

Implementing LTV-DTI – Through the Magnifying Glass¹

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1 Introduction

Macroprudential policy is now widely considered to be useful in mitigating systemic risks, including from housing booms. Yet, there are many blind spots in our understanding of how exactly it works. The paper (Jácome and Mitra, forthcoming) on which this presentation is based on, in some sense brings us back to the basics on one particular set of policy tools – the loan-to-value (LTV) and debt-service-to-income (DTI) – and tries to understand how exactly it can be implemented in countries. We are using six case-studies for the look through the magnifying glass.

We know from a survey conducted by the Fund in 2013, The Global Macroprudential Policy Instruments (GMPI) survey, that about 50% of the advanced economies and more than 50% of the emerging economies had LTVs (chart 1).² DTIs are much less in use, and are often supplemented by LTVs. But countries do not necessarily *change* the LTVs and DTIs in a macroprudential sense – lowering or tightening the limits for emerging risks and loosening them when risks are about to materialize. Only some countries have varied it over risks and that’s what this paper is about.

The main question is: how exactly do these limits work when these are changed over risks? In fact, there are many missing pieces, almost like pieces of a jigsaw puzzle. We can think of five such pieces. For instance, which indicators *trigger* a tightening of the instruments? What are the *levels* of LTV/DTIs and by how much are they adjusted? Which institutions are responsible for the tools in practice? How are the limits *applied, enforced and communicated* to the public? What are the typical interactions with monetary and fiscal policies? How can one prevent regulatory arbitrage? And, finally, are LTV/DTIs *effective* and what kind of models can be used to evaluate their effectiveness on an ongoing basis?

¹ The views expressed in this note are the author’s and do not necessarily reflect those of the International Monetary Fund or any other central bank.

² GMPI covers 132 countries, over 17 policy instruments.

This paper contributes by filling in some of the gaps. Given the enormity of the tasks, we came up with a project that made our lives simpler. We collaborated with six central banks that have been active LTV/DTI users in the macroprudential sense and coordinated case studies done by a group of people. The Central banks of Brazil, Hong Kong, Korea, Malaysia, Poland and Romania participated in this project. This paper drew lessons from the six case studies, which will be published as working papers shortly.

In what follows, I will first go through the triggers for activating the LTV/DTI tightening, the levels and the changes in the ratios, how these are enforced and communicated, which institutions are responsible and finally, whether these are effective. I will end with a set of 10 lessons that we draw from the studies and where more work is needed.

2 Triggers for Activating Policy Tightening

If we look at cross-country studies, for instance panel-logit models that mapped macroeconomic data to the probability of a banking crisis, credit growth and house price growth together form very powerful signals. The rainbow chart in chart 2 is a slice from a 3D diagram that mapped house price growth and credit growth to the probability of a systemic banking crisis. The warmer the colors, the higher is the probability of a banking crisis. Typically, in this particular rendition of the model, house price growth by itself was not a source of banking crisis, unless credit growth was involved; hence, the dark blue space at the 3 percentage point credit growth mark.³

However, when we hold our magnifying glass at the time series evidence for each of the six countries, we find that they usually cast a much wider net over and above credit and house prices. They look separately at the property sector, banks, nonbanks, households, speculative activities and other qualitative information that would show that the financial institutions are taking risk. In fact, they creatively combine micro information with macrodata to see if systemic risks are rising, with a strong eye on whether there could be debt-servicing difficulties in the future. Various vintages of NPLs are observed – for different disposable incomes, foreign-currency loans, loan tenors, LTVs etc. In fact, high LTV loans with long loan tenors send an alert signal in some countries. Furthermore, rapid mortgage loan growth with rising number of multiple mortgage loans sends an alert for rise in speculative activities.

Let me add that faced with the imminent materialization of downside risks – be it a recession or a banking crisis – policymakers also have certain triggers that

³ Also see Kang, 2014, for a range of indicators that can be used for triggering LTV and DTIs.

would make them loosen policy. But, we have not seen an explicit discussion of why policy was loosened in the six countries.

3 Levels of LTVs and DTIs

There are no magic numbers for the LTV and DTI limits and changes were mostly discretionary. In chart 3, we see different loan growth situations where the LTVs or DTIs were tightened. For some, it was done multiple times. For others, it was done together with other prudential policies and fiscal measures. LTVs varied between 60 % and 85 % but by loan types. For instance, it was lower for unhedged fx loans, much lower for commercial properties, long maturities, speculation prone areas, mortgage holders with overseas income etc. Changes were frequent because the authorities wanted to get around regulatory arbitrage, and we will talk about this a bit later.

4 Enforcement and Communication

Most countries applied it immediately, right after the announcement. They were often accompanied by higher risk weights, reserve requirements or some fiscal tools, such as stamp duties that impacted housing transactions directly. There were some protection for first time home buyers such as exemptions of the tighter LTVs, or separate government schemes that helped first time buyers meet the tighter LTV requirements. Interestingly, there was not much communication with the stakeholders before the measures were announced. However, communication strategy is key in explaining the regulation.

5 Institutions and Regulatory Arbitrage

Now the role of institutions, who does what. The six countries have different structures of decision making, and we admit that no one size fits all. But there are some basic principles (Nier et al, 2011; IMF, 2013). For instance, central banks should play a key role and it is best not to have a fragmented system of multiple agencies. In the six countries, mostly central banks monitor systemic risks whereas a diverse set of institutions take decisions on policy tools. And from what we have seen, the macroprudential decisions are not necessarily coordinated with monetary policy.

In most of the countries the institutional arrangement for decisions on LTV and DTI ratios were already in place several years ago. But a common feature is that the central bank is the key institution in charge of monitoring systemic risks – including developments in the housing market. In addition, in most countries the central bank is responsible for executing and enforcing macroprudential policies, such as LTV and DTI ratios

Whatever the institutional structures could be, policy leakages and regulatory arbitrage are inevitable. Best would be to expect it and prepare in advance including by cooperating with other authorities. The experiences of the six countries could give us some guidance on what type of leakages to expect and how to tackle these leakages. These leakages occurred through nonregulated entities, modification of the loan standards, direct crossborder lending and through foreign bank branches.

6 Effectiveness

Past work with macrodata showed that the measures were effective in curbing both credit growth and real house price growth (chart 4).⁴

However, when we looked through our magnifying glass at the six countries' experiences, we got a much more nuanced picture. The countries used various methods to do their effectiveness study creatively combining micro- with macrodata. They looked at the effectiveness of the measures on credit growth, mortgage growth, growth in real house prices, speculative mortgages, debt-servicing capabilities of the households (by looking at microdata on NPL vintages for different LTV limits on new loans). The measures were effective in reducing loan-growth and improving debt-servicing performances of the borrowers. In Hong Kong, for instance, stamp duties were better at lowering house price appreciations. Targeting the tools towards the loan segment most at risk, like speculative properties (as in Korea), worked better than aiming at overall mortgage loans.

7 Main Lessons

In conclusion, I would like to say that we have learnt some valuable lessons in trying to solve the jigsaw puzzle; I think we can say that we have got closer but there are still black spots and gaps.

7.1 Monitoring Systemic Risk – Going Beyond Credit and House Prices

Countries monitor a wide range of indicators, including those for the debtors, speculative activities and other qualitative indicators on risk-taking. Creative use of indicators based on macroeconomic, supervisory, credit bureaus, and financial

⁴ See for instance, Lim et al. (2011) and Arregui et al. (2013a) for cross-country evidence, and see Igan and Kang (2011) on Korea, Krznar and Morsink (2014) on Canada, Ahuja and Nabar (2011) and He (2014) on Hong Kong SAR, and Crowe and others (2011) for the U.S. and the references therein.

institution is key to effective monitoring. In order to do this, the macroprudential authority need access to all types of data sources.

Be on alert when:

- High LTV loans with long maturities are growing fast
- Mortgage loans and the number of borrowers with multiple mortgages are increasing fast
- Overall NPLs are decreasing due to rapid credit growth but NPLs on particular loan vintages – based on LTV, foreign-currency, income, loan tenors – are increasing.

7.2 Using the Tools

There are no magic numbers, but most countries limit LTVs to 60–85%, and DTIs to 30–45%. Although there is evidence of countercyclical changes in policy, the decisions for the changes were mostly discretionary.

NPLs by LTV-specific or DTI-specific loan vintages are very important variables for the calibration process. In particular, combinations of high-LTV loans with longer loan tenors were associated with higher NPL-ratios.

The LTV/DTI measures were often complemented by other prudential and fiscal measures to ensure effectiveness.

7.3 Taking Decisions

It is best to announce and impose the measures immediately, without discussing with stakeholders in advance; however, the policy needs to be communicated well to the public. The case studies found that reducing the time between announcement and implementation limits regulatory arbitrage.

In most countries, Central Banks monitor systemic risk but a diverse set of institutions take decisions on macroprudential policy. However, for the specific exercises for the case studies, the central banks had access to a range of data.

It is best to expect leakages, plan in advance, and cooperate with other agencies. Some instances of leakages are highlighted in the paper along with policies to curb them.

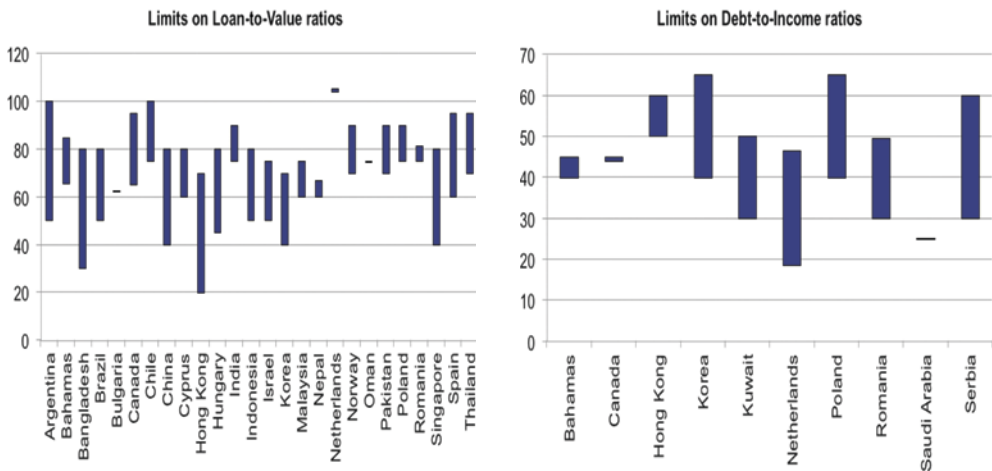
7.4 Evaluating Effectiveness

The measures seem to have been effective in reducing loan-growth and improving debt-servicing performances of the borrowers (the banks' credit quality improved). Thus the measures helped improve resilience of the financial sector against downside risks. However, the measures were, in general, not effective in curbing house price growth, except in one case. Capital flows in the real-estate market and direct

lending by foreign banks hindered the effectiveness of the measures. Targeted measures – those aimed at the group of mortgage loans most at risk – worked better.

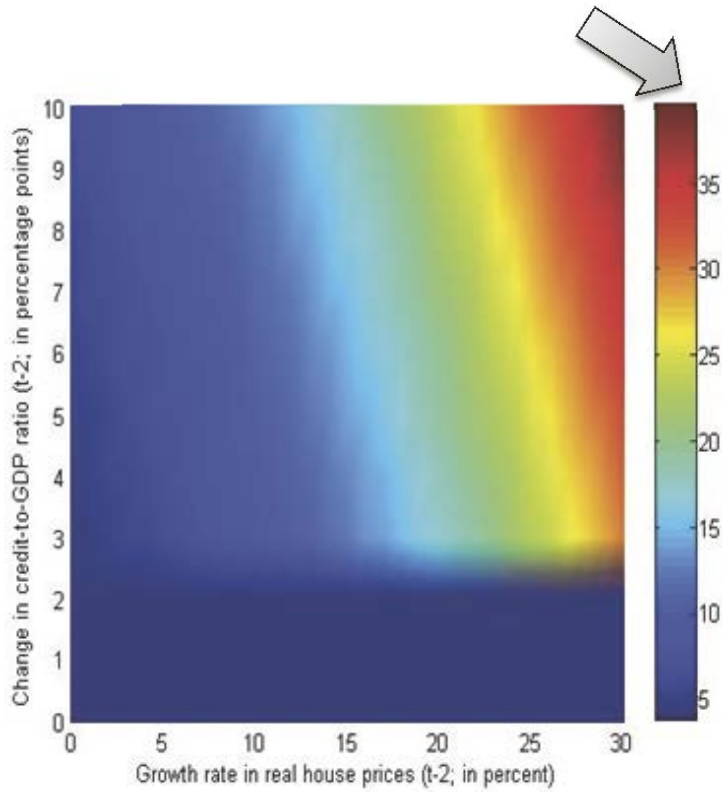
Large gaps remain in the following areas where further research and experience is needed. First, even though all the six countries changed LTV/DTIs in a discretionary fashion, further work could look at whether there are benefits to being more rules-based when deciding on how much to tighten or loosen policies. Second, the exact transmission channels through which the LTV/DTIs work in practice need further analysis, together with how these tools interact with other policies. Third, further work is needed on how to make macroprudential policies more effective in situations where there are surges in capital flows and strong and persistent demand for housing from cross-border sources. Finally, we need to tackle the trade-off between the benefits of social policies aimed at home-ownership versus the high economic costs of crisis from sub-prime lending.

Chart 1a/b: Range of Limits on LTV and DTI in 2013



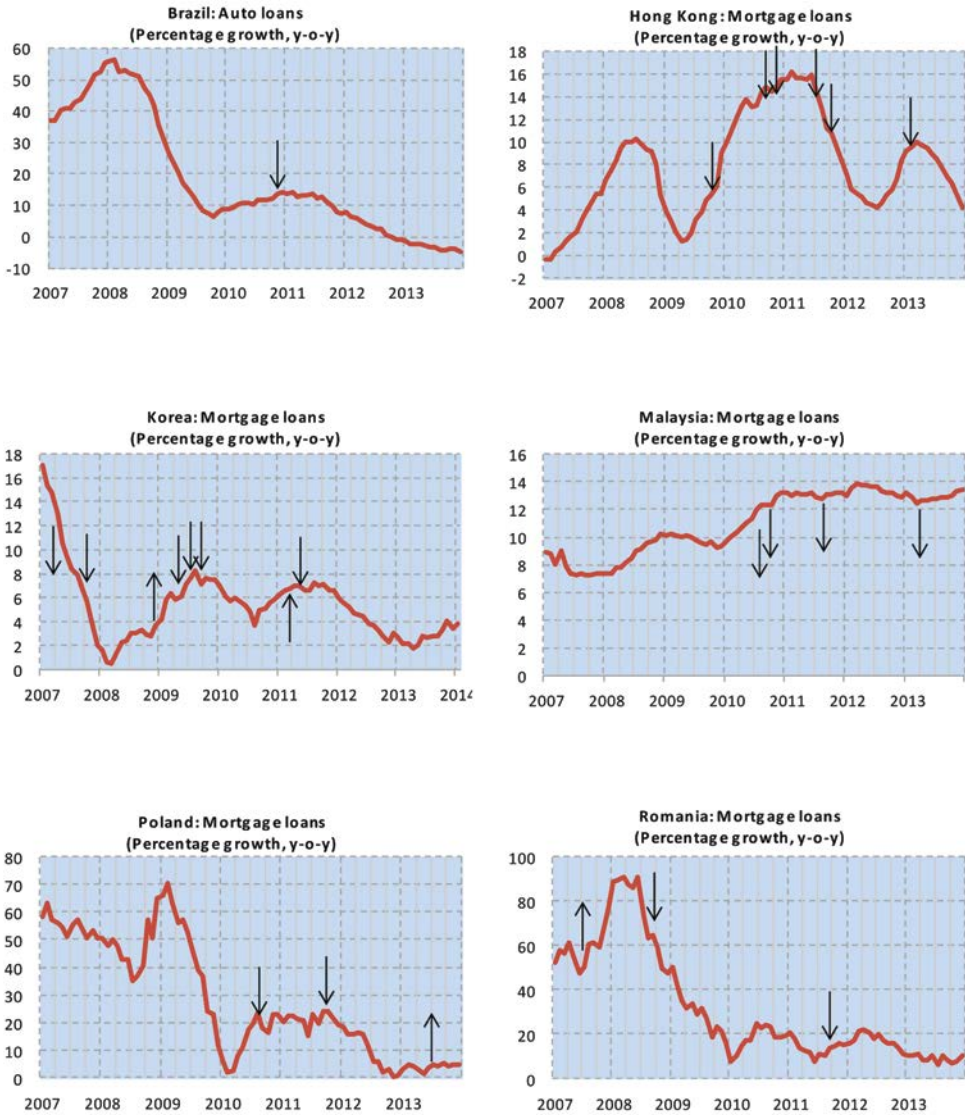
Source: Global Macroprudential Policy Indicators database; IMF staff calculations.

Chart 2: Probability of Crisis: Credit and House Price Growth



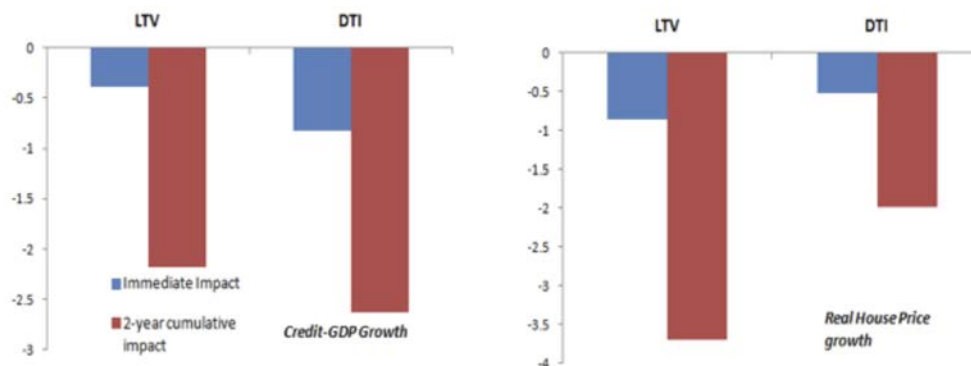
Source: Arregui, Benes, Krznar, Mitra and Santos (Evaluating Net Benefits of Macroprudential Policy: A Cookbook, IMF WP, 2013).

Chart 3: Credit Growth and Changes in LTV and DTI Ratios
 (↓ = tightening, 2007–2013)



Source: Central banks from the countries in the sample.

Chart 4: Effect of LTV and DTI on Credit and House Price Growth



Source: Arregui et al. (2013).

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