Public credit and the financial cycle

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  - Public credit generally accounts for a large share of total credit (22% on average).
  - Local Projections reveal that public credit markets are immune to foreign monetary shocks.
  - In financially developed economies, public credit is strongly countercyclical: it expands during busts and contracts during booms. Consequently, the decline in total credit and output during a bust is lower when the ex-ante share of public credit in total credit is higher. This result does not hold in countries with extensive state control of the financial sector.

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- ◇ Studying the properties of public credit is particularly relevant for this literature because: (1) public credit accounts for a large share of total credit, and (2) it can be used to finance borrowers who are below or close to the credit constraint. These borrowers play a disproportionate role in the transmission of credit shocks to the real economy (Mian and Sufi 2014).

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- My findings also inform the long-standing debate on government ownership of credit institutions: Stiglitz (1993) VS La Porta et al. (2002).

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- ◇ These institutions share some common characteristics:
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  - A focus on long-term loans to economically or politically vulnerable sectors like housing, agriculture, export industries, SMEs, local administrations...
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  - The provision of cheap loans (at below market interest rates).
- ◇ In "financially repressed" economies, public credit institutions are mostly funded through special financial circuits (long-term loans from the central bank, postal savings, fiscal receipts...). Following financial liberalization, public credit institutions turned to the market for funds, by issuing long-term state-guaranteed bonds (Monnet 2018, Musacchio 2017).

Public credit institutions

Country	Type of institution
Austria	Special credit institutions
France	Non-bank financial institutions (later named "institutions financières spécialisées")
Germany	Banks with special, development and other central support tasks
Greece	Specialized credit institutions
Indonesia	Central bank State banks Regional development banks
Italy	Istituti di credito speciale
Japan	Fiscal Loan Fund Government financial institutions
Mexico	Development banks Development funds ("fondos de fomento")
Norway	State lending institutions
US	Government (federal, state, and local)
South-Korea	Government (central) Specialized banks Development institutions
Spain	Instituto de Crédito Oficial
Thailand	Specialized financial institutions

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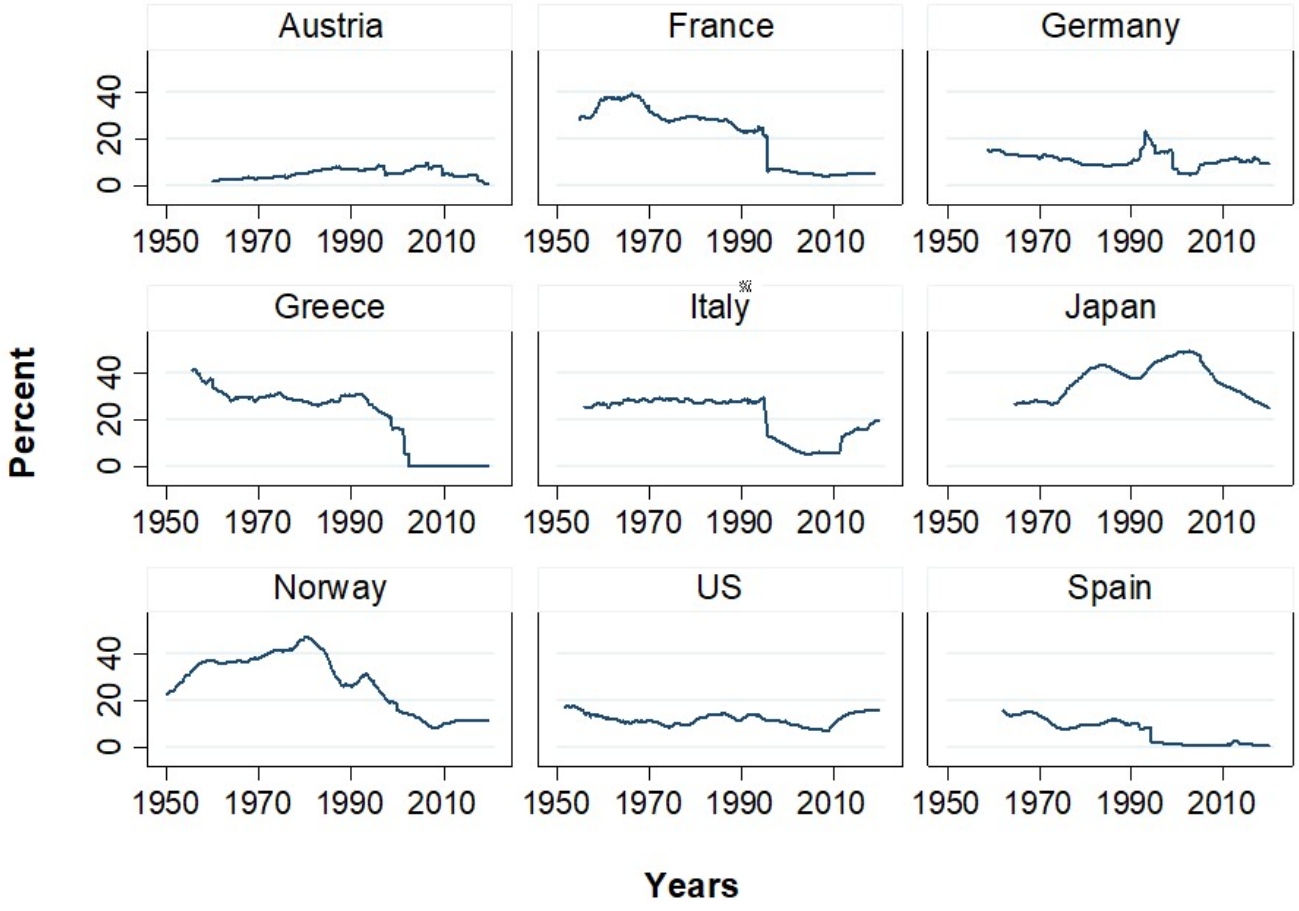
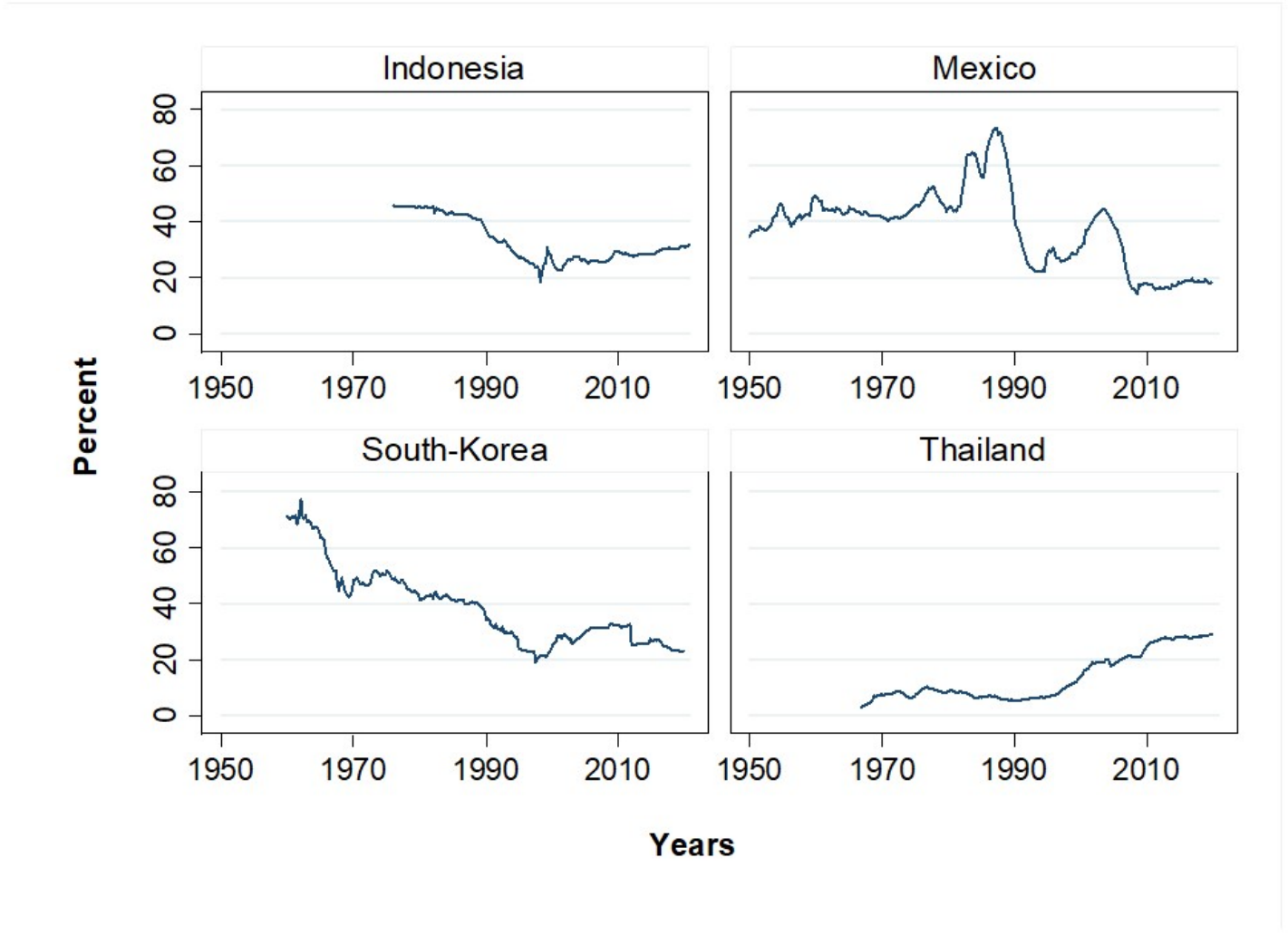
- To collect public credit data I relied on central bank archives and statitiscal reports. Importantly, public financial intermediaries are always clearly identified in these sources (i.e.: data on public credit is presented separately from private credit data), and nationalized commercial banks are excluded!

Figure 1: Public credit in % of total credit, Developed economies



Note: Total credit is calculated as the sum of public and private credit. Private credit data are drawn from Monnet and Puy (2019).

Figure 2: Public credit in % of total credit, Emerging economies



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- ◇ I use two different measures of foreign policy shocks:
  - The residual from a simple regression of the first difference in the country's three-month interest rate on a broad set of domestic macroeconomic controls (as in Jordal et al. 2019).
  - The measure of US policy shocks of Romer and Romer (2004), extended by Miranda-Agrippino and Rico (2021).

The sample

Country	Open-pegs	Average share of public credit
Austria	1962Q1-1968Q4 1970Q1-2020Q4	5%
France	1956Q3-2020Q4	21%
Germany	1954Q2-1972Q4	13%
Greece	1962Q1-1981Q2 1984Q3-2020Q4	18%
Indonesia	1978Q4-1997Q2 2007Q3-2010Q4	37%
Italy	1956Q1-1975Q3 1983Q1-2020Q4	24%
Japan	1960Q1-1977Q3	29%
Mexico	1950Q1-1981Q4 1989Q1-1994Q4	41%
Norway	None	.
US	None	.
South-Korea	1981Q2-1997Q3	35%
Spain	1963Q1-2020Q4	7%
Thailand	1956Q1-1964Q4 1968Q1-1969Q4 1990Q1-1996Q4	6%

The equation

- I run the following sequence of quarterly regressions at horizons $h \in [0; 8]$ quarters, where $Credit_{i,t+h}$ is the growth rate of a real credit aggregate (private, public or total) between $t-1$ and $t+h$, and $R_{b(i,t)}$ denotes unpredictable movements in country i's base country b short-term interest rate at time t:

$$Credit_{i,t+h} = \alpha_h + \beta_h R_{b(i,t)} + \theta_h (L) X_{i,t} + trend_t + D_i + \varepsilon_{i,t+h} \quad (1)$$

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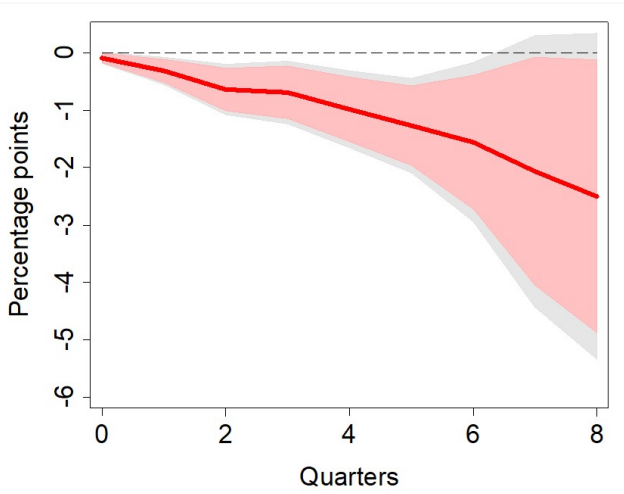
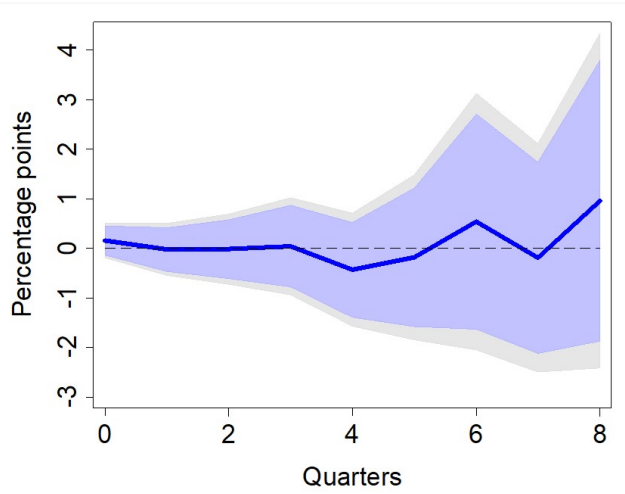
- β_h thus traces out the impulse response function of foreign interest rate shocks on subsequent real credit growth (private, public, or total).
- α_h is a constant and captures the mean of $Credit_{i,t+h}$ for country i at horizon h, L is a lag polynomial for the control variables captured in $X_{i,t}$, D_i represents country fixed-effects, and $\varepsilon_{i,t+h}$ is the projection's residual.

Figure 3: Foreign policy shocks → Growth rate of real credit aggregates (relatively open economies)



(a) Private credit



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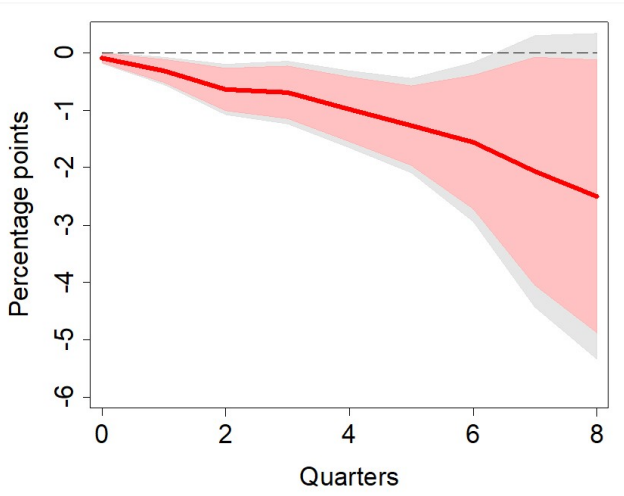

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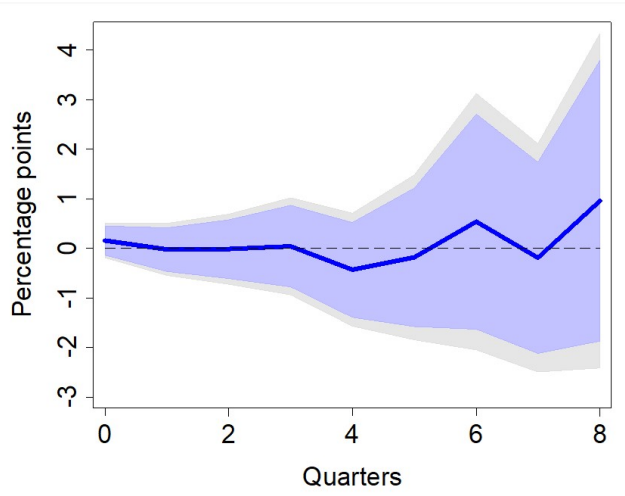

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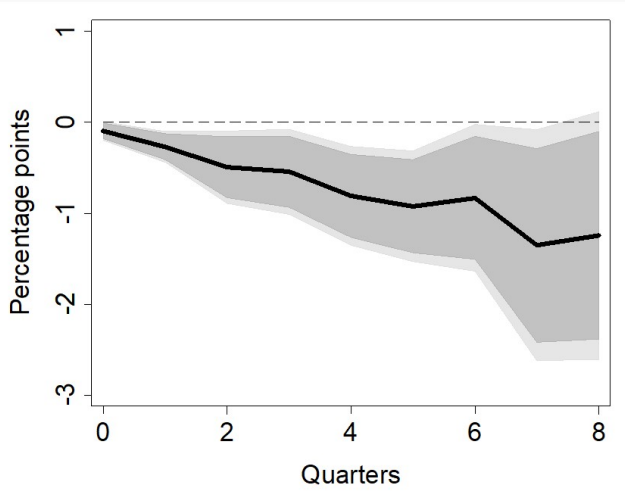
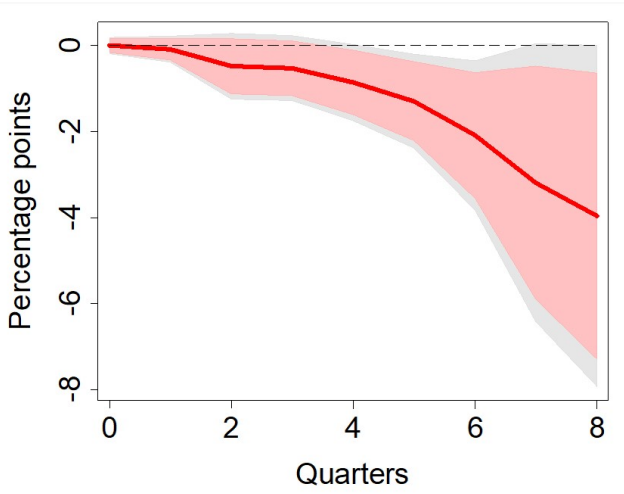


(c) Total credit

Figure 4: Foreign policy shocks → Growth rate of real credit aggregates (open economies)



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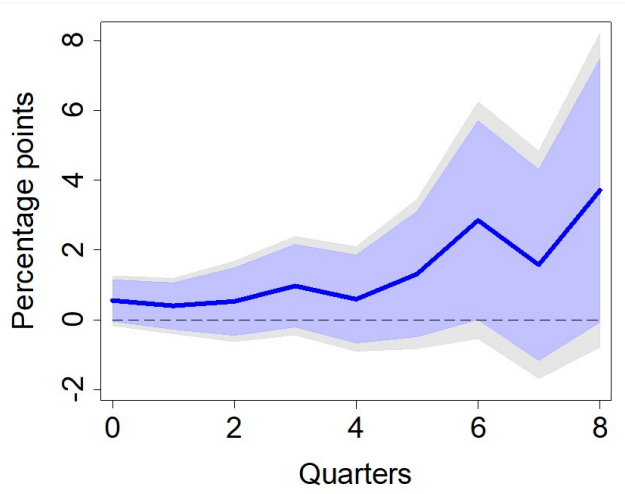

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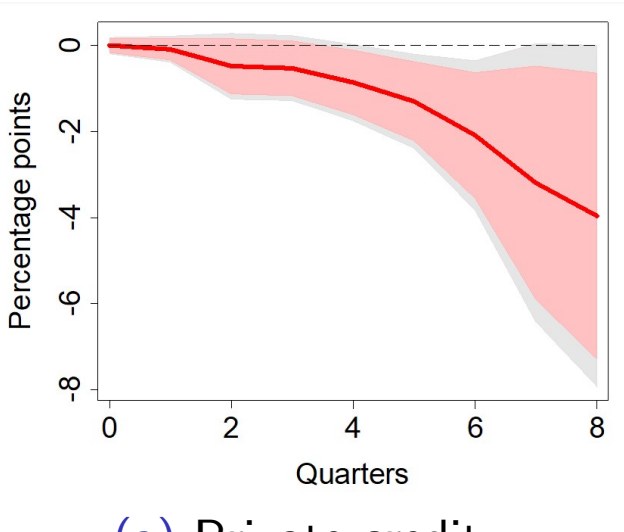

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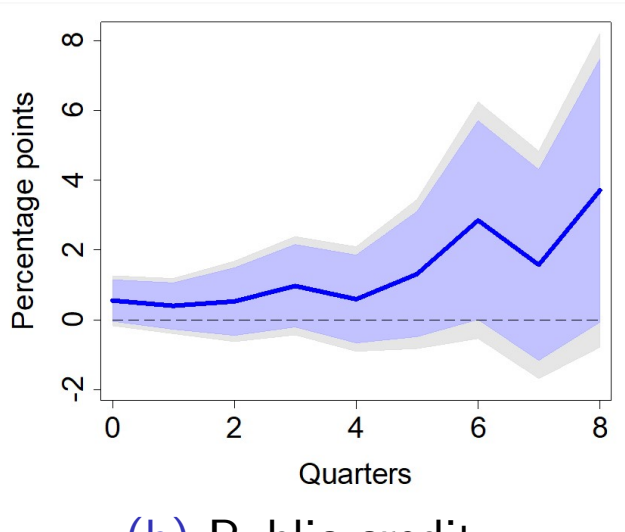
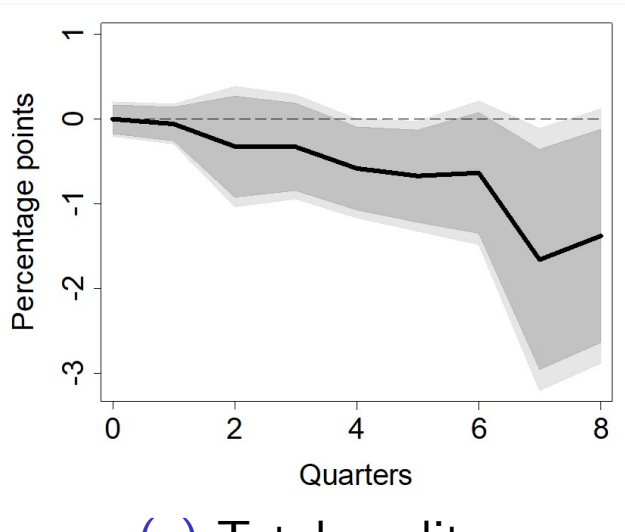


(b) Public credit



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- The risk-taking channel:
  - Monetary policy affects the willingness of market participants to take on risk exposures (Borio & Zhu 2012).
  - Public intermediaries do not face the same set of **incentives** as private intermediaries. Their losses are absorbed by the state, and they are not rewarded for extending more loans.

2) Public credit and domestic credit cycles

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- ◇ Credit booms often have large negative real effects. Many end in financial crisis. What is the behavior of public credit during booms and busts of private credit? Can public credit help mitigate the impact of the bust?
- ◇ To identify credit booms, I use the method introduced in Richter et al. (2021). I extract the cyclical component of credit by regressing, for each country, the log of real (private or public) credit y_t on its past values y_{t-h} where $h \in [3; 6]$ years (or, equivalently, $h = \{12, 16, 20, 24\}$ with quarterly data like mine).

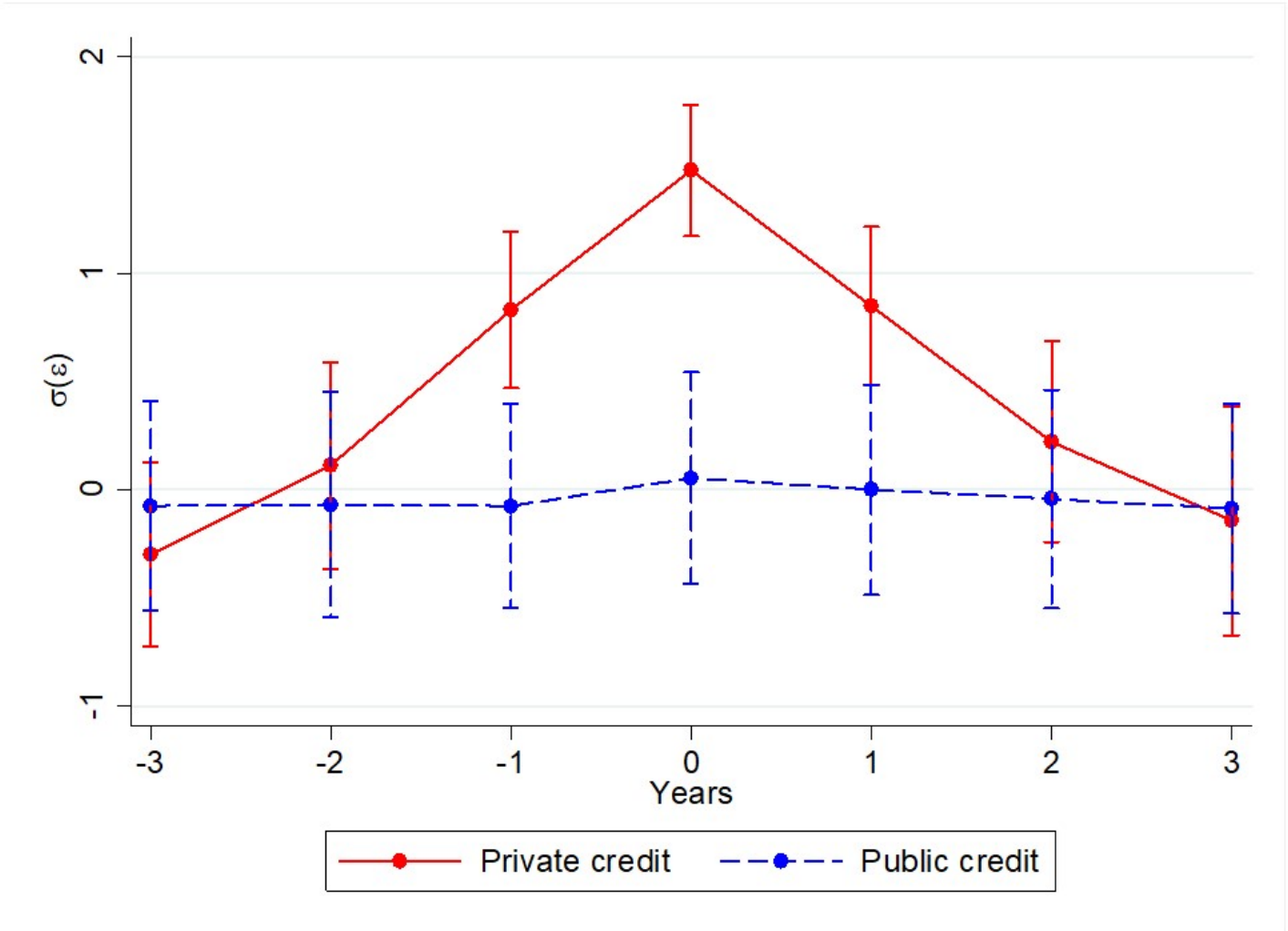
$$y_t = \beta_0 + \beta_1 y_{t-3} + \beta_1 y_{t-4} + \beta_1 y_{t-5} + \beta_1 y_{t-6} + \varepsilon_t \qquad (2)$$

The cyclical component of credit is the residual of Equation 2 ε_t. A boom occurs when the log of real credit exceeds expectations by more than a specific amount, which is defined in terms of the country specific standard deviation of ε_t

Table 1: Public and private booms - Descriptive stats

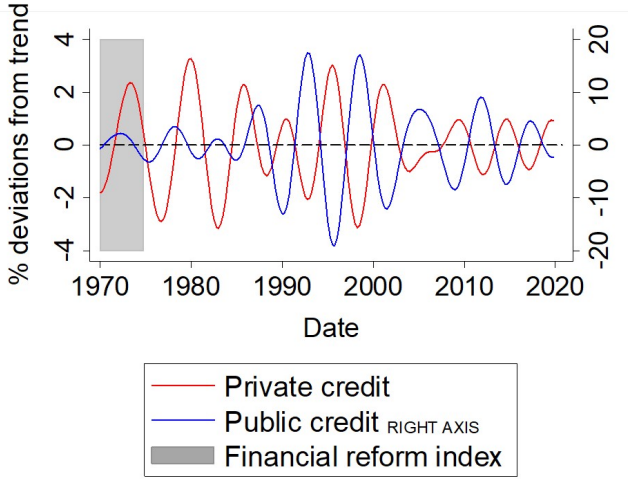
Country	Nb of private booms	Nb of public booms	Avg length private boom	Avg length public boom	Nb of "bad" private booms
Austria	6	4	3.25 years	2.75 years	3 (50%)
France	8	5	2.25 years	3 years	5 (63%)
Germany	4	4	2.5 years	2 years	2 (50%)
Greece	4	5	5 years	2.5 years	1 (25%)
Indonesia	4	5	1.75 years	2 years	2 (50%)
Italy	6	5	3 years	2 years	5 (83%)
Japan	6	6	2 years	1.75 years	3 (50%)
Mexico	5	6	2.25 years	2.25 years	5 (100%)
Norway	8	7	1.5 years	2 years	6 (75%)
US	9	7	2 years	1.75 years	6 (66%)
South-Korea	3	9	4.5 years	1.5 years	3 (100%)
Spain	7	7	2.5 years	2.25 years	3 (43%)
Thailand	7	3	2.5 years	4 years	3 (43%)
Total nb & avg length	77	73	2.75 years	2.25 years	47 (61%)

Figure 5: Event study - Public credit during a boom



Note: To construct this figure, I start with the residual of Equation 2 ε_t. I scale ε_t by its country-specific standard deviation $\sigma(\varepsilon_t)$. I then average out the result across the sample, for event-3, event-2,..., event+3 (where "event" indicates the date of the peak of the private boom).

Figure 6: Public credit and private cycles



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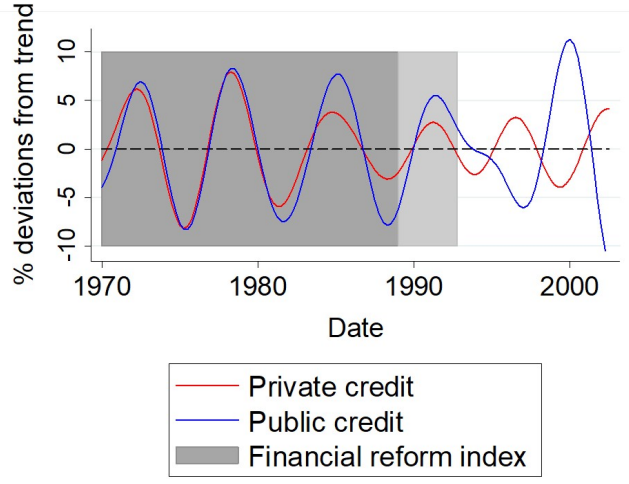
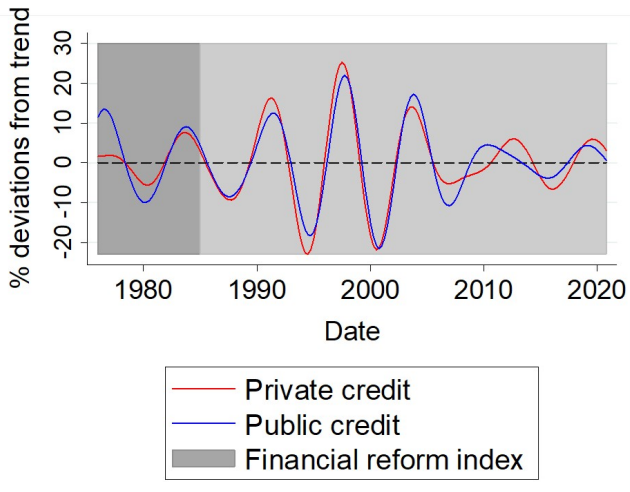


(b) Greece



(c) Indonesia

Note: The red and blue lines show the cyclical component of private and public credit respectively. The cyclical component is generated with a Christiano and Fitzgerald (2003) filter.

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- ◇ I generate a variable $Sync_{i,t}$ which takes on two different values: 1 if private and credit cycles are on the same phase, and -1 if private and credit cycles are on the opposite phase (for country i at time t).
- ◇ I then take the expected value of $Sync_{i,t}$ across the sample. To estimate the average value of $Sync_{i,t}$, I run the following panel regression:

$$Sync_{i,t} = \beta_0 + \varepsilon_{i,t} \tag{3}$$

The OLS estimate of β_0 is the sample mean of phase synchronization $\mathbb{E}[Sync_{i,t}] = \frac{1}{i \times t} \sum Sync_{i,t}$.

An econometric test (2/2)

Table 2: Public and private credit cycles synchronization

	Low liberalization	High liberalization
β_0	0.440***	-0.225***
	(0.030)	(0.042)
Observations	1911	1210
No. of countries	13	12

* p<0.1 ** p<0.05 *** p<0.01

Notes: Newey–West standard errors are given in brackets. I allow two lags to be considered in the auto-correlation structure. The low liberalization sub-sample (column 1) groups all the observations associated with a financial reform indicator below its sample mean. The high liberalization sub-sample (column 1) groups all the observations with a financial reform indicator above its sample mean. I use the indicator from Abiad et al. (2010) (as in Figure 6).

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- During a private boom (bust), the financial constraint loosens (tightens) and demand for public loans dries out (increases).
- Do political institutions play a role? (Herrera et al. 2020)

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- ◇ Can public credit mitigates the decline in total credit and output during private busts?

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- ◇ Can public credit mitigates the decline in total credit and output during private busts?
- ◇ I start with the sample of private credit booms. For each boom, I calculate the total credit (output) loss during the subsequent bust as the difference between the cumulative real growth rate of total credit (GDP) over the 5 years following the end of the boom, and the country mean growth rate of total credit (GDP).

Public credit and the real effect of private busts 1/2

- ◇ Can public credit mitigates the decline in total credit and output during private busts?
- ◇ I start with the sample of private credit booms. For each boom, I calculate the total credit (output) loss during the subsequent bust as the difference between the cumulative real growth rate of total credit (GDP) over the 5 years following the end of the boom, and the country mean growth rate of total credit (GDP).
- ◇ I then estimate the following regression over the sample of credit booms:

$$Loss_i = \beta_0 + \beta_1 Share_i + \varepsilon_i \tag{4}$$

Where *Loss* represents total credit (or output) loss following boom i, and *Share* is the ex-ante share of public credit (calculated as the % share of public credit in total credit at the end of boom i).

Public credit and the real effect of private busts 2/2

Table 3: Public credit and private busts

	(1)	(2)	(3)	(4)	(5)	(6)
Ex-ante share of public credit	1.587**	0.398	0.619***	0.519***	0.286	0.147
	(0.698)	(0.998)	(0.167)	(0.167)	(0.186)	(0.158)
Constant	-37.065***	-30.820	-12.212***	-8.712***	-11.906**	-6.556
	(11.262)	(28.392)	(2.703)	(2.674)	(5.446)	(4.383)
Observations	23	25	23	30	24	31

* p<0.1 ** p<0.05 *** p<0.01

Notes: The dependent variable is the cumulative credit loss after a credit boom in specifications (1) to (3), and the cumulative output loss in specifications (4) to (6). The cumulative credit (output) loss is calculated as the difference between the growth rate of real total credit (output) over the 5 years following a credit boom, and the country mean growth rate of real total credit (output) over 5 years. A positive (negative) loss thus indicates that the growth rate of real total credit over the 5 years following a credit boom is above (below) the growth rate in "normal" times. Specifications (1), (3) and (4) are estimated over the post-liberalization sub-sample, while specifications (2), (5) and (6) are estimated over the pre-liberalization sub-sample. In specifications (1), (2), (3), and (5) I focus on bad credit booms, while specifications (4) and (6) extend the sample to all booms (i.e. both good and bad booms).

Policy implications and conclusion

- Limited monetary policy independence is possible, even in fixed exchange rate regimes with open capital accounts. Public credit can be used to shelter selected groups of borrowers from the Global Financial Cycle.

Policy implications and conclusion

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- ◇ By targeting borrowers with no (or limited) access to private finance, public credit can help reduce the real effect of credit busts. These borrowers play a disproportionate role in the transmission of credit shocks to the real economy (Eggertson and Krugman 2012, Guerrieri and Lorenzoni 2017, Mian and Sufi 2014).

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- ◇ What next?

Appendix 1#: Data Sources (1/2)

- Austria: Annual Reports and Statistische Monatshefte of the OeNB.
- France: Rapports du Conseil National du Crédit (1953-1984). Statistiques Monétaires Mensuelles of the Bank of France (1985-1995).
- Germany: time-series database of the Bundesbank.
- Greece: Monthly Statistical Bulletin of the Bank of Greece.
- Italy: Bollettino Economico (Bank of Italy).
- Japan: Flow of Funds Statistics (Bank of Japan database).
- Norway: Statistisk Meddelelser (1950-1960), Statistisk Manedshefte (1961-1997), Bank og- Kredittstatistiskk (1998-2001) and StatBank (2002-2020).
- United States: Fed online database.
- Spain: Banco de Espana's website: `https://www.bde.es/webbde/es/estadis/infoest/bolest4.html`.

Appendix 1#: Data Sources (2/2)

- Indonesia: Indonesian Financial Statistics published by the Bank Indonesia.
- Mexico: Informe Annual of the Banco de Mexico.
- South-Korea: Bank of Korea's Economic Statistics Yearbook and the Financial Supervisory Service (FSS) database.
- Thailand: Annual Reports of the Bank of Thailand.

Appendix 2#: Public credit institutions (1/2)

- Austria: loans by the sonderkreditunternehmungen (special credit institutions) to domestic non-banks.
- France: loans by the Instituts Spécialisés du Crédit. Starting in 1984, loans by the Institutions Financières Spécialisées (IFS).
- Germany: loans by Banks with Special, Development and other Central Support tasks.
- Greece: loans by specialized credit institutions.
- Italy: loans by the Istituti Speciali di Credito.
- Japan: loans by the Government Financial Institutions, and direct loans from the Treasury (Fiscal Loan Fund).
- Norway: loans by State Banks.
- US: direct loans by the Federal Government and by the State and Local Governments.
- Spain: loans of the Instituto de Credito Oficial (ICO).

Appendix 2#: Public credit institutions (2/2)

- Indonesia: loans by state banks and regional development banks, and direct loans by Bank Indonesia.
- Mexico: loans by the development banks and by the "fondos de fomento" (development funds).
- South-Korea: loans by specialized banks, development institutions, and government loans.
- Thailand: loans by specialized financial institutions.

Public credit and the interest rate channel 1#

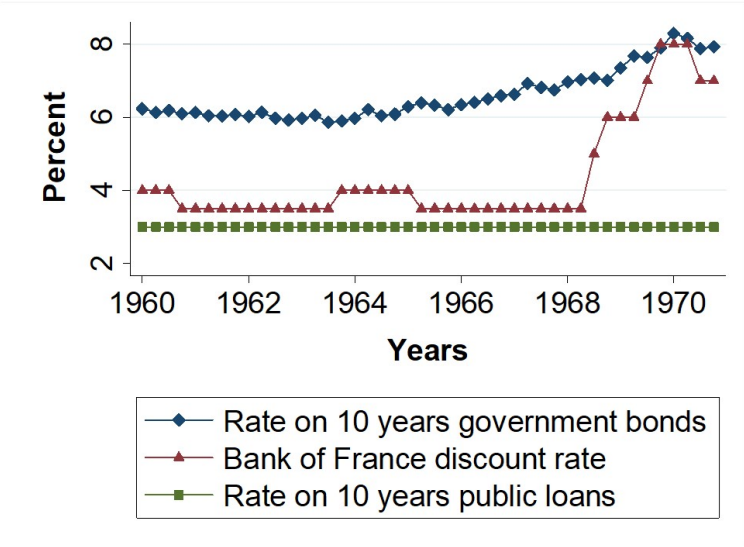

Figure 7: France

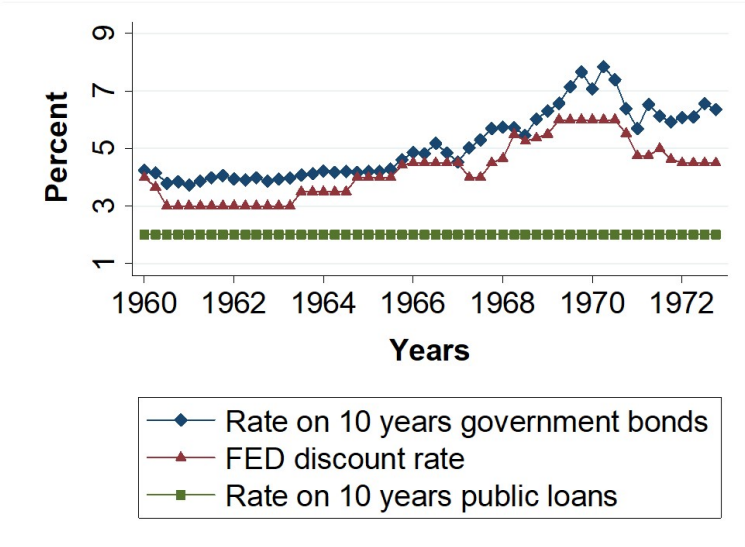

Figure 8: US

Public credit and the interest rate channel 2#

Figure 9: Norway