

Foreword

For decades, conventional wisdom in the field of macroeconomic policy focused solely on price stability, as a means to maintain economic equilibria, and assigned a central role to monetary policy in most developed countries around the world. In the classical framework, an explicit or implicit inflation target was placed at the heart of monetary policy, mainly through guiding short-term interest rates in accordance with the overall stance of policymakers. Empirical evidence gathered from episodes of low macroeconomic volatility such as the Great Moderation, as well as academic research, argued in favour of the effectiveness of the policy strategy, bearing in mind that experience showed that limited macroeconomic impact had been recorded on the backdrop of financial market distress. Moreover, taking into account that policymakers largely overlooked or underestimated the linkages between the financial sector and real economy, prudential policies were mostly focused on institution-specific risks, ignoring system-wide vulnerabilities and potential contagion effects.

The paradigm abruptly changed after the Global Financial Crisis, as shocks stemming from the financial sector severely affected macroeconomic stability, despite the low and relatively stable inflation environment. The materialization of systemic vulnerabilities accumulated in the run-up to the financial crisis, minimized or largely disregarded by policymakers, argued in favour of establishing the macro-prudential oversight framework for the financial sector, with an overarching goal of limiting the frequency and impact of future crises. Complementing the focus on the economic cycle with a view of the financial cycle, both in developed and emerging economies, together with domestic and European drivers, regulation, policy regimes and global risks is extensively argued by Dăianu (2016).

The financial market meltdown in 2008, which brought about large financial institution failures or government bailouts, significantly challenged the effectiveness of the prudential oversight framework, calling for a comprehensive overhaul in order to adequately measure and mitigate systemic risks and vulnerabilities. The significant costs of the financial crisis were borne by financial institutions, companies, households as well as the government, leading to important increases in public deficits worldwide and to mounting debt levels over the following years. Voinea, Alupoai, Dragu and Neagu (2016) investigate the effects of rising indebtedness levels around the world using complementary quantitative approaches, and find significant heterogeneity in country-specific debt thresholds. The authors conclude that country- and sector-specific measures or thresholds are warranted, taking into account the significant differences obtained from the models.

The repercussions of the global financial shock differed widely from one economy to another, depending on the underlying vulnerabilities and linkages. Emerging market economies saw significant capital outflows, amplified or dampened by structural and cyclical risks within their financial sectors related to solvency, liquidity, asset quality and ownership. Voinea, Cazacu and Neagu (2016) look at the role of expatriates and other top management teams' characteristics for banks' risk profile, strategies and lending activity. Analyzing a sample of credit institutions in the Central and Eastern European region, the authors find that banks with expatriate CEOs or a larger share of expatriates in the top management team are more risk-takers, as indicated by alternative measures of risk, with important implications for financial stability.

In the aftermath of the crisis, monetary policy was adapted to the new macro-financial environment through the wide-scale adoption of unconventional policies, in particular Quantitative Easing. Dăianu (2020) argues that, although indispensable in avoiding an economic collapse, QE programs reflect an inability to tackle fundamental issues related to resource allocation, the financial cycle, over financialization and other structural issues. The author questions the ability of unconventional monetary policies to ensure debt sustainability or act as a substitute for structural reforms in the financial, competition and fiscal areas, and extensively debates the role of QE in advanced and emerging economies.

At an institutional level, the policy response to the crisis has led to reforms worldwide, ranging from establishing macroprudential authorities tasked with maintaining financial stability to tightening financial sector regulation and establishing new safeguard mechanisms for the resolution of financial institutions in distress. Starting from the de Larosière and G20 Reports published in 2009, which argued for tightening prudential and regulatory oversight, the establishment of the

Financial Stability Board (2009) was a cornerstone in promoting the global reform of the financial sector's prudential and regulatory oversight framework, through close cooperation between national and international authorities. After 2010, most advanced economies established financial stability oversight bodies tasked with monitoring systemic risks or threats to financial system stability. In the US, the Financial Stability Oversight Council (FSOC) was set up as a collaborative body chaired by the Secretary of the Treasury, with the clear mandate of identifying risks and responding to emerging threats to financial stability. The Council brings together federal financial regulators, state regulators and an independent insurance expert. A noteworthy element is the importance attached to close cooperation between multiple authorities, given the fact that financial stability can only be preserved via a combined institutional effort.

In Europe, the foundation of the macroprudential policy framework was laid down in 2010 through the establishment of the European Systemic Risk Board (ESRB), as part of the European System of Financial Supervision (ESFS). According to EU regulation, the main objective of the ESRB is to contribute to the prevention or mitigation of systemic risks to financial stability in the Union that arise from developments within the financial system and taking into account macroeconomic developments, so as to avoid periods of widespread financial distress. In order to achieve its objectives, the ESRB identifies and monitors systemic risks and vulnerabilities on an ongoing basis, in close cooperation with national authorities and other EU and international supervisory authorities. Recommendations or warnings are issued whenever significant risks are identified or EU-wide changes to the macroprudential framework are deemed necessary, and are addressed to the Union as a whole or to specific Member States.

The coordinating role of the ESRB within the EU is an important step towards an effective macroprudential oversight framework, but remains insufficient without operationalizing macroprudential authorities in each Member State in order to assess systemic risks in their respective jurisdictions. For this reason, in 2011, the ESRB issued a Recommendation to designate, through national legislation, an authority responsible for macroprudential policy in every Member State. Therefore, following the implementation of the recommendation throughout the EU, several institutional models have appeared, ranging from designating the central bank or the financial supervisory authority as the macroprudential authority to establishing new inter-institutional bodies or granting the novel task to government authorities.

Romania complied with the ESRB recommendation by establishing an inter-institutional cooperation body, i.e. the National Committee

for Macroprudential Oversight (NCMO), comprising the authorities responsible for maintaining financial stability in Romania, namely the National Bank of Romania, the Financial Supervisory Authority and the Government, through the Ministry of Finance. The Committee is organized following the structure and framework of the ESRB and contributes to safeguarding financial stability in Romania starting 2017, thereby ensuring a sustainable contribution of the financial sector to economic growth. Recently, the NCMO has promoted the enhancement of inter-institutional dialogue on several structural vulnerabilities of the Romanian economy by establishing several working groups on promoting green finance, reducing the agri-food trade deficit or increasing sustainable financial intermediation in order to identify the best policy measures through close cooperation between all stakeholders.

Certain structural vulnerabilities have deep macroeconomic implications and warrant further investigation to uncover the potential drivers in Romania's specific case. Pal, Wruuck, Stamate and Dumitrescu (2021) examine the underlying causes for the subdued investment activity of firms in Romania and conclude that companies with a weak financial situation or with equity below the regulatory threshold cannot access external financing in order to make investments. Furthermore, the authors find other relevant factors such as the lack of skilled staff and the unpredictable economic environment that may also hinder corporate investment in Romania.

After defining the ultimate objective of macroprudential policy and establishing the designated authorities responsible for maintaining financial stability, policymakers focused on building the set of intermediary objectives and instruments available to mitigate systemic risks. The variety and complexity of the instruments, as well as transmission channels and interactions, are a direct consequence of the intricate and ever-changing nature of systemic risk.

The experience gained in the aftermath of the recent crisis provided robust arguments in favour of addressing both the time dimension, namely the build-up of excessive risks in good economic times, as well as the cross-sectional dimension of systemic risk, through common exposures, concentration or contagion risks. Moreover, policymakers can choose either to dampen the procyclical dynamics of the financial sector or to enhance the resilience of financial institutions to better withstand future shocks. From a crisis management perspective, limiting procyclicality can contribute to lowering the probability of future crises, while enhancing resilience diminishes the overall impact, should the risks materialize.

To add further complexity, the optimal policy path is difficult to attain due to the short-term costs of implementing tightening measures,

while the long-term benefits obtained through lowering the frequency and severity of crises are hard to assess and even harder to communicate to the public. In this context, the risk of an inaction bias, where authorities are reluctant to implement tightening measures, is especially worth mentioning in the case of debtor-based (imposing more restrictive limits on down payment or indebtedness requirements) or capital-based requirements. Romania's experience in implementing borrower-based instruments, spanning over more than a decade, points to their effectiveness in curbing excessive credit growth and increasing repayment capacity, as shown by Neagu, Tatarici and Mihai (2015). The authors argue in favour of implementing specific LTV or DSTI caps based on income, currency and type of loan, as opposed to market self-regulation, which generally leads to excess procyclicality and suboptimal results.

Besides the established intermediary objectives of macroprudential policy, national authorities can choose to adopt specific objectives to tackle systemic vulnerabilities in their respective jurisdictions. In the case of Romania, promoting a sustainable increase in financial intermediation was chosen as a national intermediary objective, achievable through traditional but also innovative instruments, such as improving the level of training of the bank staff directly involved in lending. The link between financial stability and the quality of banking sector staff is explored by Pîslaru, Kubinschi and Neagu (2020), using survey data for the Romanian banking sector. The authors find relevant evidence showing that banks with a higher level of staff training are more efficient and more profitable, and display a lower non-performing loan ratio after a systemic crisis.

Since its formal establishment a decade ago, the macroprudential policy framework has been put to the test several times, most notably through the recent COVID-19 pandemic, when quite a few authorities applied flexibility measures or released the capital reserves built up in previous years to support the real economy. Early evidence points to the positive effects of the measures, as sudden stops akin to the recent global financial crisis were avoided, and the financial sector continued to finance the real economy, dampening the significant economic shock brought about by the pandemic. The unique nature of the COVID crisis brought by the partial and full lockdowns, on the backdrop of unprecedented uncertainty, has prompted policymakers to shift their attention from classical signaling indicators to new sources of data, with relevance for the turbulent macro-financial environment. In this context, Alupoai, Bálint and Kubinschi (2021) build a technical toolbox to monitor a pandemic outbreak for central banks and supervisory authorities. The authors propose a holistic approach of the COVID-19 pandemic in Romania across several dimensions including: regional outbreaks and

sub-epidemic waves, counterfactual scenarios based on structural frameworks and optimal lockdown policies, population mobility, and initial considerations on the impact on economic activity.

Future challenges to the global economy are reflected in the macroprudential policy area as well, ranging from financing the transition to a green economy, to overcoming geopolitical vulnerabilities related to resources and commodities or to adequately adapting the oversight process to new developments stemming from the Fintech sector or crypto-assets. In this challenging context, the future of financial stability hinges on a delicate balancing act between adequately assessing new risks and vulnerabilities and avoiding overregulation of the financial sector, which can impede the financing of the real economy.

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The views expressed in this volume are those of the authors alone and do not necessarily reflect the views of the National Bank of Romania.

IMPLEMENTING LOAN-TO-VALUE AND DEBT SERVICE-TO-INCOME MEASURES: A DECADE OF ROMANIAN EXPERIENCE¹

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1. The paper is part of Implementing Loan-to-Value and Debt-to-Income Ratios: Learning from Six Country Experiences project led by the IMF. The countries participating in the project are: Brazil, Hong Kong SAR, Korea, Malaysia, Poland and Romania. A summary of the findings of the project is to be found in Jacome and Mitra (2015). The authors would like to thank Luis Jacome, Srobona Mitra, Ruy Lama, Angela Pîslaru (Mărgărit), Alexie Alupoaiu and the participants in the above-mentioned IMF project for their useful comments.

ABSTRACT

We describe an example of designing, implementing and calibrating two macroprudential instruments – loan-to-value (LTV) and debt service-to-income (DSTI) – based on a decade of Romanian experience with these tools. We investigate LTV and DSTI effectiveness in trimming down excessive credit growth and in preserving the quality of banks' loan portfolios. We find strong links between DSTI levels and the debtors' capacity to repay their debt, underpinning the usefulness of caps for this instrument. We find that an approach based to a large extent on banks' self-regulation produces suboptimal results, exacerbating the pro-cyclicality in the system. A one-size-fits-all approach is less effective than tailoring the DSTI and LTV measures based on debtors' disposable income, the currency of indebtedness and the destination of the loan.

EXECUTIVE SUMMARY

A decade of Romanian experience with debt service-to-income (DSTI) and loan-to-value (LTV) instruments shows that they are relatively effective in: (i) curbing high credit growth and (ii) ensuring that both debtors and creditors are able to cope with possible adverse shocks in real estate prices, domestic currency depreciation or interest rate hikes. The second point explains why the DSTI and LTV caps should be used both in the upswing and in the downswing of the credit cycle.

We find strong negative correlation between the level of indebtedness and the ability to repay the debt. Moreover, debtors with lower income and high DSTI post a higher NPL ratio, irrespective of the purpose of lending (consumer or mortgage lending). There are links between the LTV level and debtors' capacity to repay their debt: the higher the LTV, the higher the non-performing loan (NPL) ratio. These arguments underpin the usefulness of using DSTI and LTV caps to foster debtors' capacity to repay their loans.

We find that banks' self-regulation on DSTI and LTV caps, without specific guidance from the authorities, delivers sub-optimal results. The

Romanian banks behaved in a deeply pro-cyclical manner when an approach based to a large extent on self-regulation was implemented. We also find that the one-size-fits-all approach is not very effective. It is more useful to tailor the DSTI and LTV measures according to the specific patterns of possible risks. The caps for these instruments should be differentiated based on debtors' disposable income (low, medium and high), the currency of indebtedness (domestic or foreign) and the destination of the loan (mortgage or consumer loans).

The empirical evidence shows that the effectiveness of DSTI and LTV instruments in trimming down the rapid credit growth is higher than that of monetary policy instruments or other prudential measures. The Romanian specificities during the last decade largely point to this outcome; these include a high level of euroization, full capital account liberalization, a material share of FX loans, and significant foreign capital inflows.

There are three main policy messages for improving the effectiveness in using DSTI and LTV instruments. First, there is a need to strengthen the cooperation between the domestic macroprudential authority and other domestic and foreign-related authorities in order to preserve the ability of these instruments to deal with risks. Second, it is more prudent to monitor the total level of household and corporate sector indebtedness, instead of total domestic credit developments. The differences indicated by these two approaches are material. Focusing on the latter might delay the authorities' decisions on DSTI and LTV implementation or calibration, yielding sub-optimal outcomes in managing systemic risks. Third, higher transparency is needed from the authorities regarding their macroprudential intermediate objectives and, if possible, the instruments tailored to fulfill these objectives.

1. INTRODUCTION

Tentative lists of macroprudential instruments are already available at the international level (e.g. ESRB, 2013; IMF, 2013). The next step is to learn about the design, implementation, calibration and effectiveness of these instruments. Empirical findings on these aspects are relatively scarce, because, prior to the crisis, many such instruments were considered to distort the free markets, and so countries were encouraged not to use them. Debt service-to-income (DSTI) or loan-to-value (LTV) caps are among the instruments that, within a few years, changed their status from administrative to macroprudential instruments. Jacome and Mitra (2015) managed to collect details on the experience of six emerging economies that used DSTI and LTV both before and after the crisis, and have provided extremely useful findings.

Our paper falls within the stream of literature that searches for answers about operationalizing macroprudential instruments. Some papers (e.g. Aikman *et al.*, 2013; ESRB, 2014) focus on operationalizing the macroprudential regime, as a whole. Detken *et al.* (2014) target the countercyclical capital buffer operationalization. We concentrate on the operationalization of another two macroprudential instruments: debt service-to-income (DSTI) and loan-to-value (LTV). We provide inputs about their design, implementation and calibration, using the Romanian bank-level database as a case study. We also investigate their effectiveness in supporting the macroprudential intermediate objective of mitigating excessive credit growth and leverage.

Romania is among the small open economies that was forced to resort to unorthodox measures in order to cope with challenges related to capital account liberalization, the euroization of the economy, credit boom developments, etc. (details in Annex 1). Some of these unorthodox measures are now considered “the new normal” (e.g. the use of DSTI and LTV caps). After analyzing a decade of Romanian experience with these instruments, we conclude that DSTI and LTV instruments are relatively effective in curbing high credit growth and ensuring that both debtors and creditors are better equipped to withstand possible adverse shocks. However, we find that the instruments’ effectiveness in curbing house price growth is relatively poor in Romania, the result being in line with other studies (e.g. Lau and Rau, 2015 for Malaysia). On the other hand, Arregui *et al.* (2013) consider that the DSTI/LTV measures have an important impact on house price dynamics. Kim (2015) reaches the same conclusion for Korea, highlighting that the prudential measures were reinforced by fiscal ones.

We find that, in the absence of specific guidelines from the macroprudential authority, banks’ self-regulation on DSTI and LTV yields sub-optimal results. Romanian banks behaved in a deeply pro-cyclical manner when an approach based more on self-regulation was implemented. However, self-regulation might work in the downward phase of the financial cycle, when banks are more risk averse. This is the conclusion we might grasp from the Brazil (Afanasieff *et al.*, 2015) and Poland (Bierut *et al.*, 2015) experiences. We also find that it is useful to tailor the DSTI and LTV measures according to the specific patterns of possible risks. The caps for these instruments should be differentiated based on debtors’ disposable income (low, medium and high), the currency of indebtedness (domestic or foreign) and the destination of the loan (mortgage or consumer loan).

The first step in implementing DSTI or LTV caps is to know which systemic risks are more likely to be addressed by using these instruments. High indebtedness of households is one example of a risk that

might impair financial stability, and the level of debt-to-service is a good leading indicator for banking crises (Drehmann and Juselius, 2013). Macroeconomic variables and bank specific factors are also leading indicators for repayment behavior (Klein, 2013). Real estate negative developments represent another risk that might trigger a financial crisis; and Davis *et al.* (2011) provide a survey of the literature from this perspective. The main systemic risks monitored in Romania when taking policy decisions regarding DSTI or LTV caps relate to: (i) borrowers' indebtedness (or excessive credit growth – from a lender's perspective), (ii) the sectoral concentration in real estate assets, and (iii) the macroeconomic imbalances. To this end, the National Bank of Romania has developed a framework to monitor the challenges stemming mainly from the household and corporate sectors.

The rest of the paper is structured in three parts. Section II highlights the Romanian framework for DSTI and LTV: how these instruments are used (calibration, enforcement and communication processes) and how decisions are taken (institutions involved and dealing with “leakages”). The effectiveness of the instruments from the perspective of credit, house price and non-performing loan dynamics is presented in Section III. The last section concludes with a summary of the lessons to be learned from the Romanian experience.

2. USING THE INSTRUMENTS

Monitoring systemic risk

In Romania, the identification of potential systemic risks is based on both quantitative and qualitative tools. The main systemic risks that might trigger activation of the DSTI or LTV caps are: the high level of borrowers' indebtedness (or excessive credit growth – from a lender's perspective), sectoral concentration in real estate assets and macroeconomic imbalances.

At the early age of DSTI and LTV usage, the key indicators monitored by the authorities when deciding upon the introduction/calibration of these instruments were: credit growth dynamics (especially in FX), external equilibrium (current account deficit) and the inflation rate. This monitoring framework evolved in line with the macroprudential analysis agenda. More emphasis is now put on indicators flagging potential systemic risks stemming from developments in the real estate market and borrowers' (household and corporate sector) vulnerabilities, as a complement to a banking sector analysis.

The household sector is monitored largely by (i) the structure and dynamics of indebtedness and (ii) the ability to service the debt. The overall level of indebtedness is quantified by a series of indicators: the level of debt

service-to-disposable income, debt-to-assets, debt-to-net wealth and debt-to-GDP. The indebtedness is also monitored from a structural perspective: by currency (the share of FX loans in total loans granted to households), by destination (the share of mortgage and consumer loans, respectively, in total loans), by categories of disposable income (e.g. the borrowers with lower than average disposable income display a higher level of indebtedness and a higher non-performing ratio), and by tenure (short, medium, and long-term lending). Households' ability to service the debt is assessed by computing the non-performing loan ratio (total, by currency, income, destination, vintages, etc., see Table A4.1, Annex 4) and by the sensitivity analyses of the NPL response to potential shocks on interest or exchange rates. The monitoring framework is based on micro-data from the Central Credit Register (within the central bank) and Credit Bureau (private entity) databases. The analysis of these indicators points to the following conclusions: (i) lending in foreign currencies is riskier than lending in domestic currency, (ii) consumer lending should not exceed 5 years (the level above which the NPL ratio would significantly increase); and (iii) there is a threshold of indebtedness above which the ability of the borrowers to repay their debts decreases considerably (Chart A4.1, Annex 4). This threshold differs from one cohort to another (cohorts are grouped by disposable income), but an aggregate 45 percent yardstick is informally monitored.

The corporate sector is monitored from several perspectives. First, the leverage ratio (debt/capital) is computed for the overall economy, by main economic sectors, and by firm size (micro, small and medium enterprises). The yardstick for this ratio is 2, above which a closer monitoring is performed. Second, the structure and dynamics of loans granted to firms by banks and non-bank financial institutions (both domestic and foreign lenders) are examined. The focus is on the share of the FX loans granted to unhedged borrowers. Third, in order to assess the credit risk, the following indicators are quantified (i) the one-year probability of default for the corporate sector and (ii) the NPL ratio (total, by currency, economic sector, firm size, destination of the loans, etc.). Fourth, the main soundness indicators of the corporate sector (ROE, EBIT/interest expenses, etc.) are investigated. A stress-test exercise of the corporate sector is performed to assess its ability to cope with negative macro and financial developments.

The banking sector is assessed mainly through its capacity to adequately cover the expected and unexpected losses (through provisions and capital) and its ability to shield against the risks stemming from the concentration in real estate assets (the overall exposures to construction and real estate sectors, as well as the volume of real estate collateral from banks' books are computed).



For decades, conventional wisdom in the field of macroeconomic policy focused solely on price stability, as a means to maintain economic equilibria, and assigned a central role to monetary policy in most developed countries around the world. Empirical evidence gathered from episodes of low macroeconomic volatility such as the Great Moderation, as well as academic research, argued in favor of the effectiveness of the policy strategy, having in mind that experience showed limited macroeconomic impact recorded on the backdrop of financial market distress. The paradigm abruptly changed after the Global Financial Crisis, as shocks stemming from the financial sector severely affected macroeconomic stability, despite the low and relatively stable inflationary environment. The materialization of systemic vulnerabilities accumulated in the run-up to the financial crisis, minimized or largely disregarded by policymakers, argued in favor of establishing the macro-prudential oversight framework for the financial sector, with an overarching goal of limiting the frequency and impact of future crises.

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