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Motivating the Use of Different Macro-prudential Instruments: The Countercyclical Capital Buffer vs. Borrower-Based Measures

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Abstract

In the implementation of macro-prudential policy, macro-prudential authorities such as the Central Bank of Ireland face policy choices as to how best to mitigate systemic risk(s). This Letter focuses on one such policy choice. The Letter conceptually assesses a capital-based tool (the countercyclical capital buffer) compared with borrower-based instruments (e.g. loan-to-value and loan-to-income restrictions). The Letter also briefly reviews the implementation of these tools across Europe. It is found that at a high level the countercyclical capital buffer tends to be viewed as best suited, although not limited, to enhancing the resilience of the banking system. Borrower-based measures, then, provide a tool that can be used to target the resilience of households or impact directly on the flow of mortgage lending. These instruments are flexible however and policymakers can tailor their implementation, either individually or in combination, to ensure an appropriate macro-prudential policy stance with respect to the prevailing systemic risk environment.

1 Introduction

In the implementation of its macro-prudential mandate, the Central Bank of Ireland (Central Bank) is faced with policy choices as to how best to mitigate systemic risk(s). A Macro-prudential Policy Framework for Ireland (Central Bank of Ireland (2014)) notes that macro-prudential policy will aim to strengthen the resilience of the banking system and reduce the potential for imbalances to accumulate. The policy framework acknowledges the broad spectrum of potential sources of systemic risk, outlining four intermediate objectives for the banking sector. This Letter focuses on one of these intermediate objectives, that of preventing excessive credit growth and leverage, and discusses at a conceptual level the policy options available to the Central Bank to achieve this aim in the context of emerging/increasing cyclical systemic risks.

Broadly speaking, two types of policies look to address such a situation, capital-based instruments and borrower/credit-based instruments. While both provide options to a macro-prudential authority when faced with cyclical systemic risk, the instruments differ in terms of their focus, transmission channels and potential impact on different agents. This Letter compares and contrasts the two types of policies with a view to informing how these instruments may be used in practice. The utilisation of these instruments to date, by

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macro-prudential authorities across Europe, is also reviewed.

The remainder of the Letter is structured as follows: Section 2 presents an overview of the instruments in question, looking at the conceptual underpinnings as to how they might help to mitigate excessive credit growth and leverage. Section 3 provides an overview of the Central Bank's use of these instruments as well as reviewing their use more broadly across Europe. Section 4 concludes.

2 Macro-prudential instruments for preventing excessive credit growth and leverage

As discussed in Central Bank of Ireland (2014) and Grace et al. (2015), there are a range of potential macro-prudential policy instruments which aim to mitigate and prevent excessive credit growth and leverage. These include a range of capital-based measures such as the countercyclical capital buffer (CCyB), sectoral capital requirements and a systemic risk buffer, borrower-based measures such as loan-to-value (LTV) and loan-to-income (LTI) limits or indeed a macro-prudential leverage ratio. In the context of the Central Bank's existing macro-prudential toolkit and focusing on policies which are intended to operate in a cyclical manner[2], this Letter concentrates on the CCyB and borrower-based measures.

2.1 The CCyB

The CCyB is provided for in European legislation in the Capital Requirements Directive (CRD) IV and came into effect across the EU at the beginning of 2016. As a cyclical capital-based macro-prudential policy, the CCyB operates by increasing the minimum capital requirement of institutions in times of increasing systemic risk and correspondingly releasing the additional requirement during periods of financial stress or when risks have reduced once again. The design of the CCyB was based around the historical observation of a build-up in aggregate credit often occurring in advance of episodes of financial crisis. As such, credit developments are given a prominent role in the European CCyB framework, particularly relating to the stage of the cycle where systemic risks may be increasing.[3] The need to take account of a broad set of information when setting CCyB rates, however, is also acknowledged within the framework. This flexibility is an important aspect of the framework, see for instance Lozej et al. (2017), allowing macro-prudential authorities to take account of the information which is most relevant or useful when setting the CCyB. While CCyB calibration will rely on judgement, the CCyB is designed to be a broad measure, affecting exposures across asset classes. In this way, it does not provide a targeted means of dealing with credit developments at a sectoral level. Sectoral capital requirements, which operate in a similar manner but can be focused on specific sectors/categories of lending, provide an alternative capital-based macro-prudential instrument in this scenario.

Focusing on the build-up of risk, the CCyB has a direct impact on the resilience of the banking system as it increases the loss absorbing capacity of institutions and the system as a whole. Bank of England (2016) lays out the macro-prudential benefits accruing from well-capitalised banking systems. For example, better-capitalised institutions are more likely to survive periods of instability, are less likely to cut lending during a crisis and are less likely to suffer funding problems that could force them to engage in the fire-sale of assets. However, in practice there may be circumstances where the transmission of a change in regulatory capital requirements into the actual level of capital held by an institution is not straightforward. For example, when an institution's capital holdings are above regulatory requirements increases in these requirements may not result in increased capital. Nevertheless, the CCyB does impose a higher minimum capital requirement on institutions and therefore ensures a higher minimum level of resilience across the banking system than would otherwise be the case.

[2] Although its primary objective is to deal with structural systemic risk, a systemic risk buffer could also address cyclical risks where they lead to common exposures or excessive indebtedness. In an Irish context, to date the power to impose systemic risk buffers, provided for in European legislation under CRD IV, has not been transposed into Irish law. The leverage ratio as currently constituted, looks to serve mainly as a structural rather than cyclical backstop which limits the extent to which an institution can grow relative to its capital base.

[3] It is acknowledged in both CRD IV and ESRB (2014) that the decision to reduce or release the CCyB may be better informed by a different set of indicator variables to those used during the build-up phase.

Over and above the resilience effect, capital-based instruments such as the CCyB can potentially have other macro-prudential benefits. The CCyB may have a dampening effect on the upswing of the financial cycle for instance. Increased capital requirements could restrict the flow of credit where institutions either reduce or limit the expansion of their asset base, resulting in lower credit supply, or respond via a repricing of interest rates, thus reducing credit demand.[4] These dampening effects, however, are often found to be less certain than the resilience effect.

Behn et al. (2016) find that the indirect impact of dampened credit and asset price growth can account for up to a half of the overall reduction in crisis probabilities of capital-based macro-prudential policies. The finding, however, is dependent on how banks move to these higher capital ratios i.e. deleveraging versus raising new equity. In a similar vein Bahaj et al. (2016) find that an increase in individual banks' capital requirements can have a large impact on lending when lending is already weak but has little effect on lending during periods of strong credit growth. Lozej et al. (2017) examine this topic in an Irish context. They find that increased capital requirements do have some positive effect in limiting the economic cycle, although in general the effect is modest.

It is in this context, that the European macro-prudential policy framework attributes the primary aim of the CCyB to where its impact is most direct, that of enhancing the resilience of the banking sector (see for example BCBS (2010) and ESRB (2014)). However, the CCyB also provides macro-prudential authorities with a potential tool to dampen the upswing in the cycle. In addition, even where the direct impact of the CCyB may be uncertain, it may provide a channel through which policymakers can transmit their views on the level of cyclical systemic risk or act as a useful back up to prevent spillover effects.

2.2 Borrower-based measures

In terms of enhancing the resilience of the banking sector, borrower-based instruments provide policymakers with an alternative channel to that of the CCyB. Borrower-based measures operate by limiting borrowing relative to household incomes and/or property values. In this case, however, the impact on bank resilience occurs incrementally through the flow of new lending rather than on the stock of loans, as in the case of capital-based measures. On the other hand, borrower-based measures provide policymakers with a tool which directly impacts on the flow of credit and allows for the direct targeting of household sector resilience which the CCyB does not. At a more granular level again, borrower-based measures provide a wide array of options for targeting specific sources of risk in real estate and mortgage credit markets.

Borrower-based measures can be used in either a cyclical or a structural manner. They can be imposed when growing cyclical pressures emerge, for instance, or can be used as a structural (permanent) feature of the prudential regulatory framework, ensuring minimum prudent lending standards are maintained at all times. The parameters of the instruments can be adjusted, if necessary, in response to economic or market developments where those developments are reflective of an asset price-credit growth spiral emerging.[5]

2.2.1 LTV

The LTV operates by imposing a minimum deposit requirement on borrowing households relative to the value of the property. The LTV increases the resilience of the banking sector by making both borrower and lender less vulnerable in the event of property price declines i.e. lowering the loss-given-default.

While LTV restrictions are likely to prevent some of the extreme pro-cyclicality that can be associated with bubble periods, such a measure is not strictly countercyclical. As property prices increase, the amount of credit allowed expands proportionally. Moreover, an increase in the value of housing collateral increases households' capacity to finance a large deposit on a subsequent property and, as a result, the credit available for property purchase.

[4] The corresponding loosening of the buffer, when warranted by financial conditions, aims to support the provision of credit to the economy and limit the extent to which regulatory capital requirements may act as a basis for credit rationing by institutions during a downturn.

[5] The Central Bank has stated that the LTV/LTI measures, introduced in 2015, are intended to be a permanent feature of the market but it is open to adjust any or all of the parameters in response to economic, market, or other developments over time.

2.2.2 LTI

LTI measures impose borrowing restrictions relative to income. In this case, the resilience of both borrowers and lenders is enhanced by lowering the probability of default. High LTI ratios imply borrowers' repayment capacity can become stretched more quickly in the event of an income shock to the borrower. Thus, imposing lower LTI ratios provides for a greater income shock to be absorbed. LTI limits are also likely to have a more direct impact in terms of reducing pro-cyclicality than an LTV measure, given that, in general, increases in income tend to occur more slowly than increases in property prices. In this context, a cap on borrowing capacity relative to income tends to be more binding during the upswing and therefore more effective in limiting the pro-cyclicality of credit-house price dynamics.[6]

2.2.3 Joint use of LTV and LTI

When used in isolation, LTV limits may still leave borrowers' capacity to service their mortgages vulnerable to income shocks, while solely relying on LTI restrictions (without LTV measures) could leave banks exposed to house price adjustments. Therefore, in some circumstances they may be used together. When used as complements, LTV and LTI restrictions may also have a positive reinforcing impact on probability of default. LTI caps provide a buffer against the effects of income and employment shocks, thereby increasing the resilience of borrowers and reducing the probability of default. By enforcing a minimum down payment, LTV caps can also reduce borrowers' incentive to default in the event of house price declines. A number of empirical studies point to the effectiveness of borrower-based measures in limiting the pro-cyclicality of the credit cycle. For example, Lim et al. (2011) find that LTV measures are effective in limiting pro-cyclicality of credit. Claessens et al. (2013) also find that LTV limits are effective in limiting bank leverage, asset price and non-core liabilities growth, all of which contribute to credit booms.

2.3 Summary

Table 1 provides a summary of the objectives of each of instrument, as well as the transmission channel through which they operate and their respective limitations or drawbacks. The CCyB tends to be considered best suited to enhancing banking sector resilience against cyclical risks emerging at an aggregate level, however, it may also be used by authorities in a broader set of circumstances where necessary. This is reflected in Riksbank (2012) which considers the CCyB more suitable for addressing the consequences of systemic risk, by increasing the resilience of the system, than addressing the source of systemic risk. Where tools are available, to directly influence an identifiable source of systemic risk, the Riksbank argues that the CCyB should be seen as a second best solution. Borrower-based measures, then, provide a targeted instrument for dealing with emerging risks in the residential property and mortgage credit market as well as household sector resilience. In cases where mortgage credit constitutes a significant share of overall credit, they may also offer an effective method of restricting the flow of credit during a cyclical upswing.[7] Borrower-based measures also provide an alternative channel to that of the CCyB to enhance banking sector resilience.

2.4 The macroeconomic effects of macro-prudential policy

Thus far, this Letter has focused on financial stability benefits arising from the use of the CCyB and borrower-based measures. However, such policies are also likely to have a broader economic impact.

[6] It should be noted there are a number of options for limiting an individuals' borrowing capacity relative to their income e.g. debt-to-income or debt-service to income. A more detailed discussion of these options was included in the Central Bank's consultation on the residential mortgage market measures. The Central Bank has acknowledged that a debt-to-income ratio provides a more comprehensive instrument than the LTI, taking account as it does of a borrowers' total debt. However, at this stage practical complications weigh against its implementation. Nonetheless, as these issues are addressed over time with the set-up of the Central Credit Register for example, the Central Bank will reassess the appropriateness of an LTI restriction versus a possible DTI instrument.

[7] In an Irish context, mortgage credit is the largest component of the national specific measure of credit (as used in CCyB rate setting analysis). It is estimated that mortgage debt accounts for in the region of 90 per cent of household debt and about two-thirds of the overall national specific measure of credit. Therefore, at present, developments in mortgage credit are likely to strongly influence overall credit dynamics in Ireland. This is likely to lend some complementarity to the use of the CCyB and borrower-based measures.

While macro-prudential policies ultimately aim to prevent or mitigate financial crises, their use may result in lower economic activity than would have otherwise been the case in the absence of such policies. Lozej et al. (2017) and Lozej and Rannenberg (2017) use a Dynamic Stochastic General Equilibrium (DSGE)[8] framework to examine the economic effects of capital and borrower-based measures in an Irish setting. Lozej et al. (2017) find that the performance of the CCyB depends on whether the calibration of the instrument is based on indicator variables that are pro-cyclical or not after the shock. Lozej and Rannenberg (2017) find that while LTV and LTI measures may dampen economic activity in the short run, they bring a number of benefits in the medium and long run, primarily arising from a significant reduction of leverage among households.

More broadly, Clerc et al. (2015) find that increased capital requirements result in both a reduction in the supply of lending and a lower average default rate of loans. These two outcomes have opposing effects on economic activity and their net result will depend on the degree of bank failure risk present in the economy. Establishing methodologies for the assessment of the net benefits of macro-prudential policies is a growing area of research (see for example Boar et al. (2017)) and is likely to continue to evolve over time.

3 A review of macro-prudential policy implementation in Europe

Having addressed a number of conceptual issues regarding the aims and transmission channels of these policies, this section of the Letter examines the practical use of the CCyB and borrower-based measures by macro-prudential authorities in Ireland and across Europe. Particular attention is paid to the motivation for policy use and instances where the policies have been used in conjunction with one another.

3.1 Macro-prudential Policy in Ireland

In line with CRD IV, the CCyB has been operational in Ireland since 2016. Primarily reflecting the relatively subdued aggregate credit environment, the Central Bank has maintained a 0 per cent CCyB rate on Irish exposures.[9] As such, the CCyB has not had a practical impact on banks' capital requirements. The Central Bank, in 2015, also introduced a package of borrower-based measures aimed at the mortgage market. These measures are subject to periodic review and a number of minor modifications have been made arising from this process.[10]

The mortgage measures implemented by the Central Bank are activity based, applying to mortgage lending activity secured on a residential property within Ireland. They were deemed the most appropriate method for dealing with potential risks arising from the residential property and mortgage credit markets. In particular, the measures were implemented to reduce the potential for unsustainable credit-driven property booms to emerge.

The Central Bank's calibration of borrower-based measures was nuanced in a number of ways to differentiate between different sources of risk and limit unwanted effects. A stricter LTV limit is applied to second and subsequent borrowers (SSBs), than to first-time buyers, to take into account the role of existing property equity in financing deposits for subsequent properties. A stricter LTV requirement on lending for buy-to-let mortgages relative to primary dwelling mortgages is also a feature. The inclusion of proportionate caps, rather than hard limits, allows a share of lending to take place above the prescribed limits, with the aim of minimising any potential unwanted market access effects of the measures.

3.2 Use of cyclical macro-prudential policy instruments in Europe

Pekanov and Dierick (2016) presents an overview of the initial implementation of the countercyclical capital buffer regime in Europe. While the CCyB has been operational across Europe since 2016,

[8] In a DSGE model, the behaviour of firms and households is derived from microeconomic foundations. This allows the model to take into account changes in the behaviour of agents in response to policy measures. For example, the model takes into account expectations of households and firms about the future, which is key to understanding second-round and feedback effects of macro-prudential policies.

[9] Further detail on the Central Bank's approach to CCyB setting can be found on the Central Bank website here.

[10] Full details of the mortgage market measures can be found on the Central Bank website,here.

the number of countries where a non-zero rate has been implemented, although growing, remains relatively small.[11] Pekanov and Dierick (2016) note that while the credit-to-GDP gap is the main reference indicator in the European framework, all authorities take account of additional information in rate setting decisions. ESRB (2017) expands on this point and suggests that across Europe there is a relationship between CCyB levels and indicators examining over-valuation in residential real estate prices, credit growth and the strength of bank balance sheets.

More broadly, ESRB (2017) points to the widespread use of instruments targeted at residential real estate. The paper groups these measures into three categories: instruments targeted at (1) borrower repayment capacity (e.g. LTI/Debt to Income), (2) loan collateral (e.g. LTV) and (3) lender resilience (e.g. sectoral risk weights or capital buffers). Most jurisdictions have utilised a combination of measures targeting at least two of these elements.

Looking in more detail at individual country circumstances shows that those European countries, which have introduced positive CCyB rates, are also operating some form of borrower-based measure. In general, it has been the case that authorities have introduced a positive CCyB rate to enhance the resilience of the financial sector to increased cyclical risk, while introducing borrower-based measures to increase the resilience of the household sector or impact on mortgage credit dynamics.

Finally, it should be noted that policies are used in different ways across countries, in some cases being implemented as preventative (currently non-binding) measures, while in others implemented in response to observed risk. In a number of cases, authorities have introduced one instrument (primarily the CCyB) in response to an observed increase in cyclical risk and the other (borrower-based measures) with a non-binding calibration to insure against future increases in cyclical risk.

4 Conclusion

This Letter compared and contrasted a capital-based macro-prudential tool (i.e. the CCyB) with borrower-based instruments (e.g. LTV/LTI restrictions). Both are broadly aimed at achieving the same intermediate objective of macro-prudential policy, that of preventing and mitigating excessive credit growth and leverage. However, their different design and transmission channels may make them more or less effective in different situations. In general, both conceptually and based on the practical implementation to date, the CCyB is generally seen as being best suited to building resilience in the banking system against growing cyclical systemic risks. Its use, however, is not limited to banking sector resilience as it can also operate through dampening the upswing of the financial cycle for example. Borrower-based measures provide a tool useful for targeting risks relating to household sector resilience, the residential property market or directly affecting (mortgage) credit growth. In practice also, macro-prudential authorities are likely to employ a combination of measures, especially when cyclical systemic risks are elevated, in order to achieve an appropriate macro-prudential policy stance overall and/or minimise the scope for policy leakages.

[11] Countries which to date have set a non-zero CCyB rate include the UK, Norway, Sweden, Slovakia and Czech Republic.

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Table 1: A comparison of CCyB, LTV and LTI by aims, transmission channels and drawbacks

Instrument	Primary Aim	Secondary Aim	Transmission	Drawbacks
CCyB	Enhance the resilience of banking system	Limit pro-cyclicality of credit	Increase loss absorption capacity of institutions	Effectiveness in case of excess buffers may be questionable
			Aggregate credit environment	Uncertain impact on credit growth
LTV	Increase resilience of households and banks	Dampen procyclicality between credit growth and house prices	Specifically targets real estate	Loan size can increase in line with property prices
	Directly impacts credit growth		Lowers the loss given default by reducing sensitivity to property price movements	Interaction between property prices and household deposit funding
LTI	Increase resilience of households and banks	Dampen procyclicality between credit growth and income	Specifically targets real estate	Income may not be a comprehensive measure of repayment capacity*
	Directly impacts credit growth		Lowers the probability of default	
			More binding than LTV as incomes tend to increase slowly	

Source: Adapted from Grace et al. (2015).
*It should be noted there are a number of options for limiting an individuals' borrowing capacity relative to their income e.g. debt-to-income, debt-service to income. A more detailed discussion of these options was included in the Central Bank's consultation on the residential mortgage market measures. The Central Bank has acknowledged that a debt-to-income ratio provides a more comprehensive instrument, than the LTI, taking account as it does of a borrower's total debt. However, at this stage practical complications weigh against its implementation. Nonetheless, as these issues are addressed over time with the set-up of the Central Credit Register for example, the Central Bank will reassess the appropriateness of an LTI restriction versus a possible DTI instrument.