THE ASYMMETRIC AFFECTS OF HETEROGENEOUS CAPITAL FLOWS ON THE CREDIT CYCLE

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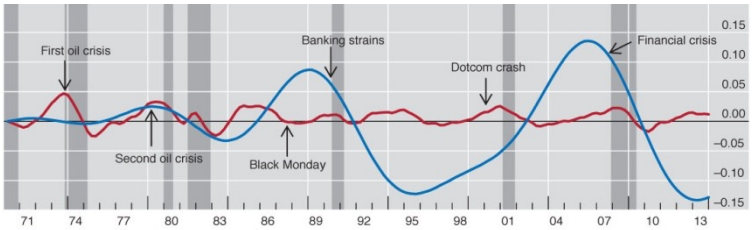
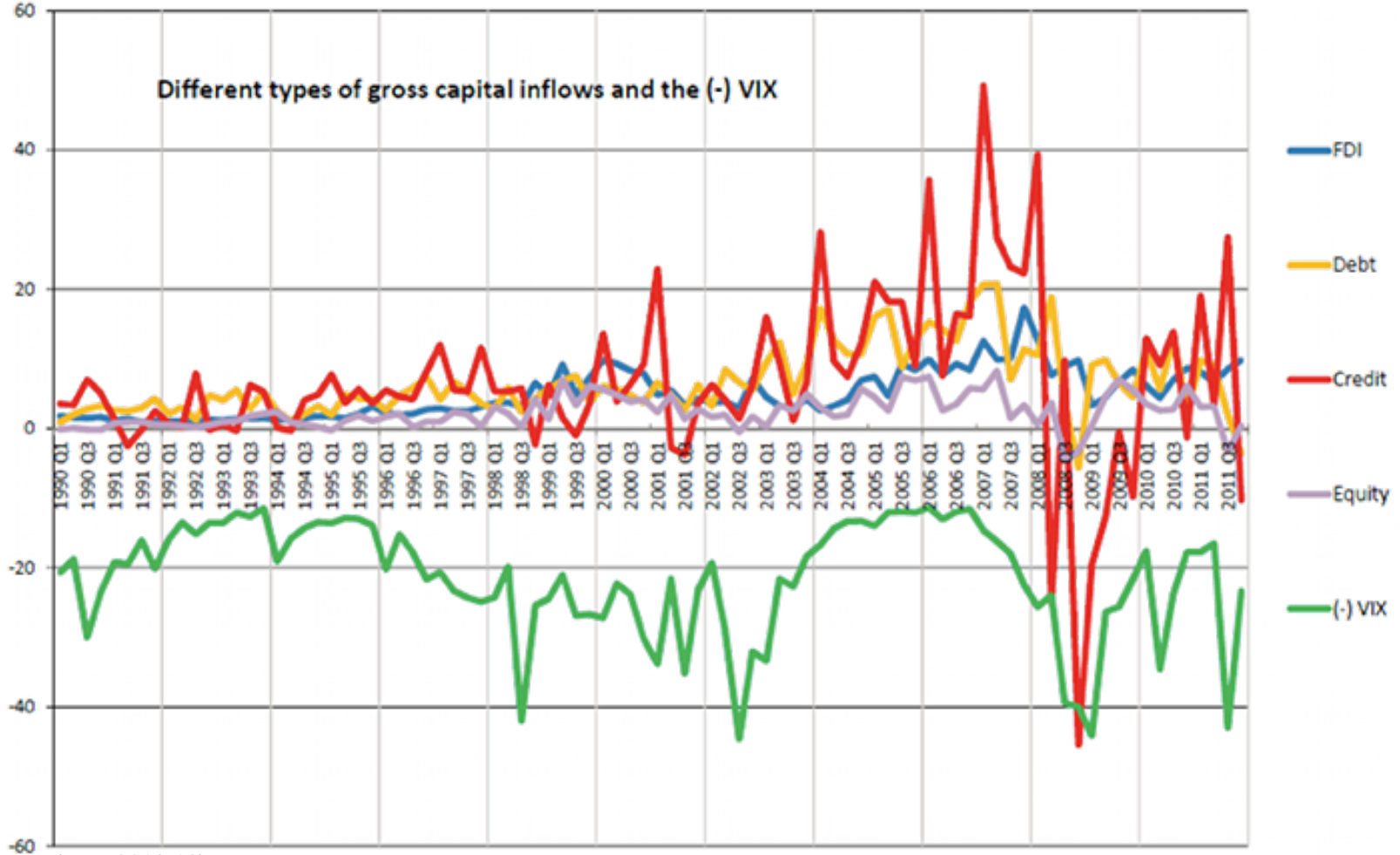
VIRTUAL WORKSHOP
NEW DEVELOPMENTS IN MACROECONOMICS

Introduction

- The IMFS is characterised by ***"excess financial elasticity"*** → inherent systemic risk
  - financial cycle >> business cycle
- International capital flow heterogeneity
  - surges, stops, flight, retrenchment
- Historical role of capital controls and macroprudential policy



The financial and business cycles in the U.S. (Drehmann, Borio, Tsatsaronis, 2012)


Different types of gross capital inflows and the (-) VIX
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2011 Q3
FDI
Debt
Credit
Equity
(-) VIX

(Rey, 2018:18)

Motivation

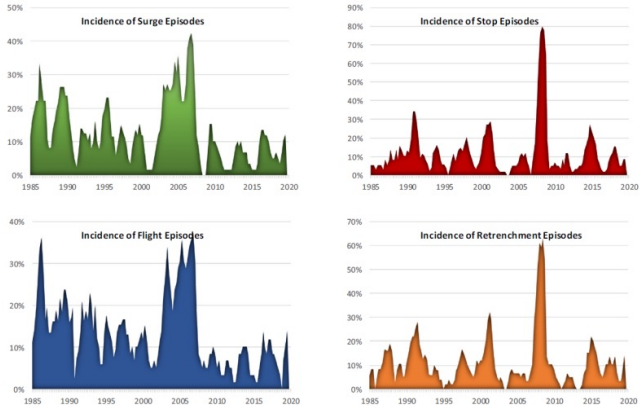
- Financial openness ***without*** financial integration creates the ***space*** for systemic risk
- Financial integration → large and persistent global imbalances
- Manifests itself in the form of credit booms
- IMFS incentivises and exacerbates a pattern of capital flows that eventually create ***macro-fragility***

Primary research questions

1. What is the impact of the exchange rate and heterogeneous capital flows on financial stability?
2. What is the historical role of capital controls and macroprudential policy?

Excess financial elasticity

- Effects and risks of global capital flow incidences on the credit cycle
- *Methodology*
  - probit model: Avdjiev, Binder and Sousa (2021)
  - linear probability model
- Heterogeneous capital flows data



Incidences of surges, stops, flight and retrenchment. Full sample. (Forbes and Warnock, 2021)

Data

1986Q1 – 2020Q3 for 32 countries

Variable	Source
Total credit to private non-financial sector	BIS
Heterogeneous capital flow episodes	Forbes and Warnock
Real GDP growth	OECD
Long-term interest rates	OECD
Real residential property price growth	BIS
Inflation rates	OECD
Real effective exchange rate indices	Breugal
VIX	CBOE
Capital controls	Pasricha et al
MaPP	Cerutti et al

Descriptive statistics and correlation heatmap

Variable	Mean	SD	Boom	Bust	Surge	Stop	Flight	Retrench	GDP growth	Interest rate	Property price growth	Inflation rate	Exchange rate	VIX	VIX^2
Boom	0.60	0.49	1	-0.41	0.15	0.02	0.12	0.02	0.24	0.16	-0.15	0.09	-0.18	0.13	0.13
Bust	0.11	0.32		1	-0.07	-0.01	-0.03	-0.01	-0.2	-0.02	-0.07	-0.09	0.09	-0.04	-0.04
Surge	0.14	0.35			1	-0.17	0.57	-0.14	0.15	0.08	0.07	0.03	0.01	-0.04	-0.04
Stop	0.14	0.35				1	-0.15	0.69	-0.21	0.08	-0.06	0.04	0.03	0.23	0.23
Flight	0.15	0.36					1	-0.17	0.11	0.15	0.03	0.08	-0.01	-0.06	-0.06
Retrenchment	0.14	0.34						1	-0.2	0.04	-0.01	-0.01	0	0.24	0.25
GDP growth	2.49	3.28							1	0.07	0.09	0.13	-0.09	-0.23	-0.24
Interest rate	5.50	3.50								1	-0.08	0.42	-0.06	0.1	0.09
Property price growth	7.35	23.66									1	-0.03	-0.05	-0.01	-0.01
Inflation rate	0.91	1.96										1	-0.04	-0.02	-0.03
Exchange rate	4.57	0.14											1	-0.07	-0.07
VIX	2.93	0.36												1	0.99
VIX^2	8.73	2.20													1

Model specification

- Probit specification:

$$Prob(Cyclephase_{it} = 1 | C_{it}, \boldsymbol{X_{it}}) = \boldsymbol{\Phi}(\boldsymbol{\alpha C_{it}} + \boldsymbol{\beta X_{it}})$$

- Panel data → structural models

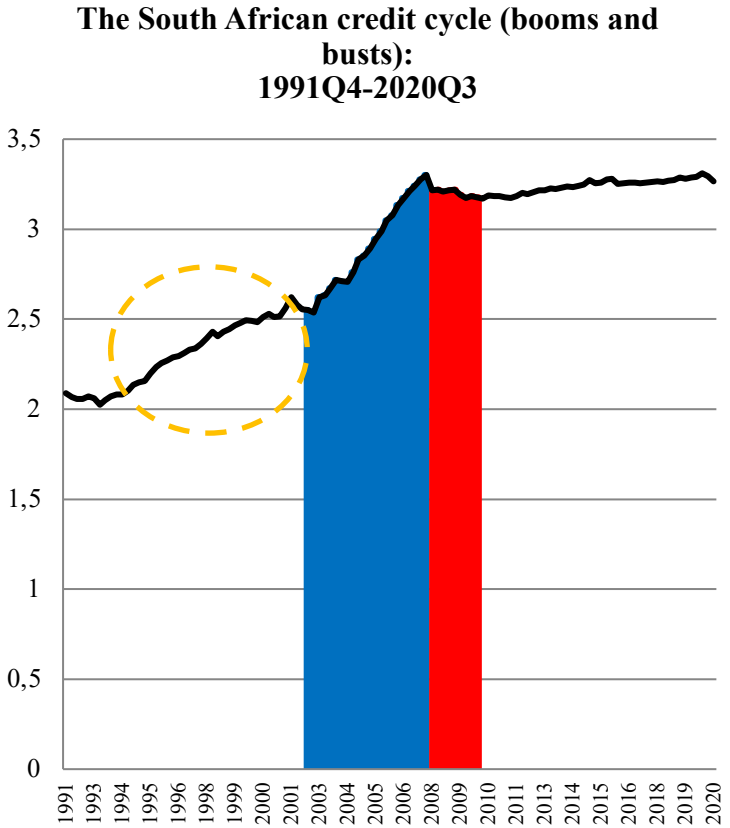
$$Cyclephase_{it}^{*} = \boldsymbol{\alpha C_{it}} + \boldsymbol{\beta X_{it}} + \varepsilon_{it}$$

$$Cyclephase_{it} = 1 \; if \; Cyclephase_{it}^{*} > 0,$$
$$and \; 0 \; otherwise$$

The credit cycle

- Estimation and algorithm
  - real credit growth
  - log, moving average, difference, define, cumulative upturn.
- Threshold comparison

	Boom	Bust
de Villiers et al (2021)	35%	-4%
Advjiev et al (2021)	51%	-7%
Arena et al (2011)	30%	
Aikman et al * (2013)	24%	



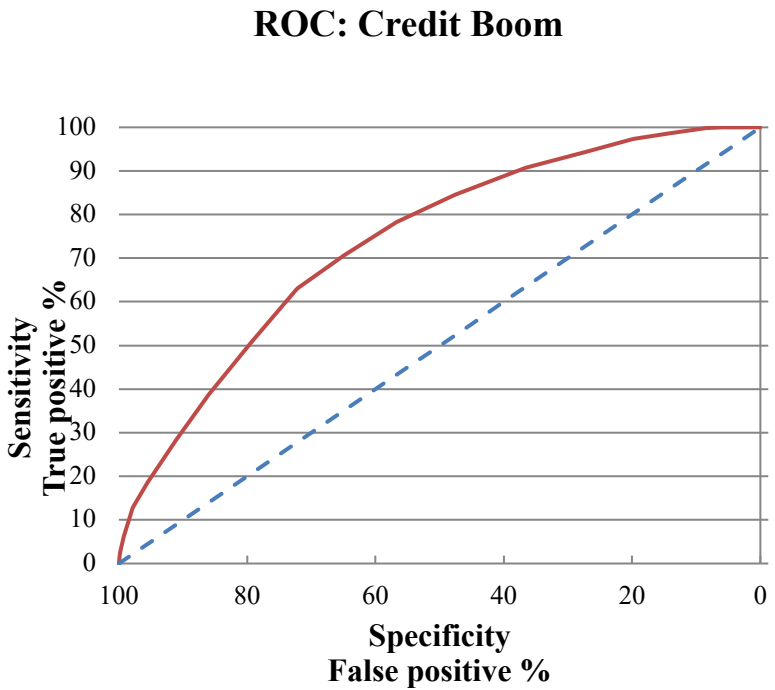
Probit --- Credit cycles and heterogeneous capital flow episodes

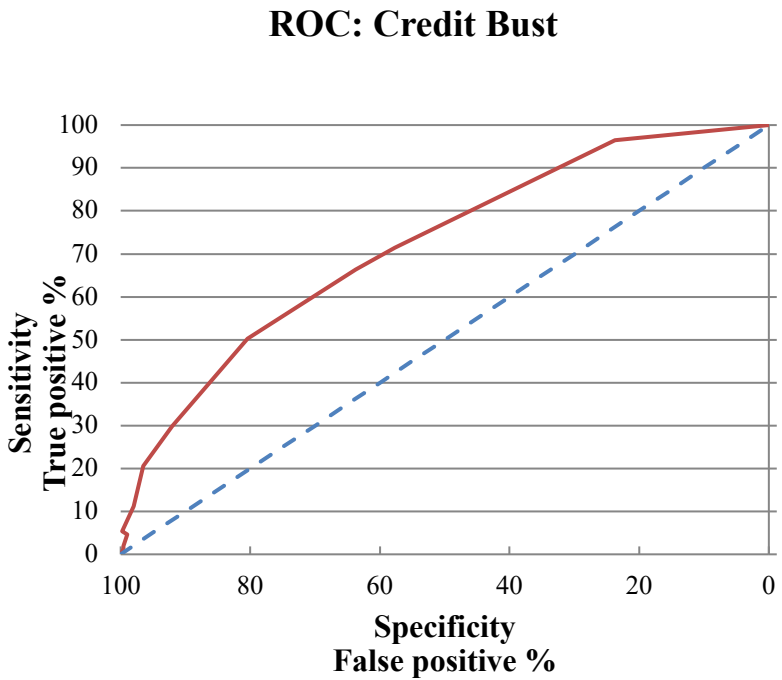
	Boom	Bust
Surge	0.567*** (0.090)	-0.360*** (0.130)
Stop	0.074 (0.092)	-0.207* (0.125)
Flight	0.149* (0.086)	0.060 (0.119)
Retrench	0.177* (0.094)	-0.042 (0.125)
GDP growth	0.137*** (0.009)	-0.114*** (0.010)
Long-term interest rate	0.029*** (0.008)	0.014 (0.010)
Property price growth	-0.013*** (0.001)	-0.004** (0.001)
Inflation rate	0.014 (0.033)	-0.162*** (0.043)
Effective exchange rate	-1.273*** (0.157)	0.523*** (0.202)
VIX	3.015*** (0.492)	-1.767*** (0.636)
VIX^2	-0.379*** (0.084)	0.208* (0.108)

Average marginal effects

$\frac{\partial \Phi(\alpha C_{it} + \beta X_{it})}{\partial t} \cdot \frac{dt}{dx} = f(\alpha C_{it} + \beta X_{it})$	Boom	Bust
Surge	0.190***	-0.062***
Stop	0.025	-0.036
Flight	0.050*	0.010
Retrench	0.060*	-0.007
GDP growth	0.046***	-0.020***
Long-term interest rate	0.010***	0.002
Property price growth	-0.004***	-0.001**
Inflation rate	0.005	-0.028***
Effective exchange rate	-0.427***	0.090***
VIX	1.011***	-0.304***
VIX²	-0.127***	0.036*

Receiver-operating characteristics





Primary research questions

1. What is the impact of heterogeneous capital flows on financial stability?
2. What is the historical role of capital controls and macroprudential policy?

Probit --- Credit cycles and heterogeneous capital flow episodes: Capital controls

	Boom	Bust
Surge	0.762*** (0.117)	-1.004*** (0.139)
Stop	0.286** (0.122)	-0.653*** (0.140)
Flight	0.383*** (0.117)	-0.514*** (0.135)
Retrench	0.386*** (0.123)	-0.677*** (0.142)
Inflow easing	0.190*** (0.060)	-1.134*** (0.227)
Outflow easing	-0.042 (0.062)	-0.323*** (0.107)
Inflow tightening	0.124 (0.144)	-0.525** (0.230)
Outflow tightening	-0.023 (0.184)	0.210 (0.199)

Probit --- Credit cycles and heterogeneous capital flow episodes: Prudential index

	Boom	Bust
Surge	0.735*** (0.102)	-1.030*** (0.123)
Stop	0.237** (0.105)	-0.538*** (0.127)
Flight	0.285*** (0.098)	-0.527*** (0.116)
Retrench	0.217** (0.104)	-0.739*** (0.125)
Prudential index	-0.014* (0.184)	-0.163*** (0.012)

Average marginal effects: Capital flow management measures

	Boom	Bust
Inflow easing	0.068**	-0.351 ***
Outflow easing	-0.015	-0.1002***
Inflow tightening	0.045	-0.163**
Outflow tightening	-0.008	0.065
Prudential index	-0.005*	-0.049***

Conclusions

- ***Asymmetric affects*** of heterogeneous capital flows on the credit cycle
- Capital flow surges and the exchange rate
- Long-term interest rate ***amplifies*** the credit cycle
- ***Feedback loop*** between surges, flight and exchange rate
- ***Synchronisation*** of domestic business and credit cycles
- Historical role of capital flow management measures

Thank you for this opportunity.

Are there any questions?

Key references (slides)

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