

Motivation

Credit market  
frictions

Stylised model

Long-run  
effects

Business cycle  
effects

Sensitivity  
analysis

Summary and  
conclusion

# The effects of asymmetric information in an open economy

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# Motivation

## Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

- Credit markets can have real economic effects.
- Wicksell's early writings on monetary dynamics
- Fisher's "debt-deflation theory of great depressions"
- Distressed financial and banking systems (e.g. US, UK, Scandinavia, Latin America, Japan, east Asian countries) have rekindled interest in credit markets.

# Motivation

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

- Credit market frictions are caused by asymmetric information between borrowers and lenders.
- Borrowers know more about their investment projects than lenders do.
- Agency costs arise when lenders delegate control over resources to borrowers, and borrowers (agents) have an incentive not to perform in the best interest of lenders (principals).
- Agency costs increase firms' cost of external finance relative to internal funds.

# Motivation

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

- The literature has focused on closed economies (e.g. Bernanke and Gertler, 1989, Carlstrom and Fuerst, 1997 and Bernanke, Gertler and Gilchrist, 1999).
- Credit market frictions may be more pronounced in small open economies than in large closed economies.
- This paper assesses the effects of asymmetric information between borrowers and lenders in an open economy with access to international capital markets.
- It builds on Carlstrom and Fuerst's closed economy model.

# Credit markets

Motivation

Credit market  
frictions

Stylised model

Long-run  
effects

Business cycle  
effects

Sensitivity  
analysis

Summary and  
conclusion

- Current theories of the role of credit markets build on the economics of imperfect information.
- Information is a public good.
- Less than socially optimal quantity of information may be produced.
- Financial intermediaries and markets can reduce the asymmetric information problem.
- But this is costly.

# Ex ante information asymmetry

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

- Lenders cannot differentiate between borrowers with different credit risks before providing loans.
- This leads to an adverse selection problem.
- Financial intermediaries are more likely to lend to high-risk borrowers.
- Those who are willing to pay higher interest rates will, on average, be worse risks.

# Ex post information asymmetry

Motivation

Credit market  
frictions

Stylised model

Long-run  
effects

Business cycle  
effects

Sensitivity  
analysis

Summary and  
conclusion

- Only borrowers can costlessly observe actual returns after project completion.
- This leads to a moral hazard problem.
- Borrowers engage in activities that reduce the likelihood of a loan being repaid.
- This type of asymmetric information is included in the model.

# Open economies

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

- Credit market frictions may be more pronounced in small open economies.
- Small economies tend to have a large number of small firms and fewer large businesses.
- Small firms are more affected by asymmetric information because of economies of scale in acquiring and monitoring information.
- In open economies with access to international capital markets, domestic savings are not constrained to domestic (risky) investments.
- The cost of borrowing is influenced by movements in the exchange rate.



# Six agents

Motivation

Credit market  
frictions

Stylised model

Long-run  
effects

Business cycle  
effects

Sensitivity  
analysis

Summary and  
conclusion

- Households
- Firms
- Financial intermediaries
- Entrepreneurs
- Government
- Monetary authority

# Financial intermediaries

- Financial intermediaries help overcome an information asymmetry problem.
- They provide external financing to entrepreneurs.
- Entrepreneurs also use their own net worth.
- Instead of lending to risky entrepreneurs financial intermediaries can hold risk-free foreign bonds.
- Access to international capital markets increases the opportunity cost of lending to entrepreneurs, who may default on their debt.
- This increases the rate of return lenders demand for the use of their funds.

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

# Information asymmetry

Motivation

Credit market  
frictions

Stylised model

Long-run  
effects

Business cycle  
effects

Sensitivity  
analysis

Summary and  
conclusion

- Entrepreneurs' production technology is subject to idiosyncratic shocks.
- Only entrepreneurs can costlessly observe the shocks.
- The information asymmetry creates a moral hazard problem.
- Entrepreneurs have an incentive to underreport the true value of their technology shock.

# Debt contract

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

- Financial intermediaries lend to entrepreneurs via a debt contract.
- The optimal contract is structured so that entrepreneurs always truthfully report their technology shock.
  - In the event of default, financial intermediaries monitor entrepreneurs and confiscate all returns from their projects.
  - Entrepreneurs with larger net worth receive larger loans.
- The size of loans financial intermediaries are willing to provide is influenced by the opportunity cost of not lending internationally.

# Households

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

- maximise utility
- work
- own firms
- rent capital to firms
- can hold domestic and foreign bonds
- must hold demand deposits to purchase consumption and capital goods

# Firms

Motivation

Credit market  
frictions

Stylised model

Long-run  
effects

Business cycle  
effects

Sensitivity  
analysis

Summary and  
conclusion

- are monopolistic competitors
- hire labour and capital from households and entrepreneurs
- use commodity inputs, which they import at the beginning of each period
- produce output of consumptions goods
- pay dividends to households at the end of each period

# Entrepreneurs

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

- produce the capital that firms use in the production of consumption goods
- use their own net worth, which consists of their after-tax wage earnings and the market value of their capital stock
- obtain external financing from financial intermediaries
- face idiosyncratic technology shocks
- who are still solvent after the shocks occur repay their loans and make their consumption decisions

# Government

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

- collects taxes on households' and entrepreneurs' wage and rental incomes
- uses this revenue to purchase consumption goods from firms
- has a balanced budget constraint in each period



# Monetary authority

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

- has an explicit consumer price inflation target
- adjusts the nominal rate of interest paid on domestic bonds
- follows a Taylor rule with interest rate smoothing

# Long-run effects of asymmetric information

Motivation

Credit market  
frictions

Stylised model

Long-run  
effects

Business cycle  
effects

Sensitivity  
analysis

Summary and  
conclusion

- The stylised model is solved for a steady state with and without agency costs.
- The two steady states are compared.
- The information asymmetry problem disappears when entrepreneurs' production process is certain.
- Entrepreneurs no longer become bankrupt and default on their debt.
- They can obtain all external financing directly from households.
- They no longer need collateral or net worth.

# Agency costs in the open economy

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

	Agency cost model	No agency costs	Difference
capital	26.068	27.151	4.2 %
investment	0.538	0.559	3.9 %
output	4.495	4.552	1.3 %
cost of external finance	3.4 %	0.0 %	-3.4 p.p.

- The cost of external finance is higher than in Carlstrom and Fuerst's closed economy (3.4 % compared to 2.4 %).

# Productivity shock

Motivation

Credit market  
frictions

Stylised model

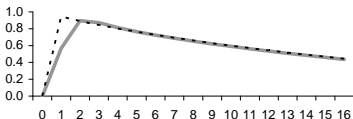
Long-run  
effects

Business cycle  
effects

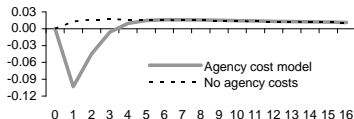
Sensitivity  
analysis

Summary and  
conclusion

output



interest rate



- An appreciation of the domestic currency increases the relative return to foreign assets and reduces (domestic and foreign) lenders' willingness to provide funds to entrepreneurs.
- This raises further the cost of external finance.

# Foreign demand shock

Motivation

Credit market  
frictions

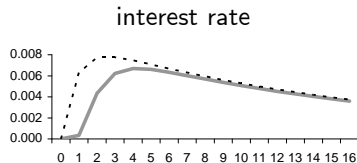
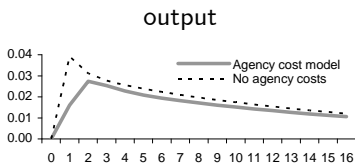
Stylised model

Long-run  
effects

Business cycle  
effects

Sensitivity  
analysis

Summary and  
conclusion



- As in the case of the productivity shock, the presence of agency costs dampens the effects on output and the central bank's response.

# Reduced access to international capital markets

Motivation

Credit market  
frictions

Stylised model

Long-run  
effects

Business cycle  
effects

Sensitivity  
analysis

Summary and  
conclusion

- Financial intermediaries can only lend to entrepreneurs.
- That is, they can no longer hold risk-free foreign bonds.
- This lowers the cost of external finance.
- The cost of external finance no longer includes the opportunity cost of not lending internationally.
- The reduction in the cost of external finance raises steady state capital, investment, output and consumption.

# Productivity shock

Motivation

Credit market  
frictions

Stylised model

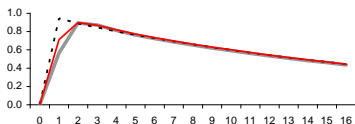
Long-run  
effects

Business cycle  
effects

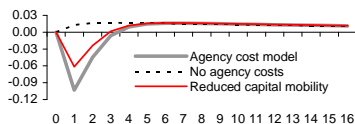
Sensitivity  
analysis

Summary and  
conclusion

output



interest rate



- A reduction in capital mobility lessens the effects of agency costs following a supply shock.
- The exchange rate no longer affects the cost of external finance.

# Foreign demand shock

Motivation

Credit market  
frictions

Stylised model

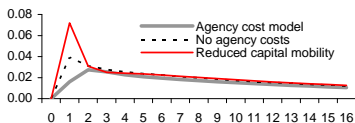
Long-run  
effects

Business cycle  
effects

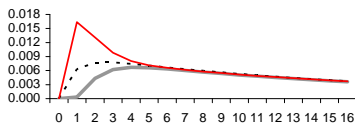
Sensitivity  
analysis

Summary and  
conclusion

output



interest rate



- The real exchange rate appreciation no longer raises the cost of external finance.
- In fact, the cost of external financing falls
- ... as the positive demand shock leads to a reduction in investment to meet increased foreign demand.



# Summary and conclusion

- This paper assessed the effects of asymmetric information between borrowers and lenders in a small open economy with access to international capital markets.
- Only borrowers could costlessly observe actual returns after project completion.
- The ex post information asymmetry led to agency costs and a moral hazard problem.
- Financial intermediaries helped overcome the information asymmetry.
- They lent via a debt contract and monitored borrowers who defaulted on their debt.

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion

# Main findings

- Asymmetric information and agency costs have real economic effects.
- They raise the cost of external finance and lower steady state investment, capital and output.
- The long-run effects are exacerbated in an open economy.
- Agency costs impact on the business cycle.
- Shocks to the economy affect the cost of external finance.
- In an open economy the cost of external finance is also influenced by the exchange rate.
- Whether agency costs dampen or magnify business cycle fluctuations depends on the degree of capital mobility and type of shock.

Motivation

Credit market  
frictions

Stylised model

Long-run  
effects

Business cycle  
effects

Sensitivity  
analysis

Summary and  
conclusion

# Implications of findings

- The results underline the importance of well-functioning financial systems.
- Macroeconomic models that do not account for asymmetric information in credit markets provide an incomplete description of the economy.
- Credit market interactions are altered in small open economies compared to large closed economies.
- Credit market frictions may change with increases in international capital mobility due to financial liberalization and globalization.

Motivation

Credit market frictions

Stylised model

Long-run effects

Business cycle effects

Sensitivity analysis

Summary and conclusion