

## Research Question

Which macroprudential policy instrument performs best at stemming risks from the housing market when banks can control both sides of their balance sheet?

## Contribution

- Our contribution is to evaluate two common macroprudential instruments in a framework where banks control both their assets and liabilities. This allows the model to capture rapid swings in credit and house prices, with relatively stable domestic savings, evident in the data.
- A small literature exists analyzing macroprudential policies in such a framework, e.g. Benes et al. (2014b), Benes et al. (2016) and Fukač et al. (2018). These papers focus on scenario analysis.
- Our work adds by analyzing whether rules for
  - *demand-side* instruments, namely Loan-to-Value Ratio policies, and,
  - *time-varying capital requirements*,
 stabilize the economy or improve welfare.

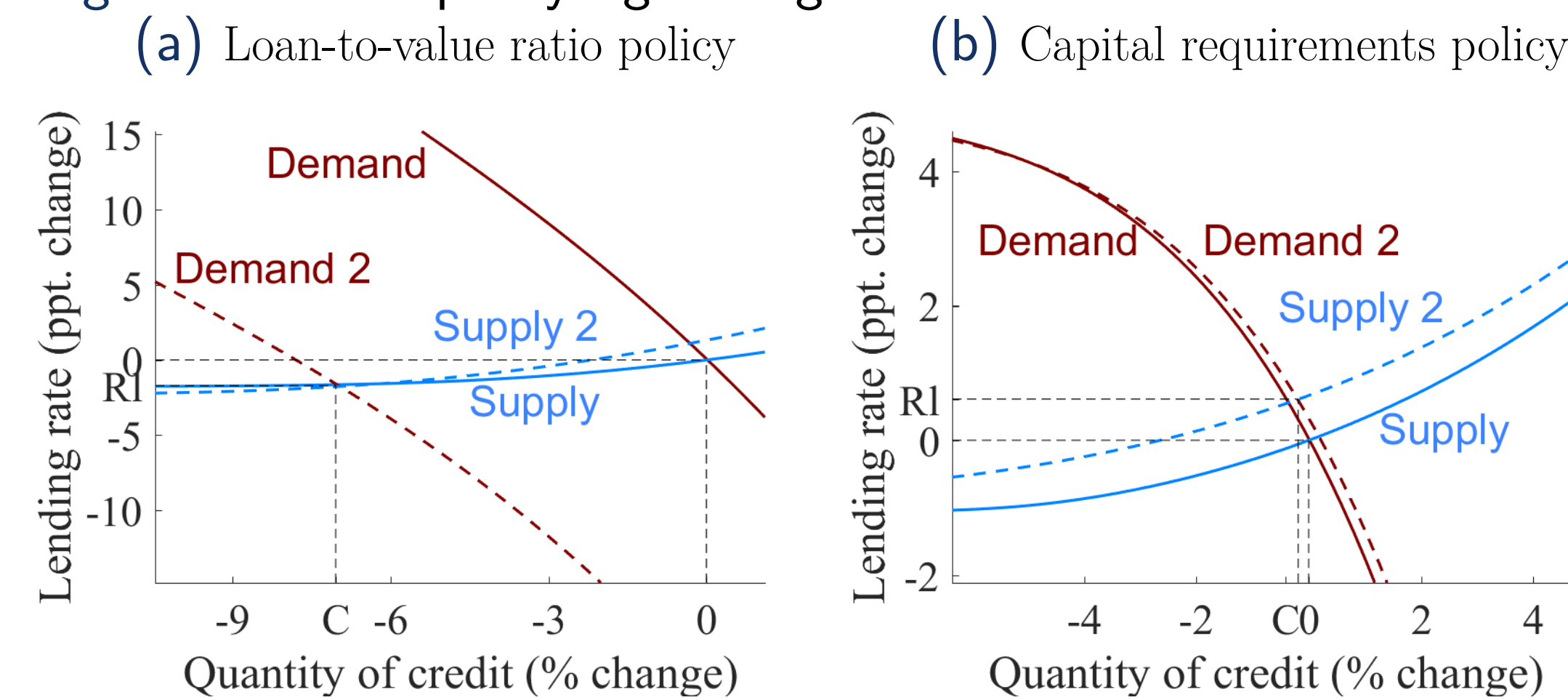
## Model

- Small-open economy model, based on the IMF's macroprudential model, MAPMOD (Benes et al. 2014a), with housing added (Fukač et al. 2018).
- Banks:
  - Maintain a stock of equity and raise deposits (domestic and foreign).
  - Foreign deposits are in perfectly elastic supply, so banks can choose their liabilities.
  - Extend mortgages. The probability of default depends of house price growth, and cannot be fully diversified away.
  - Extends mortgages to the extent they are profitable (the non-performing loans ratio increases with lending). So, if profitable, banks can 'create domestic credit' by raising foreign deposits and extending loans.
- Banks must pay a *penalty if their equity-to-loan ratio is below a certain level*. Varying this capital requirement is the first policy instrument.
- Households pay a *premium that increases with the loan-to-value ratio*. The second instrument.
- Calibrated to New Zealand (1991 - 2007).

## Policy Effects

- A tightening of the loan-to-value ratio policy reduces housing and credit *demand*. This primarily reduces house prices and the quantity of credit.
- Tightening the capital requirements policy reduces credit *supply*, which largely increases the lending rate (and bank equity). It has little effect on credit and house prices.

Figure: Effect of policy tightening shocks on the credit market

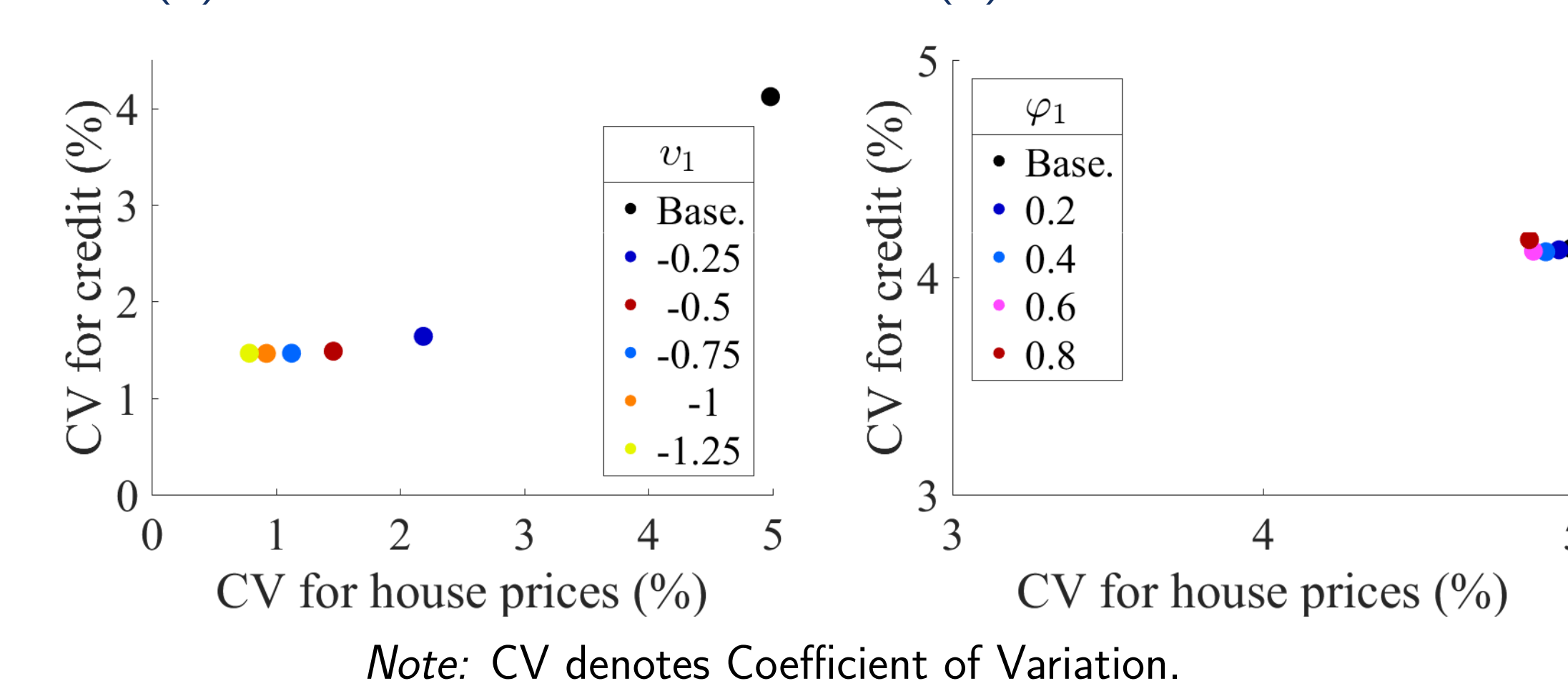


Notes: Curves are the supply and demand for credit prior to and in the period of the policy shock. Shocks are 5 and 1 ppt respectively.

## Stability Implications

- Allowing the loan-to-value ratio policy to respond to house prices is very effective in reducing the variance of house prices and credit. Decreases defaults.
- Time-varying capital requirements policy is ineffective in promoting stability. Also, it increases the variance of the lending rate.

Figure: Policy rules and the volatility of credit and house prices



Note: CV denotes Coefficient of Variation.

## Welfare Implications

- Loan-to-value ratio policy set in response to house prices improves welfare. It reduces housing market volatility, enabling higher consumption and lower labour supply.
- Time-varying capital requirements policies reduce welfare, by increasing interest repayments.

## Further Results

- Policy reacting to credit delivers similar results.
- Macroprudential policies interacting, or responding to other variables, delivers no further benefit.
- Monetary policy, compared with macroprudential policies, has larger effects on activity and prices for a given effect on the housing and credit markets. Monetary policy 'leaning against the wind' is therefore *not* a substitute.

## Main Result

Policies affecting the *demand for credit*, such as **loan-to-value ratio policies**, **outperform time-varying capital requirements** which affect credit supply. They reduce fluctuations in credit, house prices and defaults, and *improve welfare*.

## Macroprudential Policy Rules

- Policy instruments respond to house prices in deviation from mean ( $\Sigma_t$ ):

$$\varphi_t = (1 - \varphi_2)\varphi_0 + \varphi_1\Sigma_t + \varphi_2\varphi_{t-1}$$

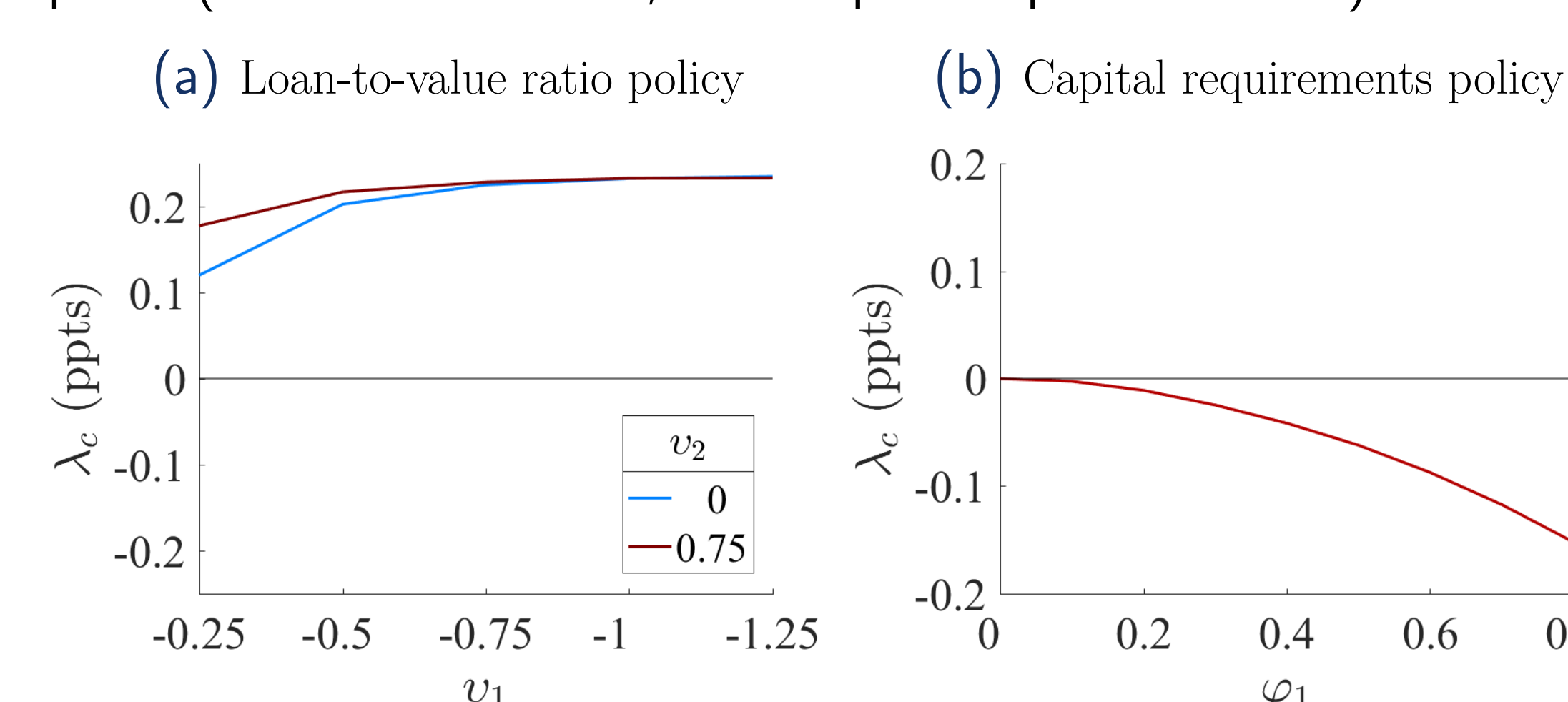
$$\Upsilon_{c,t} = (1 - v_2)v_0 + v_1\Sigma_t + v_2\Upsilon_{c,t-1}$$

where  $\varphi_t$  is the capital requirement,  $\Upsilon_{c,t}$  determines the premium for high loan-to-value ratio loans.

- We examine the effect of varying  $\varphi_1$ ,  $\varphi_2$ ,  $v_1$  and  $v_2$  on financial stability – the variances of credit, house prices and defaults – and on welfare.

## Welfare Implications

Figure: Welfare implications of policies responding to house prices (relative to baseline, consumption equivalent units)



## Conclusion

Activist demand-side macroprudential instruments, such as loan-to-value ratio policy set in response to house prices, increase welfare and outperform policies affecting the supply of credit.

## References

- Benes, J., M. Kumhof, and D. Laxton (2014a). "Financial Crises in DSGE Models: A Prototype Model", *International Monetary Fund Working Paper*, 14/57.
- (2014b). "Financial Crises in DSGE Models: Selected Applications of MAPMOD", *International Monetary Fund Working Paper*, 14/56.
- Benes, J., D. Laxton, and J. Mongardini (2016). "Mitigating the Deadly Embrace in Financial Cycles: Countercyclical Buffers and Loan-to-Value Limits". *International Monetary Fund Working Paper*, 16/87.
- Fukač, M., L. Greig, and D. Snethlage (2018). "Towards Understanding Macro-financial Impacts of Loan-to-Value Ratio Policy in New Zealand: A General Equilibrium Perspective". *Australian Economic Review*, 51.1, pp. 99-131.

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