The Tradeoffs in Leaning Against the Wind

François Gourio[1] Anil K Kashyap[2] Jae Sim[3]

[1]The Federal Reserve Bank of Chicago
[2]Booth School of Business, the Bank of England
[3]The Board of Governors of the Federal Reserve System

IMF Annual Research Conference

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The views herein do not reflect those of:

- the Board of Governors of the Federal Reserve System,
- the Federal Reserve Bank of Chicago,
- the Bank of England.

Motivation

- Two uncontroversial observations
  - Financial crises have large, persistent effects on GDP
  - Excess credit creation sometimes precedes crises
- Conventional view: deal with this using time-varying macroprudential policy
- But what if there are no good macroprudential options?

Motivation cont'd

- Absent macroprudential options, should monetary policy respond to credit developments?
- Many say no because:
  - Responding to inflation is sufficient (Bernanke and Gertler 1999)
  - The effect of monetary policy on crisis risk is small (Svensson 2016)
  - IMF staff study (2015) concludes the costs of doing so outweigh the benefits

Outline

1. Model description
2. Comparison of alternative policy rules
3. When is leaning against the wind attractive?
4. Conclusions

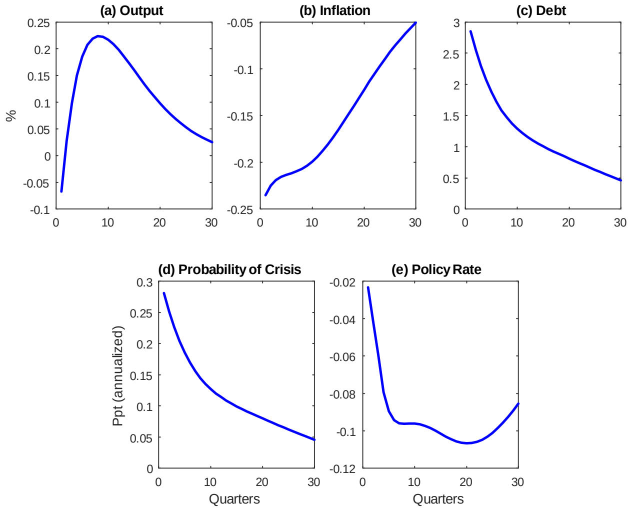
Model Properties

Small New Keynesian DSGE model with standard demand and productivity shocks, plus three twists:

1. Tradeoff theory of capital structure
   - Induces a bias towards debt financing: "excess credit"
2. Inefficient financial shocks that lead to excessive credit fluctuations
   - Modeled as a shock to the tax benefit of debt
3. Financial crises that entail permanent output losses
   - Reduced form approach tying crises to excess credit
   - $\log(p_t) = b_0 + b_1 * \log(\hat{b}_t)$ where $\hat{b}_t$ = excess credit relative to flexible price without financial shocks
   - Baseline crisis probability is 2 percent per year

Financial Shock

- $R_t = 0.85 R_{t-1} + 0.15[R^* + 1.5(\pi_t - \pi^*) + 1.0 \log(\hat{y}_t)]$



Monetary Policy Shock

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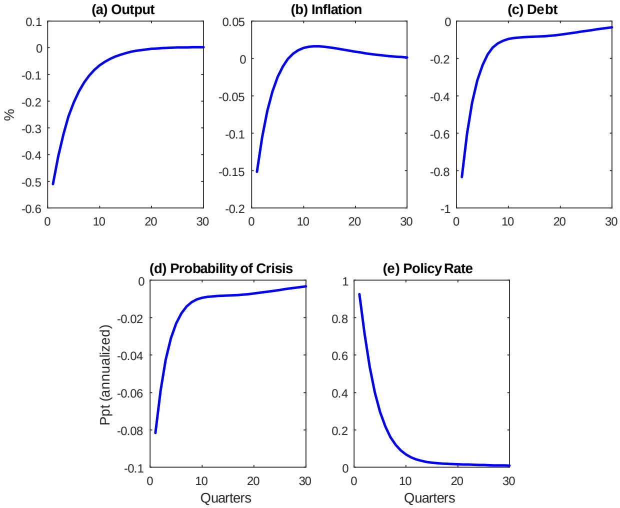


Optimal Simple Rules

We consider rules of the forms:

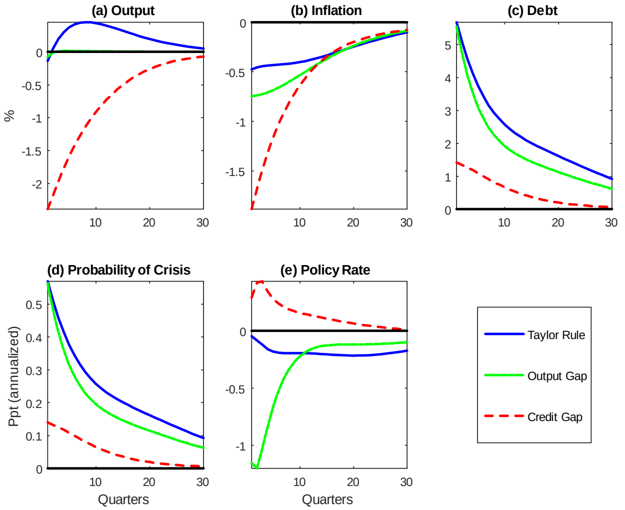
- $R_t = 0.85R_{t-1} + 0.15[R^* + 1.5(\pi_t - \pi^*) + \phi_y \log(\hat{y}_t) + \phi_b \log(\hat{b}_t)]$ where

$\hat{y}_t$: output gap
$\hat{b}_t$: "credit gap" (that affects prob fin crisis)

- We optimize over ϕ_y or ϕ_b (or both) to maximize welfare

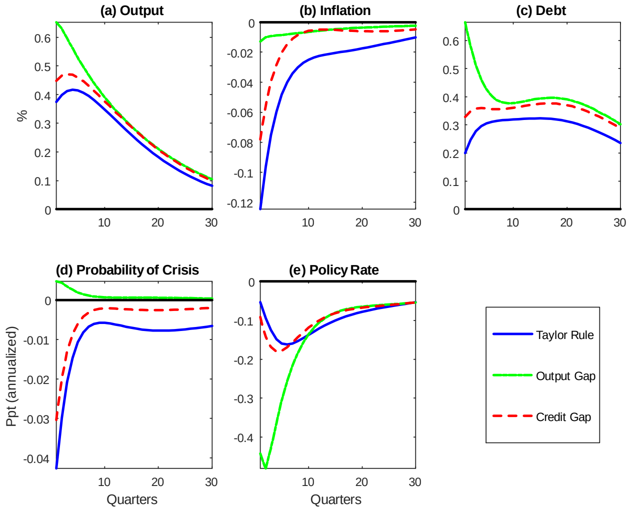
IRFs to Financial Shock

Taylor99 vs Optimized OG vs Optimized LAW



IRFs to Technology Shock

Taylor99 vs Optimized OG vs Optimized LAW



Comparing Optimal Simple Rules

Table: Benchmark Model

	Output gap only	Credit gap only	Both gaps
Welfare gain (CE %)	–	0.065	0.081
Coefficient ϕ_y	100	–	100
Coefficient ϕ_b	–	1.88	83.37
$100\times$SD(Π)	0.30	0.51	0.48
$100\times$SD(Y)	1.71	2.84	2.52
$400\times$E(crisis prob)	2.08	2.02	2.02
$400\times$SD(crisis prob)	0.61	0.22	0.26

- The credit gap rule delivers slightly higher welfare. Here we report consumption equivalent differences.

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- Gains from the credit gap rule come despite higher volatility of inflation and output

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- Gains from the credit gap rule are due to lower crisis risk and less volatility in the crisis risk

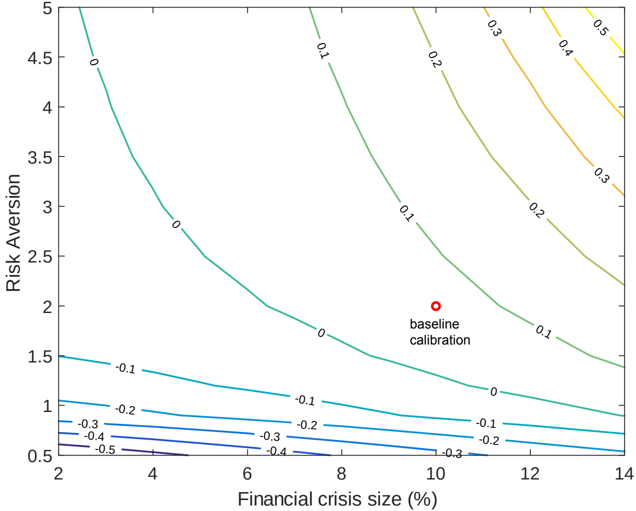
What drives the result?

- Without credit shocks, stabilizing output gap is optimal:
  - offset the demand shock completely
  - accommodate the technology shock
  - "Divine coincidence" of Blanchard and Gali (2007)
  - and also consistent with Bernanke-Gertler (1999)
- With credit shocks, stabilizing output gap still better than credit gap if financial crises are exogenous.
  - Little benefit to offsetting credit shocks, focus on inflation and output
- Credit shocks + endogenous financial crises are critical for result.

What matters for these results?

- Clearly parameter-dependent:
  - size of output lost in a financial crisis (benchmark: 10%)
  - risk aversion (benchmark: 2)
  - variance of inefficient credit shocks (benchmark: 20% of output variance)
  - sensitivity of crisis to the credit gap
- Note model supposes:
  - small effect of MP on the probability of a financial crisis
  - long-run neutrality of monetary policy

Effects of Risk Aversion and Crisis Size



Volatility of Credit Shocks

Table: Effect of Standard Deviation of Financial Shocks on Optimal Policy

SD. of financial shocks (relative to benchmark)	33%	66%	100% (benchmark)	133%	166%
Optimal coeff. on credit ϕ_b	96.1	2.96	1.88	1.55	1.41
Cons. equivalent (%)	0.002	0.022	0.065	0.126	0.207
SD(Y) under LAW	1.97	2.38	2.85	3.34	3.87
SD(π) under LAW	0.19	0.36	0.51	0.65	0.81
Mean(crisis prob): LAW	2.00	2.00	2.02	2.04	2.08
SD(crisis prob): LAW	0.7	0.13	0.22	0.31	0.40

- The relative performance of the credit gap rule grows as inefficient credit shocks become more volatile
- Tradeoff is always between fewer crises and less volatility in crisis risk versus more volatility in inflation and output.

Effect of Mismeasurement

Table: Optimal Policy Rules with Mismeasured Gaps

	Output gap only	Credit gap only	Both gaps
Cons. equivalent (%)	0	0.124	0.124
Coefficient ϕ_y	100	0	0.02
Coefficient ϕ_b	0	1.59	1.61
$100\times$SD(Π)	0.39	0.53	0.53
$100\times$SD(Y)	0.00	2.41	2.40
$400\times$E(crisis prob)	2.09	2.01	2.01
$400\times$SD(crisis prob)	0.70	0.34	0.34

- LAW does even better when the output and credit gaps are both imperfectly measured

Conclusion

- LAW is more likely to be advantageous when
  - Crises are endogenous
  - Inefficient credit fluctuations are more important
  - Losses in crises are bigger
  - Risk aversion is higher
  - Output and credit gaps are poorly measured
- Warning: Many of these conditions are hard to estimate
- When LAW is welfare improving it trades off crisis prevention against more volatile inflation and output in normal times

IRFs to Demand Shock

Alternative Rules

- $R_t = 0.85R_{t-1} + 0.15[R^* + 1.5(\pi_t - \pi^*) + \phi_y \log(\hat{y}_t) + \phi_b \log(\hat{b}_t)]$