

The Monetary Financing of a Large Fiscal Shock

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THE OPINIONS EXPRESSED ARE PERSONAL AND DO NOT NECESSARILY
REPRESENT THOSE OF THE EUROPEAN CENTRAL BANK, THE BANK
OF PORTUGAL, OR THE EUROSISTEM.

- COVID-19 causing a large increase in public debts:
 - in the euro area from 85.9% (2019) to 102% (2021) according to European Commission (2020)
- We revisit the question of the optimal financing of an exogenous, surprise increase in gov't spending:
 - optimal fiscal and monetary policy with noncontingent debt and nominal rigidities.

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- Literature with long-term debt: Lustig, Sleet and Yeltekin (2008) and Faraglia, Marcet, Oikonomou and Scott (2013, 2019a, 2019b)
 - *Effective* inflation can be less volatile, but must change persistently
 - With Calvo prices, low, persistent inflation also costly: price dispersion
 - Firms must choose constant prices in the face of increasing P level.

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- Mankiw-Reis (2002) sticky information firms
 - Once most firms update info, (announced) future infl. no longer costly
 - With long-term debt, future inflation is *effective*
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- Conclusion: the standard result is fragile:
 - optimal inflation after a large fiscal shock may be considerably higher than we thought.

- Key model ingredients
- Sticky information vs. sticky prices
- The optimal response to a COVID-size public finance shock
- Conclusions

Key model ingredients

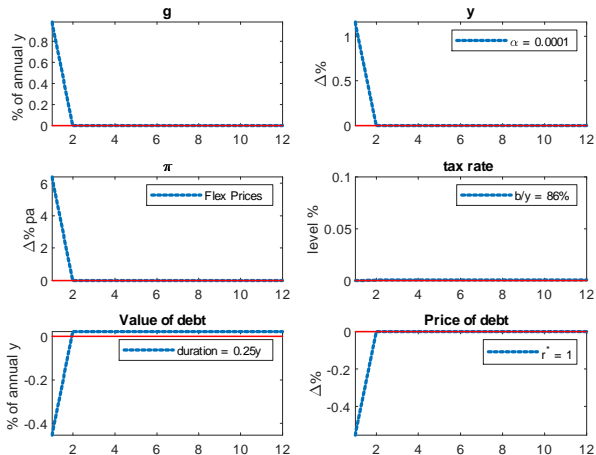
- To maximise comparability with the existing literature, we rely on a standard framework (Benigno and Woodford, 2003):
 - Households consume an aggregate of differentiated intermediate goods; and work in all intermediate firms;
 - Intermediate goods produced under monopolistic competition;
 - Exogenous government spending shock G_t ;
 - Linearized Ramsey problem, timeless perspective

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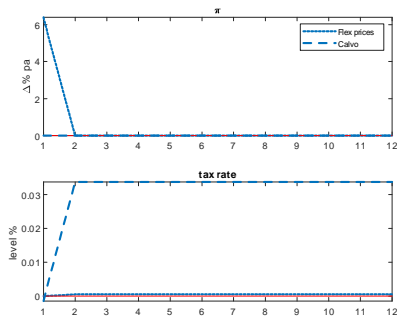
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 - Linearized Ramsey problem, timeless perspective
- Deviations from Benigno and Woodford (2003):
 - Distortionary taxes on labour and full taxation of profits
 - Perpetual bonds with geometrically declining coupon (Woodford, 2001)
 - Fraction δ of firms prices à la Calvo, $1 - \delta$ has sticky information
 - Euro area calibration for gov't debt/GDP (86%) and average maturity (privately held: 5.8y) ; $r^* = 1\%$.

THE FINANCING OF A FISCAL SHOCK:
SHORT BONDS

Flexible prices

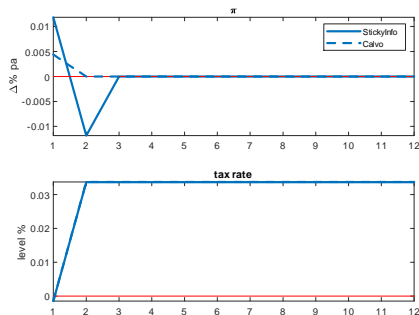


Sticky prices



- Calvo pricing generates large costs of inflation.
- Hence no infl. response to adverse fiscal shock.
- Need for a permanent increase in the tax rate.

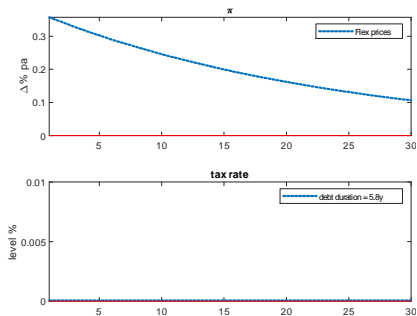
Sticky information



- Inflation must occur on impact to be effective in reducing value of debt.
- Ability to set price plans, rather than fixed price, is immaterial.
- Near-price stability remains optimal as in the sticky price case.

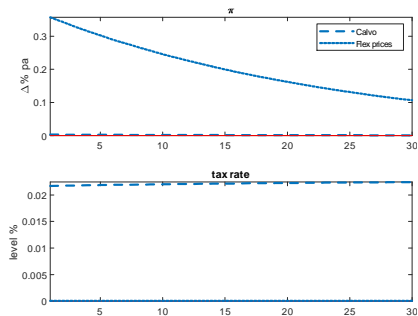
THE FINANCING OF A FISCAL SHOCK:
LONG BONDS

Flexible prices



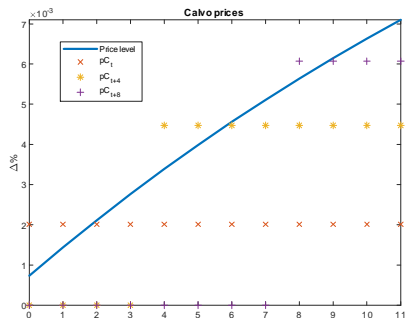
- Flexible prices ($\alpha \rightarrow 0$) call for a highly persistent, but relatively small increase in inflation after a fiscal shock.
- Akin to a change in the inflation target.
- No need to increase taxes.

Sticky prices



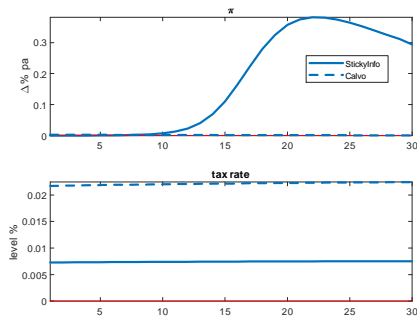
- Calvo prices ($\delta \rightarrow 1$) call for price stability, even if a small inflation increase would be effective.
- Need to increase taxes.
- Why so much price dispersion?

Reset prices



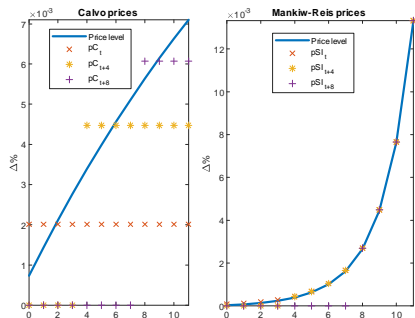
- Price dispersion between firms able to adjust their prices and other firms
- Newly adjusted prices are constant, even if known increasing P level
- Price dispersion persists even after most firms have adjusted

Sticky information



- An inflation increase is desirable, if delayed.
- Akin to *announced* change in the future inflation target
- Allows for a smaller increase in taxes.
- Why lower price dispersion?

Reset prices



- Delayed inflation reduces price dispersion between firms able to adjust and other firms
- Newly adjusted prices can adapt to increasing P level
- Price dispersion disappears after most firms have adjusted

The financing of a fiscal shocks: robustness

- Information stickiness
 - The stickier the information, the more delayed is the inflation response

The financing of a fiscal shocks: robustness

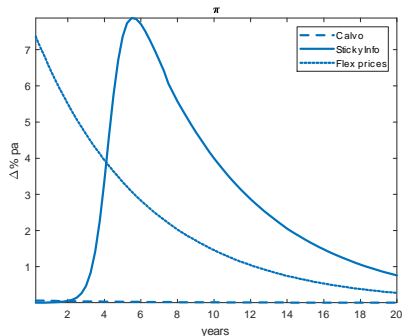
- Information stickiness
 - The stickier the information, the more delayed is the inflation response
- Debt duration: non-monotonic inflation response.
 - Long duration: low and persistent inflation is very effective in reducing the value of debt → *optimal inflation is low*.
 - Short duration: only high and short-lived inflation is effective; this is very costly → *optimal inflation is low*.
 - Intermediate duration: inflation is neither very effective, nor very costly → *optimal inflation is relatively high*.

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- Starting from relatively high levels (7.4y), QE purchases have lowered the maturity of privately held public debt (5.8y) in the euro area:
 - the optimal response of inflation has become higher.

THE FINANCING OF A LARGE FISCAL SHOCK:
LONG BONDS

Optimal inflation responses to a pandemic-size shock



- Flex prices: very persistent infl. increase.
- Calvo prices: permanent increase in taxes.
- Sticky info: delayed, persistent inflation increase (smaller tax rise)

- The COVID-19 pandemic has caused a surge in public debts levels. In the absence of a growth spurt, question of how to finance them.
- Sticky prices literature calls for zero inflation and a permanent increase in taxes. We find that this result is not robust to an alternative assumption on the source of nominal rigidity.
- Under sticky information, optimal response to pandemic-size increase in debt includes a gradual, long-lasting and sizable inflation rise.
- Similar to an announced future target change:
 - implementable;
 - conceivable in response to exceptional shocks.
- The long maturity of public debt plays a crucial role.