

Policy Contribution

Sustainable banking regulation: accounting for economic inequality

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Abstract:

Prudential policies aiming for financial stability led to a significant growth of banking regulation in advanced economies in the past two decades. Concurrently, economic inequality continued rising in major advanced economies. Knowing that economic inequality may fuel financial crises, we explore how prudential policies regulating the banking sector affect social metrics of sustainability such as economic inequality. Our empirical analysis shows that prudential policies may alter the distribution of income and wealth. We disentangle possible transmission channels and put forward a central causal mechanism for this relationship. Finally, we argue that prudential policy evaluation processes need to account for unintended effects on economic inequality in a systematic way and by means of quantitative analytical methods.

JEL Classification:

D31: Personal Income, Wealth, and Their Distributions, G28: Government Policy and Regulation, F34: International Lending and Debt Problems

Keywords:

Income inequality, Wealth inequality, Microprudential policy, Macroprudential policy

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Introduction

The number of regulations aiming for financial stability in the banking sector has increased significantly in advanced economies throughout the last two decades. This trend intensified following the global financial crisis of 2007-2009 and the sovereign debt crisis in Europe in 2013. Concurrently, throughout the same time period, individual countries have seen upsurges in economic inequality, both in terms of income and wealth, as thematised by Piketty (2014).

The key aim of prudential policies is the stability of the financial system, which includes avoiding precedents where taxpayers' money have been used for resolution. These policies at large have proved their effectiveness for restoring liquidity and trust in the financial system. However, prudential policy instruments may have unintended effects on taxpayers by altering the distribution of income and wealth in the economy (see Figure 1). Such unintended effects, whether inequality-widening or inequality-narrowing, are not systematically explored and quantified in policy evaluation processes, neither ex-ante nor ex-post.

The motivation behind understanding the effects of prudential policies on economic inequality builds upon two arguments. The first argument was put forward by Stiglitz (2009). Stiglitz argues that, as income inequality increases and indebtedness among vulnerable households rises, the risks to financial stability are building up. Once income levels fail to adjust, as quickly as price levels do, a financial crisis is likely. Kirschenmann et al. (2016) provide empirical support for this argument, by showing that income inequality is a relevant predictor of financial crises in advanced economies, in particularly when inequality is high. Thus, given that rising income inequality leads to a higher probability of financial crisis, in cases where policies aiming at financial stability unintentionally contribute to higher income inequality, the goal of financial stability is jeopardised. The second argument is embedded in the context of the international policy agenda. The Financial Stability Board (FSB) and the United Nations (UN) acknowledged in policy discourses the significance of the interplay between the goals of financial stability and the goals of sustainable economy. In 2018, the FSB launched a review of post-crisis regulation in order to identify any unintended effects as well as whether any of these effects undermine the overarching aim of financial stability. Since income and wealth inequality are metrics of sustainability in the UN's framework of Sustainable Development Goals (SDGs), identifying and quantifying any unintended redistributive effects of prudential policies is essential.

This paper aims to answer the following question: Do prudential policies affect the distribution of income and wealth? We explore analytical frameworks for assessing the effects of prudential policies on economic inequality in the context of advanced economies. A particular focus is given to disentangling the transmission channels of the introduction of these policies to changes in income and wealth inequality. Analysing only income inequality might lead to partial conclusions, since certain advanced economies might have relatively low levels of income inequality whilst displaying high levels of wealth inequality. Therefore, we choose to explore economic inequality as a whole, accounting for both income and wealth inequality. Finally, this policy contribution is based on research analyses and does not consist of regulatory conclusions concerning redistribution.

Figure 1: Interplay of prudential policy, economic inequality, and financial stability



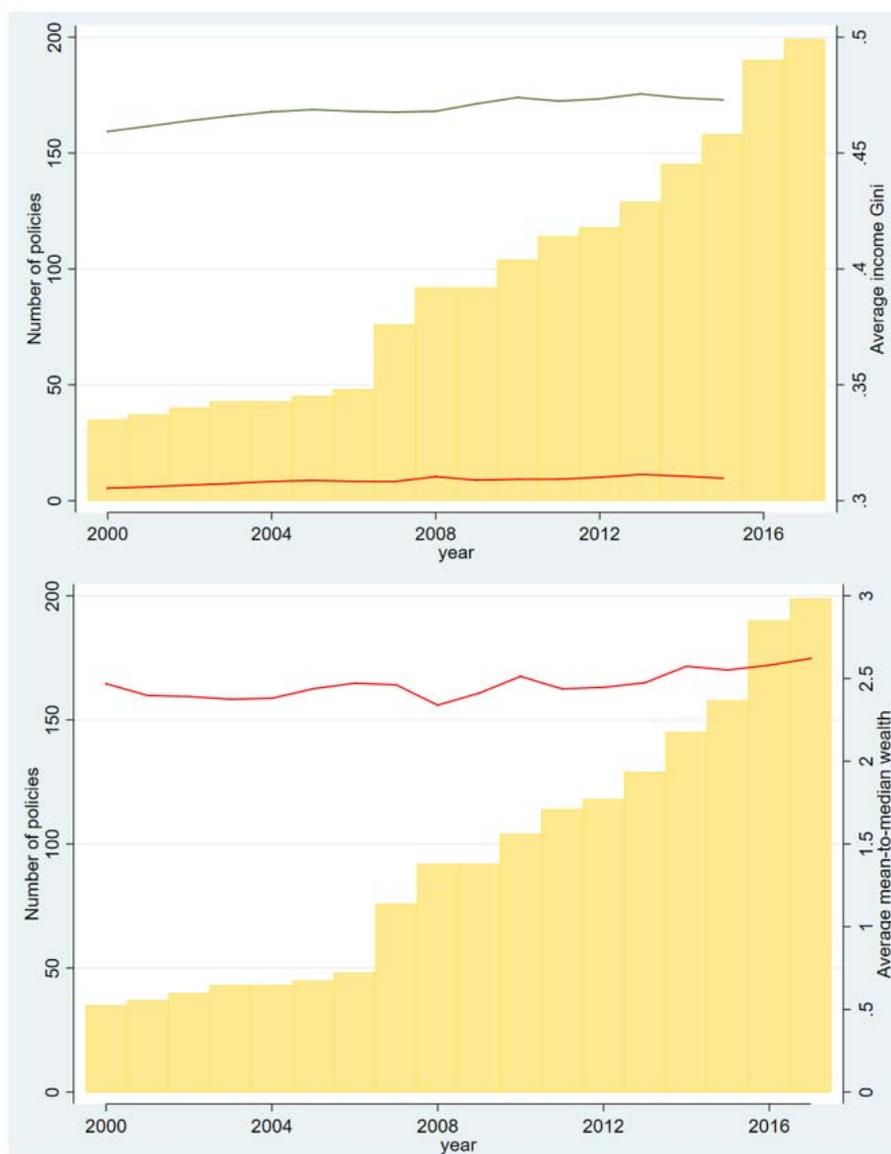
Note: The figure illustrates the relationship of interest of this study, depicted with the orange arrow, in the context of financial stability.

Prudential policies and economic inequality

In the public policy field, prudential policies are microprudential and macroprudential policies that govern financial stability and are not monetary policy instruments. Whereas microprudential policies focus on the health of individual financial institutions, macroprudential policies focus on the risks to the financial system as a whole. We review the empirical literature on the effects of microprudential and macroprudential policies on income and wealth distributions. In this process, we differentiate

between macro-analytical frameworks, which make use of panel data approaches and general equilibrium analysis, and micro-analytical frameworks, which employ propensity matching and partial equilibrium analysis. Furthermore, we differentiate between studies providing evidence on the effects of microprudential policies and macroprudential policies on income and wealth inequality.

Figure 2: Evolution of economic inequality with prudential policies in advanced economies, 2000-2017



Note: The figure in panel A shows average market income gini (green line) and average disposable income gini (red line) across an unbalanced panel of 40 advanced economies. The figure in panel B shows the net wealth mean-to-median (red line) for the same set of countries. The solid bars in both panels show the number of prudential policies in place across all countries in the studied panel. Data sources: Solt (2016) for market income inequality and disposable income inequality, Shorrocks et al. (2018) for the wealth inequality along with own calculations, Cerutti et al. (2017a) and Cerutti et al. (2017b) for prudential policies.

With respect to microprudential policies, we find that no study explores the effects of the minimum capital regulation. However, we find one study that explores the effects of changes in policies regulating the loan origination process. D'Acunto & Rossi (2017) explore the changes in the Dodd-Frank Wall Street Reform and Consumer Protection Act concerning the loan origination process as a

potential explanation for the mounting wealth inequality in the USA. The authors argue that following this change in regulation the middle-class households have been cut out of the mortgage market.

With respect to macroprudential policies, we identify three relevant studies. Frost and Van Stralen (2018) use a macro-analytical framework to explore empirically the causal associations between a range of macroprudential policies and income inequality levels. Using data for a mixed panel of advanced and developing economies, the authors find a positive association between selected macroprudential policies and income inequality. Acharya et al. (2017) and Tzur-Ilan (2016) adopt a micro-analytical framework and provide evidence into the causality relationship between borrower-related macroprudential policy instruments and aspects of the distribution of wealth. Acharya et al. (2017) study the effect on residential mortgage credit of the introduction of LTV and DTI caps in Ireland. The authors find that, following the introduction of these instruments, banks (i) reduce the rate charged to high-income households who buy expensive properties and (ii) increase their mortgage to the high-income quantile, whilst issuance to the bottom-income quantile does not change. The results of this study support the argument that borrower-related macroprudential instruments make the wealthy group wealthier, increasing wealth inequality. Tzur-Ilan (2016) examines the effects of the introduction of Loan-To-Value limits in Israel and finds that (i) rates charged on mortgages have increased for all categories of borrowers, (ii) borrowers buy cheaper houses and in lower quality neighbourhoods, (iii) demand for consumer credit increased significantly. Since consumer credit is a form of unsecured debt associated with higher rates, borrowers increase the economy's overall exposure to the risk of recession and unemployment. The results support the argument that LTV macroprudential instruments are likely to make less-wealthy borrowers more vulnerable.

The above review shows that the existing empirical literature on the effects of the prudential policies on income inequality and wealth inequality is generally scarce. The main reasons identified are limitations with respect to (i) the state of literature on transmission mechanisms and (ii) the data availability. We give an account of these limitations in the following.

First, the transmission channels of both microprudential and macroprudential policies to economic inequality are complex. The literature on this matter is scattered and mostly in its infancy. Nevertheless, much can be learned from contiguous streams of research. An increasing amount of studies explore the effects of monetary policy on income and wealth distributions (Ampudia et al. (2018), Adam and Tzamourani (2016), Auclert (2017)). In addition, several empirical studies explore the effect of prudential policies on credit growth and house price appreciation (Akinci and Olmstead-Rumsey (2018), Zhang and Tressel (2017) for the Euro Area), whilst another stream of literature connects credit-to-GDP to income inequality (Baiardi and Morana (2018) for the Euro Area, De Haan and Sturm (2017)). All these adjacent bodies of literature may inform conjectures relating to the transmission mechanisms of prudential policies to economic inequality.

Second, available data on prudential policies, income, and wealth would not cover a full economic cycle as necessary for analysis since macroprudential policy instruments have been mostly introduced in advanced economies after the global financial crisis. The data on income and wealth was prone to cross-country inconsistency of measurement and scattered coverage. Significant improvements have been achieved in the recent years on cross-country data on prudential policies thanks to the work of Cerutti et al. (2017a) Cerutti et al. (2017b), on income thanks to the work of Solt (2016) and UN-WIDER, and on wealth thanks to the work of Shorrocks et al. (2018), and the two waves of EU Household Finance and Consumption Survey. Though the historical available data is still insufficient to draw definitive judgement, we do have much more evidence than we used to.

We initiate an empirical analysis exploring the relationship between a range of prudential policy instruments based on data from Cerutti et al. (2017a) and Cerutti et al. (2017b) and income inequality data based on Solt (2016). We employ a macro-analytical framework using a panel data approach with fixed effects on 34 advanced economies over the time period 2000 – 2016. We document the following first results. Disposable income gini has a positive association with concentration limits in place in the year before, Basel 3 capital requirements in the prior two years, and Debt-To-Income instruments in place in the three years before. Market income gini has a positive association with concentration limits in the prior year, limits of foreign currency credits in the prior year, and Basel 3 capital requirements in the prior two years. Furthermore, market income gini show a negative causal association with dynamic provisioning in the prior one and two years. These first results for income inequality confirm the hypothesis that certain prudential policies may alter income inequality. Whereas certain policy instruments have a positive effect, other instruments have a negative effect on income inequality. We initiate an analogous empirical study for wealth inequality using data from Shorrocks et

al. (2018). We find preliminary evidence of statistically significant associations between selected policy instruments and wealth inequality. These findings are subject to further sensitivity analysis.

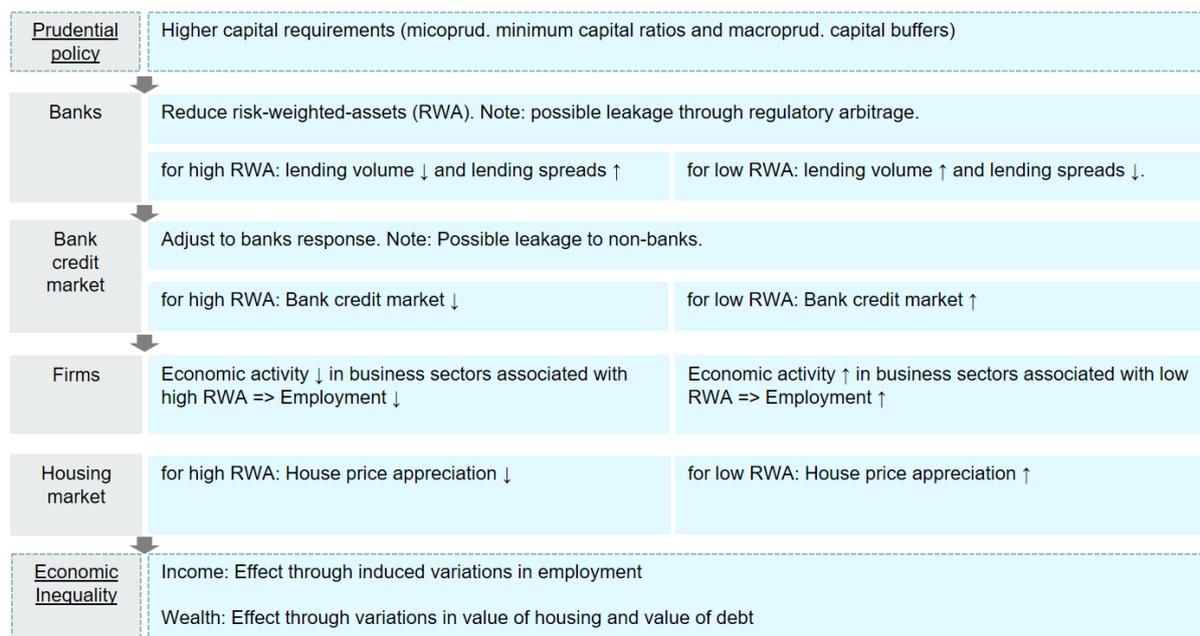
The studies reviewed and our empirical analysis support the hypothesis that prudential policies may have redistributive effects and invite further research. For doing so, the analysis of policy effects requires disentangling possible transmission channels, outlining a central causal mechanism whilst incorporating empirical insights gained from macro- and micro-analytical frameworks.

Transmission channels

Prudential policy may affect economic inequality through different transmission channels. In the following, we outline the transmission mechanism for two categories of policies: capital related instruments and borrower related instruments.

Capital related instruments encompass policy instruments that require banking institutions to have higher capital ratios. These instruments are microprudential minimum capital ratios and macroprudential capital buffers e.g. countercyclical capital buffers, SIFI surcharges. The transmission mechanism is a sequence of responses involving banks, the credit market, the asset market, economic activity in aggregate, and households.

Figure 3: Transmission mechanism for capital related policies



Banks typically respond to requirements of higher capital ratios by adjusting their lending such as to reduce the denominator i.e. the overall risk-weighted assets (RWA). The adjustment is done by reducing the lending volume and increasing lending spreads for high risk-weighted-assets (Martynova, 2015) and / or by increasing lending volume and decreasing lending spreads for low risk-weighted-assets. Nevertheless, leakages through regulatory arbitrage may happen. Second, the bank credit market, where offer and demand meet, responds to the change in banks supply of credit such that the bank credit market for high RWA contracts whilst the bank credit market for low RWA expands. As documented by Zhang and Tressel (2017) for the euro area, measures that increase the cost of bank capital are generally effective in reducing credit growth. Clearly, where the bank credit market contracts, leakage to the non-bank credit market e.g. shadow banking may occur. The change on the credit market implies constrained funding opportunities on one hand for firms and on the other hand for households.

First, we examine the firms funding channel. The firms channel translates the effect through reduced economic activity in the business sectors associated with high RWA e.g. start-ups, small-and-medium enterprises and expansionary activity in the ones associated with low RWA e.g. big corporations. Variations in economic activity imply variations in employment and consequently in labour income of

households. Across households, labour income represents the main share of income for low-income households and a slightly lower share in the total income of high-income households. Thus, higher capital requirements may indirectly lead to increases in income inequality¹.

Second, we examine the households funding channel. The adjustment of the bank credit market affects the chances of households of getting funding through a mortgage and / or consumer loans. In this setup, it becomes much easier for wealthier households associated with a better credit rating (and hence lower RWA) to get a loan with a narrower lending spread than it would be for less wealthy households associated with a lower credit rating (and hence higher RWA). The asset market shall respond such that asset prices will increase for those segments of the asset market where leverage is in excess. Thus, higher capital requirements may lead to increases in wealth inequality by making the wealthy segment of the population wealthier.

Borrower related instruments encompass policy instruments that require banking institution to limit their lending to households. These instruments are macroprudential Loan-To-Value (LTV) and Debt service-To-Income (DTI). The transmission mechanism is a sequence of responses that starts with the response of banks to the policy introduction. Banks respond by adjusting their lending volume and lending on the mortgage and consumer loan portfolios. Acharya et al. (2017) and Tzur-Ilan (2016) have documented empirical evidence on this aspect. Consequently, the bank credit market for the assets concerned – typically housing – shall be altered. However, as leakages to non-banks e.g. peer-to-peer lending may happen, this response may not hold for the whole credit market². The asset market responds by house price appreciation in the housing segment where leverage is in excess. Finally, LTV and DTI instruments have (i) direct effect on the distribution of value of assets through variations in asset prices and (ii) direct effect on the distribution of the value of debt through variations in the lending volume and lending spread. Across the net wealth distribution, housing wealth is disproportionately important for the bottom 30% of EA households³. Thus, ceteris paribus, LTV and DTI instruments may lead to rises in wealth inequality by making the wealthy wealthier and the less wealthy more vulnerable. Conversely, the effects on income inequality diffuse through the rental income, which is typically associated with wealthier households that have investments in real estate property.

When measuring the effects of prudential policies, several additional aspects require attention. First, the effect of a policy change may manifest gradually and with a time lag that may range from nine to 36 months (Martynova, 2015). Second, the individual effect of one policy may be altered by the individual effect of another policy, such that measuring the joint effect of policies and the individual effect of policies may lead to different results. Third, the implementation of the same policy across countries is very heterogeneous. For instance, the implementation of LTV caps throughout several countries does not imply that the LTV cap level is the same e.g. 95% in Finland and 80% in Cyprus. Fourth, monetary policy has a strong interplay with prudential policies and may counteract or amplify certain effects of these policies. Finally, we acknowledge that certain countries deliberately adopted the policy stance of making home ownership possible to households through mortgage e.g. Netherlands, whereas other countries have the majority of households renting rather than buying e.g. Germany.

Conclusions and recommendations

By disentangling the transmission mechanism and testing the effect through a panel data approach, we conclude that prudential policies may alter income inequality. Furthermore, we disentangle the transmission mechanism from prudential policies to wealth inequality and argue that prudential policies may also alter wealth inequality.

Building upon these conclusions, we bring forward three recommendations.

Ex-ante and ex-post policy evaluation

¹ Ampudia et al. (2018) show the effect of monetary policy (not prudential policy) on economic activity through aggregate demand and ultimately on labour income distribution.

² Braggion (2017) documents that non-regulated peer-to-peer-credit platforms help circumventing LTV caps in China.

³ Domanski et al. (2016) and Adam and Tzamourani (2016) show empirical evidence for the distributional consequences of asset price fluctuations for households given their asset and debt portfolio structure.

Currently, the benefit and cost analysis in policy evaluation processes is often qualitative. Ex-ante quantitative analysis of redistributive effects is rare and ex-post analysis is only partly done. Accounting quantitatively for redistributive effects needs to be an integral part of ex-ante and ex-post policy evaluation schemes.

Transmission channels and Complex interactions

There are a multitude of transmission channels and behavioural responses in form of leakages such as shift of activities to non-regulated sectors. Furthermore, there are complex interactions between prudential policies themselves as well as between prudential policies and monetary policy. Finally, effects may manifest with a time delay as well as gradually throughout several periods. One single model shall not capture all these dimensions. Combining the findings from two or more models shall be necessary. What one model does not pick up or explain well, may be explained by another model. The spectrum of possible quantitative methodologies is large. Partial equilibrium type of analysis (e.g. regressions) shall be suitable for the evaluation of individual policies and for the evaluation of interaction and coherence of these. General equilibrium type of analysis (e.g. ABM, extended DSGE, micro-founded structural models) shall be suitable for the evaluation of overall effects and the evaluation of interaction and coherence of policies.

Assessing effects on inequality against benchmark

In order to allow differentiation of desirable and undesirable consequences on income and wealth inequality, the policy evaluation process requires a methodology for setting a benchmark for inequality against which the effects can be quantified.

The above recommendations shall contribute to establishing policy evaluation processes that account for unintended effects on economic inequality in a systematic way and by means of quantitative analytical methods. Enhanced policy evaluation processes shall benefit policy makers in understanding to which extent banking regulation that aims at financial stability is ultimately sustainable for households i.e. the taxpayer after accounting for unintended effects and where eventual corrective redistributive measures need to be taken.

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