Macroprudential Policy, Banks' Profitability and Monetary Policy

Structure of presentation

Section 1

Personal resume

- Over 15 years working experience in the commercial and central banking and research environment (BoC, CBTT, BIS, UBS, CIBC).

- Representative on various financial sector and banking statistics policy committees in Canada and at international organisations (IMF & BIS).

- M.Sc. Financial Economics (Brunel University).

- B.Sc. Economics (University of the West Indies, St Augustine).

- International Certificate in Banking Risk and Regulation (GARP).

Ph.D. research

Theory of macroprudential policy and tools (1)

- IMF-FSB-BIS (2016) defined macro-prudential policy as the use of primarily prudential tools to limit systemic risk. A key aspect of the definition is the concept of systemic risk, which is the widespread disruption of the provision of financial services that is caused by an impairment of all or parts of the financial system and this disruption can cause serious negative consequences for the real economy.

- Two dimensions of systemic risk:

    Time dimension.

    Cross-sectional or structural dimension.

- What is the rationale for macro-prudential policy?

A recap of prior thesis chapters

- **Chapter 1**, we examine the effectiveness of macroprudential policy and its instruments in reducing the build-up of financial imbalances in the wider economy, as measured by the aggregate credit-to-GDP gap. This approach has not been done elsewhere. We find a number of

Chapter 3 research objectives

- The **first purpose** is to study the costs that are incurred when macroprudential policy are employed in the financial sector. We contend that although the aim of macroprudential policy is to prevent or limit financial instability across the broad financial system, the currently-suggested macroprudential tools and new regulations target the banking sector narrowly. This can be seen as an added cost to banks which in turn can affect banks' profitability and hence their ability to lend and potential economic growth.

- The **second purpose** is to look at macroprudential policy's relationship with monetary policy in the context of the specific profitability measure, namely the net interest margin. (**Not presented today**)

- **Hypothesis 1:** Whereas macroprudential policy has been employed to address financial system imbalances or to prevent the build-up of these imbalances, if the macroprudential policy is to be effective, there should also be a significant and negative effect on banks' profitability.

- **Hypothesis 2**: Whereas there may be a significant (positive/ negative) relationship between the interest rate (monetary policy) and bank profitability, and macroprudential policy is expected to have a significant and negative effect on bank profitability (Hypothesis 1), then macroprudential policy also has a significant effect on the bank interest rate margin when interest rates are allowed for, thus offsetting

Hypothesis 1 result expectation

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Why hypothesis 1 and result expectation? (1)

- Empirical literature on the effectiveness of macroprudential policy

  Many of these studies have specifically focused on the effectiveness of macroprudential policy in the area of the financial sector where there is the most potential for systemic risk to develop, that is the credit and housing markets and the banking sector.

- Credit-to-GDP gap effect

  First, the effectiveness of MPP in reducing the credit-to-GDP gap (Thesis Chapter 1). We find a number of tools to be effective including loan-to-value and debt-to-income ratio regulations, notably when the credit gap is positive. Banks credit make up a large portion of credit-to-GDP ratio.
  (*"Macroprudential Policy and the Credit-to-GDP Gap"*, Submission to the European Journal of Finance)

Why hypothesis 1 and result expectation? (2)

- Credit and housing markets effect

    Second, Lim et al (2011), Dell'Ariccia et al (2012), Jiménez et al (2012), Vandenbussche et al (2012), Akinci and Olmstead-Rumsey (2015), Cerutti et al (2017), Carreras et al (2018) using macro data. They found various MPP tools to be effective in reducing the financial system imbalances (credit and house price growth).

- Bank assets

    Third, Claessens et al (2014) using bank-by-bank data. Similarly, they found that policies aimed at borrowers are effective in (indirectly) reducing the build-up of banking system vulnerabilities. They suggested that measures aimed at banks' assets and liabilities are also very effective.

Why hypothesis 1 and result expectation? (3)

- Empirical literature of the cost of regulation to the banking sector.

  Van den Heuvel (2008) found, using US banking data, that the welfare cost of current capital adequacy (Basel Accords) of 8%, reduces consumption by between 0.1% and 1% because it reduces the ability of banks to create liquidity.

  Tchana (2012) found, using US banks data for the period 1993 to 2010, that higher capital

Why hypothesis 1 and result expectation? (4)

Variable	Credit-to-GDP gap	Credit and housing markets	Bank assets
LTV	_***	_***	_***
DTI	_***	_**	
FC		_*	_*
TAX		_***	
INTER		_***	
CONC	_***		
LTVCAP	_***	_*	
SIFI			
DP	_**	_***	
CTC			_***
LEV			

Section 2
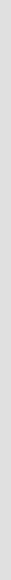
Determinants of Banks' Profitability (1)

- We look at the issue using the theory on the determinants of banks' profitability.

- We collected annual financial statements banking data on 92 countries, 34 advanced countries and 58 emerging markets economies, 6,010 banks (3,095 banks from advanced countries and 2,915 banks from emerging market economies) and 84,140 observations. The types of banks included are universal commercial banks, retail and consumer banks, banks, wholesale banks, and Islamic banks. Investment banks and private banks are excluded due to different balance sheet and income structure as are bank holding companies, to avoid double counting.

- The data are collected from Fitch Connect for the period 2000-2013.

Determinants of Banks' Profitability (2)

North America	Caribbean	Europe		Eurozone	Asia
Canada	Bahamas	Austria	Poland	Austria	China
USA	Barbados	Belgium	Portugal	Belgium	Hong Kong
	Belize	Bulgaria	Romania	Cyprus	India
Central America	Guyana	Croatia	Russia	Estonia	Indonesia
Costa Rica	Jamaica	Cyprus	Serbia	Finland	Japan
El Salvador	Suriname	Czech Republic	Slovak Republic	France	Korea
Guatemala	Trinidad and Tobago	Denmark	Slovenia	Germany	Malaysia
Honduras		Estonia	Spain	Greece	Mongolia
Mexico	**Africa**	Finland	Sweden	Ireland	Philippines
Nicaragua	Algeria	France	Switzerland	Italy	Singapore
Panama	Angola	Germany	Turkey	Latvia	Thailand
	Cote D'Ivoire	Greece	UK	Lithuania	
South America	Egypt	Hungary	Ukraine	Luxembourg	**Middle East**
Argentina	Ghana	Iceland			

Determinants of Banks' Profitability (3)

Model Specifications ROAA and ROAE (1)

We stipulate the following ordinary least squares (OLS) model of the determinants of banks' profitability

$$Y_{it} = \alpha_{it} + \beta Internal_{it-1} + \text{Þ} Macro_{ijt-1} + Industryi_{ijt-1} + BCrisis_{ijt-1} + \epsilon_{it}$$

where i3(lo)7T E,otes the individual ba E,k, j refers to the country in which bank i operates t indicates time period. The depT E,dant variable, Yit denotes the banks' profitability (ROAA or ROAE). The variable denoted by I E,ternal is the vector of ba E,k internal factors. The Macro variable is the vector of macroeconomic variables. The industry competition variable we use is the Lerner Index. BCRISIS variable is a vector capturing the presence of a banking crisis during the period a country experiT E,ced a banking crisis as defined by Laeven and Valencia (2018).

Model Specifications ROAA and ROAE (2)

- We estimated OLS with lagged independent variables. Lagging the variables by a year is to avoid the potential issues of endogeneity (see Beck et al (2013), Davis et al (2019), de-Ramon et al (2018)). All variables are winsorised at 99% to avoid an impact of outliers.

- The results of the Hausman test suggested that fixed effects model is appropriate. (ROAA - Hausman test, X^2: 170.62, p-value:0.00; ROAE - Hausman test, X^2: 103.95, p-value: 0.00).

- We further examine the joint significance of the fixed effects (banks and/ with time effects), the fixed effect models are tested using the Likelihood Ratio test. The results are supported by the highly statistical significance of the Likelihood Ratio test at 1%, 5% and 10%, which suggest banks and/ time fixed effected are significant in the models.

- The models were estimated with bank level fixed effects with White's cross-sectional standard errors and covariance (corrected for degrees of freedom) as in Davis and Karim (2018).

Model Specifications ROAA and ROAE (3)

- Models were estimated for the following periods and country groups.

  All countries (92) for the period 2000 to 2013

  All countries (92) for the 2000 to 2006

  All countries (92) for the period 2007 to 2013

  Advanced countries (34) for the period 2000 to 2013

  Advanced countries (34) for the 2000 to 2006

  Advanced countries (34) for the period 2007 to 2013

  Emerging countries (58) for the period 2000 to 2013

  Emerging countries (58) for the 2000 to 2006

  Emerging countries (58) for the period 2007 to 2013

Modelling results ROAA and ROAE (1)

Modelling results ROAA and ROAE (2)

Dependent variable: ROAA and ROAE		
	ROAA	ROAE
	Panel OLS with bank level fixed effects	Panel OLS with bank level fixed effects
Macroprudential instruments		
Loan-to-Value Ratio (LTV(-1))	-0.129**	-2.441***
	(-2.001)	(-3.573)
Debt-to-Income Ratio (DTI(-1))		

Modelling results ROAA and ROAE (3)

- Overall in the period 2000-2013 (**all countries**), the model results suggest that a policy limiting borrowings (asset measures) such as loan-to-value ratios (LTV and LTVCAP) and debt-to-income ratios (DTI), liquidity measure, domestic currency loans limits (CG) as well as the capital measure, general countercyclical capital buffer (CTC) had the most consistent effect on banks' profitability. These instruments are statistically significant and negatively related to ROAA and ROAE.

- The results are fully in line with our expectation since credit measures are the most effective in reducing credit activities in an economic upswing and thus banks' profitability.

Modelling results ROAA and ROAE (4)

- **Advanced countries**: LTV and LTV CAP have significant and negative effect on ROAA and ROAE, while DTI, SIFI and FC have negative and significant on ROAE only over the period 2000-2013.

- **Emerging market economies**: DTI, CG, TAX have significant and negative effect on ROAA and ROAE, while CTC has a negative and significant on ROAA only over the period 2000-2013.

Summary results

Variable	Credit and housing markets measures	ROAA	ROAE
LTV	-***	-***	-***
DTI	-***	-***	-***
FC	-*		
TAX	-***		
INTER	-***		
CONC	-***		
LTVCAP	-***	-**	-**
SIFI			

Section 3

Robustness checks of the results (1)

Independent variables coefficient values are reported and the t-statistics are reported in parenthesis below each estimated coefficient. Variables are winsorised at 99%. *** significant at 1%, ** significant at 5%, * significant at 10%. The interest rate factors were tested and highly insignificant in the models as a result they were dropped from the models.

Dependent variable: ROAA and ROAE		
	ROAA	ROAE
	Panel OLS with country fixed effects	Panel OLS with country fixed effects
Macroprudential instruments		

Robustness checks of the results (2)

Independent variables coefficient values are reported and the t-statistics are reported in parenthesis below each estimated coefficient. Variables are winsorised at 99%. *** significant at 1%, ** significant at 5%, * significant at 10%. The interest rate factors were tested and highly insignificant in the models as a result they were dropped from the models.

Dependent variable: ROAA and ROAE				
	Retail and Consumer Banks		**Universal Banks**	
	ROAA **Panel OLS with banks fixed effects**	**ROAE**		

Conclusion

- The empirical results suggest in the sample period, 2000-2013, a number of measures of macroprudential policy such as assets measures, loan-to-value ratios measures (LTV and LTVCAP) and debt-to-income ratios (DTI), liquidity measure, domestic currency loans limits (CG) as well as the capital measure, general countercyclical capital buffer (CTC) had a negative and significant effect on banks' profitability as measured by return of average assets (ROAA) and return on average equity (ROAE).

- Some macroprudential measure may affect the credit and housing markets but may not necessarily impact banks' profitability such as limits on foreign and domestic currency loans (FC and CG), levy/taxes (TAX), concentration limits (CONC), etc. This may suggest that banks are able to pass on the cost to clients which would require further investigation. Further, there is a weaker effect in more developed and more financially open economies, suggesting some avoidance and/or disintermediation of the policy (Cerutti et al 2017).

Thank you