The Interaction Between Monetary and Macroprudential Policies

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Range of views on monetary-macropru interaction

- Svensson (2015): ‘*Little or no support for leaning against the wind for financial stability purposes*’

- Stein (2013): only ‘*monetary policy gets in all the cracks*’

- Shin (2015): ‘*both monetary policy and macroprudential policies have some effect in constraining credit growth and the two tend to be complements*’

- I’ll talk you through some results from a model I’ve developed with BoE colleagues (Aikman et al. 2017)

Basic model (extends Ajello et al. (2016))

$$y_1 = E_1{}^{ps} y_2 - \sigma(i_1 - E_1{}^{ps}\pi_2 + \omega s_1) + \epsilon_1{}^{y}$$ IS curve

$$\pi_1 = E_1{}^{ps}\pi_2 + \kappa y_1 + \nu s_1 + \epsilon_1{}^{\pi}$$ Phillips curve

$$\Delta Credit_1 = \varphi_0 + \varphi_i i_1 + \varphi_s s_1 + \epsilon_1{}^{B}$$ Real credit growth

$$s_1 = \psi CCyB_1 + \epsilon_1{}^{s}$$ Credit spread

$$\gamma_1 = f(\Delta Credit_1, CCyB_1)$$ Crisis probability

$$y_2 = \begin{cases} y_{2,nc} & \text{with probability } 1 - \gamma_1 \\ y_{2,c} & \text{with probability } \gamma_1 \end{cases}$$ Period 2 outcomes

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Resilience: Crisis prob depends on credit growth and CCyB

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CCyB and monetary policy both reduce build-up in credit

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IS curve

$$\pi_1 = E_1{}^{ps}\pi_2 + \kappa y_1 + \nu s_1 + \epsilon_1{}^{\pi}$$

Phillips curve

Credit spread affects both demand and potential output

$$\Delta Credit_1 = \varphi_0 + \varphi_i i_1 + \varphi_s s_1 + \epsilon_1{}^{B}$$

Real credit growth

$$s_1 = \psi CCyB_1 + \epsilon_1{}^{s}$$

Credit spread

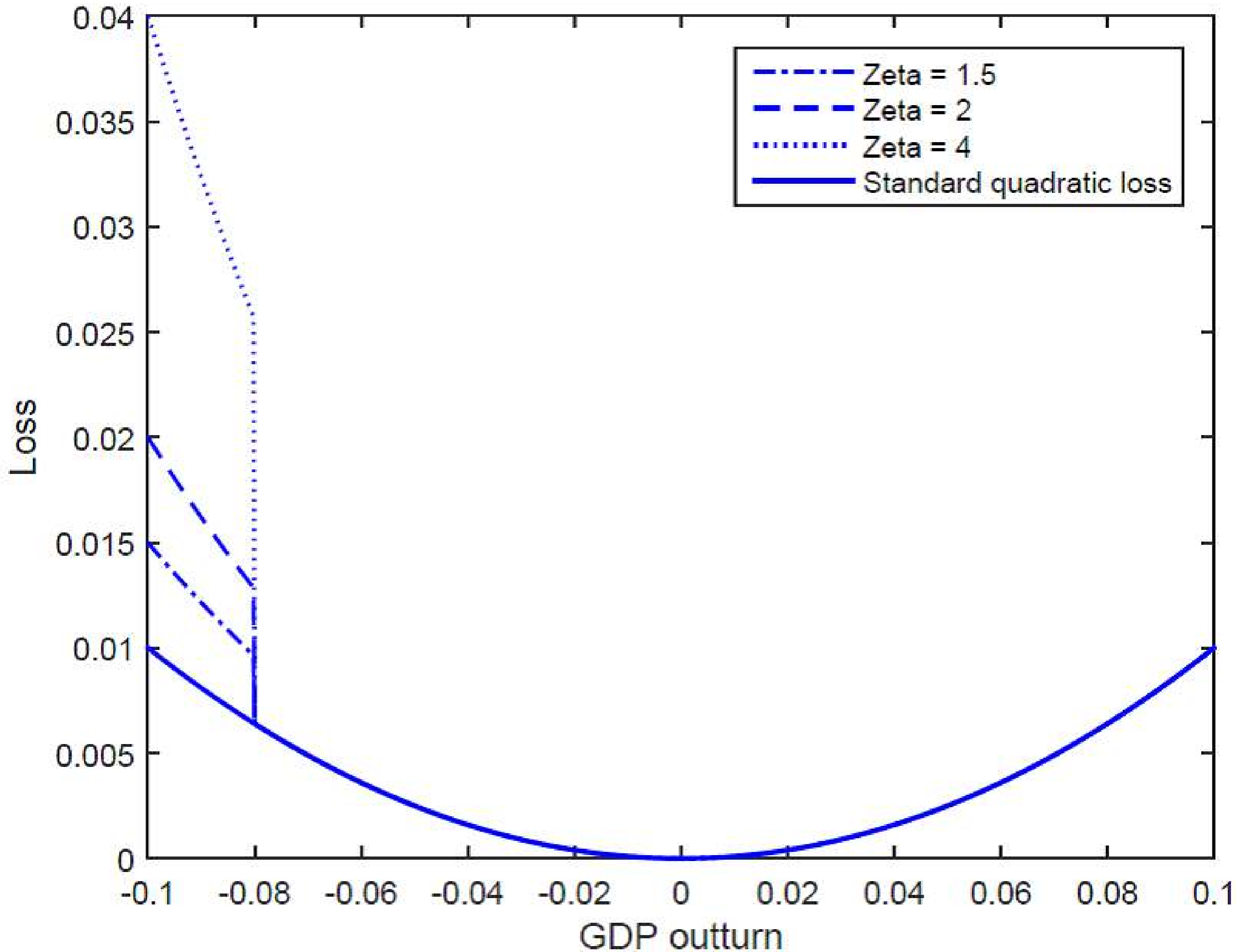
$$\gamma_1 = f(\Delta Credit_1, CCyB_1)$$

Crisis probability

$$y_2 = \begin{cases} y_{2,nc} & \text{with probability } 1 - \gamma_1 \\ y_{2,c} & \text{with probability } \gamma_1 \end{cases}$$

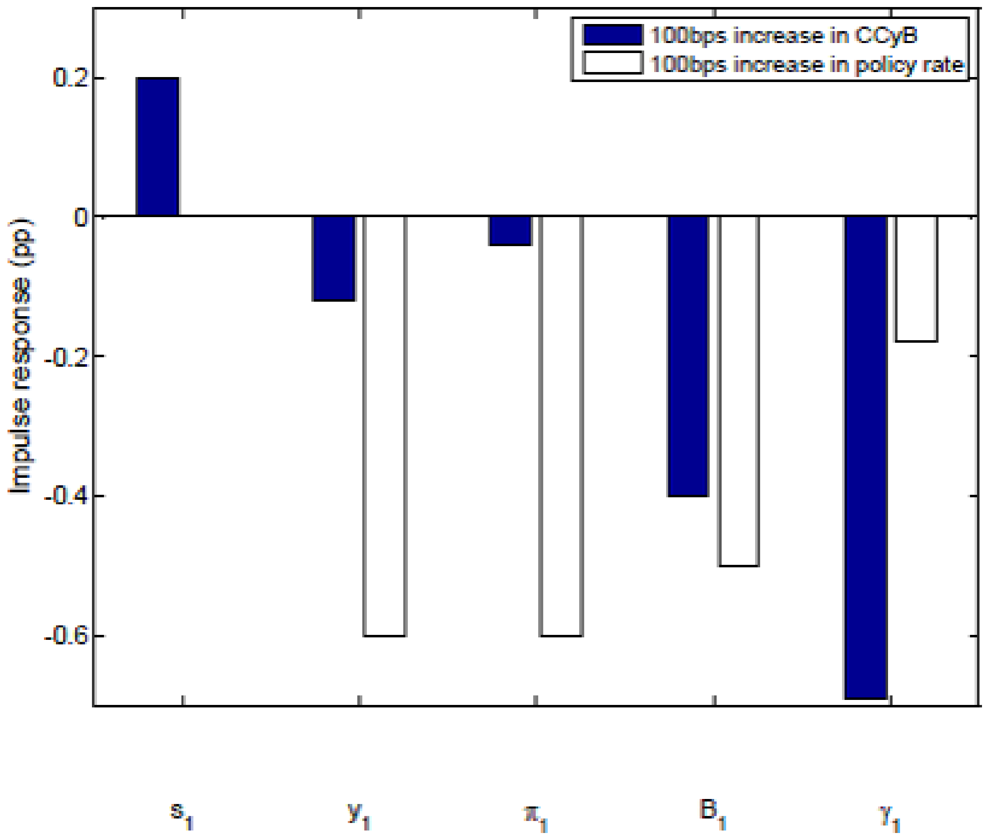
Period 2 outcomes

Policy objectives – beyond quadratic loss



Model calibration – match evidence on monetary policy and CCyB transmission mechanism

Figure 1: *Impacts of 100 basis point increases in the CCyB and monetary policy rate*

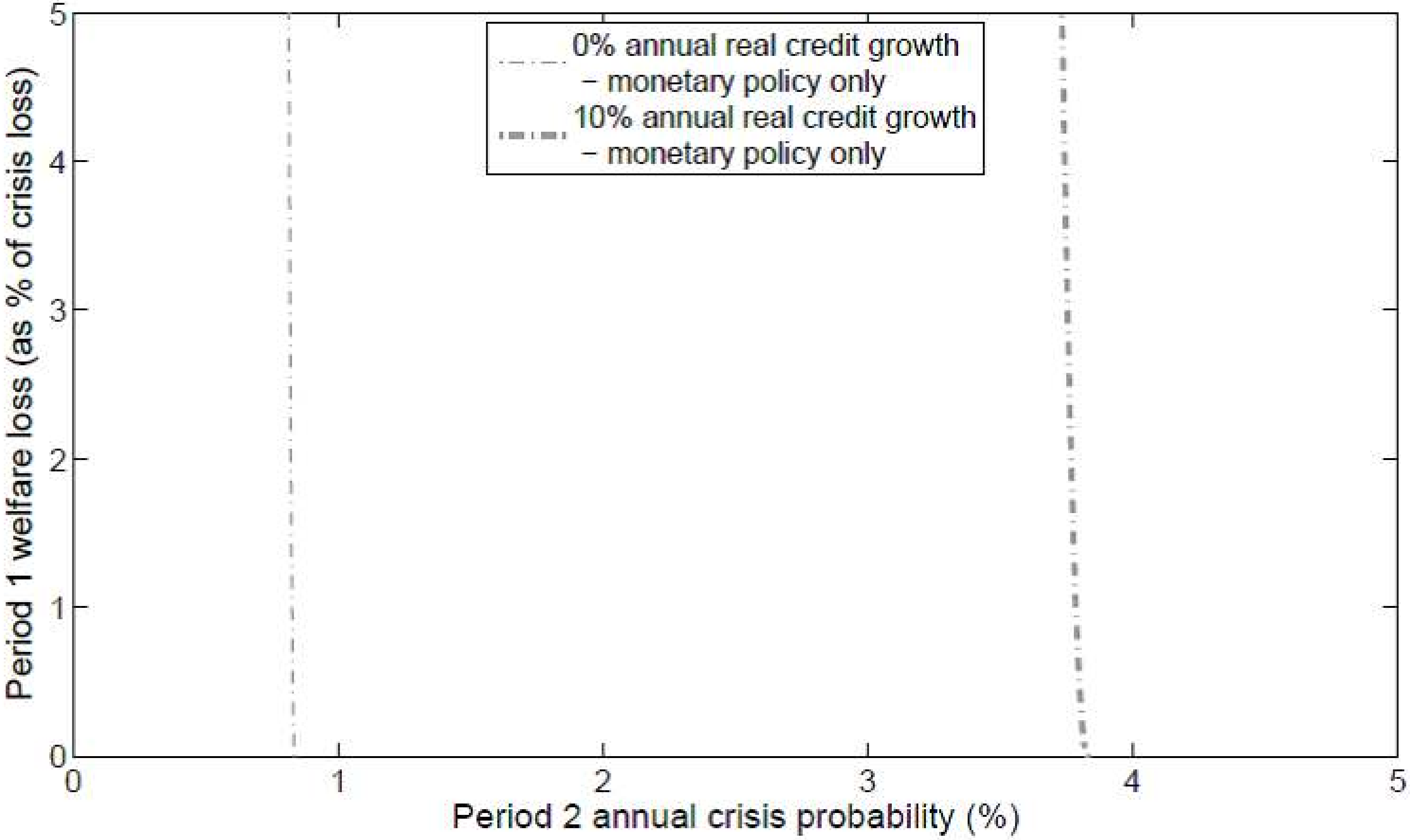


Notes. The figure presents the impact on key model variables (the credit spread, s_1, output, y_1, inflation, π_1, credit growth, B_1, and the crisis probability, γ_1) of a 100 basis point exogenous increase in the CCyB (dark blue bars) and the monetary policy rate (white bars).

Key results

- Introducing the CCyB dramatically improves the intertemporal trade-off
- CCyB needs to be adjusted aggressively to achieve these benefits
- Monetary policy and macroprudential policy can be complements or substitutes depending on the source of the shock
- The gains from formal policy coordination are small – except at the ZLB

Intertemporal trade-off with monetary policy only



Intertemporal trade-off with monetary policy and CCvB

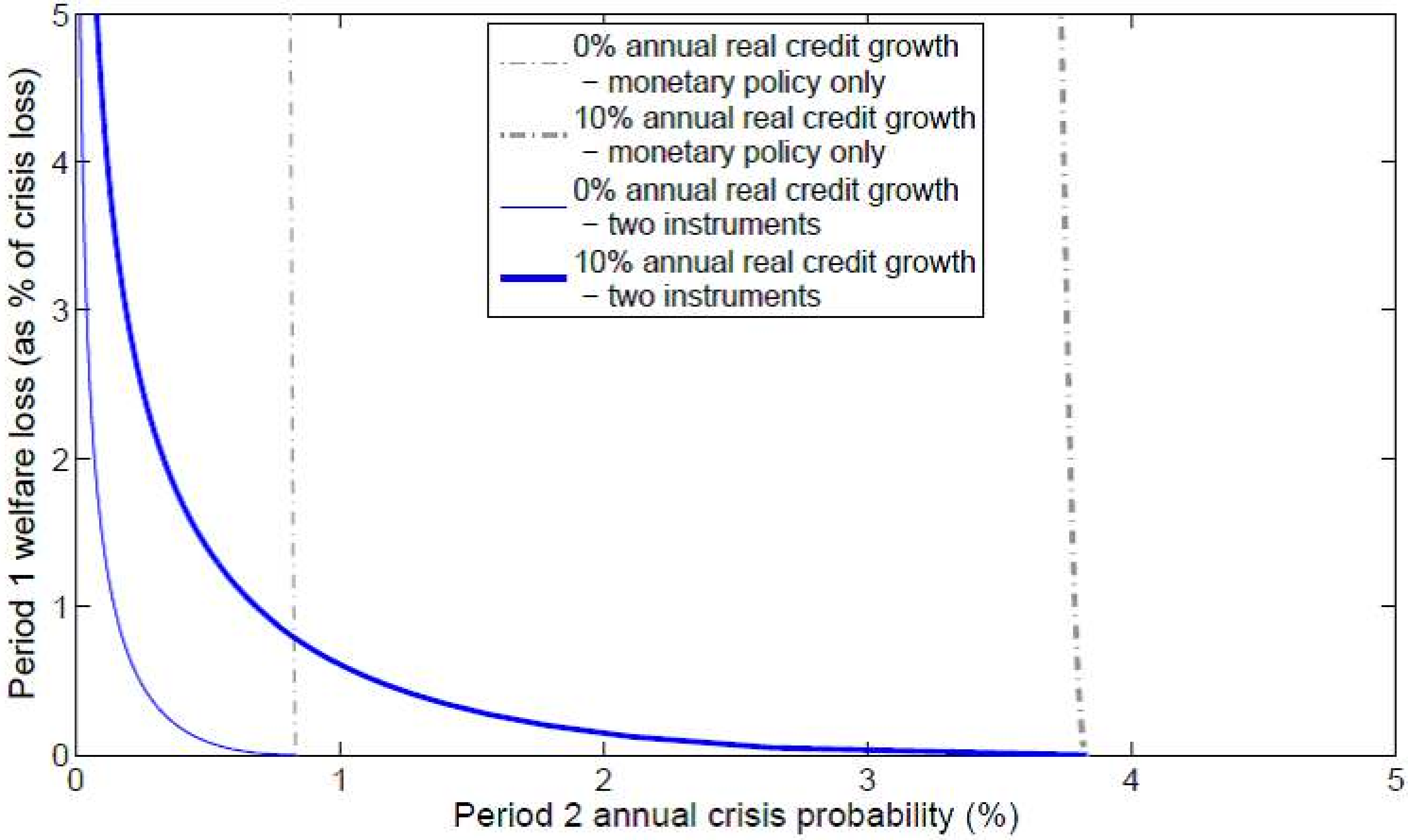


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Table 4: *Macroeconomic outcomes under different policy regimes and model variants*

Case	SD(y_1)	SD(π_1)	SD(B_1)	median(γ_1)	SD(i_1)	SD(k_1)	$E(L)$
Simulation using credit shocks only							
$\zeta = 0$:							
(i) Myopic policy regime	0	0	5.8	2.39	0	-	3.62
(ii) Monetary policy-only regime	0.002	0.002	5.8	2.39	0.003	-	3.62
(iii) CCyB regime	0.11	0.005	5.3	0.77	0.11	1.45	1.37
$\zeta = 2$:							
(iv) Myopic policy regime	0	0	5.8	2.39	0	-	10.86
(v) Monetary policy-only regime	0.005	0.005	5.8	2.39	0.008	-	10.86
(vi) CCyB regime	0.13	0.006	5.2	0.40	0.13	1.74	2.48
Simulation using all shocks							
$\zeta = 0$:							
(vii) Myopic policy regime	0.25	0.013	5.9	2.57	2.03	-	4.10
(viii) Monetary policy-only regime	0.25	0.013	5.9	2.57	2.03	-	4.09
(ix) CCyB regime	0.16	0.008	5.4	0.75	2.05	2.28	1.53
$\zeta = 2$:							
(x) Myopic policy regime	0.25	0.013	5.9	2.57	2.03	-	11.51
(xi) Monetary policy-only regime	0.25	0.014	5.9	2.57	2.03	-	11.50
(xii) CCyB regime	0.20	0.010	5.3	0.40	2.1	2.23	2.66

Notes. The table presents results obtained by running a stochastic simulation of the model. The standard deviations of output (y_1), inflation (π_1), credit growth (B_1), the interest rate (i_1) and the CCyB (k_1) are reported in terms of annual percentage points; the median crisis probability (γ_1) is reported as an annual percentage rate; expected losses are reported as a per cent of losses incurred in the event of a financial crisis occuring in period 2. The results are reported for two alternative values of ζ, the relative weight placed on stabilising the crisis probability in the loss function. For both sets of results, expected losses are shown as a per cent of losses incurred in the event of a crisis assuming that $\zeta = 0$, $L_{2,c}|\zeta = 0$.

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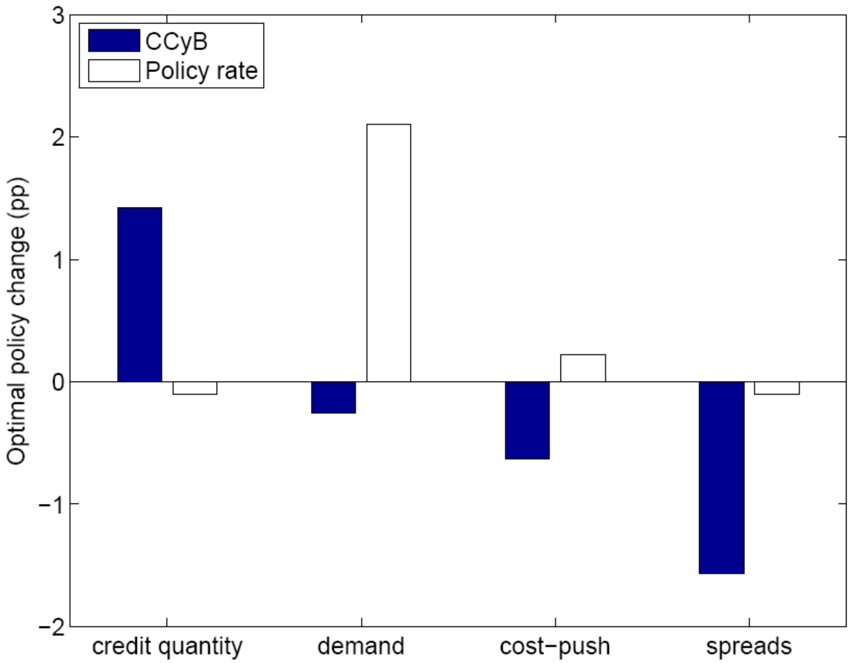
Policies can be both substitutes and complements

Table 5: *Optimal policy in response to a credit boom (Shock to: ξ_1^B)*

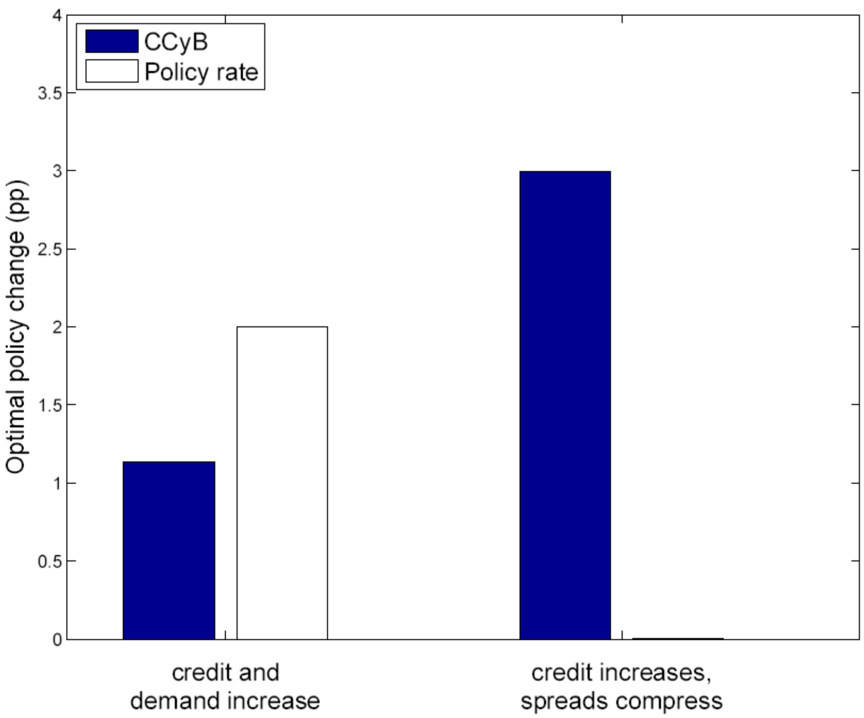
Case	Δk_1	Δi_1	Parameter restriction	Intuition
Instrument complements	$+$	$+$	$\frac{\kappa^2}{\kappa^2+\lambda}\frac{\nu\psi}{\kappa} > \sigma\omega\psi$	The impact of the CCyB on potential output sufficiently exceeds its impact on demand
Instrument substitutes	$+$	$-$	$\frac{\nu\psi}{\kappa}\frac{\kappa^2}{\kappa^2+\lambda} < \sigma\omega\psi$, $\frac{\frac{\partial\gamma_1}{\partial k_1}}{\frac{\partial\gamma_1}{\partial i_1}}\frac{\sigma}{(\sigma\omega\psi+\frac{\kappa^2}{\lambda+\kappa^2}\frac{\nu\psi}{\kappa})} > 1$	The impact of the CCyB on potential output does not sufficiently exceed its impact on demand, and the CCyB has a comparative advantage for reducing crisis probability
Instrument substitutes and sign switches	$-$	$+$	$\frac{\frac{\partial\gamma_1}{\partial k_1}}{\frac{\partial\gamma_1}{\partial i_1}}\frac{\sigma}{(\sigma\omega\psi+\frac{\kappa^2}{\lambda+\kappa^2}\frac{\nu\psi}{\kappa})} > 1$	The impact of the CCyB on potential output does not sufficiently exceed its impact on demand, and monetary policy has a comparative advantage for managing the crisis probability

Optimal response to different shocks

Individual shocks



Combinations of shocks



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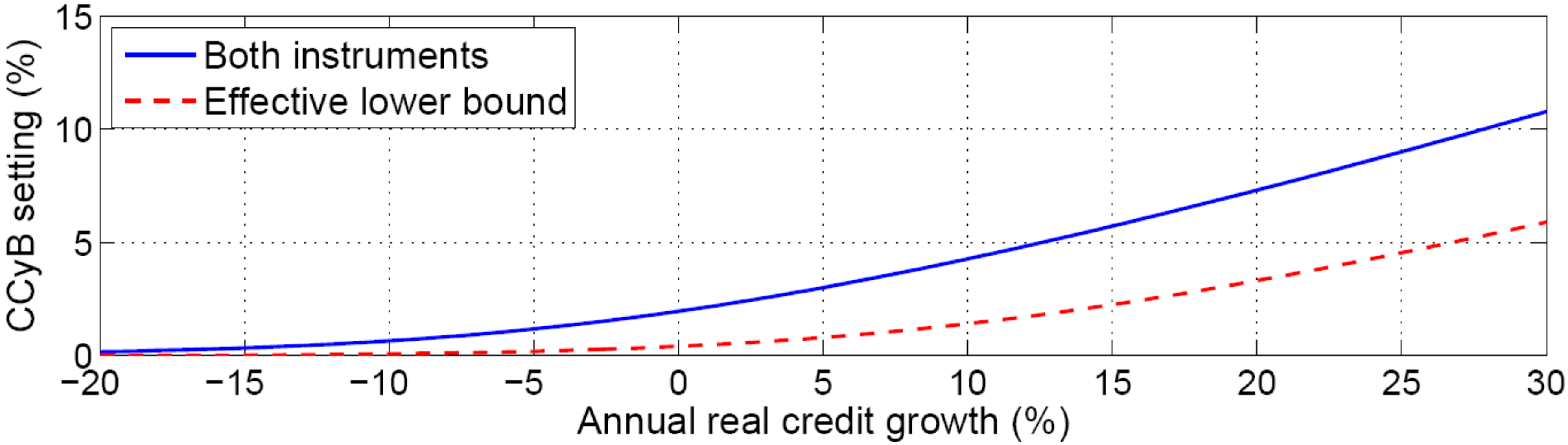
Implications of the effective lower bound



- If monetary policy is constrained, use the CCyB less aggressively as greater consideration is needed for its effects on aggregate demand