Economics 435
The Financial System
(12/2-7/2021)

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UW Madison
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Rev 12/3/2021 slides 10,12
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Outline

- The New Monetary Framework
- Overview of Monetary Policy Channels
- CC-LM Model
- Financial Accelerator

The New Monetary Policy Strategy

Components/Implications

- From full employment to maximum employment
- From inflation target to (quasi-) price level target (aka “Flexible Average Inflation Target” or “FAIT”
- Implies generally looser monetary policy in pre-Covid context

From Full Employment to Maximum Employment

The maximum level of employment is a broad-based and inclusive goal that is not directly measurable and changes over time owing largely determined by nonmonetary factors that affect the structure and dynamics of the labor market.

https://www.federalreserve.gov/monetarypolicy/guide-to-changes-in-statement-on-longer-run-goals-monetary-policy-strategy.htm

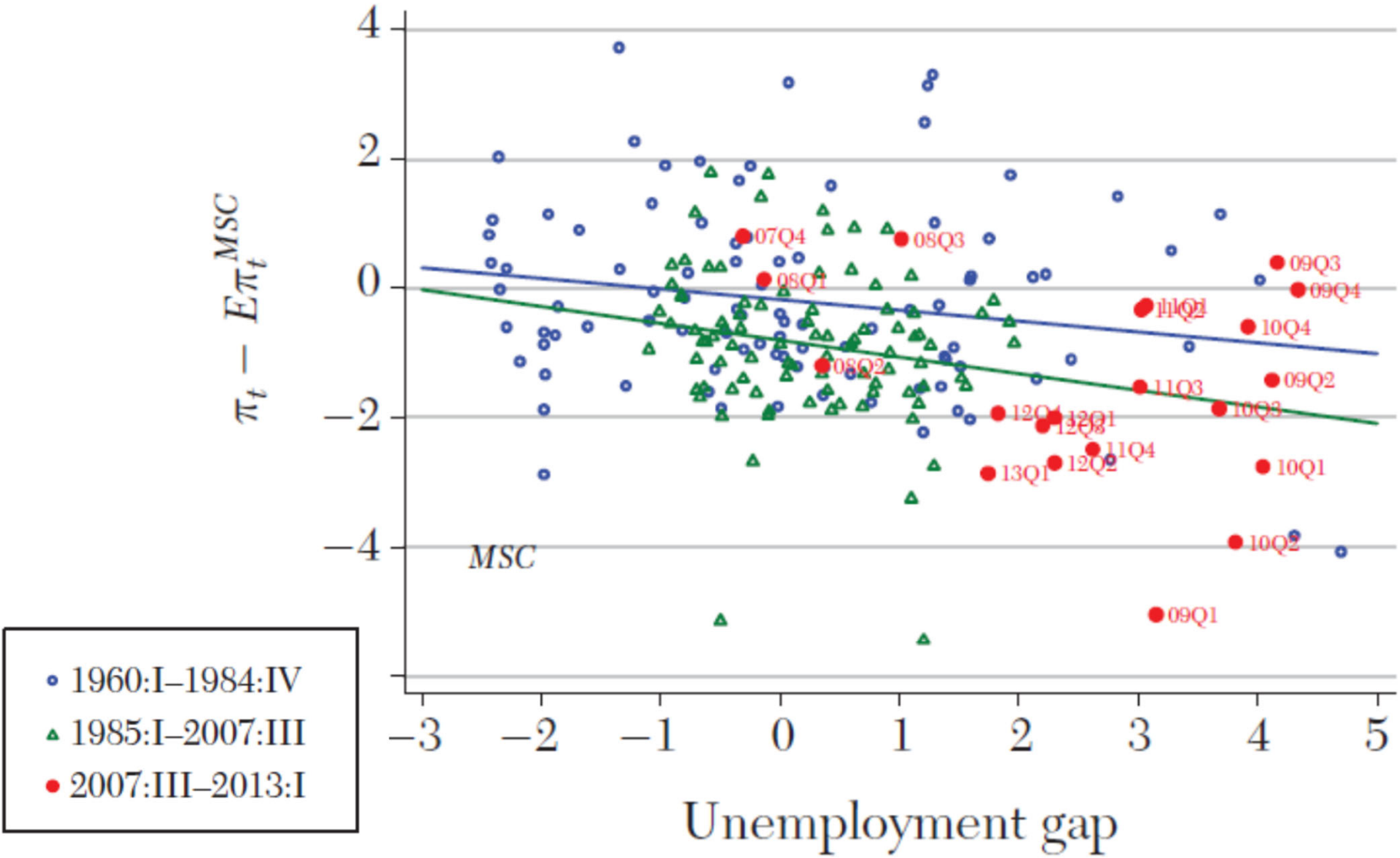
Rationale

- The natural rate of unemployment is imprecisely estimated
- The Phillips curve is apparently very flat

$$(1) \qquad \pi_t = \beta E_t \pi_{t+1} + \kappa X_t + shock_t$$

where π_t is the rate of inflation at time t, $E_t \pi_{t+1}$ is the mathematical (FIRE) expectation of inflation at time $t+1$ given information available at time t, β is the discount factor, X_t is the output gap (more generally, a measure of slack in the economy), κ measures the slope of the Phillips curve and is a function of structural parameters, and $shock_t$ is a "cost-push" shock.[13] Note that this for-

Panel C. Phillips curve with household inflation expectations



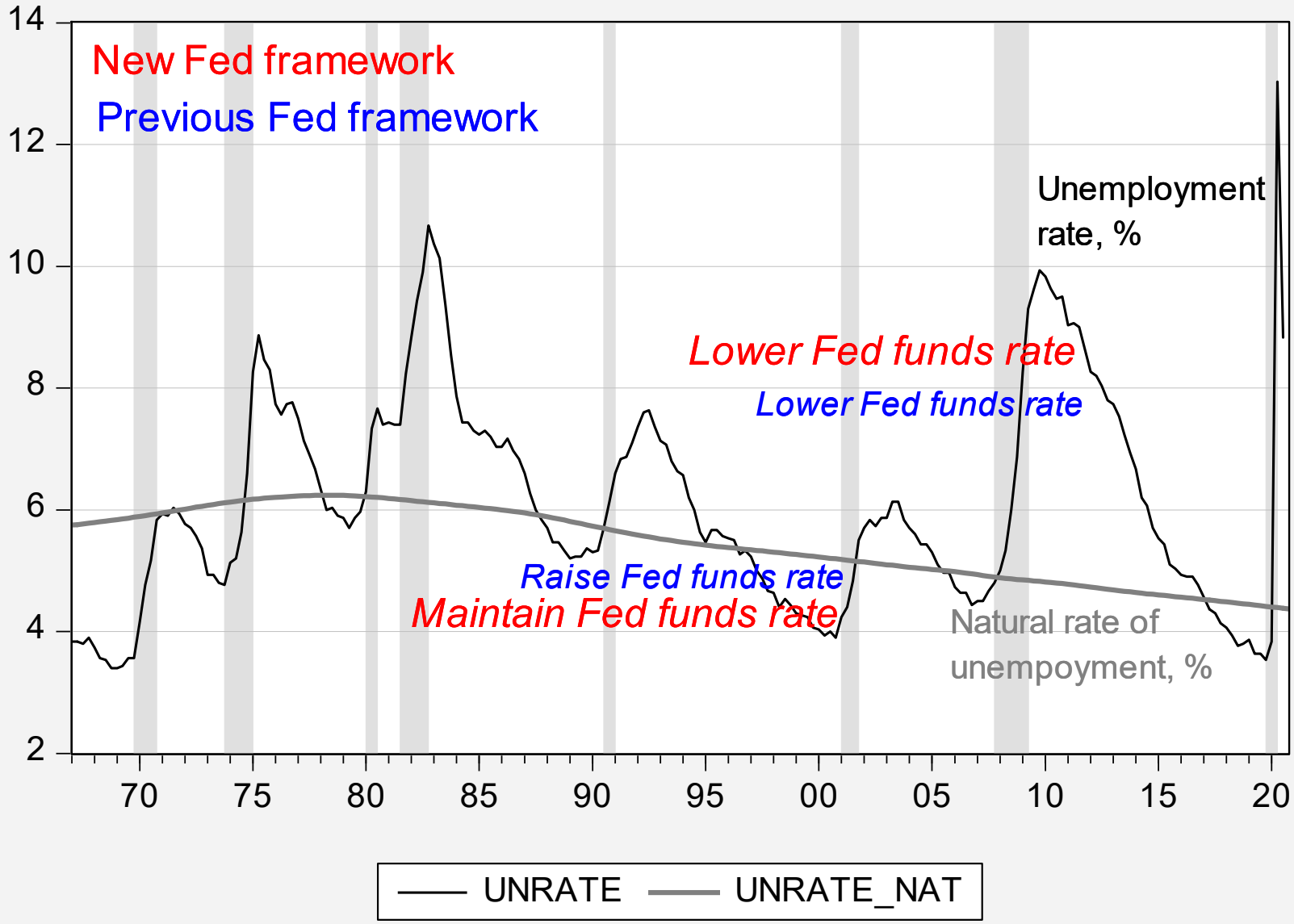
https://www.ssc.wisc.edu/~mchinn/Coibion_jel.20171300.pdf

Policy Implications

- Look at shortfalls from natural rate
- Asymmetric response
- If unemployment exceeds natural rate, lower the policy rate
- If unemployment is less than the natural rate, don’t raise policy rate

https://www.brookings.edu/blog/up-front/2020/08/28/a-more-inclusive-employment-mandate/

Implied Policy Action

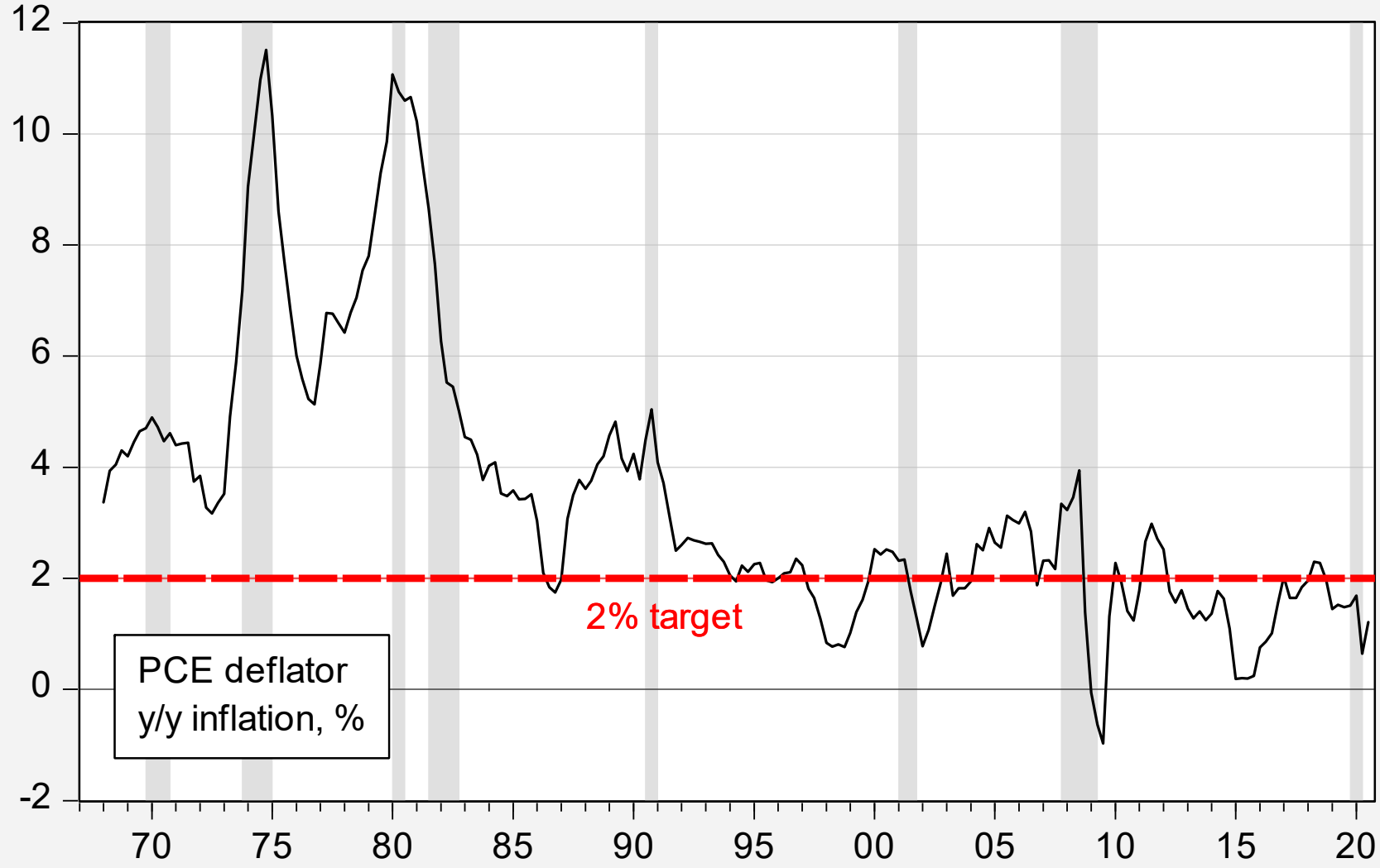


From Inflation Targeting to (Quasi-) Price Level Targeting

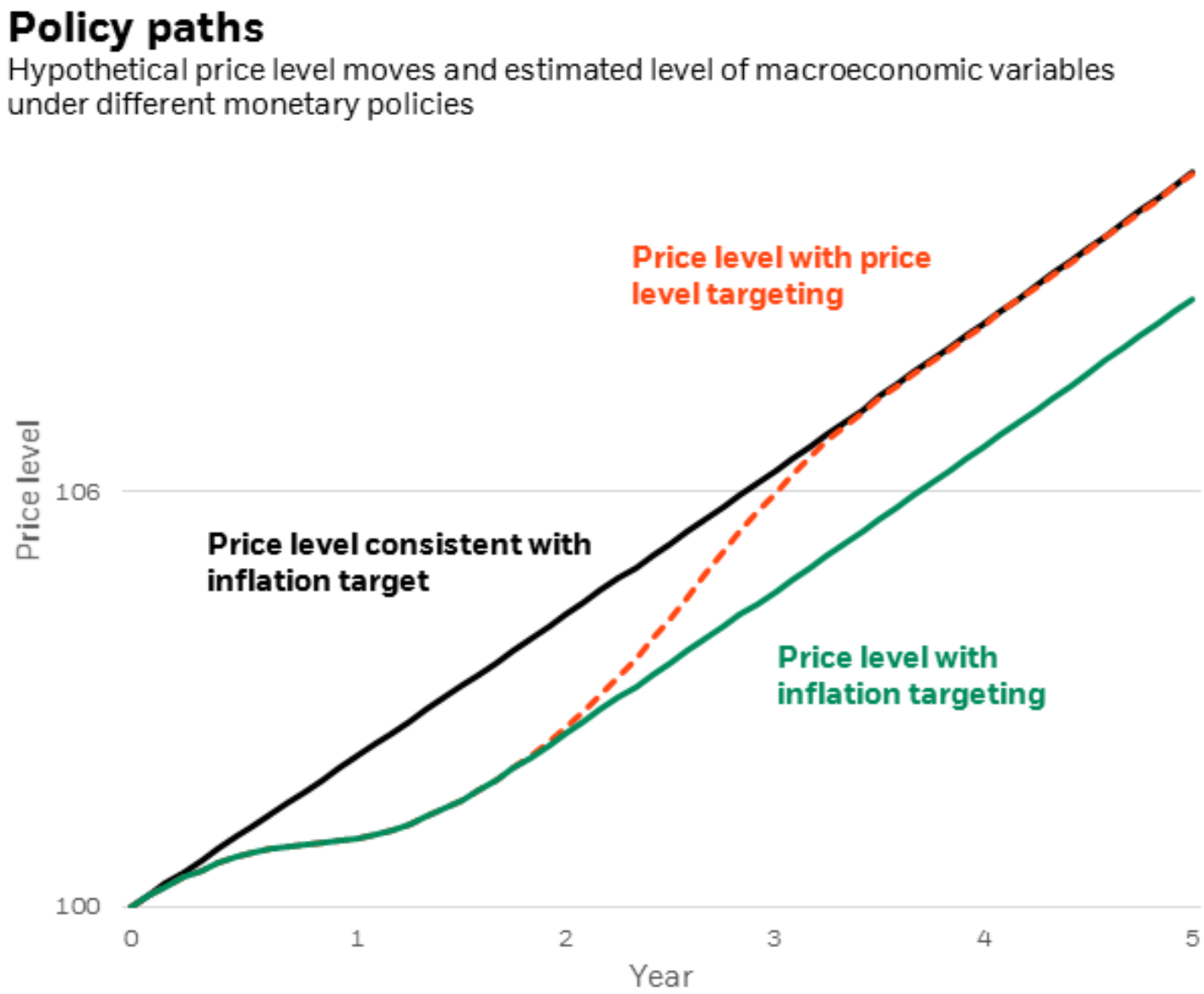
"In order to anchor longer-term inflation expectations at this level, the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time."

https://www.federalreserve.gov/monetarypolicy/guide-to-changes-in-statement-on-longer-run-goals-monetary-policy-strategy.htm

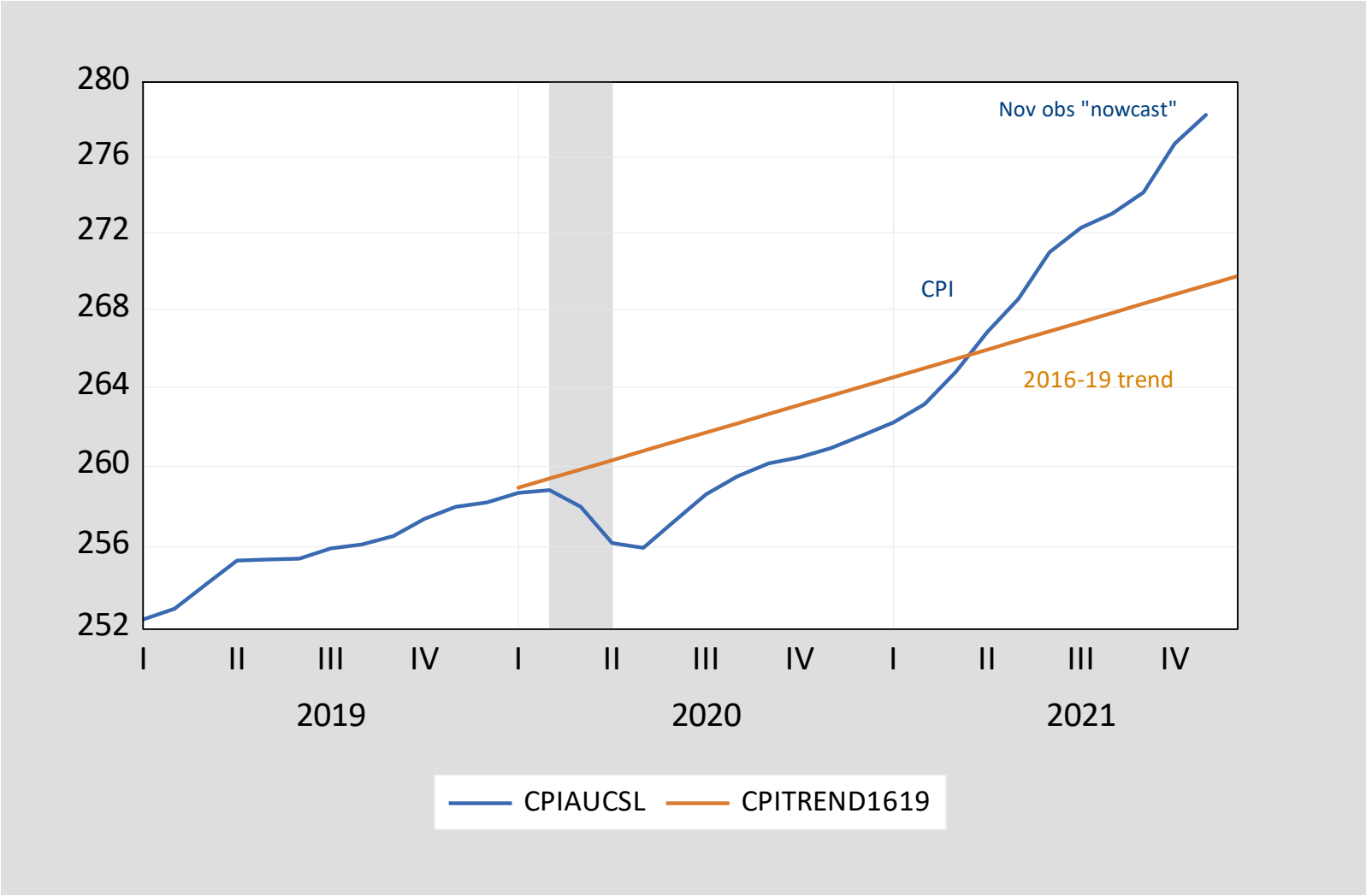
The Inflation Record



Graph: “Flexible Average Inflation Target” (FAIT)



Current Situation



Undershooting trend price level implies overshooting for some time– but we've overshot too much now to be consistent with FAIT

Policy Implications

- Inflation target shortfalls will not be "forgotten"
- Undershooting inflation target implies subsequent overshooting
- Give US has been undershooting inflation target for years, implies looser monetary policy in near future
- Had the old framework been in place, monetary policy would have been tighter

Overview of Monetary Policy Channels

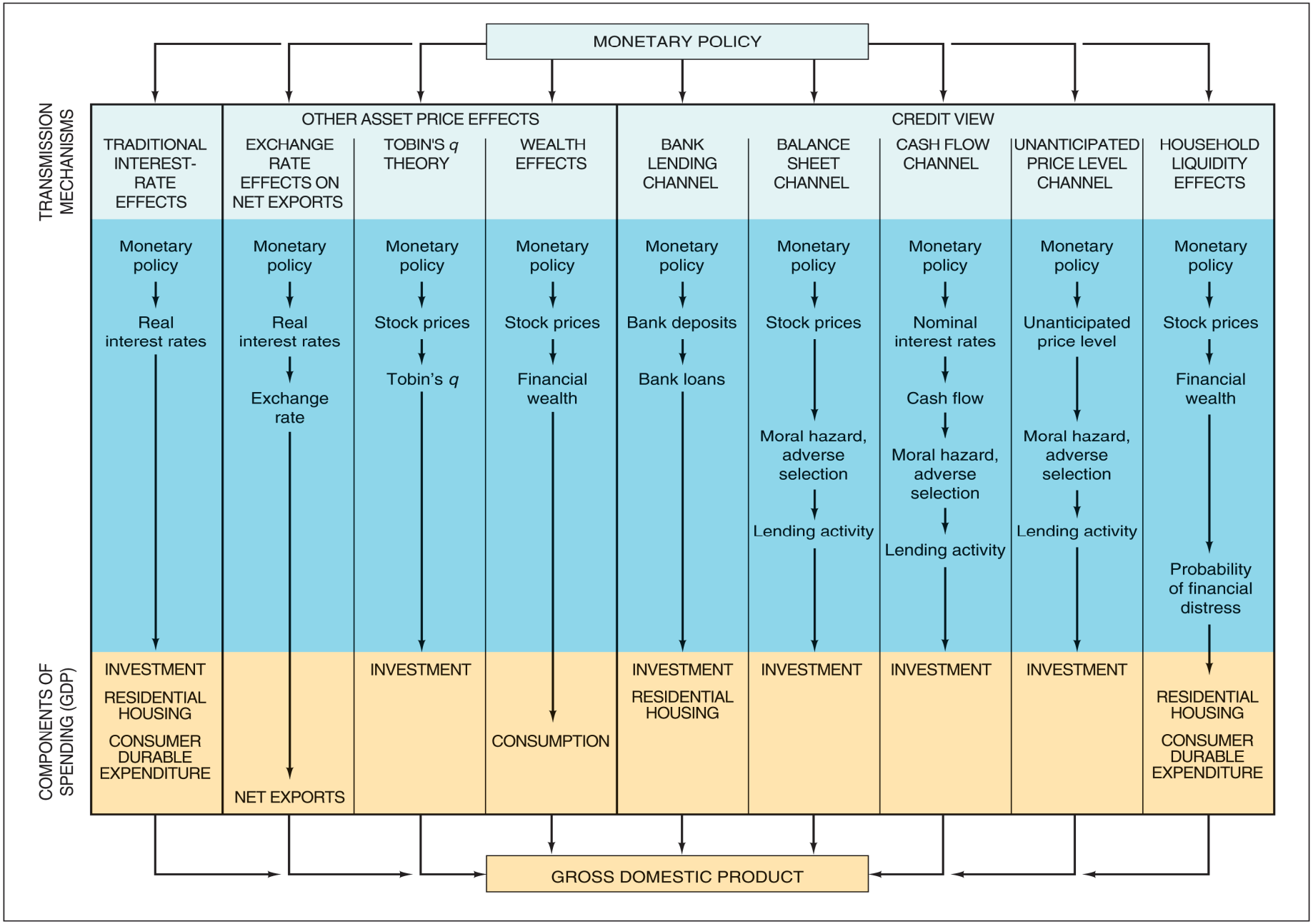


FIGURE 3 **The Link Between Monetary Policy and GDP: Monetary Transmission Mechanisms**

CC-LM Model

CC-LM (Bernanke-Blinder)

Bank lending channel; imbeds a banking sector into an IS-LM model. (1) Loan mkt; (2) Money mkt; (3) IS curve.

$$L(\rho, i, y) = \lambda(\rho, i) D(1 - \tau). \tag{1}$$

$$D(\underset{-}{i}, \underset{+}{y}) = m(\underset{+}{i}) R. \tag{2}$$

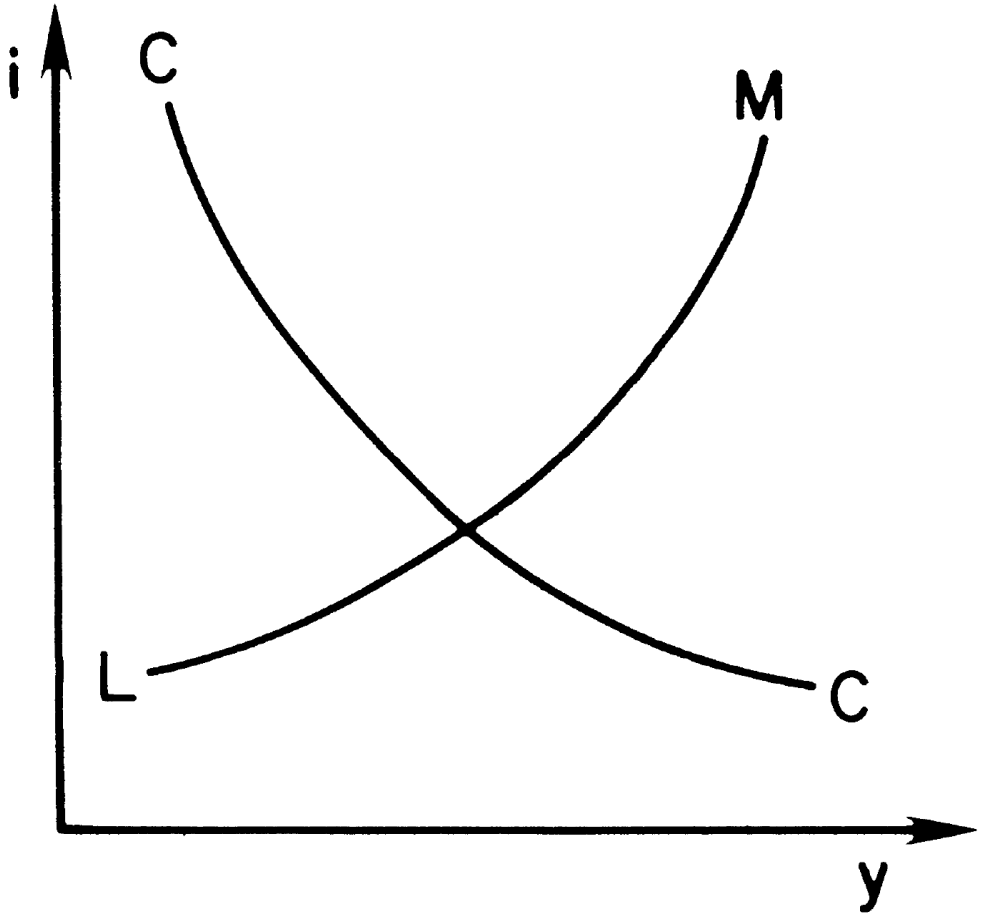
$$y = Y(\underset{-}{i}, \underset{-}{\rho}). \tag{3}$$

CC-LM

Solved for rho using loan mkt, and LM to get (4). Substitute (4) into (3) to get (5), the CC curve, which is a combined commodities and credit curve.

$$\rho = \phi\left(\underset{+}{i}, \underset{+}{y}, \underset{-}{R}\right). \tag{4}$$

$$y = Y\left(i, \phi\left(i, y, R\right)\right), \tag{5}$$



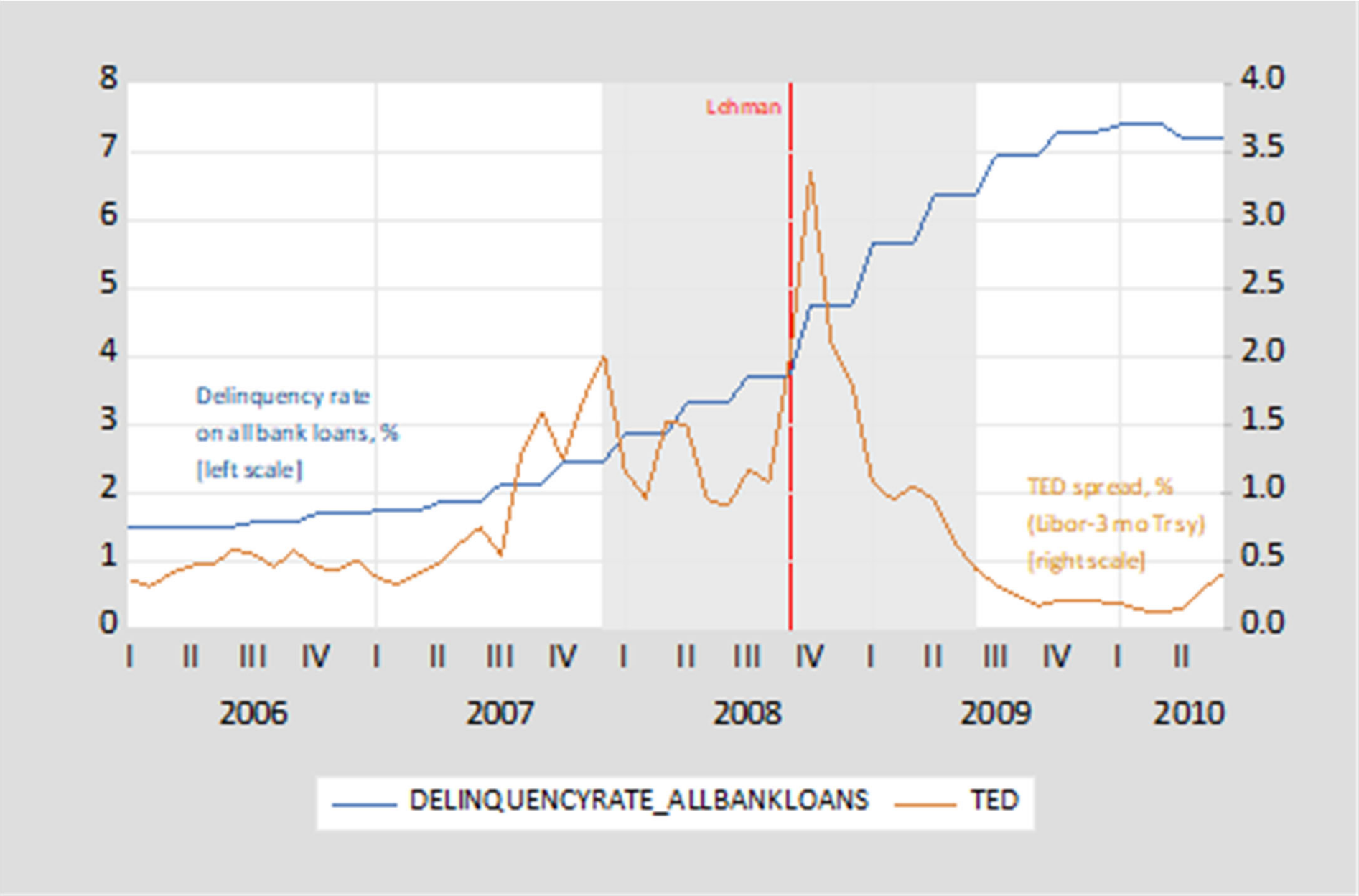
CC-LM Comparative Statics

TABLE 1—EFFECTS OF SHOCKS ON OBSERVABLE VARIABLES

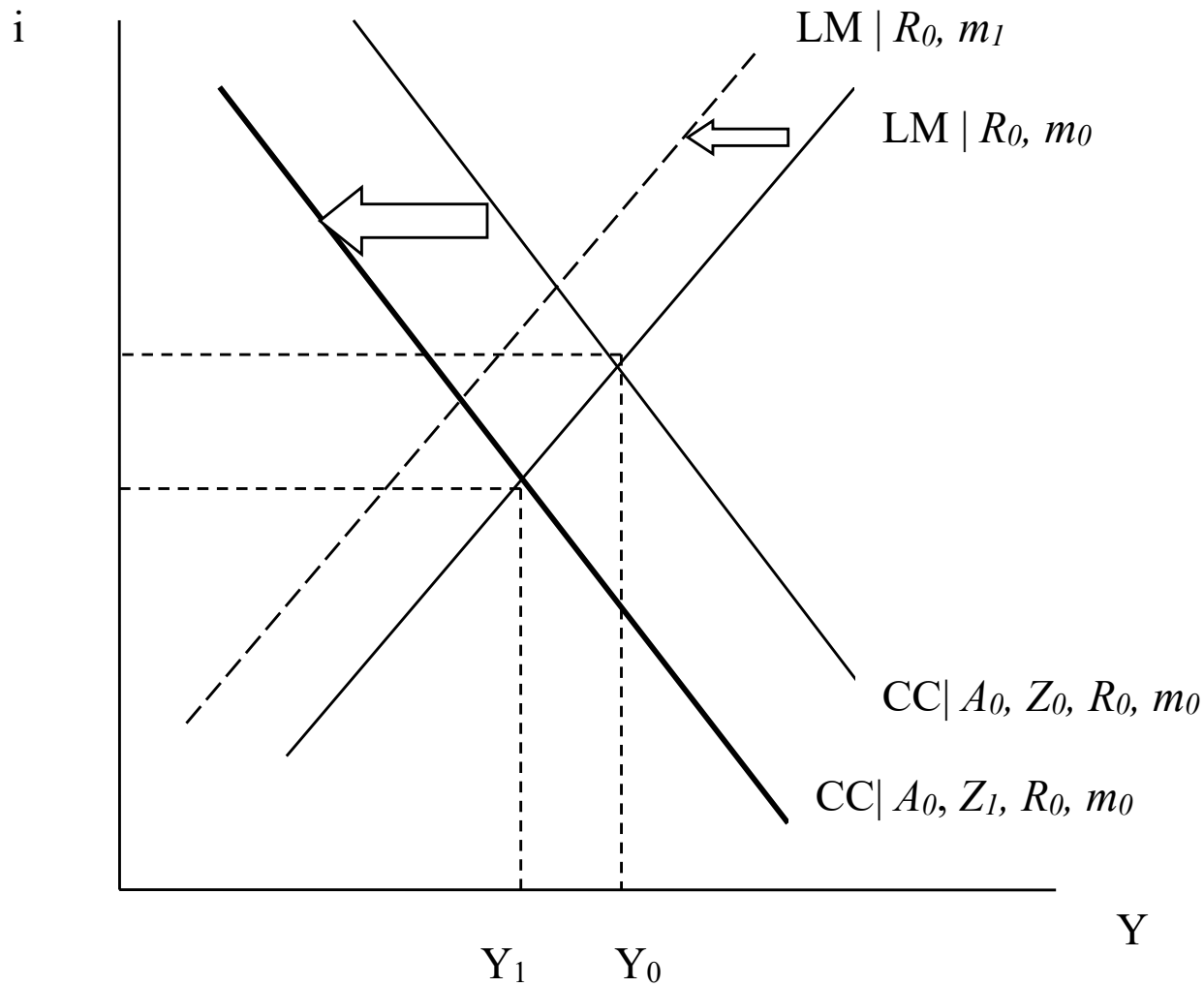
Rise in:	(1) Income	(2) Money	(3) Credit	(4) Interest Rate[a]
Bank Reserves	+	+	+	−
Money Demand	−	+	−	+
Credit Supply	+	+	+	+
Credit Demand	−	−	+	−
Commodity Demand	+	+	+	+

[a] On bonds.

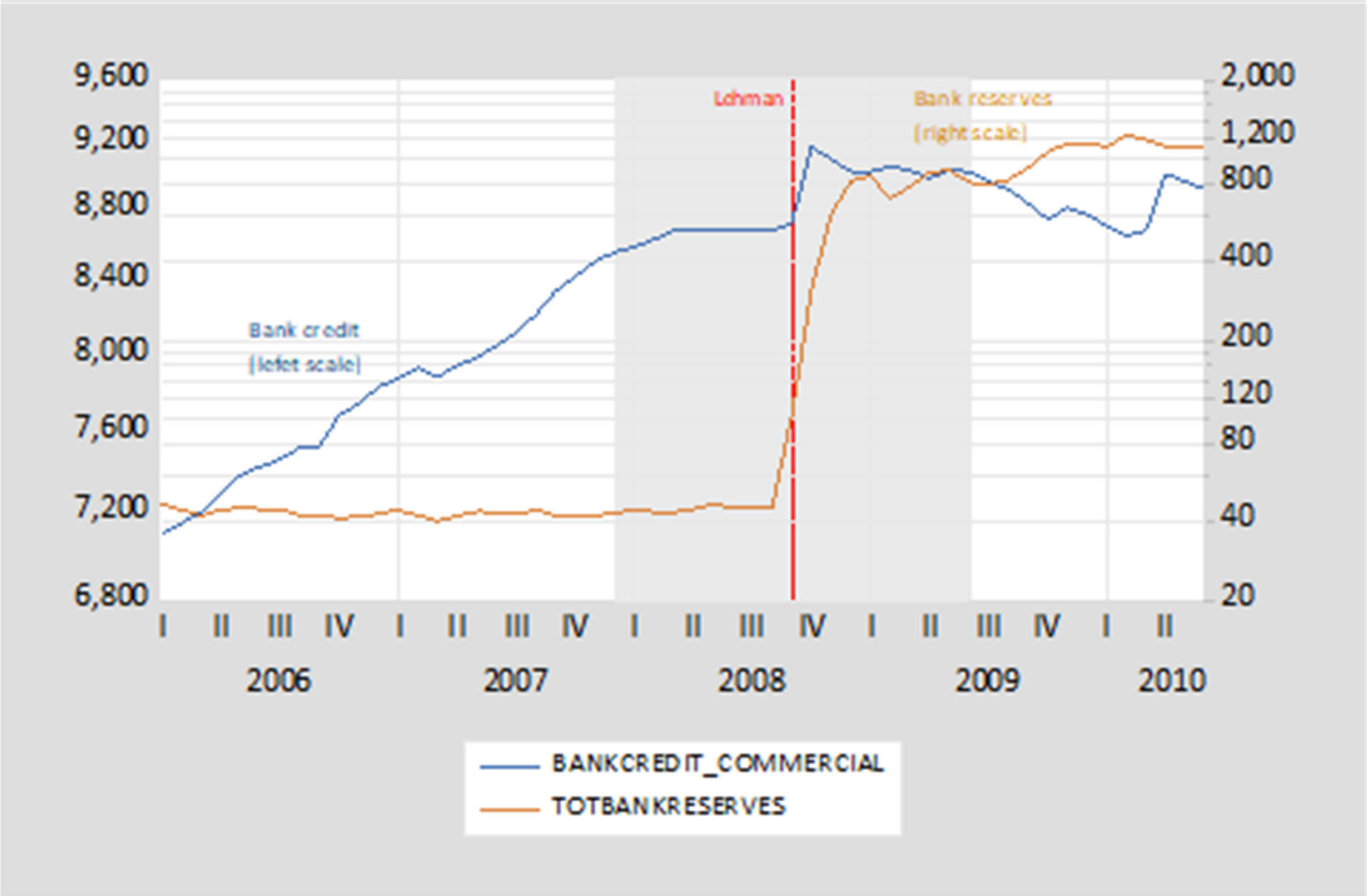
Case Study: Banks in Distress, 2006-10



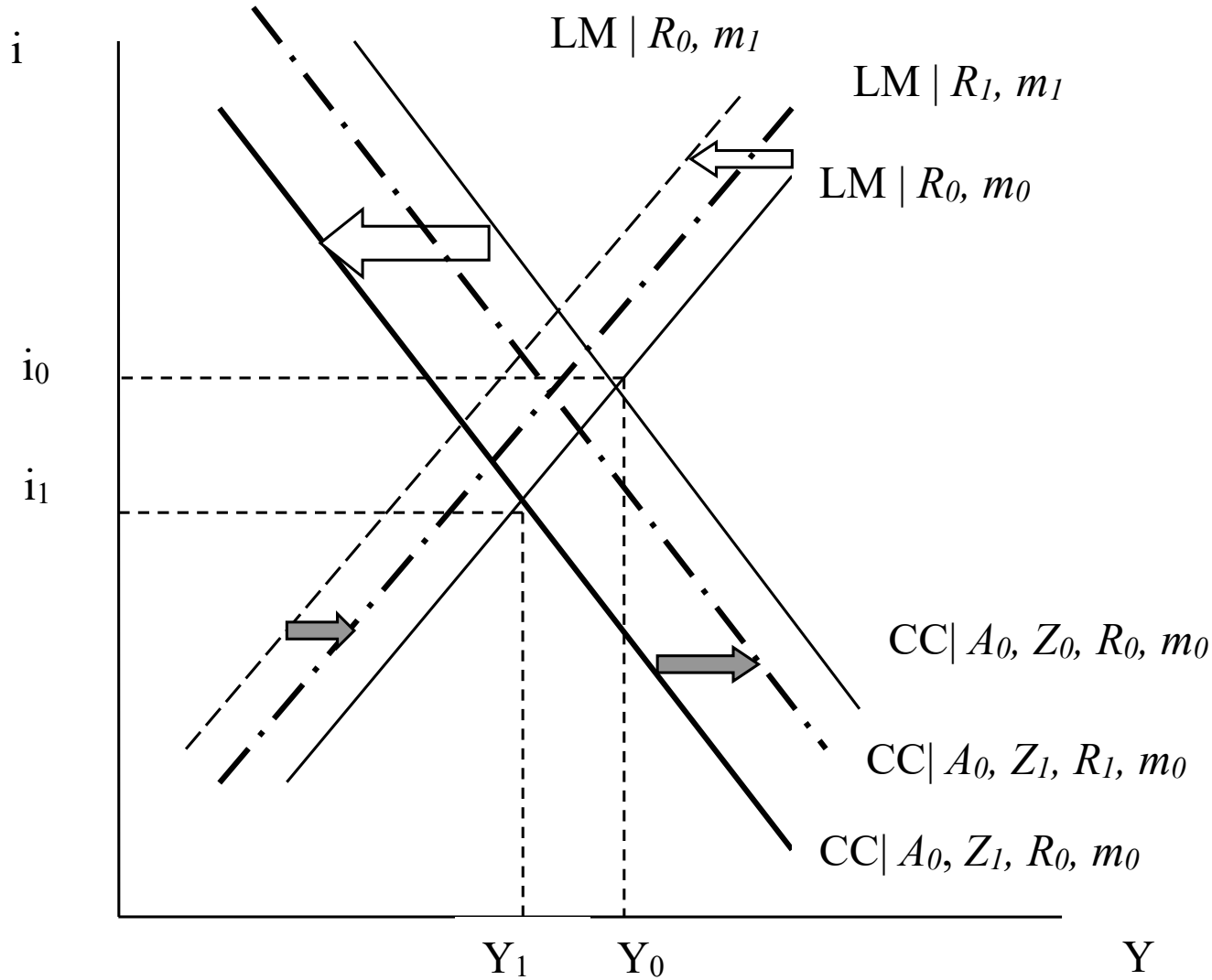
Interpretation: Housing & Banks



Lending and Bank Reserves: 2006-10



Interpretation: Fed Response



The Financial Accelerator

Financial Accelerator

(Bernanke-Gertler-Gilchrist, 1996)

First, external finance is more expensive than internal finance, unless the external finance is fully collateralized. The higher cost of external finance reflects the agency cost of lending (the inevitable deadweight loss that arises because of asymmetric information).

Second, given the total amount of finance required, the premium on external finance varies inversely with the borrower's net worth, which we define as the sum of his internal funds (liquid assets) and the collateral value of his illiquid assets.

Finally, a fall in the borrower's net worth, by raising the premium on external finance and increasing the amount of external finance required, reduces the borrower's spending and production. This last result is the heart of the financial accelerator: To the extent that negative shocks to the economy reduce the net worth of borrowers (or positive shocks increase net worth), the spending and production effects of the initial shock will be amplified.

Collateral Constraints: Recession induced decline in capital value

Pre-Shock Firm Balance Sheet

Assets	Liabilities
Capital (1 million machines × $1000/machine = $1 billion)	Debt ($700 million)
	Equity ($300 million)

Net worth = $300 million

Post-Shock Firm Balance Sheet

Assets	Liabilities
Capital (1 million machines × $800/machine = $1 billion)	Debt ($700 million)
	Equity ($100 million)

Price of machines falls by 20%
Net worth = $100 million

Financial Accelerator

- Two periods, 0, 1
- Two factors, K (fixed) x_1 (variable)
- At end of period 1, can sell fixed factor at q_1 ; x_1 price = 1 and depreciates fully
- Begins period 0 w/ cash flow $a_0 f(x_0)$ and debt obligation $r_0 b_0$ (r_0 is gross interest rate)
- Output in period 1 is $a_1 f(x_1)$

Financial Accelerator

New borrowing and variable inputs linked:

$$x_1 = a_0 f(x_0) + b_1 - r_0 b_0. \tag{1}$$

Suppose difficult to seize output (difficult to observe) but easy to seize fixed factor. Then fixed factor can serve as collateral:

$$b_1 \leq (q_1 / r_1) K. \tag{2}$$

Financial Accelerator

- Unsecured lending is not feasible in this environment.
- Means there is a "collateral in advance" constraint.

$$x_1 \leq a_0 f(x_0) + (q_1/r_1)K - r_0 b_0. \tag{3}$$

Spending on the variable input cannot exceed the entrepreneur's net worth, equal to the sum of gross cash flow $a_0 f(x_0)$ and net discounted assets, $(q_1/r_1)K - r_0 b_0$. If the entrepreneur's net worth is less than the unconstrained optimal value of x_1, which satisfies $a_1 f'(x_1) = r_1$, then the constraint (3) binds.

Financial Accelerator

- When (3) binds, $a_1 f'(x_1) > r_1$ (marginal value of dollar inside firm exceeds dollar outside firm)
- Fall in net worth raises agency premium $a_1 f'(x_1) - r_1$, also reduces borrower's spending.
- Net worth declines (and spending falls) if:

  - cash flow, $a_0 f(x_0)$, falls

  - asset price, q_1, falls

  - initial debt obligations, b_0, rises

Financial Accelerator

V. Conclusion

The theory underlying the financial accelerator suggests that (1) borrowers facing relatively high agency costs in credit markets will bear the brunt of economic downturns (the flight to quality); and that (2) reduced spending, production, and investment by high-agency-cost borrowers will exacerbate the effects of recessionary shocks. As our paper has discussed, we now have fairly strong evidence—at least for the case of firms—that downturns differentially affect both the access to credit and the real economic activity of high-agency-cost borrowers. It would be useful to investigate these cross-sectional implications for other sectors, notably the household and banking sectors. Quantification of the importance of the financial accelerator in macroeconomic dynamics is an equally important topic for future research.

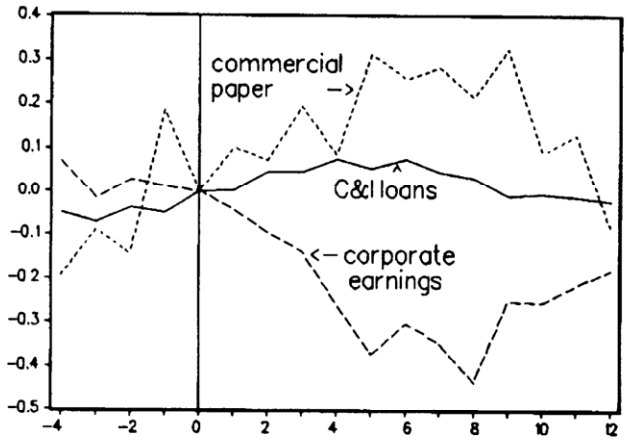
Flight to Quality

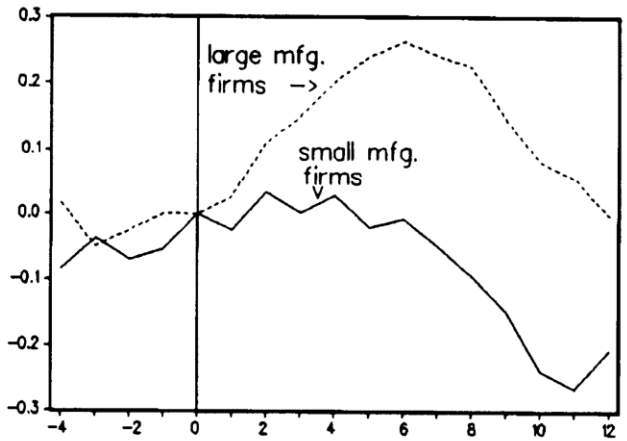
FIGURE 1.—BEHAVIOR OF SHORT-TERM DEBT AGGREGATES AND CORPORATE EARNINGS AROUND ROMER EPISODES OF TIGHT MONEY

Commercial Paper, C&I Loans, and Corporate Earnings

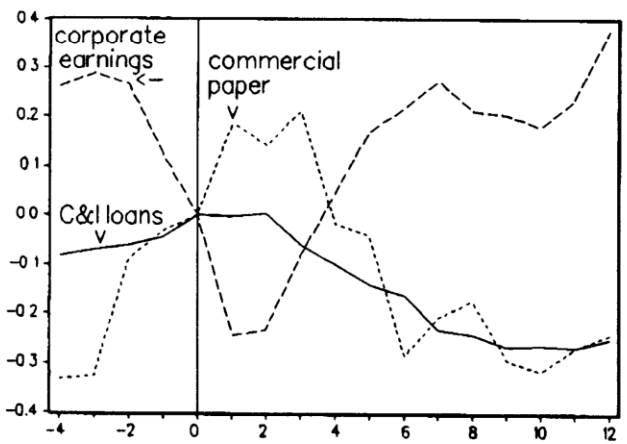
Short-Term Debt of Manufacturing Firms

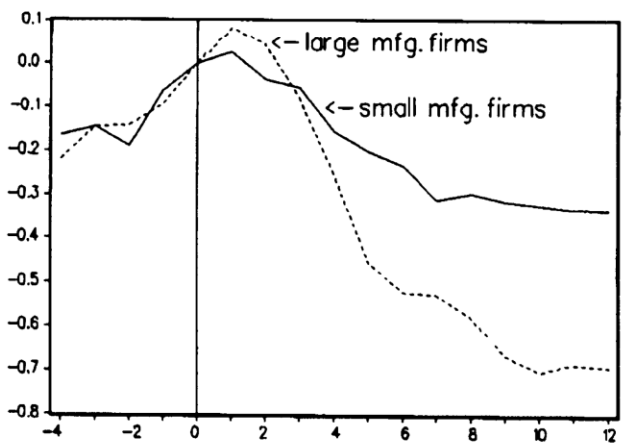
1968:4



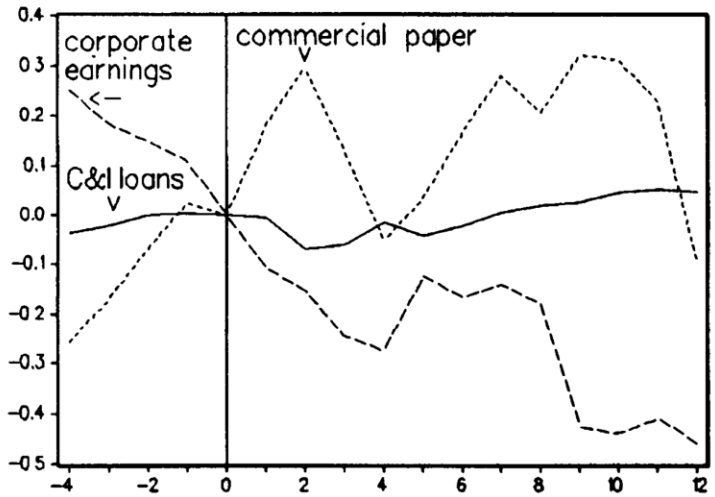


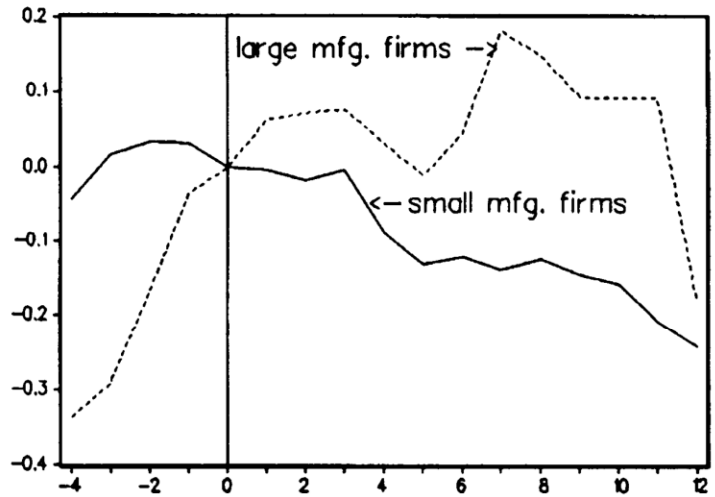
1974:2



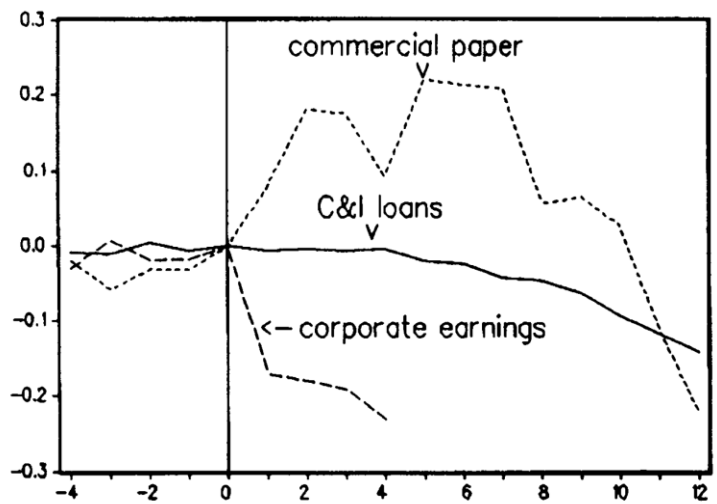


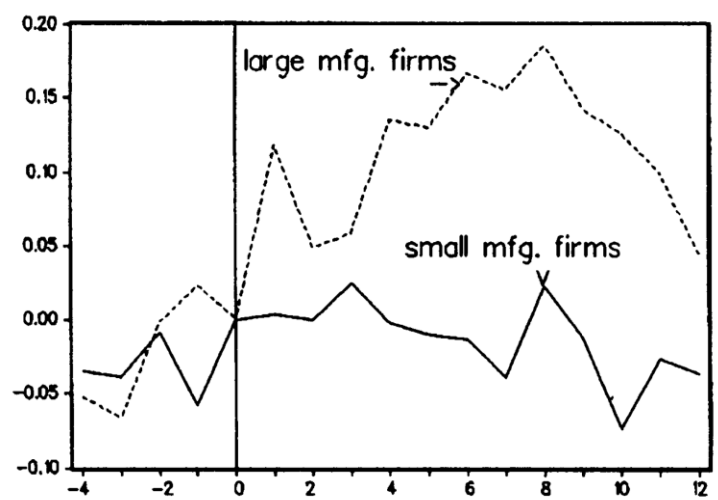
1979:4





1988:4





Source: Bernanke, Gertler and Gilchrist (*REStat*, 1996)