General Lessons from Iceland’s Monetary and Financial Experience

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The opinions expressed herein are those of the author and do not necessarily reflect the opinions or policy of neither the Central Bank of Iceland nor Aarhus University.
Preface

• Many lessons from Iceland’s experience could be discussed, but given the context and time constraint, I will focus on lessons particularly related to macrofinancial linkages ...

• ... that I believe are relevant for a broader group of small open economies, ...

• ... both in terms of understanding the underlying dynamics and designing more resilient policy frameworks
Introduction

“Macrofinancial linkages are hard to model, hard to measure, and hard to manage”

Christopher Crowe and Jonathan D. Ostry
Dissertation: Macrofinancial linkages and crises in SOEs

Chapter 1: Weathering the financial storm
Cross-country analysis of the recent global financial crisis

Chapters 2-3: The long history of financial boom-bust cycles in Iceland
Analysis of financial cycles and crises in one country over more than a century

Chapter 4: Households’ position in the financial crisis in Iceland
Micro-data based analysis of a key sector in the recent financial crisis

Chapter 5: Cross-border credit intermediation and domestic liquidity provision in a small open economy
DSGE model with a sophisticated credit market and macrofinancial linkages
The finance cycle as an analytical tool to foster understanding of macro-financial linkages and crises

“Macroeconomics without the financial cycle is like Hamlet without the Prince”
Claudio Borio
Definition and data

Definition of the financial cycle

• The term generally refers to the co-movement of a set of financial variables, including both quantities and prices – its most parsimonious representation relies on house prices and credit
• We measure the financial cycle as the low-frequency cyclical co-movement of a broader set of financial variables to attain additional insight and expose potentially important small open economy features – including the role of global spillovers

Annual data for the period 1875-2013*

• Financial variables
  • Real house prices, credit, and money, as well as banking system assets, leverage, and liability composition
• Macroeconomic variables
  • GDP, domestic demand, trade deficit, the nominal and real exchange rate, terms of trade, and inflation
• In addition: international data to analyse global spillovers

*Some banking system variables only extend back to 1886.
Method to extract cyclical components from the data

Medium-term cycles in individual series

- As has become standard in this literature, we apply the Christiano and Fitzgerald frequency filter to log-differences of our series
- We then cumulate these growth series into log-levels (starting from zero at the first observation of the variable) to construct medium-term cycles for each individual variable

The aggregate financial cycle

- We estimate the aggregate financial cycle using a principal component analysis to identify the low-frequency cyclical co-movement of our set of financial variables
- We thus identify the financial cycle as the first principal component, i.e. the one that explains most of the combined variability in our variables
The financial cycle and its composition

- Our principal component analysis reveals that there indeed exists a well-defined aggregate financial cycle in Iceland.
- Seven identified cyclical expansions: the latest one standing out in size and duration.
- Important role for bank balance sheets, especially during periods of liberalised financial markets and institutions.
- The cycle’s duration, amplitude, and intensity grows over the period spanning more than a century.

1. Financial cycle and contribution of individual cyclical components, weighted with their normalised factor loadings. House price component refers to the contribution of the medium-term cycle in real house prices to the financial cycle. Credit component refers to the weighted average contribution of medium-term cycles in real credit, credit-to-GDP and credit-to-M3 to the financial cycle. Bank balance sheet component refers to the weighted average contribution of medium-term cycles in bank assets-to-GDP, foreign non-core bank liabilities ratio and total non-core liabilities ratio to the financial cycle. The individual components are normalised so that their sum has the same mean and standard deviation as the aggregate cycle.

Important value in the financial cycle approach ...

Uncovers forgotten lessons of the past

- The fact that financial cycles usually take a long time to complete – decades even – calls for a longer view and data span than is usually required to analyse most other economic phenomena ...
- ... which leads to the uncovering of forgotten lessons and the realisation that “there is nothing new except what has been forgotten”

Focuses on stocks rather than shocks

- Focuses on the medium-term cycles of each series which tend to dominate the cyclical behaviour of financial variables – with business cycles (2-8 years) playing a relatively small role ...
- ... and therefore allows for an important role for stocks rather than shocks, as well as the interaction between balance sheets and price developments
… which would come as no surprise to Great Depression-era economists

“It is [...] not possible to give an adequate analysis of the major business cycle [...] without taking account of the impact on that cycle of the longer cycle of building construction. This factor is one of the most profound of the various influences which cause one major business cycle to differ from another. And in this factor we are able to see against the background of earlier American experience a part of the explanation of the severity of the Great Depression starting in 1929.”

Alvin Hansen, 1941

“When over-indebtedness stands alone, that is, does not lead to a fall of prices [...], the resulting "cycle" will be far milder and far more regular. Likewise, when a deflation occurs from other than debt causes and without any great volume of debt, the resulting evils are much less. It is the combination of both—the debt disease coming first, then precipitating the dollar disease— which works the greatest havoc”.

Irving Fisher, 1933
Characteristics: the cycle is long, has large real effects,

• The financial cycle is much longer than the typical business cycle: 16 years on average and has lengthened over time – lasting 19.5 years on average in the post-WW2 period (due to lengthening of expansionary phase)
• Large differences in economic activity over different phases of the financial cycle: growth is almost three times higher in the expansionary phase and business cycle contractions that coincide with financial cycle contractions are more drawn out

1. Business cycles refer to cycles of 2-8 years in GDP. Duration measured from troughs to peaks for expansions, from peaks to troughs for contractions, and from peak to peak for complete cycles. 
2. Median growth rate of domestic demand and GDP over expansionary and contractionary phases of the financial cycle and the relative duration (in years) of contractions in each series that coincide with the contractionary phase of the financial cycle relative to contractions that do not coincide with contractionary phases of the financial cycle.

... its peaks frequently coincide with financial crises,

- Financial crises (5 banking and 6 “multiple” crises) are closely aligned with peaks in the financial cycle: about 80% of cyclical peaks coincide with a financial crisis within a 3 year window
- An early-warning exercise suggests that the aggregate financial cycle has a lower noise-to-signal ratio than the individual financial variables – highlighting their important interaction in amplifying financial imbalances

1. Multiple financial crises are estimated using a version of the Harding-Pagan non-parametric common cycle algorithm designed to capture the clustering nature of currency, inflation, and banking crises.

.. and it seems to be mainly driven by the global cycle

- Strikingly strong ties between the Icelandic financial cycle and its global counterpart: 6 of the 7 peaks in Iceland coinciding with a corresponding peak in the global financial cycle and the two cycles are in the same phase 75% of the period notwithstanding different policy and openness regimes
- This seems to hold more broadly as can be observed from the Danish and Norwegian financial cycles below

1. Financial cycle, estimated as the first principal component of the medium-term cycle of the credit-to-GDP ratio and real house prices for Denmark and Norway, with the US serving as a proxy for the global financial cycle. Dates for domestic financial crises in Norway and Denmark are from Reinhart and Rogoff (2011).

Bottom line and some policy issues

**Bottom line**

- There exists a well-defined financial cycle that seems to play an important role in macroeconomic developments and financial crises.
- Evidence of strong global financial cycle spillovers, even across different policy and openness regimes – operating through various transmission channels.
- Hence, the financial cycle entails powerful, pro-cyclical, and long-lasting forces, which to a significant degree originate outside the domestic domain.

**Policy issues**

- How can the design of domestic policy frameworks take the financial cycle and global spillovers, as well as their associated macrofinancial linkages, into account to attenuate the boom-bust dynamics they give raise to?
Ongoing post-crisis policy reforms in Iceland

**Institutional**
- Monetary policy committee
- Financial stability council with a systemic risk council
- Governance within and across policy spheres

**Intermediary objectives**
- Safeguard monetary policy transmission, avoid being overburdened
- Limit systemic risk (across the time and cross-sectional dimensions)
- Strengthen the financial system’s resilience to busts

**Toolbox**
- FX interventions
- Liquidity and funding regulation
- Capital buffers
- Capital flow management measures
- Debtor tools
Capital flow management

“Are the financing conditions set in the main world financing centres setting the tone for the rest of the world, regardless of the exchange-rate regime?”

Helena Rey
Excessive capital flows and crises

• Foreign capital markets always been an important source of funding for Icelandic entities – but the greatest excesses and associated crises have nevertheless taken place within relatively liberal regimes
• Break-down of fixed exchange rate regime following the liberalisation in 90s (similar to other Nordic excl. DK)...
• ... and excessive capital flows, hefty build-up of leverage and systemic risk in the 2000s resulting in a large crisis

Gross capital flows and current account balance 1980-2015

Iceland's leverage cycle in the 2000s

1. Gross capital inflows from non-residents represent their net purchases of domestic assets, while gross capital outflows from residents (shown as negative values) represent their net purchases of foreign assets. The current account in 2008-2015 is based on estimated underlying current account.

Self-reinforcing procyclical feedback-loop for capital flows, risk appetite, and balance sheet expansions.

- **Capital inflows as confidence increases**: Capital inflows lead to higher exchange rate and asset prices. Balance sheets strengthen.
- **Capital outflows as confidence decreases**: Capital outflows lead to lower exchange rate and asset prices. Balance sheets weaken.
- **Increased domestic demand**: Increased domestic demand leads to higher volatility and risk. Balance sheets strengthen.
- **Decreased domestic demand**: Decreased domestic demand leads to lower volatility and risk. Balance sheets weaken.

Capital flow management measure to mitigate risks

Risks

- Risks associated with capital flows depend especially on their relative size and composition, as well as domestic financial market and balance sheets’ resilience to their associated volatility: these risks need to be considered against cross-border capital flows’ well-known benefits.

Policy

- Iceland’s experience a vivid example: it should be recognised that conventional macroeconomic and financial stability policies may need to be complemented with capital flow management measures (CFMs) to hinder institutions and policies from becoming overburdened – this has indeed already been implemented in the form of a reserve requirement in Iceland.

CFMs: complementary when policy is constrained

Surge of capital inflows

Macro stability
Overheating, excessive appreciation, sectoral allocation

Financial stability
Credit and asset price booms, mismatches, external liabilities

Macro policies
Exchange rate, monetary-fiscal policy mix, FX interventions

Prudential policies
Directed at financial institutions, debtors, and markets

Capital flow management measures
E.g. unremunerated reserve requirements or tax on inflows

1. Figure partly based on Ostry et al. (2011). Managing capital inflows: What tools to use? IMF Staff Discussion Note, no. SDN/11/06.
Assessment of borrowers’ financial difficulties and debt restructuring

“Easy money is the great cause of over-borrowing”

Irving Fisher
Importance of reliable and detailed enough data

**In the run-up to the crisis**
- Mainly access to aggregate data and incomplete samples of household-level data were only available with a long lag and firm-level data was limited to a few listed companies.
- The balance sheet expansion was clear from the available data, but the build-up of vulnerabilities and increased risk were only partly observable.

**When the crisis hit**
- Serious lack of data to assess the effects of the crisis on borrowers’ financial position and provide policy advice.

**Post-crisis**
- Nationwide household-level database and an extensive firm-level database built in 2009 by the Central Bank in response to the crisis.
Identification of type of problems, key characteristics, and design of solutions

- Financial distress
- Over-indebtedness
- Distress and over-indebtedness
Financial distress and over-indebtedness

• Financial distress more likely to lead to bankruptcies than negative housing equity
• Households in both distress and negative housing equity are most likely to default
• Focus of relief measures

1. Households are defined to be in financial distress if their disposable income is insufficient to cover both debt payments and necessary living costs.

Characteristics of vulnerable households problems

- Roughly a third of households in distress at year-end 2010 were middle-income families with children, while 37% were low-income singles.
- Almost half of households in negative housing equity were high-income families while one-in-six were low-income singles.

1. Households are defined to be in financial distress if their disposable income is insufficient to cover both debt payments and necessary living costs.

Characteristics of vulnerable households problems

- Just shy of 47% of households in simultaneous payment and debt problems were middle-income families with children, of which 2/3 were FX borrowers.
- Roughly 22% of households in this highly vulnerable position were low-income singles, split evenly between being FX and ISK borrowers.

1. Households are defined to be in financial distress if their disposable income is insufficient to cover both debt payments and necessary living costs. 2. I-V represents the income quintiles within each borrower group, from the lowest (I) to the highest (V).

Debt restructuring framework

• Debt restructuring involves deciding how to distribute the burden from a systemic crisis
• This is a daunting task and the tendency is often to wait and hope that it will self-correct
• Experience shows that there are some key factors important for the success of debt restructuring involving direct collaboration between borrowers and lenders:

Capital position of banks

• The most common mistake is to inject too little capital into the banking system during recapitalisation, resulting in cosmetic restructuring

Incentives provided by the institutional framework

• Bankruptcy laws, accounting rules and out-of-court schemes

Relationship between creditor and debtor

• It is important to ensure that links between the borrower and the lender – whether these are business connections, ownership ties, or family or friendship ties – do not have a detrimental effect on debt restructuring
Result of post-crisis adjustment and debt restructuring

- All sectors within the economy are currently less indebted than prior to the beginning of the pre-crisis boom period
- The banks’ capital and liquidity position is also historically strong
- The net external position of the country as a whole is the strongest for many decades and better than among advanced economies in general
- Combination of flow and stock adjustment
Concluding remarks
Concluding remarks

• Focused on the general lessons from Iceland’s experience with dealing with macrofinancial linkages and crises
• In particular to cast light on the underlying dynamics at play and guidelines for designing more resilient policy frameworks
• More work is needed to better able to capture these dynamics within a full-blown model, but in the final chapter of the dissertation I take a small step in that direction
• Macrofinancial linkages will, however, continue to be hard to model, measure, and manage for years to come