federal Reserve Bank of Chicago; Thomas B. King, Federal Reserve Bank of Chicago; Anna Orlik, Federal Reserve Board; and Rebecca Zarutskie, Federal Reserve Board

https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications-system-analytical-work.htm

Figure 3. The Performance of Average Inflation Targeting Rules across Models



Note: AIT is average inflation targeting; PCE is personal consumption expenditures.
Source: Authors calculations.

個人的な貢献

- 不確実性とゼロ金利
  - Nakata (2016): Optimal fiscal and monetary policy with occasionally binding zero bound constraints
    - https://www.sciencedirect.com/science/article/pii/S0165188916301531
  - Nakata (2017): Uncertainty at the Zero Lower Bound
    - https://www.aeaweb.org/articles?id=10.1257/mac.20140253
  - Hills, Nakata, and Schmidt (2019): Effective lower bound risk
    - https://www.sciencedirect.com/science/article/pii/S0014292119301813
  - 引用
    - Janet Yellen (March 2015, December 2015, March 2016)
    - Richard Clarida (February 2019)
    - Lael Brainard (September 2017, October 2017, March 2018, May 2018)

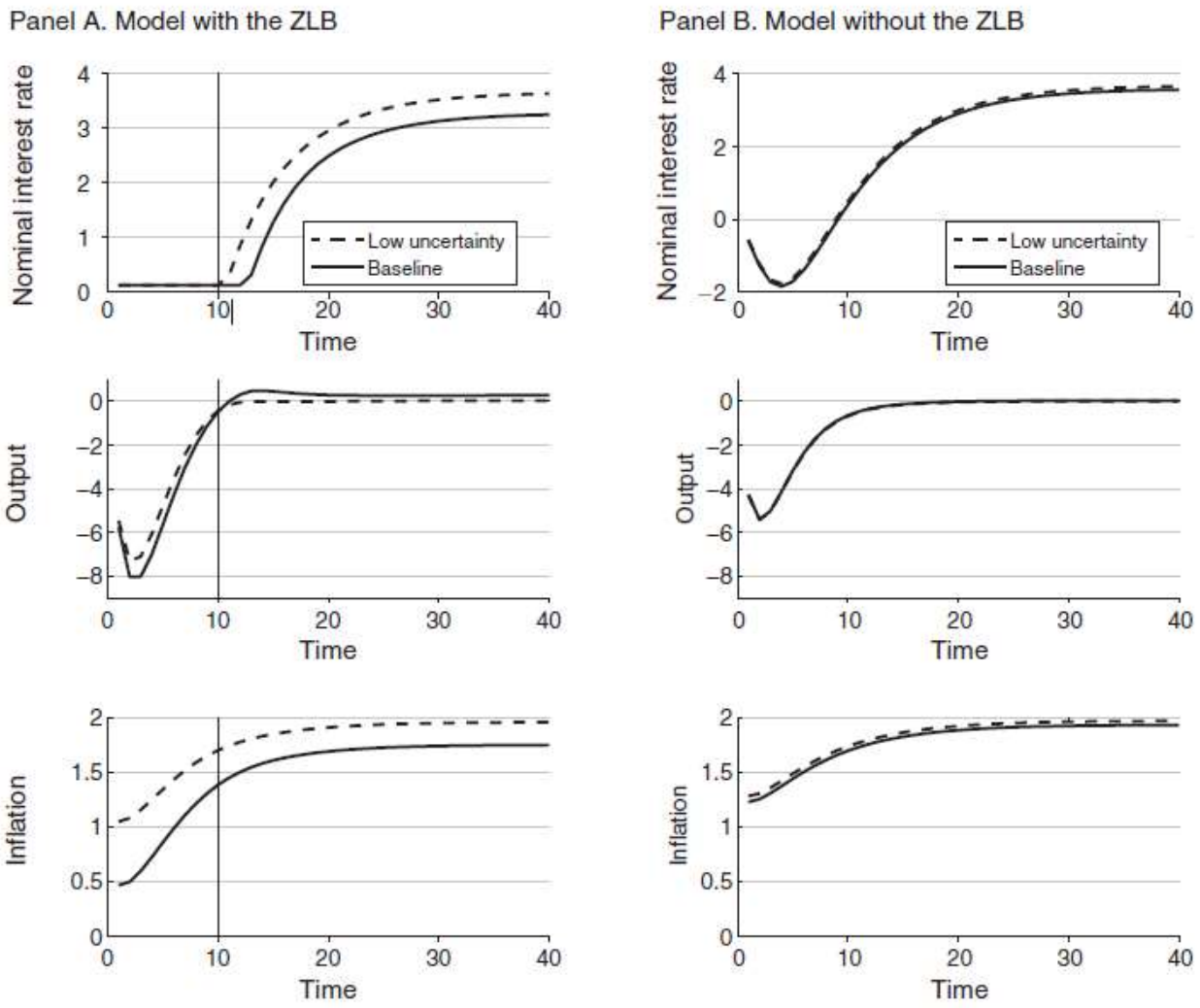


FIGURE 11. EFFECTS OF UNCERTAINTY IN THE EMPIRICAL MODEL

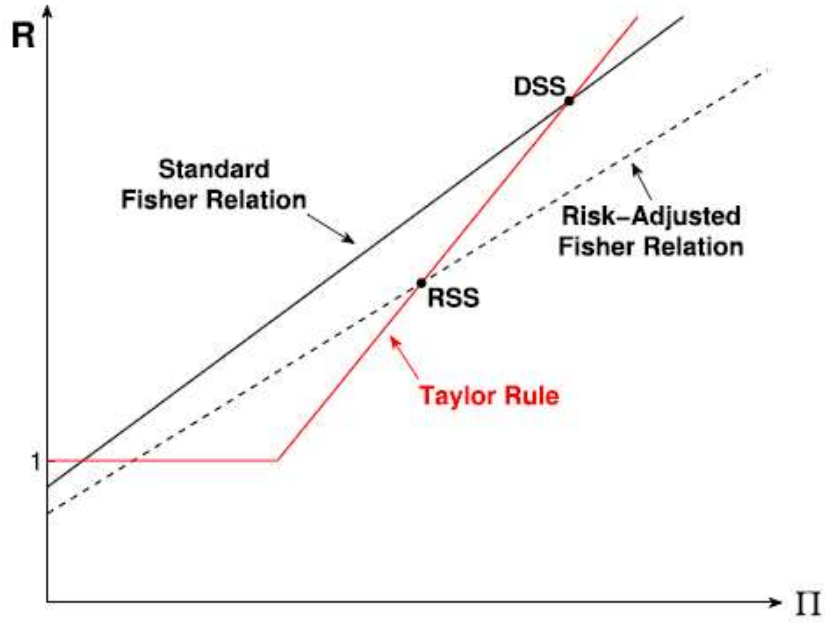


Fig. 3. The risk-adjusted Fisher relation and the Taylor rule. †DSS stands for "deterministic steady state," and RSS stands for "risky steady state."

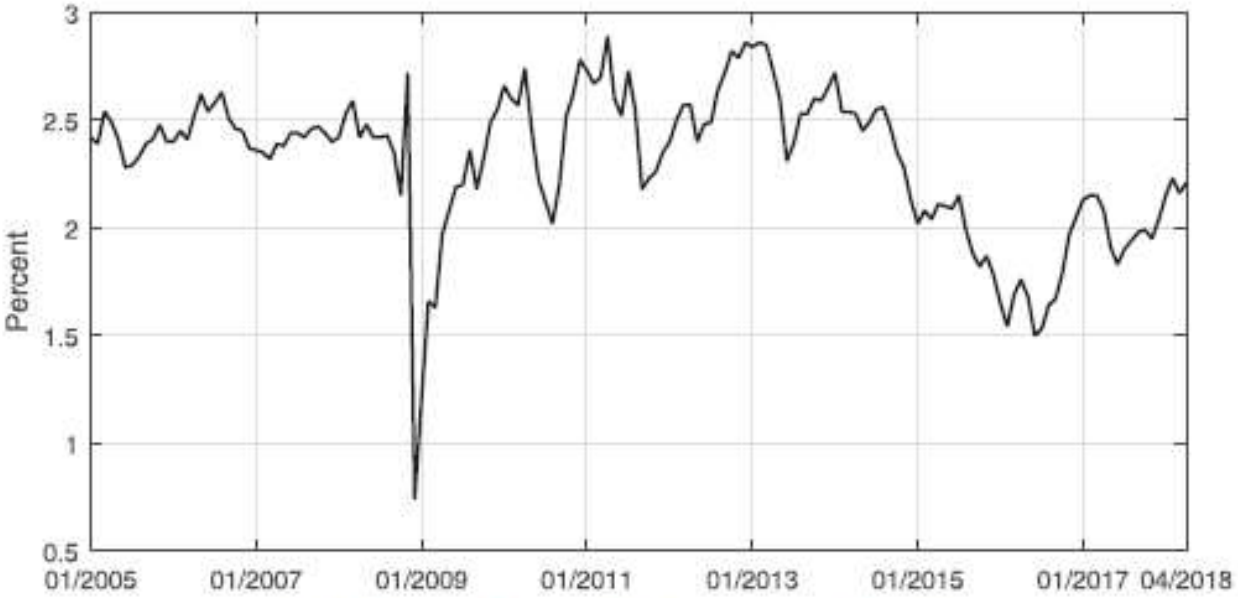


Fig. 1. 5-year, 5-year forward inflation expectation rate.
Source: Federal Reserve Bank of St. Louis; monthly frequency.

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- 金融政策の枠組み
  - Nakata and Schmidt (2019): Conservatism and liquidity traps
    - https://www.sciencedirect.com/science/article/pii/S0304393218305580
  - Nakata and Schmidt (2019): Gradualism and liquidity traps
    - https://www.sciencedirect.com/science/article/pii/S1094202518303806
  - Nakata, Schmidt, and Yoo (2018): Speed limit policy and liquidity traps
    - https://www.carf.e.u-tokyo.ac.jp/en/research/w4511/
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We assume that society's value, or welfare, at time t is given by the expected discounted sum of future utility flows,

$$V_t = u(\pi_t, y_t) + \beta E_t V_{t+1}, \tag{5}$$

where society's contemporaneous utility function, $u(\cdot, \cdot)$, is given by the standard quadratic function of inflation and the output gap,

$$u(\pi, y) = -\frac{1}{2}\left(\pi^2 + \bar{\lambda} y^2\right). \tag{6}$$

This objective function can be motivated by a second-order approximation to the household's preferences. In such a case, $\bar{\lambda}$ is a function of the structural parameters and is given by $\bar{\lambda} = \frac{\kappa}{\theta}$.[9]

Monetary policy is delegated to a central bank. The value for the central bank is given by

$$V_t^{CB} = u^{CB}(\pi_t, y_t) + \beta E_t V_{t+1}^{CB}, \tag{7}$$

where the central bank's contemporaneous utility function, $u^{CB}(\cdot, \cdot)$, is given by

$$u^{CB}(\pi, y) = -\frac{1}{2}\left(\pi^2 + \lambda y^2\right). \tag{8}$$

Proposition 4. *Suppose that p_L and p_H are sufficiently low so that $p_L \leq p_L^*(\Theta_{(-p_L)})$ and $p_H \leq p_H^*(\Theta_{(-p_H)})$ for all λ in $[0, \bar{\lambda}]$. Then, welfare is maximized at $\lambda = 0$.*

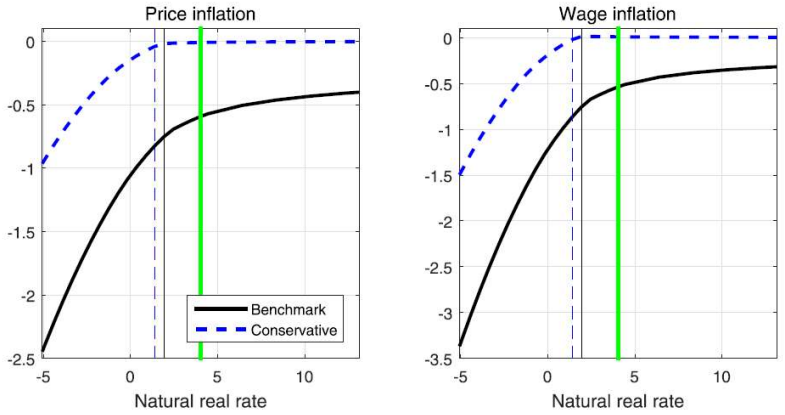

Fig. 2. Equilibrium responses to the natural real rate.

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  - Nakata (2015): Credibility of Optimal Forward Guidance at the Interest Rate Lower Bound
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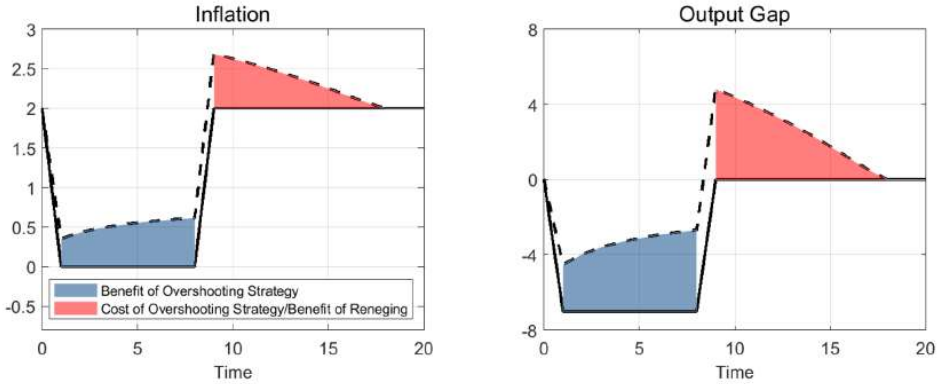
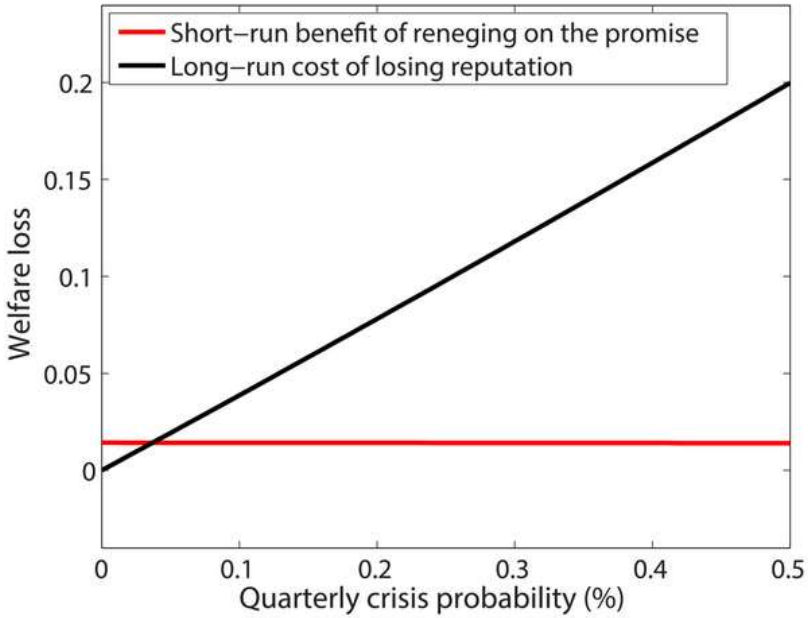
Figure 1: Illustration of Time Inconsistency



Note: The solid black line is the optimal policy without the ability to commit to future policy actions; the dashed black line is the optimal policy with the ability to commit to future policy actions.
Source: Authors' calculation.

Figure 2. Costs and Benefits of Reneging on the Promise



理論研究の今後

- これからのゼロ金利制約に関する理論研究
  - 長期国債
  - 金融政策の枠組み
    - 金融システムの安定と政策金利、金融・財政政策の枠組み
  - デフレ均衡（恒常的なゼロ金利環境）

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- 長期国債・イールドカーブ
  - Chung et al. (2018): Monetary Policy Options at the Effective Lower Bound: Assessing the Federal Reserve's Current Policy Toolkit
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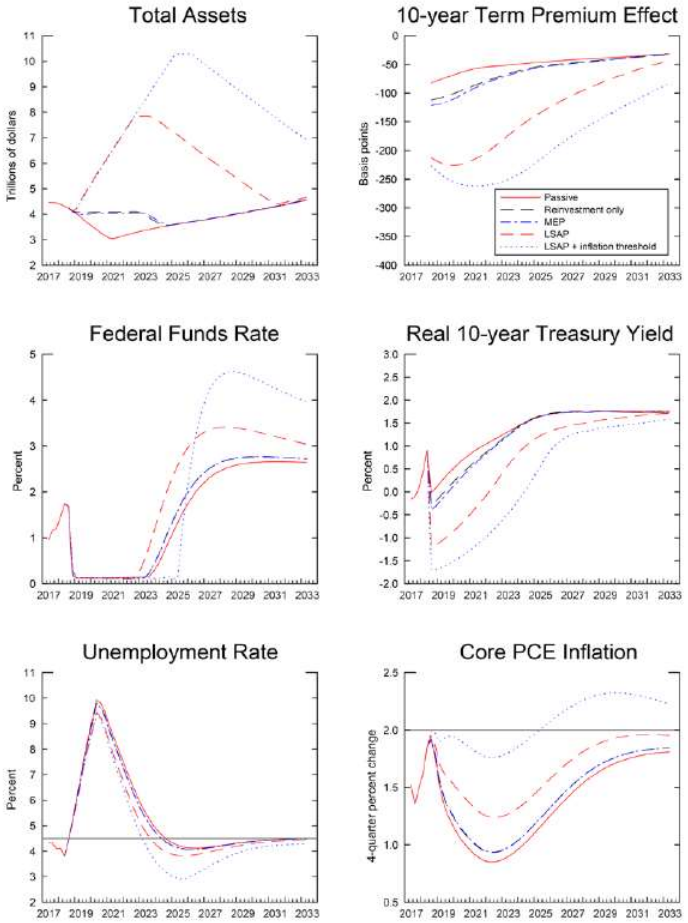
  - Nakata and Tanaka (2016): Equilibrium Yield Curves and the Interest Rate Lower Bound
    - https://www.federalreserve.gov/econres/feds/equilibrium-yield-curves-and-the-interest-rate-lower-bound.htm
  - 引用
    - Richard Clarida (February 2019, 2020)

Figure 5: Balance sheet policies in a recession scenario



Sources: Authors' calculations.

Notes: The results are obtained by solving the FRB/US and balance sheet models jointly so that, for each balance sheet policy, the macroeconomic outcomes, balance sheet holdings, and term premium effects are mutually consistent. The results are conditioned on the assumption that price and wage setters, as well as financial market participants, have perfect foresight of the recession scenario and balance sheet policies. The "LSAP + inflation threshold" policy maintains policy rates at the ELB and continues asset purchases until inflation reaches 2 percent.

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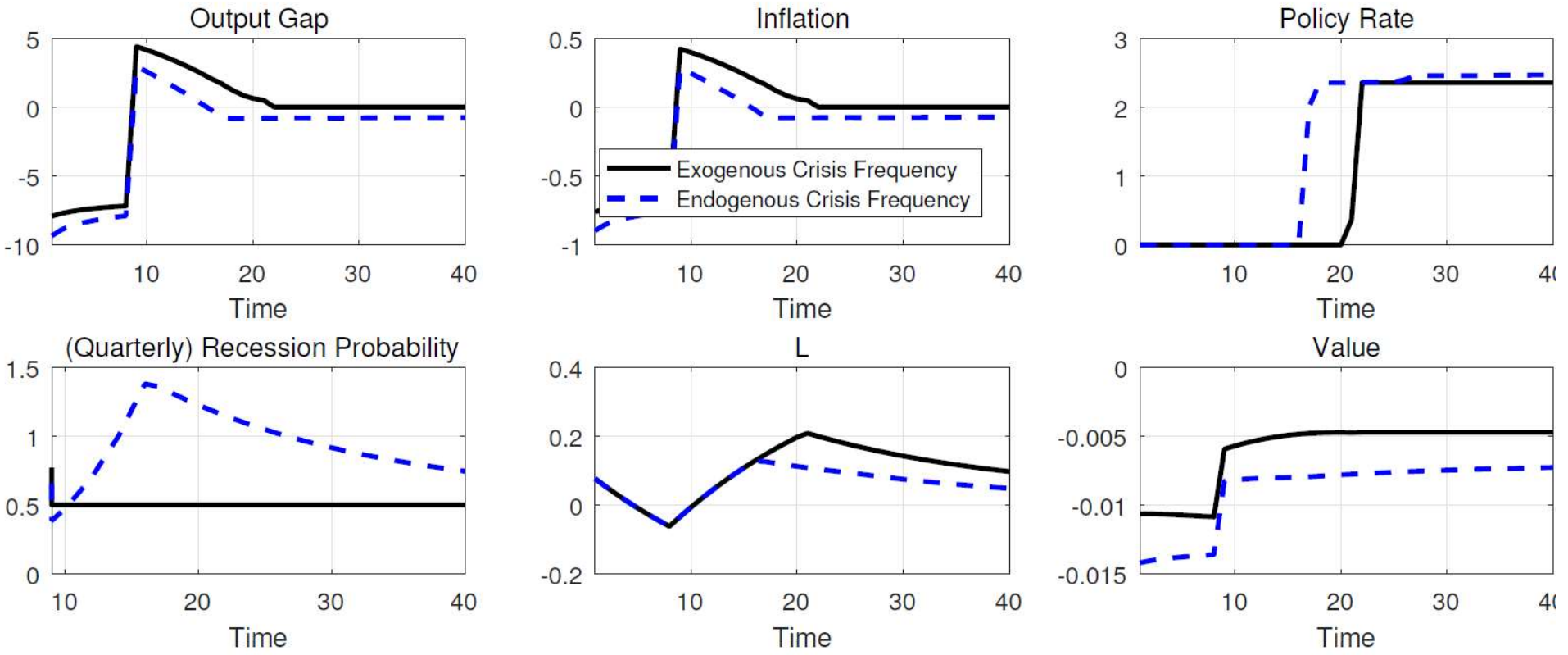
Output Gap
Time
Inflation
Exogenous Crisis Frequency
Endogenous Crisis Frequency
Time
Policy Rate
Time
(Quarterly) Recession Probability
Time
L
Time
Value
Time

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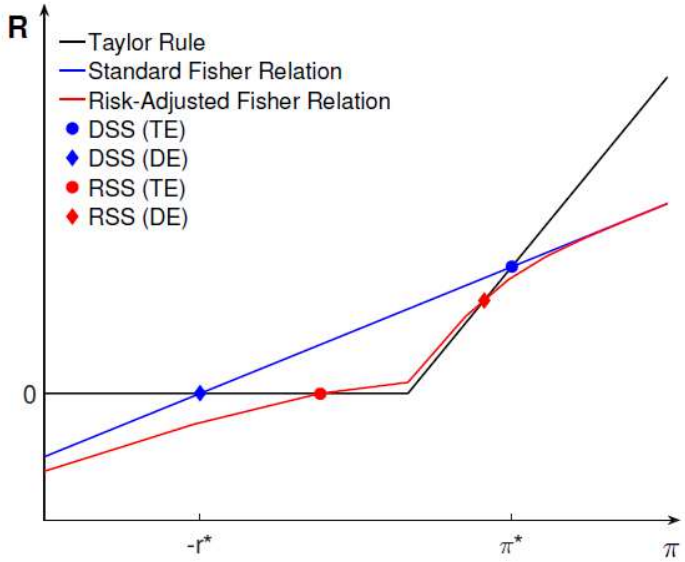
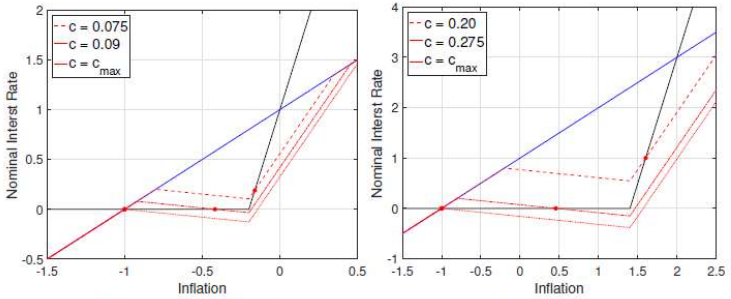
  - Coyle, Nakata and Schmidt (work-in-progress): Deflationary Equilibrium under Uncertainty

Figure 1: Standard and Risk-Adjusted Fisher Relation



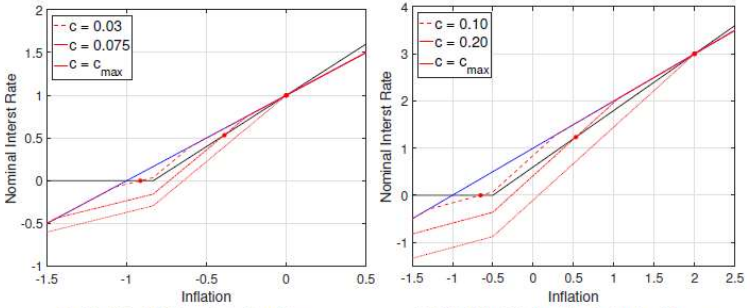
*Note: RSS stands for "deterministic steady state," RSS stands for "risky steady state," TE stands for "target equilibrium," and DE stands for "deflationary equilibrium." π^* is the inflation target.

Figure 4: Risky Steady States: $\phi_\pi \in (\overline{\phi}_\pi, \infty)$



(a) Model with Zero Inflation Target (b) Model with Positive Inflation Target

Figure 3: Risky Steady States: $\phi_\pi \in (1, \underline{\phi}_\pi)$



(a) Model with Zero Inflation Target (b) Model with Positive Inflation Target