

A BROADER VIEW OF HOUSING- MARKET MACROPRUDENTIAL MEASURES

Keynote address to the Bank of Malta/ECB Research Workshop
“Macroprudential policy and real estate markets: objectives,
effectiveness and new challenges”

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Introduction

- Whereas a wide range of macroprudential policies can affect the housing market, the most commonly-used are Loan-to-Value limits and Debt-Service-to-Income limits.
- These are the key borrower-related policies in the macroprudential toolbox, other policies apply more directly to financial institutions. They are respectively the most commonly used policy by advanced countries (LTV) and the eighth (DSTI), see Chart from Alam et al (2019)
- The focus of macroprudential policy on the housing market raises a number of conceptual and policy issues and we seek to provide some points for discussion.
- There is extensive analysis of the effectiveness of these instruments in the housing market, not least at this workshop, and also among other macroprudential tools in respect of individual policy targets (house prices, risk, credit expansion). Some general issues can be identified in such research.
- Meanwhile, what is less common is an assessment of the broad effects of these borrower-related tools not only on housing but also financial institutions and the wider economy
- This is a gap that we seek to fill in this keynote address, using mainly our own work. The suggestion is that further work in these areas is warranted, not least to give an assessment of comparative advantage of the different tools available as well as appropriate combinations

Frequency of use of macro-prudential policies

Figure 3. Frequency of Policy Actions by Instrument, January 2010–December 2016

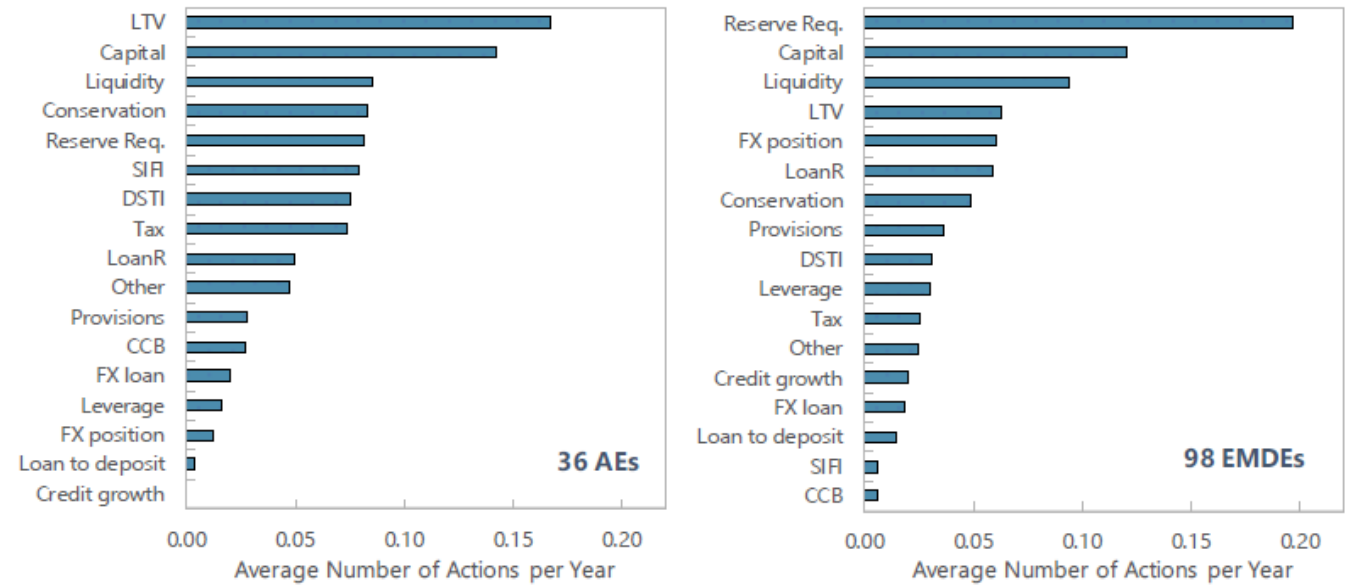
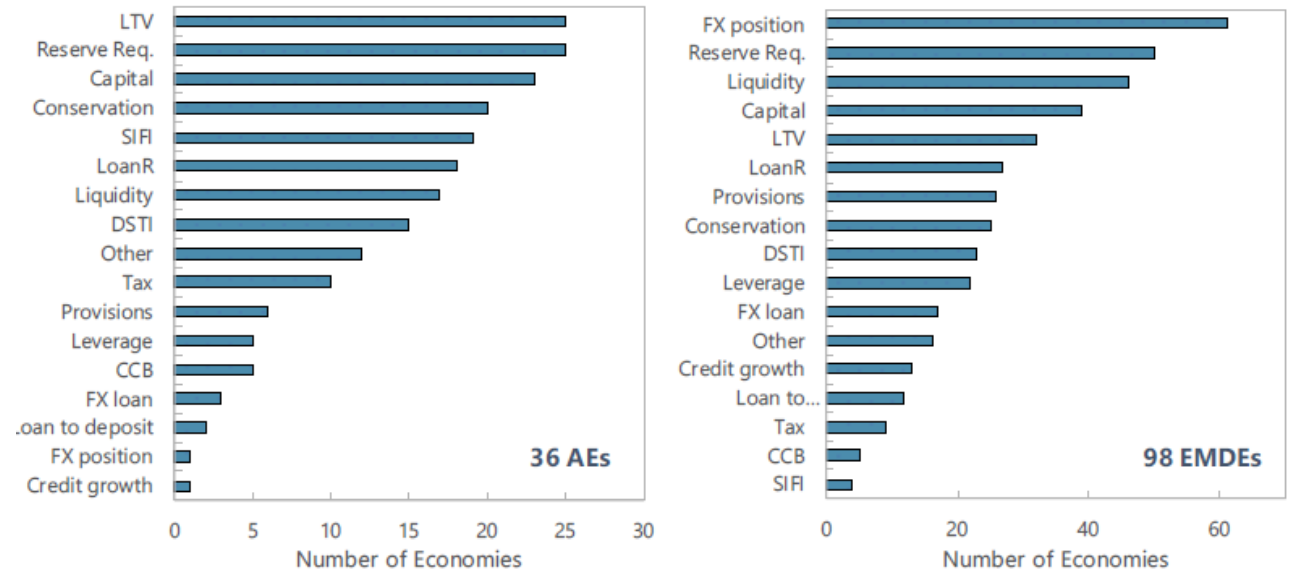


Figure 2. Prevalence of Use by Instrument, December 2016



• Source: Alam et al (2019)

- The paper is structured as follows:
 - Macroprudential policy and housing – some broad considerations
 - Some modelling issues in macroprudential studies
 - Macro effects of the policy tools
 - Micro effects of the tools on bank profitability
 - Micro effects of the tools on banks' net interest margins
 - Micro effects of the tools on bank risk
 - Some other key results in the literature
 - Concluding remarks

Macroprudential policy and housing – some broad considerations

- Why do we want to control housing finance?
 - Usual reasons for macroprudential policy are “to protect and enhance the resilience of the whole financial system, to safeguard stability”
 - Is aim to prevent excessive rises in house prices?
 - And/or to ensure resilience for borrowers and hence lenders by limiting leverage?
 - Defaults are rarer (depending on the legal framework, notably for recourse versus non-recourse) than for other types of loan. Even in negative equity, recourse loans may continue to be serviced.
 - Historically, banking crises have been driven by commercial property lending and not residential (such as the Scandinavian crises, Japan, the US Thrifts – and to a considerable extent UK banks in 2008)
 - Control via macroprudential tools is largely limited to housing demand – supply is more related to interest rates and government limits on land use (although demand-driven price changes may also affect supply)
 - Is the concern more about spillovers to consumption from loss in net wealth if house prices collapse, even if households do not default? (Eerola 2017) Or hysteresis effects on productivity from housing market collapse (Barwell 2017)? So use macroprudential tools to be a more selective policy than interest rates?
 - Such arguments are at most indirectly linked to financial stability. Is housing market macroprudential largely to reduce the macroeconomic impact of a downturn, thus easing the task for monetary policy?

- Vagueness in operational objectives leads to difficulties in accountability, “framework hysteresis”, leaves open scope for self-interested direction of policy (Aikman 2022)
- Are borrower-based policies sufficient alone – what should be the relationship with the countercyclical buffer (Fell 2022)?
- Does policy focus too much on banks and not institutional investors that are becoming increasingly active in housing? (Munoz and Smets 2022)
- How does macroprudential restraint relate to the highly tax-favoured status of housing compared with holding most financial assets, which encourages borrowing? Tax measures have a macroprudential impact but are usually under control of fiscal and not monetary/regulatory authorities – how well coordinated?
- Could an LTV/DTI rule create new benchmarks, undermining the risk management of the lenders?
- How will the housing markets handle the current tightening of monetary policy and rise in long rates, and how should macroprudential policies respond?

Some modelling issues in macroprudential studies

- Measurement problems with macroprudential measures – most cross-country are categorical with only progress to making numerical for LTV (Alam et al 2019)
- Need for studies to look at micro household data as well as bank and macro data, not least to show distribution of leverage
- Cross-country studies often overweight countries with large numbers of banks – a more even sample may be more appropriate (as in Davis et al 2022)
- Results may differ markedly by bank size, capitalisation and loan quality (Morgan et al 2019 and our results below)
- Studies often omit the potential impact of banks' market power/competition as a control variable (Chan et al 2021)
- Many studies look at effects of policy change only when cumulative measures (showing stringency/stance) may be appropriate also
 - Macroprudential measures can have effects not just initially but also subsequently and because it cannot be shown at what point the policy becomes binding (Meuleman and Vander Vennet (2020).
 - Cumulative measures less likely to be subject to issues of endogeneity, as they are mostly predetermined (Bergant et al 2020).

Macro effects of the policy tools

- Carreras et al (2018) assess the effects of a range of policies on house prices and real personal sector debt at a macro level using cointegration techniques for 19 OECD countries
- Main result is that LTV and DSTI are much more effective for restraining house prices than for real credit growth
- Suggestion is made that the more simple “partial adjustment” approaches typical in the literature may give a false picture
- Note that all the studies cited below have an appropriate set of control variables to limit omitted variables bias

Results for macro effects with cointegration

	Real house price growth	Real household credit growth
Baseline (IMF1 database)		
LTV	-0.0023* (1.7)	-0.0023 (1.3)
DSTI	-0.004** (2.0)	0.0043* (1.8)
LTV Cap	-0.0046** (2.4)	0.0024 (1.1)
Baseline (BIS database)		
LTV	-0.0025* (1.9)	0.002 (1.3)
DSTI	-0.0047** (2.3)	-0.0004 (0.1)
Panel VECM (IMF1 database)		
LTV	-0.0034** (2.7)	-0.0005 (1.3)
DSTI	-0.0068** (2.2)	-0.0024 (0.9)
LTV Cap	-0.0039** (2.3)	0.0007 (0.5)
FMOLS (IMF1 database)		
LTV	-0.0023* (1.9)	-0.004** (2.5)
DSTI	-0.0055*** (3.6)	-0.0034 (1.6)
LTV Cap	-0.0046*** (3.1)	-0.0033* (1.7)
“Simpler approach” (IMF1 database)		
LTV	-0.0049*** (4.2)	-0.0058*** (3.9)
DSTI	-0.0037** (2.3)	-0.0037* (1.9)
LTV Cap	-0.0039*** (2.7)	-0.004** (2.2)

Micro effects of the tools on bank profitability

- Davis et al (2022) assess effect of MPP on bank return on average assets (ROAA) and return on average equity (ROAE) via OLS regressions with a range of bank-specific, macroeconomic and industry variables for 7250 global banks over 1990-2018 in 92 countries
- Use of latest IMF database (IMAPP) from 2020. Includes advanced country and leveraged results for bank size and capitalisation
- Main result is that LTV/DSTI policies have little significant effect on average bank profitability, including global, advanced and EMDE samples
- But there is a clear negative impact on small bank profitability that is not present for large banks. A similar although more mixed pattern is evident for capitalisation where the more highly capitalised banks lose out especially for LTV and ROAA. Larger and less well capitalised banks may have more scope to take on more profitable but riskier business when the housing MPPs are tightened

Results for effects on bank profitability

	ROAA	ROAE
Global sample		
LTV	0.021 (1.1)	0.14 (0.9)
DSTI	0.009 (0.2)	0.086 (0.2)
Advanced countries		
LTV	-0.0021 (0.1)	0.118 (0.6)
DSTI	-0.032 (0.8)	-0.521 (1.3)
Emerging and developing		
LTV	0.062** (2.2)	0.215 (1.0)
DSTI	0.018 (0.2)	0.842 (1.1)
Leveraged by bank size		
LTV (MPP)	-0.052*** (4.0)	-1.78 (1.5)
LTV (MPP*SIZE)	0.48*** (4.4)	1.73* (1.8)
DSTI (MPP)	-1.06*** (4.0)	-6.35* (1.8)
DSTI (MPP*SIZE)	0.99*** (4.5)	5.97* (1.9)
Leveraged by capitalisation		
LTV (MPP)	0.12*** (3.8)	-0.14 (0.5)
LTV (MPP*CAP)	-0.14*** (3.8)	0.39* (1.7)
DSTI (MPP)	0.07 (1.1)	-0.71 (0.9)
DSTI (MPP*CAP)	-0.08 (1.5)	1.05* (1.8)

Source: Davis et al (2022). Note: CAP and SIZE are demeaned

Micro effects of the tools on the net interest margin

- Davis et al (2020) assessed the relation of macroprudential tools to the net interest margin for banks, using a sample for advanced countries over 1990-2018 and the IMAPP database
- The independent variables include the level and difference of interest rates and the yield curve which affect the margin, in line with existing work (short term effect negative, long term positive). Relevant to current monetary tightening
- MPP works similarly to monetary policy with a tightening leading to a lower NIM but the long term effect (for DSTI) is for the margin to increase. This may be consistent with a riskier balance sheet in the long run
- The narrowing short run effect of LTV is accentuated when monetary policy is tightened at the same time

Results for effects on net interest margin

Coefficient for	MPP	DMPP	DMPP(-1)
Individual macroprudential Instruments			
LTV	-0.00525 (0.3)	-0.051*** (3.2)	0.00783 (0.2)
DSTI	0.0515** (2.2)	-0.0726*** (4.5)	-0.0652 (1.6)
Interaction with interest rate	MPP*CBR	DMPP*DCBR	DMPP(-1)*DCBR(-1)
LTV	0.0024 (0.2)	-0.0249 (1.0)	-0.0879*** (3.5)
DSTI	-0.0043 (0.4)	0.0533 (0.6)	-0.0163 (0.3)

Micro effects of the tools on bank risk

- Chan et al (2022) assess the effect of MPP on the Z-score for individual banks (where $Z\text{-score} = (\text{ROA} + (\text{Capital}/\text{Assets}))/\text{SD}(\text{ROA})$, where ROA is the return on assets and SD is the standard deviation)
- Their main focus is on East Asia where MPP have been used for the longest period, but include a test for European banks, cited here
- Key innovation is to not only include competition (Lerner Index) as an independent variable – which raises risk - but also allow for interaction between competition and MPP
- Main result is that the housing market tools in the long run directly reduce Z-score and hence raise the level of risk
- Allowing for interaction with competition, the more competitive banks take more risk, a “competition fragility” result. Accordingly, more supervisory attention in Europe should be given to the more competitive firms which are shown to take relatively more risk in response to macroprudential policies.

Results for effects on the Z score

	DMP	MP-1	DMP*LERNER-1	MP-1*LERNER-1
Direct effect only				
LTV	-0.032 (0.9)	-0.033 (1.5)		
DSTI	0.003 (0.1)	-0.084** (2.1)		
Direct effect and leveraged effect				
LTV	-0.038 (0.9)	-0.072** (2.8)	-0.001 (0.1)	0.032** (2.1)
DSTI	-0.042 (0.6)	-0.132*** (3.7)	0.034 (0.7)	0.05** (2.5)

Source: Chan et al (2022), Lerner is demeaned

Some new results using IMF % LTV data

- We transform using $100 - \text{LTV}$, so the data are zero for where there are no LTV limits, rising to $100 - X$ where limits apply (so for 80% LTV, MP is 20). Accordingly it rises with the stringency of the LTV policy
- Again the lower the LTV the higher the level of risk as measured by the log Z-score
- There is a reduction in mortgage lending from a tighter LTV constraint but no reduction in overall lending, suggesting in combination with the Z-score result a substitution to higher risk lending
- There are again variations in these effects depending on bank market power. The more competitive banks take more risk as shown by the Z-score. They also reduce mortgage lending more and adjust overall lending less.

Results using 100-LTV as MP variable

	DMP	MP-1	DMP*LERNER-1	MP-1*LERNER-1
Direct effect only				
Log Z-score	-0.012** (2.8)	-0.057*** (3.4)		
D log mortgages loans	-0.0036 (1.1)	-0.0025*** (6.5)		
D log gross loans	-0.0007 (1.1)	-0.00005 (0.3)		
Direct effect and leveraged effect				
Log Z-score	0.0072 (1.7)	-0.0081*** (4.1)	-0.015*** (4.1)	0.0022** (2.3)
D log mortgages loans	-0.01 (1.4)	-0.0034*** (7.6)	0.0045 (1.2)	0.00092** (2.1)
D log gross loans	0.0012 (1.5)	0.00025 (1.1)	-0.0014*** (2.8)	-0.00027** (2.3)

Source: author's estimates, Lerner is demeaned

Some other key results in the literature

- Meuleman and Vander Vennet (2020) found that overall systemic risks and risks for individual banks are reduced by lending standards policies but they increase systemic linkage risk – seen as linked to risk shifting from restricted classes of asset such as household mortgage lending to risky corporate borrowers
- Nakatani (2020) found that a higher LTV reduces the possibility of a banking crisis, although they did not test with other MPPs
- Alam et al (2019) found that LTV restrains house prices but not credit in advanced economies but DSTI did not affect either. They found no wider effect of these policies on consumption or GDP
- Fendoglu (2017) and Davis et al (2017) find that borrower-based measures are more effective than financial institution based measures in controlling the BIS aggregate credit/GDP gap
- Bergant et al (2020) found macroprudential regulation – including credit demand policies such as LTV and DSTI - can considerably dampen the impact of global financial shocks on emerging markets via capital flows or market volatility.

Concluding remarks

- There is some ambiguity on the objective of housing-market macroprudential policy, which may in turn lead to issues inter alia in terms of accountability
- A key issue at present is the appropriate macroprudential stance as monetary policy is tightened to counter inflation
- Some issues arise from standard practice in macroprudential policy modelling, including consistent measurement of policies in cross-country datasets
- We contend that a wider range of effects of LTV/DSTI policy should be considered beyond their immediate effect on mortgage lending and house prices, and some illustrations of key effects are included based on our existing work and some other recent studies

- Tightening of the main housing market policies – LTV and DSTI – have the following effects in our research:
 - they tend to affect house prices negatively rather than real household credit.
 - they tend to reduce profitability for smaller and more highly capitalised banks, although there is not a significant effect across banks as a whole
 - they tend to narrow the bank interest margin in the short run although the long run effect is positive
 - they tend to raise bank risk in the long run, all the more so when the bank has a weaker market power
 - They appear to impact on aggregate mortgage lending and not on total bank lending
- Furthermore, Meuleman and Vander Venet (2020) find rising systemic linkage risk that they relate to risk shifting although other forms of risk are reduced
- However, other results in the literature show however that wider risks such as banking crises and macroeconomic volatility may be reduced by such measures
- We suggest there is some indication that banks may respond to housing market controls with greater balance sheet risk. This may require consideration of what additional policies are needed to ensure overall financial stability

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