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Macroprudential Policy Efficiency:

Assessment for the Uncollateralized Consumer Loans in Russia

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Abstract

We use the Russian banks' 2015-2019 data to evaluate the effectiveness of the macroprudential measures in curbing the booming consumer lending segment. We find that the measures are successful in reducing the overall loan portfolio riskiness and in capital cushion accumulation by banks. In the short-run of up to 1-2 quarters after the measure announcement date banks tend to reduce both the new loan volumes and the average consumer loan portfolio growth rate. Such reduction is more typical with the smallest market players. However, in the longer time horizon up to a year from the measure application date we observe the increase in the average credit growth rates. Such findings correspond to the experience of the emerging markets of Argentine, Colombia, Thailand. In general, we consider that the observed credit growth after the measure implementation is smaller than it could have been without the measures in place. We also expect that the observed lending growth rate brings less financial instability risks and it reflects the potential for the natural loan extension in Russia.

1. Introduction

Prudential regulation aims at providing financial stability. Its conventional realization encompasses a set of regulatory restrictions, add-ons and/or regulatory ratios. The latter include capital adequacy, liquidity coverage ones etc. In case the bank meets such requirements, the regulator expects it may pass through a financial crisis without soliciting bail-out funds from the Central Bank. However, meeting the very same criteria during the crisis times may be over-restrictive, or procyclical (Altman et al. 2002,Gordy and Howells 2004, Behn et al. 2014, etc.), i.e. might constraint bank even more and consequently limit economic activity exacerbating crisis and preventing rapid recovery. The described dilemma is known as the trade-off between microprudential measures and macroprudential ones. The former include the mentioned ratios and target individual bank stability. The latter have a larger toolkit and target economic system stability overall. Policymakers started publicly discussing macroprudential toolkit composition after the Asian crisis in 1997 (Crockett 2000) and Dot-com crises in 2001 (Borio 2003). However, Clement 2010 claims the knowledge and importance was given to macroprudential tools early in the onset of the Basel Committee for Banking Supervision (BCBS) in 1970s. Nevertheless, wider adoption of macroprudential policy tools started after the Global financial crisis (GFC) of 2007-09. At the time (Schoenmaker 2014) even introduced a term 'macroprudentialism'.

The objective of this paper is to investigate macroprudential policy tools efficiency that targeted restricting uncollaterilized consumer lending in Russia. We contribute to the literature in several distinct ways. First, we demonstrate definitely positive outcomes of the policy measures. Those include the rise in capital cushions of banks and the decrease in the overall riskiness of their loan books. We prove that the tightening macroprudential policy limits the targeted lending segment boom only in the short-run. Such measures influence more the banks with the smaller market share of the targeted loans and with the smaller portion of such loans on its books. In the long-run macroprudential measures are associated with larger credit growth. Though it may seem counter-intuitive, we explain the underlying rationale. In the absence of tightening measures the credit growth could have been much larger. We traced similar patterns in the rapidly growing credit segments in Argentine and Colombia (Gambacorta and Murcia 2020), and in Thailand (BIS 2020).

Second, we undertake the robustness checks that were discussed in the literature (e.g. Budnik and Jasova 2018, BIS 2020), but not implemented. Those are the measure announcement date and the measure sensitivity consideration, respectively. It is important to consider the measure announcement date as by it all the information may already be fully absorbed by banks. This means that banks may adapt to a much extent their lending strategies by the measure implementation date. The measure sensitivity is important as the measure is not a mere signal, but an actual constraint to the bank strategy. The tighter is the constraint, the more pronounced the bank response is expected.

Third, our paper may be treated as a data paper due to the unprecedented full coverage of the macroprudential measures introduced in Russia since 2016 (see Annex 6.2). We consider our paper to be of value for those who study Russian banks as we additionally provide complete list of bank mergers that took place from 2016 to follow approach of (Lindner et al. 2019) (see Annex 6.3).

To arrive at our findings we discuss the existing macroprudential policy research in Section 2. We underline that there is no pure consensus on whether such measures achieve the target set by the regulators or not. Then we discuss the available data in Section 3. We focus the reader attention on the real-world environment that is often neglected in such analysis. The five particular measures of our interest are a subset of a larger set of about 60 measures implemented during the same period. Hence, we cannot judge that the bank change in consumer lending is the purely direct outcome of the five only consumer-lending-oriented measures introduction. For instance, the obtained overall long-term neutral impact might be the resultant of the two forces, for instance, in 2018. First one is the the consumer lending macroprudential tightening. Second one is the fact that the smaller Russian banks (with the basic license) have enjoyed capital relief due to abolishing of the capital conservation buffer. We reintroduce the methodology in Section 4. In the absence of the truly control (unexposed) group, we benchmark the change in lending growth to the multi-period macroprudential measure proxies

controlled for the typical bank features. We deliver our results in Section 5 by additionally presenting the cumulative measure impact for the dynamic panel regressions. Section 6 concludes by comparing our findings to that of the previous researchers.

2. Literature Review

Since the world financial crisis of 2007-09 various macroprudential instruments have been implemented by mostly every country in the world. Please, see instruments' classification in relevant reviews of (Kahou and Lehar 2017) and (Lubis et al. 2019). They analyzed about 250 and 125 papers dealing with macroprudential policies, respectively. As the time passed, researchers and regulators started wishing to evaluate whether such policies were efficient or not. When asking about the macroprudential policy tool efficiency, most are interested whether such a tool helped to curb lending. There are two distinct streams of evidence provided.

First group of researchers claim that macroprudential tools are efficient in restricting lending, or in limiting credit booms. They ground their evidence on the multi-dozen country studies, see (Bruno et al. 2017, E. Cerutti and Claessens 2017, Dautović 2019, Morgan et al. 2019, BIS 2020, Gambacorta and Murcia 2020, Meuleman and Vennet 2020, Revelo et al. 2020), as well as on researching single country cases. For instance, (Danilova and Morozov 2017) investigate Russia; (Duprey and Ueberfeldt 2020) consider Canada; (Gómez et al. 2020) focused on Columbia; (Yarba and Güner 2020) looked at Turkey. However, some of papers have disclaimers on the limited efficiency of macroprudential tools. For instance, (E. Cerutti and Claessens 2017) find that the efficiency of macroprudential policies is less pronounced during economic boom periods. (Meuleman and Vennet 2020) claim that those are more efficient for problem banks.

Second group is less populated. It argues that macroprudential policies are not at all efficient. First, they may produce short-term restricting impact, but in the long-run they even accelerate lending. Second, limiting lending for a particular (highly-risky) segment or for particular agents (banks taking high risks or banks with concentrated risks) merely leads to loans flow to unregulated segments and agents. Thus the lending throughout the entire banking system does not diminish. The evidence here comes also from two research streams. First one investigated pools of dozens of countries, see (E. Cerutti, Correa, et al. 2017) and (Budnik and Jasova 2018). Second one considers country-specific cases. For example, (McCann and O'Toole 2019) look at Ireland; (Basten 2020) focuses on the neighboring United Kingdom; Kim and Oh 2020 consider South Korea. In an earlier paper (Kim and Mehrotra 2017) find that there is a counter-balancing effect from the effective macroprudential measures. They argue that the price of curbing credit growth comes together with the shrinkage in GDP growth or rise in inflation. They base their findings on 2000-2012 data for four Asian economies. As for the developed economies, (McCann and O'Toole 2019) and (Basten 2020) discuss bank switching or substitution effects, i.e. when macroprudential tools target particular lending segment, banks switch to other ones, but do not cap their overall risk-appetite. Difference in findings is that (Basten 2020) argues that there is a switching from mortgage-lending to other lending in the UK; (McCann and O'Toole 2019) argue that restrictive macroprudential policy in Ireland stimulates higher risk-taking abroad (namely, in the United Kingdom). Similar to (McCann and O'Toole 2019), (Norring 2019) comes to the same evidence only for the developing economies.

However, none of this papers remark that the observed credit growth after measure implementation might be a policy success. For instance, BIS 2020 only claims such a finding as a counter-intuitive one in the case of Thailand. However, we need to interpret the findings with the research limitations that the economists face. Ideally, we wished to have two quite populated groups of banks: one being a treatment and another - a control one. So that banks are randomly allocated to groups, and we could apply macroprudential tools to a treatment one. However, such an imaginary experiment is not feasible. The fact is that we do not observe the lending with no macroprudential tools in place in parallel to them being in place. That is why we actually argue that observing credit growth after the restriction by construction (i.e. the higher risk-weight and higher capital allocation to such loans) implies that without the restriction the growth would have been much larger. This is quite natural

when we consider cases with the positive coefficient near the tightening macroprudential indicators for Argentine and Colombia in (Gambacorta and Murcia 2020) and for Thailand in (BIS 2020). All these countries, as well as Russia that we discuss below, have rapidly expanding credit markets. Observing credit growth even after the tightening announcement or application means that otherwise it would have boomed even more. This is an important consideration that we should remember and that we did not come across before. We consider this as an important contribution to the literature on the effectiveness of the macroprudential tools research.

There are several papers that use a different viewpoint on the macroprudential policies. We classify them into two groups. The first group develops theoretical models incorporating such policies. The second one looks at supplementary issues, though they were out of scope in the other papers. Let us briefly describe papers from these two groups.

By now we found four papers building theoretical models with macroprudential tools inside them. Overall, all of them conclude that such tools are efficient in curbing lending. Most of them investigate capital adequacy related tools, except (Agenor 2019) who looks at the reserve requirement. Some of them generally support the regulation tightening (Kara and Ozsoy 2016, Agenor 2019, Martinez-Miera and Repullo 2019, Carney 2020). Two other papers provide interesting disclaimers when macroprudential tools may be inefficient. For instance, (Gertler et al. 2020) say that such tool works well when the panic or a bank run is expected. However, when such expectation is not viable (otherwise, the crisis cause is not of irrational, but of fundamental origin), the tool does not much improve the welfare. (Rubio and Unsal 2020) use a DSGE model to show that macroprudential tools may be efficient. They underline that time-varying active ones may be more efficient if and only if there is full information available. However, under uncertainty – that is the case in real life – passive and less volatile tools should be preferred. Despite the preference, they still harm the welfare. Thus its use should be considered with care.

Another group of papers does not investigate the efficiency of macroprudential policy tools. Their authors discuss adjacent issues. For instance, (Aikman et al. 2019) look whether two regulators could have better passed the world financial crisis of 2007-09 if macroprudential tools were actively used. They conclude that the British regulator is more prepared to the crisis than its US counterpart. However, they point out that the British one may take too long time to identify problems. (Tente et al. 2019) develops a credit stress-testing framework by considering macroprudential policy tools. (Gaganis et al. 2020) investigate the corporate governance in banks in the presence of macroprudential policy tools. Would like to draw special attention to the paper by (Yarba and Güner 2020). All the papers mentioned above deal with bank response to the macroprudential tools imposed on banks. This seems natural research hypothesis. However, (Yarba and Güner 2020) make the step forward. As macroprudential policy intends to limit lending, it means that companies have to become less leveraged, i.e. they should demonstrate decrease in debt used when macroprudential policy is activated. Interestingly they find that their hypothesis holds only for small enterprises.

There are four more features to mention that researchers dealing with macroprudential policies look at. First, macroprudential policies' efficiency may be regarded not only as a tool to curb lending, but also to manage inter-country capital flows, see (Bruno et al. 2017, Eugenio Cerutti and Zhou 2018, Lubis et al. 2019, Takáts and Temesvary 2019, Akdogan 2020). The common finding here is that the target is attained. However, capital flows may be looked at from opposite angles. For instance, (Lubis et al. 2019) state that the capital flow environment predefines the macroprudential tools' efficiency. On the opposite, (Akdogan 2020) claims that it is macroprudential policy that drives the changes in the capital flows. Particularly, he argues that restrictive macroprudential policy limits capital outflows from a country, whereas easing macroprudential policy stimulates capital inflow to a country, but to a lesser extent.

Second, macroprudential policy is often considered in alliance to monetary policy. It can be investigated directly. Then (Bruno et al. 2017, Budnik and Jasova 2018, Lubis et al. 2019, Gambacorta and Murcia 2020; and Revelo et al. 2020) argue that tightening monetary policy helps to increase the efficiency of macroprudential policy. (Takáts and Temesvary 2019) claim that tighter macroprudential policy may mitigate the monetary policy in the currency issuer country. (Jimenez et al. 2014) find that

low-capitalized banks tend to offer more loans under mild monetary policy. That is why they support adding more responsibilities to Central Banks to undertake macroprudential tightening. However, (Stavrakeva 2019) opposes and says that in the presence of systemic risks and the large fiscal capacities there should be no such a tightening. Inversely, (Martinez-Miera and Repullo 2019) derive that both tighter monetary and tighter macroprudential policy help to raise overall financial stability, though the macroprudential one should be preferred. Their predecessor (Kara and Ozsoy 2016) also claimed that macroprudential liquidity regulation was essential to incentivize optimal investments in risky assets. Using theoretical model, they arrive at under-investment in the presence of increasing macroprudential capital requirements and with the absence of the liquidity ones. Thus we get that they strongly support Basel III initiatives on liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) introduction. Additionally, researchers at least add monetary policy indicator as the control factor in their regression models, see (BIS 2020).

Third, banks adjust their lending policies not instantaneously, but they make strategical moves much in advance. That is why (Budnik and Jasova 2018) argue that it is important to trace not the macroprudential policy implementation date, but the announcement date. However, researchers do not consider it. The cause is the absence of such information in the common IMF database on macroprudential measures.

The last, but not least point is the macroprudential policy treatment. Most researchers use a discrete variable indicating easing or tightening, or proceed with an aggregate of such dummy indicators, i.e. with a macroprudential index, see (Bruno et al. 2017, E. Cerutti and Claessens 2017, Gambacorta and Murcia 2020, Kim and Oh 2020). However, various measures may have different intensity or different sensitivity (Budnik and Jasova 2018). For instance, there might be different capital adequacy ratio add-ons (mark-ups) for a countercyclical buffer in different economic environments. Alternatively there might be different risk-weight add-ons for different riskiness of assets. Similar to the previous point, researchers lack researching the macroprudential policy tool sensitivity because of data absence in the unified dataset.

We wished to provide above a comprehensive review of papers investigating macroprudential policy tools. Now we wish to highlight the papers that would be more important for our purpose. Primarily, those are the papers incorporating the BIS methodology, e.g. (BIS 2020) and (Gambacorta and Murcia 2020). Papers by (Budnik and Jasova 2018; Dautović 2019) are also close to us as they suggest considering measure announcement date and looking at alternative performance metrics. The papers by (E. Cerutti and Claessens 2017; Norring 2019) are our peers as they proceed with granular macroprudential measures data collection.

We wish to bring the following novelty to the existing literature on macroprudential policy effectiveness measurement. First, we collect granular data on the macroprudential instruments utilized in Russia during 2015-2020. Such data includes the measures step-wise timing from the announcement to the implementation dates. It has the measures' sensitivity record, i.e. comparable indicators per each measure in terms of risk-weight percentage points changes. Such data can enrich the existing IMF dataset discussed in (E. Cerutti and Claessens 2017; Norring 2019) etc. Second, we are the first to thoroughly reproduce the BIS methodology with respect to Russia. This adds additional knowledge to the findings in (BIS 2020; Gambacorta and Murcia 2020). Third, we accompany the baseline findings with extensions that were discussed, but not implemented. For instance, we transit from a simplified macroprudential index that merely signals the measure activation - as is commonly done in (Bruno et al. 2017; Kim and Mehrotra 2017; E. Cerutti and Claessens 2017; Gambacorta and Murcia 2020; Kim and Oh 2020) - to a comprehensive macroprudential sensitivity measure. Another tested macroprudential tool feature is the announcement date. (Budnik and Jasova 2018) mentioned the need to consider the macroprudential measure impact since its announcement. However, we failed to find papers that investigated it. The most probable reason is that the commonly used IMF dataset lacks such information. We expect that the four points mentioned above bring extra light on the macroprudential measures use experience in the countries like Russia.

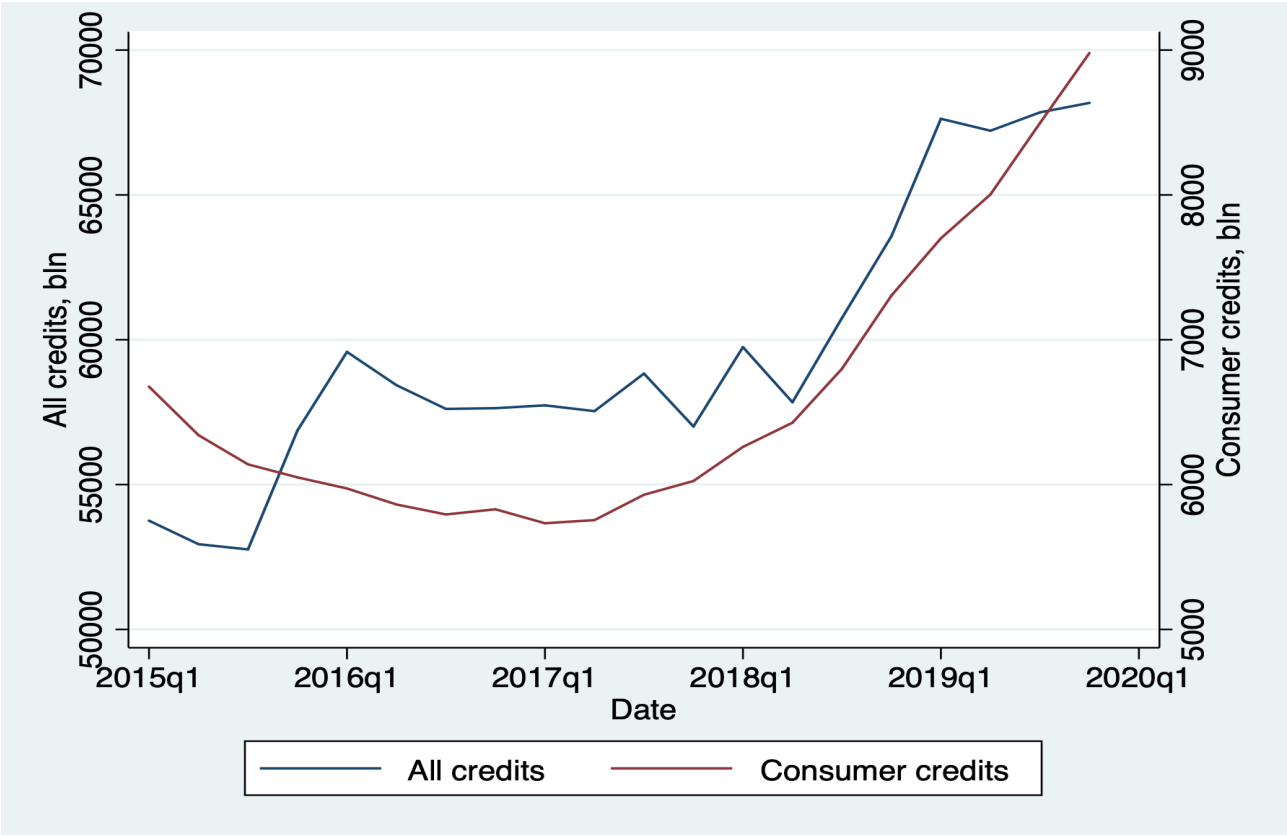

Figure 1: Dynamics of the total lending volumes since 2015 in Russia

3. Data description

To estimate the effectiveness of macroprudential measures we use bank-level data. Thus we have a panel dataset covering 2015-2019 years. The most of our variables are available on a monthly basis. Nevertheless to use more variables of interest and to stay in line with the (BIS 2020) methodology we provide our analysis using quarterly data.

Since the main goal of this research is the estimation of the effectiveness of macroprudential tools in restricting the uncollateralized consumer credit growth we use data on the size of the relevant loans from the bank reports. However to provide the robustness check we use information about the size of credit provided by a given bank during the quarter. These variables could show different results since some credits can be repaid during a quarter and we will not see them in the size of consumer credit available at the end of the quarter. In addition, we look at two other bank performance metrics: average loan portfolio risk-weight and the capital cushion. The latter indicator is the number of percentage points of actual capital ratio in excess of the prudential minimum level.

Let us take a look at the overall patterns embedded in our dataset. Since 2015 the Russian lending segment started galloping both overall and in the uncollaterilized consumer loans domain in particular (see Figure 1). However, this credit boom is accompanied with the decline in the overall loan riskiness and rise in the bank's capital cushions (see Figure 2).

Following the (BIS 2020) methodology, we use several control variables. To consider the macroeconomic factors we take such variables, as:

- real GDP growth,
- key rate,
- exchange rate,
- oil price (due to specificity of Russian economy).

Addressing the problem that different banks can react in various ways to macroprudential measures changes we incorporate bank-specific controls:

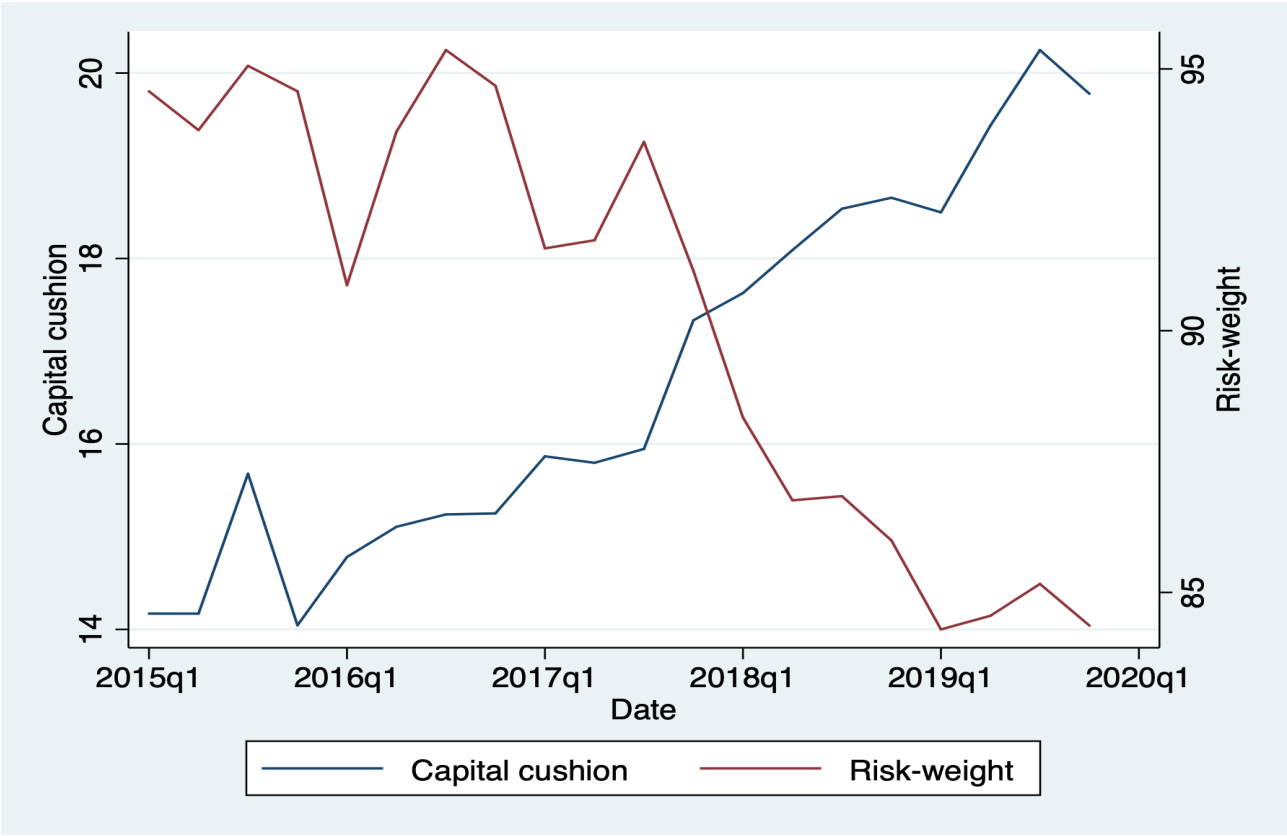

Figure 2: Dynamic of the capital cushion and the average risk-weight since 2015

- SIZE - total assets
- LIQ - liquidity ratio
- CAP - capital ratio
- DEP - deposits over total assets
- CtA - consumer credit over total assets

In Appendix 6.1 you may find the table with the description of all the used variables and sources.

As most of variables used are in nominal terms we transform them into real term using CPI. Policy rate may change not only in the end of the time period. So we decided to calculate a time-weighted rate using the following principle. For example, if the rate was 7% during one month out of three and the rest of the period it was 4% then we will have $7\% \times \frac{1}{3} + 4\% \times \frac{2}{3} = 5\%$. Otherwise we will take into account only final policy rate of 4% and monetary policy change might look more stimulative than it actually was. Then we also transform the interest rate into real terms using inflation rate based on the CPI.

During the considered period of time there were plenty cases of banking merges, liquidations, bankruptcies, etc. We did not drop observations on the closed banks since they can give us information about banking sector response to macroprudential policy measures. To account for the bank mergers during 2015-2019 years we use methodology that was offered in the literature (for example, see (Lindner et al. 2019)). Banks indicators were aggregated during time before merger thus giving us a single bank.

We merged banks from the starting date for those banks that have merged any point in time since 2015. As there were several consecutive mergers, we merged the bank with the 'before' license number with the 'ultimate' license number bank. For the entire list of banks considered in 2015-2019, please, refer to Table 5.

We have chosen the homogeneous dataset starting January 2016 with bank control variables dating one year back. We claim the set to be homogeneous as in March 2016 the BCBS finished examining Russia for the compliance of capital and risk regulation standards implementation (see BCBS 2016).

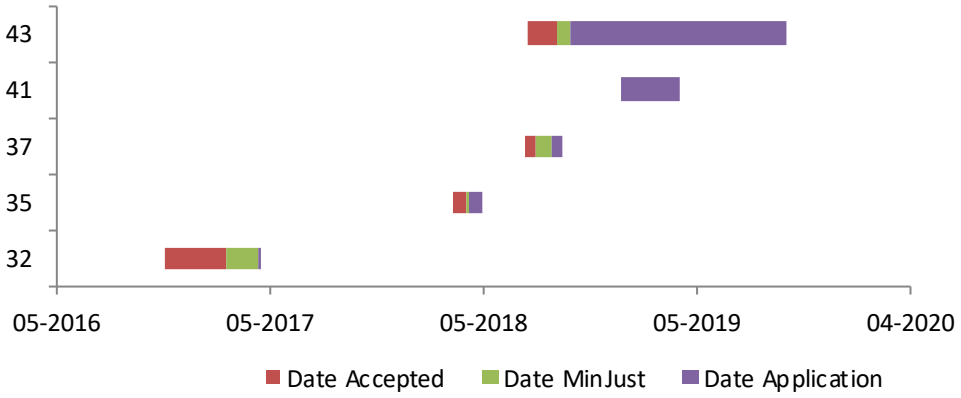

Figure 3: Implementation Schedule for the Macroprudential Measures Restricting Uncollateralized Consumer Loans in Russia.

An explicit result of the inspection is the overall CAR minimum drop from 10% to 8% of RWA to reflect risk-weight increases in other domains. That is why looking deeper into the history of the Russian banking system may increase the set inhomogeneity.

We investigate the impact of a special set of macroprudential measures, i.e. the ones aiming at limiting growth in the uncollateralized consumer lending. The measures implementation schedule is presented at Figure 3. However, we need to attest that the pure impact of these measures may be mixed with the outcome for another 55 measures introduced in Russia. For details, please, consult Figure 4 and Table 6.2 (where the line starts from the draft announcement date; the legislation acceptance date follows; then the legislation is approved by the Ministry of Justice (MinJust) and it may take some more time for the measure to come to force, or to be applied). For illustration, consider the introduction of the second and third macroprudential mark-ups, see rows 35 and 37 in Table 6.2. They were applicable since mid and end of 2018. However, the very same time mostly half of the Russian banks by number experienced a significant stimulus. Those were the banks with the so called basic license (i.e. the one prescribing focusing mainly on the interior banking operations, to avoid cross-border ones and limit foreign currency-denominated activities). In the mid 2017 a set of measures were announced to withdraw capital conservation buffer requirement for banks with the basic license. Those measures also were applicable since end of 2018, see rows 27-31 in Table 6.2. This means that 2018 was the year after the two announcements for banks with basic license: to raise risk-weight mark-up for consumer loans and to decrease the capital ratio minimum overall. Both actions (measures, instruments) took place simultaneously starting from 2019. This means that each particular bank with the basic license could have materially revised its lending policy and strategy during 2018 to enter the new year of 2019. Thus the effect of interest could be mixed.

Furthermore we try to overcome outliers problem. We flagged observations as outliers in the following cases:

- Consumer loan changes more than five times in any direction.
- Capital adequacy ratio is oddly large (above 500) or negative (during bank bailout).
- Consumer loan exceeds total assets.

In case the deposits or liquid assets exceed the total assets, we replace them with the value of assets and do not treat them as outliers (although it is possible to compare results with and without such observations). Finally, as for the macroprudential policy, following the (BIS 2020) methodology we create a variable that equals 1 in case the policy was tightened in this quarter, -1 if it was loosened and 0 if it remained unchanged, see Figure 5.

A possible disadvantage of such an approach is that information about new policy measure reach banks earlier than it becomes applicable. Thus banks can change their behavior not in the moment of policy application, but in the moment the draft legislation appears. Another drawback of the presented approach is that the strength of policy measures is considered as irrelevant, but it may not

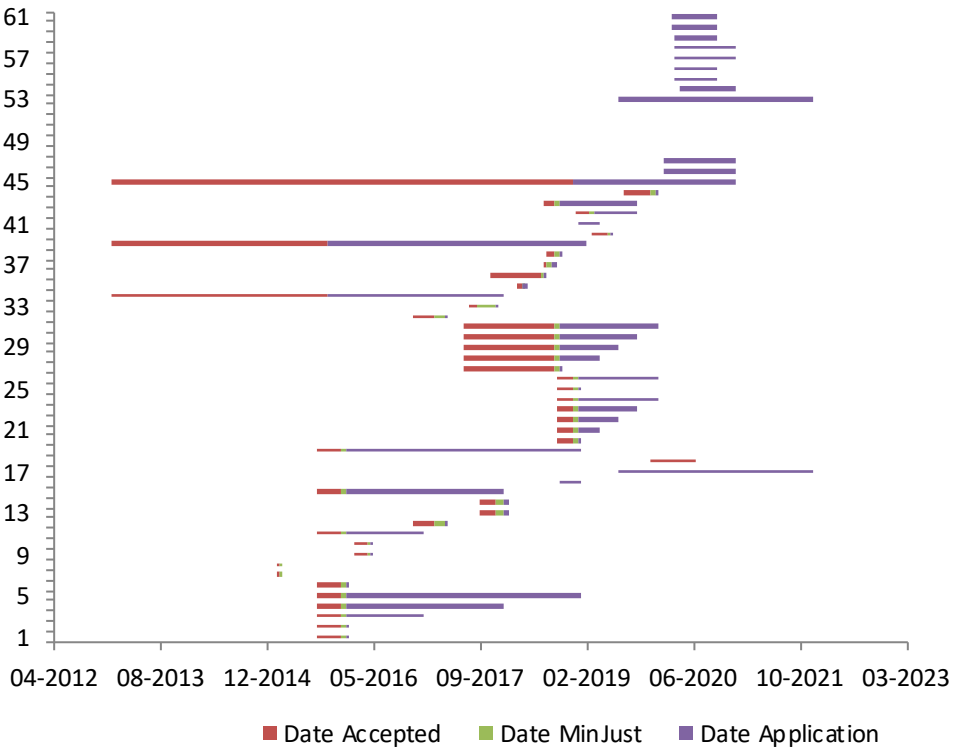

Figure 4: Intersection of All Macroprudential Measures Implementation in Russia.

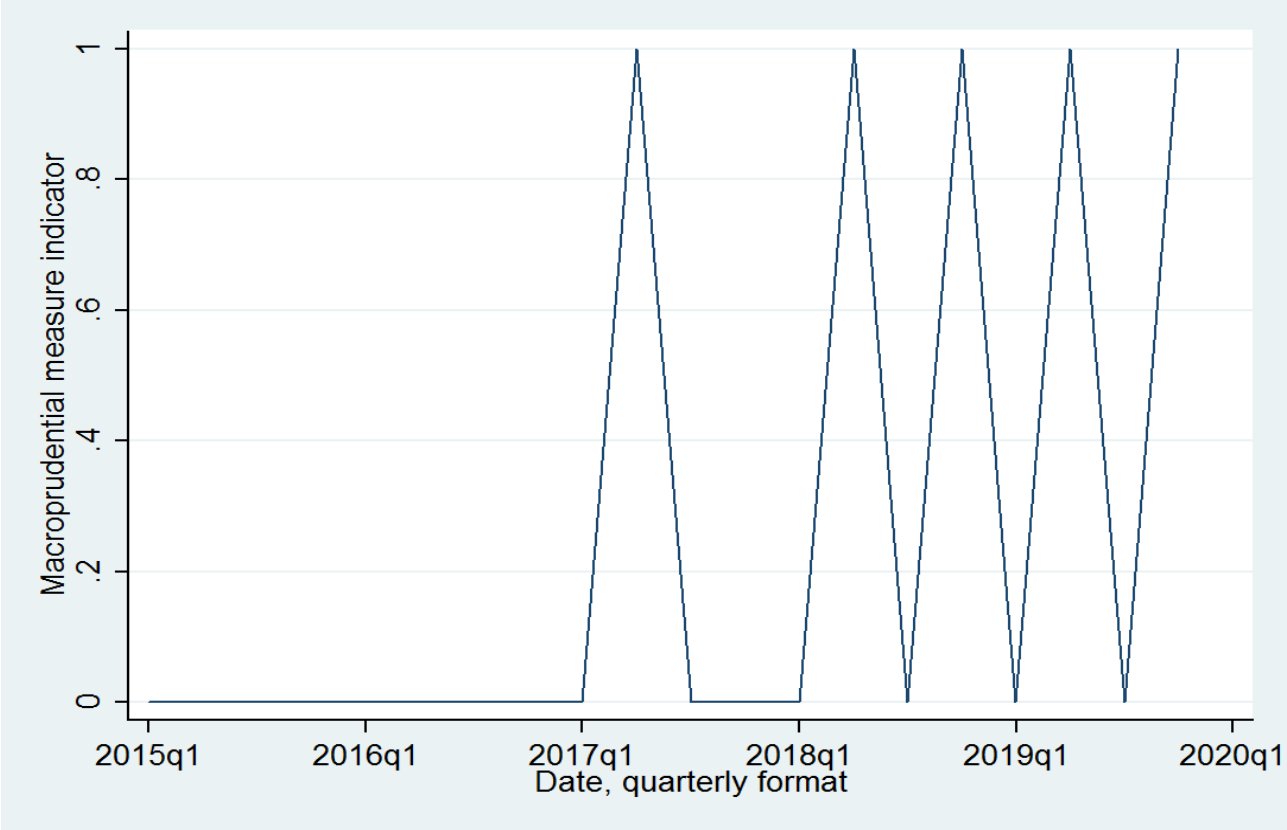

Figure 5: The Macroprudential Measure Explanatory Variable as a Flag, one stands for measure application

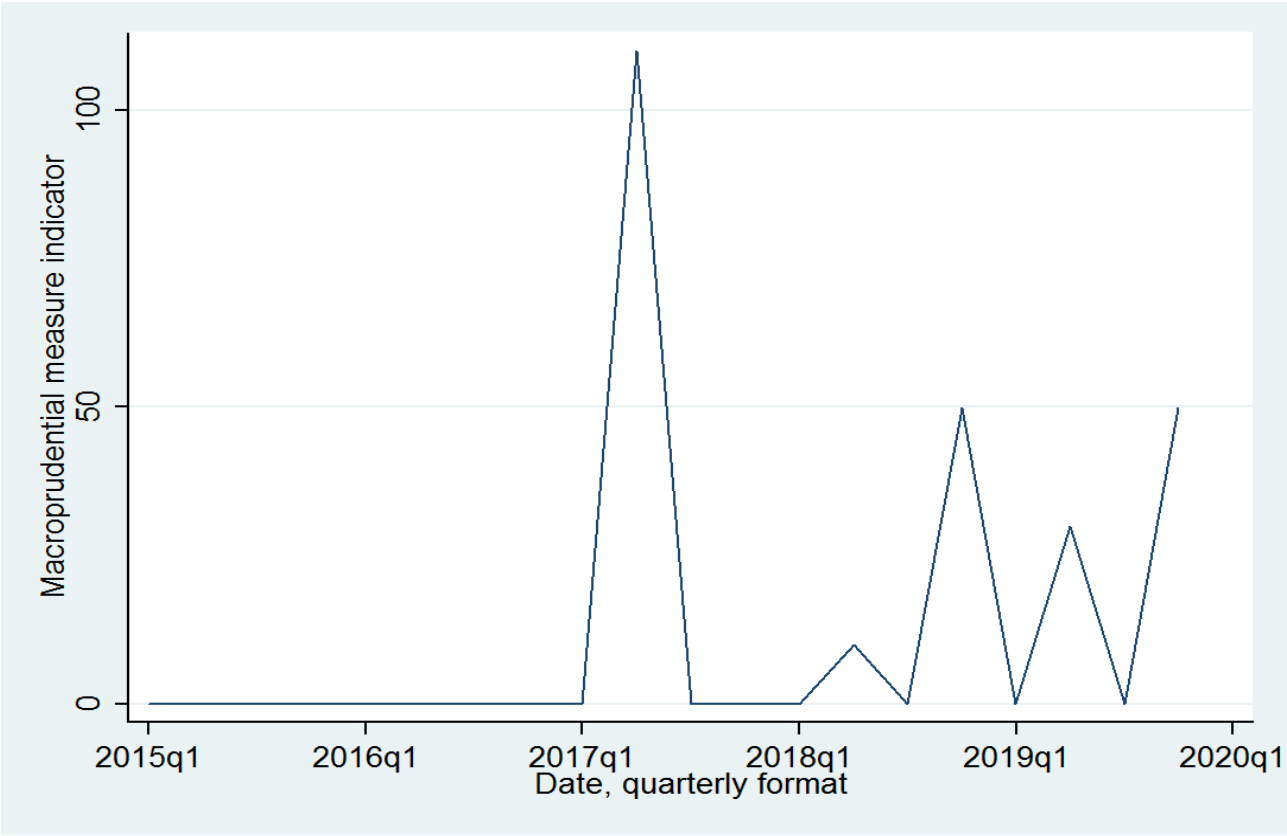

Figure 6: The Macroprudential Measure Explanatory Variable as a Sensitivity Indicator, difference in risk-weight percentage points

be true. For instance, the first median macroprudential risk-weight (RW) mark-up for the consumer loans was 120 percentage points (pp.), see row 32 in Table 6.2. For comparison the second mark-up added only another 10 pp., see row 35 in Table 6.2.

So we try to consider this aspect and try to quantify the strength (sensitivity) of the macroprudential policy. To do this we suppose that the size of measure is equal to the change in risk-weights for capital requirements, see Figure 6. We found necessary information in the Bank of Russia regulatory documents.

After all the transformations listed above we get to a panel dataset with 650 banks on average observed from 2015 to 2019 year on a quarterly basis. All the descriptive statistics are available in the Table 1.

4. Methodology

Now we will discuss the econometric approach that we use to estimate the effect of macroprudential policy. The baseline model used in the (BIS 2020) research is the following:

$$\Delta Y_{b.t} = \alpha_b + \sum_{j=1}^{k} \gamma_j \Delta Y_{b,t-j} + \sum_{j=0}^{k} \beta_j MaP_{t-j} + \vartheta X_{b,t-1} + \\ + \sum_{j=0}^{k} \delta_j MaP_{t-j} \cdot X_{b,t-1} + \theta macrovars_t + \epsilon_{b,t} \quad (1)$$

where $\Delta Y_{b.t}$ is change in logarithm of consumer credits (as for the other dependent variables we use only the difference, without the logarithm); MaP_t is the variable of macroprudential policy, that

Table 1: Descriptive Statistics for the Principal Variables

VARIABLES	N	mean	sd	min	max
Stock of consumer loans growth	9,531	-4.149	22.63	-158.6	158.2
New consumer loans growth	8,132	-6.509	135.9	-923.0	889.0
Capital buffer	11,759	16.40	26.38	-22.19	844.1
SIZE	11,623	10.97	2.099	3.485	19.25
CAP	11,276	32.60	34.67	0	854.1
RW	11,276	91.01	41.63	0.265	697.4
LIQ	11,623	39.06	23.57	0	100
DEP	11,623	55.81	23.32	0	100
CtA	11,623	7.713	11.83	0	93.92

we discussed in detail in section 3; $X_{b,t-1}$ are bank controls; $macrovars_t$ are macroeconomic control variables; k is maximum number of lags used in the regression.

Since we use the lag of dependent variable as an independent variable in the regression, the endogeneity problem appears. This requires us to estimate dynamic panel regression (DPD). To do this, we use methods developed in (Arellano and Bond 1991; Blundell and Bond 1998) etc. Most of technical issues concerning instrument choice, number of lags used, etc., were covered in (Roodman 2009b; Roodman 2009a; and Kripfganz 2020).

The choice of the number of lags of the dependent variable was made on the basis of Arellano-Bond autocorrelation test. In case the test statistics does not allow us to reject H_0 about the absence of the second-order autocorrelation, there is no need to use lags of orders higher than one. For the macroprudential policy variable some papers offer starting not from zero lag, but with the next period. This may be justified in case the measure became applicable in the end of the period and it can not take an effect on loans that were given in the same time period. We consider lags up to three quarters to estimate the effect over the entire year.

To check the robustness of our results we compare results from a DPD model with a simple fixed effect (FE) model. However, we can not estimate the regression in a way it was presented above in equation 1 due to endogeneity problem. Moreover there is no sense to estimate FE regression in this case since bank-specific effect is already included in the lag of dependent variable. Thus we will estimate the following equation:

$$\Delta Y_{b.t} = \alpha_b + \sum_{j=0}^{k} \beta_j MaP_{t-j} + \vartheta X_{b,t-1} + \sum_{j=0}^{k} \delta_j MaP_{t-j} \cdot X_{b,t-1} + \theta macrovars_t + \epsilon_{b,t} \quad (2)$$

This equation is almost the same to Equation 1, but the lag of dependent variable is excluded.

When estimating GMM, we often obtain statistically significant coefficient for the lagged value of the dependent variable. In such a situation the cumulative effect of a macroprudential measure for a year may be different compared to a mere sum of the four-quarter lagged values (Table 4). This is applicable for situations when we control for the first lagged value of the dependent variables, not for the fourth. Then we used the following formula to compute the cumulative effect of macroprudential measures on the loan growth. Notations are the ones introduced for the Equation 1.

$$\Delta Y_t|_{MaP_{t-j}=1;j=\overline{0;3}} = \sum_{j=0}^{3} \left[\beta_j \cdot \left(\sum_{m=0}^{3-j} \gamma_{j+1}^{m} \right) \right] + \beta_0 \cdot (2\gamma_1\gamma_2 + \gamma_2 + \gamma_3) + \beta_1\gamma_2 \quad (3)$$

5. Results

Tables with all the estimation output can be found in Appendix 6.4. We may classify all the effects into two broad categories. The welcome and intuitive findings and the probably counter-intuitive ones. Table 15 ($FE(1)$) presents the results for the new loans given per quarter. This dependent variable is a flow one, whereas the conventional (BIS 2020) approach is to look at the change of total loans. In fact the change in total loans equals the change in new loans given less the redeemed amount. As for the consumer loans, the amount of uncollaterilized consumer loans given is around one fifth of the respective total loan book. We may argue that each measure implementation results in a -15 pp decrease of the loans given during the first quarter after the measure announcement date. For instance, after the most sensitive first mark-ups' announcement the average total amount of new loans given shrank from RUB 1 bn 60 m to RUB 888 m one quarter later. We would have expected the opposite result. Banks could have increased new loans approval prior to the measures application so that lesser part of the portfolio will be subject to new prudential mark-ups. However, it seems that banks tend to take a break, to revise their loan calculators and accumulate capital to enter the new phase under the mark-up application, disregarding how heavy those are.

Another positive finding is the consecutive decrease - mostly by construction - of the average risk-weight of the loan book. As we see from Table 16 ($FE(1)$), every measure is associated with on average 2 pp. risk-weight decline within the first quarter of the announcement date.

Decrease in the new loans given and the risk-weight has its reflection in the risk of the capital buffer (cushion). Table 17 ($FE(1)$) shows that the cushion rises around 1 pp. starting from the third quarter of the measure announcement date. However, we do not find long-lasting effects for the risk-weight and capital cushion dynamics. We should remember that the capital cushion and average portfolio risk-weights are affected not by merely five measures of interest, but by the entire list of 60 instruments. That is why the affect cannot be fully traced with respect to tightening consumer lending measures. To overcome this limitation, we suggest to look deeper into the sector specific indicators.

In most cases we can see that the cumulative effect of macroprudential policy for the consumer loan portfolio growth is not significant. However we can notice that coefficients of MaP_t and MaP_{t-1} is negative in most cases (although they are insignificant), while deeper lags of macroprudential policy variables are positive. This can be explained by the following idea. Banks become more restricted in the moment of new policy measures implementation. It leads to the slowing in consumer credit growth. But after half a year banks restore capital buffer and start offering more loans (see Table 5).

Table 2 comports the comparison of summed up and cumulative impacts of the macroprudential measures on the uncollateralized consumer lending growth. The summed up effect is the mere sum of the four coefficients for the MaP. The cumulative one corresponds to the Formula 3. In most cases the findings are similar. The only differences are material for the Table 11 output. There are changes to both the sign and scale of the impact. Table 12 differs from Table 11 in that we add interaction terms there. As for Table 12, we do not observe similar material differences for the cumulative and summed up impact. That is why we suggest more relying on Table 12, rather than on Table 11 findings.

One more important notice should be provided here. We use the first lag of X_b to control for some bank-specific factors. However, all these variables may be affected by macroprudential measures applied in previous periods. So in case we estimate the effect of the policy that was implemented in time t on the credit growth in time $t+2$, bank controls will refer to time $t+1$. This means that these variables might be affected by the same macroprudential measure as the dependent variable. Thus the coefficients may be biased and we can not think of the $\sum_{j=0}^{k} \beta_j$ as a cumulative effect of macroprudential measure on credit growth since part of the effect will be incorporated into other coefficients in the regression. There may be different ways to overcome this problem. We choose to estimate our basic regressions using the fourth lag of X_b. The results can be found in Table 8. We can see that in most cases results are quite robust. But we prefer to provide all the following robustness checks with the baseline model due to some reasons. First of all, in case we use deeper lags, we lose at least a quarter of the observations. Moreover, in case we keep bank controls as endogenous instruments, we have to use even deeper lags as instruments so they become less informative and this

Table 2: Cumulative effect of macroprudential measures

Table	Model	Effect	
		Cumulative	Summary
Baseline regression			
Table 7	without interactions	-1,889	-1,688
Table 7	with interactions	5,429	5,258
Regressions by clusters on credit to assets			
Table 9	Cluster 1	-2,771	-2,814
Table 9	Cluster 2	6,272	5,665
Table 9	Cluster 3	7,057	5,747
Regressions by clusters on capital buffer			
Table 10	Cluster 1	-2,684	-2,344
Table 10	Cluster 2	0,339	0,247
Table 10	Cluster 3	-11,058	-10,81
Regressions with different macroprudential measures without interactions			
Table 11	Fact, Applied	-1,889	-1,688
Table 11	Sensitivity, Applied	0,0992	0,885
Table 11	Fact, Draft	-4,460	0,693
Table 11	Sensitivity, Draft	-0,037	0,741
Regressions with different macroprudential measures with interactions			
Table 12	Fact, Applied	5,429	5,258
Table 12	Sensitivity, Applied	0,174	0,156
Table 12	Fact, Draft	-2,407	-2,557
Table 12	Sensitivity, Draft	0,023	0,022
Regressions with market share			
Table 13	without interaction	-2,798	-1,845
Table 13	with interaction	24,244	26,77
Regressions for change in share of new consumer loans			
Table 14	without interactions	-1,25	-0,70
Regressions for growth rate of new consumer loans			
Table 15	without interactions	-40,02	-58,37
Regressions for change in average risk-weights			
Table 16	without interaction	4,81	6,80
Regressions for change if capital cushion			
Table 17	without interaction	-1,21	-1,10

may cause problem with instrument validity. All these factors can explain the insignificant AR(1) test in DPD model estimation.

Despite the fact that we did not get significant results for the interaction terms we decided to check some further hypothesis. First of all, we suppose that banks with higher share of consumer loans will be more exposed to the macroprudential policy tightening. So we cluster all the banks into three parts on the basis of consumer credit share to total assets using k-means approach. We can see that the overall cumulative result is significant only in the second group and it has positive sign. It is worth noticing that we do not see the negative effect for the small lags of policy variable. For the third cluster with the highest share of consumer credit only the second lag of policy variable is significant. Despite this fact the cumulative effect is insignificant (see Table 7).

Another hypothesis is that more restricted banks in terms of capital buffer will be more exposed to the policy tightening. To check this we divide banks into three clusters on the basis of the excess capital amount. The results are presented in Table 10. The only significant coefficient of policy measures is for MaP_t in the third cluster. It means that banks with a high capital buffer prefer to slow down credit activity after implementation of more restrictive measures. It may be explained by the bank lending policy with highly concentrated portfolio.

Third hypothesis was that banks with higher market share will suffer more from macroprudential tightening. So banks with lower market share can try to gain a part of the market. Since market share is very close by definition to the consumer loan share (CtA) we tried to use the first variable as a regressor. The results are presented in Table 13. We can see that market share coefficient is negative in regressions with interactions. Moreover, in case of DPD regression cumulative coefficient of interaction term is positive and have p-value close to 10%. It means that generally banks with higher market share have lower credit growth, but when macroprudential policy is implemented, banks with higher market share have higher credit growth rate, i.e. they are unwilling to abandon the market due to high IT investments in the automated consumer lending scoring technologies.

Finally, we use different ways to define macroprudential policy variables. We discussed the methodology in details above. Estimation results are presented in Table 11 and Table 12. Results of regression for MaP in the moment of application has the same sign both in case of fact and sensitivity of the measure. If we use the draft legislation publication date (draft) instead of the measure implementation date (apply), we can see the negative coefficient of the first lag. It means that banks change their lending policy after the draft publication date. Although this result is not found in regressions with interactions.

6. Conclusion

Macroprudential regulatory tools became particularly wide-spread after the world financial crisis of 2007-09. Emerging market economies got rich experience in implementing various combinations of such tools. Russia is not an exception. Herein we put an objective to evaluate their efficiency with particular focus on uncollaterilized consumer lending segment.

We managed to contribute to the existing literature in the four distinct ways. First, we collected the unique dataset on the macroprudential measures implemented in Russia. It consists of over 60 measures introduced from 2015 to 2020. Each measure has a type description (general/specific; easing or tightening one; whether it is related to uncollaterilized consumer lending or not). We added information on to which banks it was applicable; what it sensitivity in terms of the risk-weight mark-up equivalent is. We carefully verified the timing of each measure starting from its announcement (draft document publication); its formal (legal) acceptance; its registration with the Ministry of Justice and the ultimate application date. Such a dataset is a unique extension to the existing IMF dataset used in (E. Cerutti and Claessens 2017; Norring 2019) etc.

Second, we departed from the BIS methodology coined in (BIS 2020; Gambacorta and Murcia 2020). By extending the methodology to the announcement dates - as recommended by (Budnik and Jasova 2018) - and measure sensitivity we were able to learn more about the macroprudential measures effectiveness. We followed the idea of (Dautović 2019) for the risk-weighted assets (RWA) investigation

and we find that such measures led to decrease in the overall credit riskiness of the Russian banks' loan portfolios. Such a decrease in riskiness enabled banks to accumulate capital cushions. Though such a capital accumulation is a world-wide trend, as noted by (Borio 2020), we consider it to be particularly important on the eve of the COVID-19 pandemics'-related challenges. We also find that the tightening consumer-lending-oriented measures were successful in the short-term curbing of the new loan volumes provided and in decreasing the average consumer loan portfolio growth rate. Mostly often we observed that such contractions took place after the announcement dates, and not after the application (implementation) ones. When we look at the longer term horizon, we observe the increase in credit growth rate after the measure implementation. Such effects are called counter-intuitive for the Thailand, see (BIS 2020). As we also find such a rise with the Argentine and Colombia in (Gambacorta and Murcia 2020), we do not consider our finding a counter-intuitive for the following reason. From one side, we do not observe the credit growth rate if the macroprudential measures have not been implemented. From another side, all the mentioned countries - like Argentine, Colombia, Russia, Thailand - share the commonality. All of them have a sky-rocketing consumer credit market. This means that when we observe credit growth after the tightening measure in place, it means that without it the growth rate could have been much larger.

Due to the uniquely collected dataset we are able to step further from the measure signalling effect to its sensitivity one. Thus, we find that any risk-weight mark-up of 10 pp are associated with 1 pp p.a. increase in consumer lending. Such findings coincide with several works, e.g. (E. Cerutti, Correa, et al. 2017; Budnik and Jasova 2018; McCann and O'Toole 2019; Basten 2020; Kim and Oh 2020). Additionally, we also observe the redistribution effects like that in (McCann and O'Toole 2019) and (Basten 2020). To some extent they are also similar to (Yarba and Güner 2020). In particular, we find that the tightening macroprudential measures limit consumer lending growth of the smallest banks, the least market players (with smaller consumer loan portfolios). The largest banks inversely increase consumer lending overall throughout the year, but the middle players (banks with neither the least, nor the largest consumer loan portfolios) overcome the largest ones in the pace of consumer lending growth disregarding the tightening nature of the implemented measures. Besides, the banks with the smallest capital adequacy ratios (often the largest in size) tend to increase consumer lending more than those with larger capital buffers and larger capital ratios. In other words, banks do not wish to spend the accumulated capital buffer to pay for the burden of the new measures. This effect may be attributable to the technology-intensive nature of the consumer lending. Those banks, that have invested much in IT, do not wish to easily capitulate in front of the competitors who earlier economized on such investments.

Thus, we find out that consumer lending-oriented macroprudential tightening measures may be helpful in fast curbing lending growth. However, to obtain a permanent result such measures should be either introduced regularly (like it was done in Russia in 2016-2018), or be accompanied with the alternative measures. Latter might be a combination of counter-stimulating mark-ups for risk-weights depending on LTV (as was done in Russia in the end of 2019).

Appendix

6.1 Data and sources.

Table 3: Data and sources

Variable	Units of measure	Description
General information about banks balance sheets.		
Total assets	RUB k	In nominal terms. Monthly. Banking reporting form 0409101
Total liquid assets	RUB k	Financial assets which may be delivered during the next 30 days. In nominal terms. Monthly. Banking reporting form 0409135.
Risk-weighted assets	RUB k	Computed according to the amount of total regulatory capital and different capital adequacy ratio (N1.0, N1.1 or N1.2). Authors' calculation.
Total loan portfolio	RUB k	In nominal terms. Monthly. Banking reporting form 0409101
Total consumer loans	RUB k	In nominal terms. Monthly. Banking reporting form 0409115
Total (retail) loans to individuals	RUB k	In nominal terms. Monthly. Banking reporting form 0409101.
Total consumer loans issued during the previous quarter	RUB k	In nominal terms. Quarterly. Banking reporting form 0409126.
Total uncollateralized consumer loans issued during the previous quarter	RUB k	In nominal terms. Quarterly. Banking reporting form 0409126.
Total regulatory capital	RUB k	In nominal terms. Monthly. Banking reporting form 0409135.
Core regulatory Tier 1 capital	RUB k	In nominal terms. Monthly. Banking reporting form 0409135.
Regulatory Tier 1 capital	RUB k	In nominal terms. Monthly. Banking reporting form 0409135.
Deposits	RUB k	In nominal terms. Monthly. Banking reporting form 0409101.
Requirements for capital, CAR, capital buffer		
N1_0	pp	Capital adequacy ratio for total regulatory capital. Monthly. Banking reporting form 0409135.
N1_1	pp	Core regulatory Tier 1 capital adequacy ratio (CET 1). Monthly. Banking reporting form 0409135.
N1_2	pp	Regulatory Tier 1 capital adequacy ratio. Monthly. Banking reporting form 0409135.
Minimum capital conservation buffer	pp	Bank of Russia Instructions No. 139-I,No. 180-I,No. 199-I.
Minimum requirement for capital adequacy ratio	pp	Bank of Russia Instructions No. 139-I,No. 180-I,No. 199-I.
Minimum requirement for ore regulatory Tier 1 capital adequacy ratio	pp	Bank of Russia Instructions No. 139-I,No. 180-I,No. 199-I.
Minimum requirement for regulatory Tier 1 capital adequacy ratio	pp	Bank of Russia Instructions No. 139-I,No. 180-I,No. 199-I.
Minimum capital buffer for domestic systemically important banks	pp	Additional required capital buffer for SIB. Bank of Russia Instructions No. 139-I,No. 180-I,No. 199-I.

Variable	Units of measure	Description
Capital buffer	pp	Actual capital buffer above capital conservation buffer and capital buffer for SIBs. Monthly. Bank of Russia Instructions No. 139-I,No. 180-I,No. 199-I and authors calculation.
Indicators of bank type.		
BankType	-	Type of bank used to calculate some macroprudential policy indicators. Includes base license, universal license, non-bank credit organization, SIB and the usage of IRB.
Base	-	The indicator for bank with base license. Taken from registration book of bank licenses
IRB	-	Dummy for banks that apply Basel II IRB approach. http://www.cbr.ru/queries/xsltblock/file/86301?fileid=-1&scope=2052, http://www.cbr.ru/collection/collection/file/24203/bsr_2018.pdf
License	-	Type of bank license. Registration book of bank licenses.
Systemically important bank	-	Indicator for the SIB bank. https://cbr.ru/press/PR/?file=13092017_194655ik2017-09-13T19_46_25.htm
Universal bank license	-	Indicator for bank with universal license. Registration book of bank licenses.
Non-bank credit organization	-	The indicator for non-bank credit organization. From registration book of bank licenses.
License recall	-	Time indicator of the period when bank license was recalled. https://www.banki.ru/banks/memory/
Macroeconomic variables.		
CPI	pp	Chain index, no seasonal adjustment. Monthly. https://gks.ru/price
Real GDP	RUB bn	GDP in constant 2016 prices, no seasonal adjustment. Quarterly. https://gks.ru/free_doc/new_site/vvp/kv/tab6.htm
Real effective exchange rate	pp	Quarterly growth of the Index of Ruble real effective exchange rate relative to currency bundle, no seasonal adjustment. https://fedstat.ru/indicator/42134
Policy rate	pp	Weighted on the length of validity period of interest rate. In nominal terms. Quarterly. https://www.cbr.ru/eng/ and authors' calculation.
Oil price	USD	Brent oil price per barr, last month average. https://inflationdata.com/articles/inflation-adjusted-prices/historical-crude-oil-prices-table/

6.2 Measures.

Table 4: Russian Macroprudential Measures Since 2015 Complete Registry.

No.	Macroprudential Measure Introduction (Elimination)	ref. No.	Focus	Impact	Consumer	Bank License	Sensitivity (dRW)	Date Draft	Date Accepted	Date MinJust	Date Application
1	decrease in the overall CAR as a result of RCAP inspection by the BCBS		General	Ease		ALL	-20.0	10.08.15	30.11.15	28.12.15	01.01.16
2	Step-wise introduction of the capital conservation buffer (CCB), stage 1		General	Tight		ALL	7.8	10.08.15	30.11.15	28.12.15	01.01.16
3	stage 2 for the CCB		General	Tight		ALL	7.2	10.08.15	30.11.15	28.12.15	01.01.17
4	stage 3 for the CCB		General	Tight		ALL	6.8	10.08.15	30.11.15	28.12.15	01.01.18
5	stage 4 for the CCB (eventually was shifted)	20	General	Tight		ALL	6.3	10.08.15	30.11.15	28.12.15	01.01.19
6	D-SIB capital buffer step-wise introduction, stage 1		General	Tight		D-SIB	1.9	10.08.15	30.11.15	28.12.15	01.01.16
7	Risk-weight (RW) mark-up for the foreign currency nominated mortgage loans		Specific	Tight		ALL	150.0	13.02.15	16.02.15	20.02.15	20.02.15
8	Elimination of earlier introduced RW mark-ups for uncollaterilized consumer loans with efficient interest rate (PSK) with the range of 25-35% p.a.		Specific	Ease	Yes	ALL	-10.0	13.02.15	16.02.15	20.02.15	20.02.15
9	RW mark-up for the foreign currency nominated loans offered to legal entities		Specific	Tight		ALL	30.0	05.02.16	07.04.16	22.04.16	25.04.16
10	RW mark-up for the non-resident securities' investments		Specific	Tight		ALL	50.0	05.02.16	07.04.16	22.04.16	25.04.16
11	D-SIB capital buffer, stage 2		General	Tight		D-SIB	2.5	10.08.15	30.11.15	28.12.15	01.01.17
12	RW mark-up for foreign currency nominated uncollaterilized consumer loans		Specific	Tight		ALL	490.0	02.11.16	13.02.17	10.04.17	12.04.17
13	RW mark-up on mortgage loans		Specific	Tight		ALL	150.0	18.09.17	06.12.17	10.01.18	27.01.18
14	elimination of RW mark-up for project finance		Specific	Ease		ALL	-50.0	18.09.17	06.12.17	10.01.18	27.01.18

No.	Macroprudential Measure Introduction (Elimination)	ref. No.	Focus	Impact	Consumer	Bank License	Sensitivity (dRW)	Date Draft	Date Accepted	Date Min-Just	Date Application
15	D-SIB capital buffer, stage 3		General	Tight		D-SIB	3.6	10.08.15	30.11.15	28.12.15	01.01.18
16	RW mark-up for mortgage loans with low down payment		Specific	Tight		ALL	50.0	01.10.18	01.10.18		01.01.19
17	RW decrease for low LTV mortgages		Specific	Ease		ALL	-50.0	30.06.19			01.01.22
18	RW mark-up for mortage loans		Specific	Tight		ALL	60.0	01.12.19	01.07.20		01.07.20
19	D-SIB capital buffer, stage 4 (shifter later)	25	General	Tight		D-SIB	4.0	10.08.15	30.11.15	28.12.15	01.01.19
20	delay in CCB introduction	5	General	Ease		Universal	-6.3	12.09.18	29.12.18	28.12.15	01.01.19
21	CCB re-introduction, stage 1		General	Tight		Universal	1.3	12.09.18	29.12.18	28.12.18	01.04.19
22	CCB re-introduction, stage 2		General	Tight		Universal	1.3	12.09.18	29.12.18	28.12.18	01.07.19
23	CCB re-introduction, stage 3		General	Tight		Universal	1.2	12.09.18	29.12.18	28.12.18	01.10.19
24	CCB re-introduction, stage 4		General	Tight		Universal	2.4	12.09.18	29.12.18	28.12.18	01.01.20
25	1Y delay in D-SIB capital buffer introduction	19	General	Ease		D-SIB	-4.0	12.09.18	29.12.18	28.12.18	01.01.19
26	D-SIB capital buffer ultimate introduction		General	Tight		D-SIB	4.0	12.09.18	29.12.18	28.12.18	01.01.20
27	elimination of already introduced CCB for banks with basic license		General	Ease		Basic	-21.8	01.05.17	28.12.16	25.09.18	08.10.18
28	elimination of future CCB for banks with basic license (see measure 21)		General	Ease		Basic	-1.3	01.05.17	28.12.16	25.09.18	01.04.19
29	elimination of future CCB for banks with basic license (see measure 22)		General	Ease		Basic	-1.3	01.05.17	28.12.16	25.09.18	01.07.19
30	elimination of future CCB for banks with basic license (see measure 23)		General	Ease		Basic	-1.2	01.05.17	28.12.16	25.09.18	01.10.19
31	elimination of future CCB for banks with basic license (see measure 24)		General	Ease		Basic	-2.4	01.05.17	28.12.16	25.09.18	01.01.20
32	first RW mark-up for the uncollateriliized consumer loans		Specific	Tight	Yes	ALL	120.0	02.11.16	13.02.17	10.04.17	12.04.17
33	RW mark-up for investments in equity funds		Specific	Tight		ALL	200.0	01.08.17	08.09.17	30.11.17	16.12.17
34	IRB use by a bank		Specific	Ease		1481	-27.5	29.12.12	01.10.15		01.01.18

No.	Macroprudential Measure Introduction (Elimination)	ref. No.	Focus	Impact	Consumer	Bank License	Sensitivity (dRW)	Date Draft	Date Accepted	Date Min-Just	Date Application
35	second RW mark-up for the uncollaterilized consumer loans		Specific	Tight	Yes	ALL	10.0	06.03.18	02.04.18	05.04.18	29.04.18
36	RW mark-up on foreign currency nominated loans		Specific	Tight		ALL	20.0	01.11.17	04.07.18	11.07.18	24.07.18
37	third RW mark-up for the uncollaterilized consumer loans		Specific	Tight	Yes	ALL	50.0	10.07.18	26.07.18	22.08.18	09.09.18
38	lowring RW for SME and mortgage loans		Specific	Ease		ALL	-55.0	25.07.18	03.09.18	25.09.18	08.10.18
39	IRB use by a bank		Specific	Ease		3292	-27.5	29.12.12	01.10.15		01.02.19
40	allowance to use external credit ratings for RW		Specific	Ease		ALL	-50.0	26.02.19	06.05.19	23.05.19	07.06.19
41	fourth RW mark-up for the uncollaterilized consumer loans		Specific	Tight	Yes	ALL	30.0	21.12.18	21.12.18	21.12.18	01.04.19
42	RW mark-ups for IRB risk-weights		Specific	Tight		IRB	145.0	17.12.18	12.02.19	13.03.19	01.10.19
43	fifth RW mark-up for the uncollaterilized consumer loans (differentiated by debt-to-income ratio)		Specific	Tight	Yes	ALL	50.0	13.07.18	31.08.18	25.09.18	01.10.19
44	lowering RW for SME and investment graded loans		Specific	Ease		ALL	-35.0	23.07.19	29.11.19	27.12.19	01.01.20
45	IRB use by a bank		Specific	Ease		1326	-27.5	29.12.12	04.12.18		31.12.20
46	D-SIB capital buffer differentiation and consequent increase		General	Tight		1481	27.8	23.01.20			01.01.21
47	D-SIB capital buffer differentiation and consequent increase		General	Tight		1000	16.7	23.01.20			01.01.21
48	elimination of RW mark-up on foreign currency nominated loans to medical technology producers	60	Specific	Ease		ALL	-50.0	10.03.20	10.03.20		10.03.20
49	preferrential RW treatment of local currency nominated loans to medical technology producers	61	Specific	Ease		ALL	-30.0	10.03.20	10.03.20		10.03.20

No.	Macroprudential Measure Introduction (Elimination)	ref. No.	Focus	Impact	Consumer	Bank License	Sensitivity (dRW)	Date Draft	Date Accepted	Date Min-Just	Date Application
50	it is allowed not to apply restrictive RW mark-ups to loans offered to individuals who were diagnozed with the presence of COVID-19 for half-year since April 1, 2020		Specific	Ease		ALL	-200.0	20.03.20	20.03.20		20.03.20
51	RW mark-up decrease on mortgages offered after April 1, 2020		Specific	Ease		ALL	-100.0	10.03.20	10.03.20		10.03.20
52	elimination of RW mark-ups on mortgages offered prior to April 1, 2020		Specific	Ease		ALL	-200.0	03.04.20	03.04.20		03.04.20
53	reject of earlier announced measure on RW decrease for mortgage loans to introduce it sooner	17	Specific	Tight		ALL	50.0	30.06.19			01.01.22
54	eralier introduction of lower RW on mortgages with low LTV	53	Specific	Ease		ALL	-50.0	17.04.20	17.04.20		01.01.21
55	allowance to neglect CCB		General	Ease		Universal	-28.1	20.03.20			30.09.20
56	allowance to neglect D-SIB capital buffer		General	Ease		D-SIB	-12.0	20.03.20			30.09.20
57	reject of D-SIB differenciation and increase	46	General	Ease		1481	-27.8	20.03.20	20.03.20		01.01.21
58	reject of D-SIB differenciation and increase	47	General	Ease		1000	-16.7	20.03.20	20.03.20		01.01.21
59	restoring RW mark-up on foreign currency nominated loans to medical technology producers		Specific	Tight		ALL	200.0	20.03.20	20.03.20		30.09.20
60	restoring RW mark-up on foreign currency nominated loans to medical technology producers	48	Specific	Tight		ALL	50.0	10.03.20	10.03.20		30.09.20
61	elimination of preferrential RW treatment of local currency nominated loans to medical technology producers	49	Specific	Tight		ALL	30.0	10.03.20	10.03.20		30.09.20

6.3 Bank Mergers.

Table 5: Registry of Russian Bank Mergers Since 2015

		Bank License No.					Bank License No.		
	Event Date	Merged	Merging	Final		Event Date	Merged	Merging	Final
1	15.01.2015	1134	3373	3373	32	01.02.2018	3104	3397	3397
2	03.02.2015	1415	2644	2644	33	28.02.2018	2145	3061	3061
3	15.06.2015	1776	2209	2209	34	26.03.2018	2555	2998	2998
4	22.06.2015	1088	2998	2998	35	15.05.2018	3283	3365	3365
5	07.07.2015	3459	2672	2672	36	10.06.2018	2093	3421	3421
6	04.09.2015	825	2997	2997	37	02.07.2018	2888	3279	3279
7	26.10.2015	2377	3368	3368	38	12.11.2018	3137	963	963
8	09.12.2015	3493	474	474	39	12.11.2018	3329	963	963
9	25.04.2016	2571	1751	1751	40	15.11.2018	3537	3279	3279
10	10.05.2016	3534	1000	1000	41	26.11.2018	1942	1470	3251
11	17.05.2016	1084	1093	1093	42	01.01.2019	323	2209	2209
12	10.06.2016	1574	2562	2209	43	01.01.2019	2827	2209	2209
13	17.06.2016	1701	2562	2209	44	07.03.2019	23	3279	3279
14	17.06.2016	1957	2562	2209	45	30.04.2019	1132	2312	2312
15	01.07.2016	3461	3251	3251	46	08.05.2019	128	1326	1326
16	01.08.2016	2594	2998	2998	47	01.06.2019	3338	2272	2272
17	22.08.2016	1971	2209	2209	48	08.07.2019	752	2529	2529
18	19.09.2016	3504	53	53	49	10.07.2019	1717	3061	3061
19	11.11.2016	777	2562	2209	50	15.11.2019	1972	3255	3255
20	18.11.2016	1276	323	2209	51	15.11.2019	1242	3255	3255
21	18.11.2016	2562	323	2209	52	29.11.2019	312	912	912
22	20.01.2017	2771	1460	1460	53	17.01.2020	704	3269	3269
23	24.03.2017	3052	323	2209	54	17.01.2020	3360	1354	1354
24	27.03.2017	901	963	963	55	21.01.2020	735	2998	2998
25	27.04.2017	3275	963	963	56	22.01.2020	1411	3061	3061
26	27.04.2017	3371	2241	2241	57	06.03.2020	2053	3255	3255
27	02.05.2017	3038	2275	2275	58	06.03.2020	232	3255	3255
28	02.05.2017	1006	2275	2275	59	26.03.2020	3085	963	963
29	03.11.2017	153	323	2209	60	26.03.2020	735	2998	2998
30	13.11.2017	2873	2063	2063	61	27.03.2020	1470	3251	3251
31	01.01.2018	1623	1000	1000					

6.4 Regression outputs

Table 6: Regressions with and without quarter dummies(QD)

VARIABLES	(1) FE without QD	(2) FE with QD	(3) GMM without QD	(4) GMM with QD
$\Sigma_{j=0}^{3}\beta_j MaP_{t-j}$	6.061***	2.414	5.545	-1.688
MaP_t	-1.661**	-0.826	-1.490	-2.166
MaP_{t-1}	2.401**	-1.783	2.144	-2.772
MaP_{t-2}	4.107***	1.669	3.991***	0.797
MaP_{t-3}	1.214	3.354***	0.900	2.453**
$SIZE_{t-1}$	-2.070	-1.453	1.395	10.034**
LIQ_{t-1}	-0.013	-0.008	-0.107	0.017
CAP_{t-1}	-0.016	-0.014	-0.025	-0.044
DEP_{t-1}	0.049	0.048	0.177	-0.146
CtA_{t-1}	-0.684***	-0.692***	0.354	-0.115
Oil_growth_{t-1}	0.009	0.013	0.010	0.020
Δkey_rate_{t-1}	-0.332*	-0.857***	-0.271	-0.811***
GDP_growth_{t-1}	-0.220	0.210	0.250	0.281
$\Delta REER_{t-1}$	-0.044	0.003	-0.014	0.093
Q1		-3.923***		-5.541***
Q2		-3.346***		-3.953***
Q3		1.531		0.517
Y_{t-1}			0.068	0.046
Constant	22.335	17.108	-28.631	-101.945***
Observations	8024	8024	8011	8011
Groups	649	649	648	648
R^2_{overall}	0.00146	0.000438		
R^2_{between}	0.0199	0.0186		
R^2_{within}	0.0178	0.0234		
Sargan p-value			0	0
Hansen p-value			4.98e-07	0.198
N of instrument			52	55
AR(1)			0	0
AR(2)			0.960	0.844

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Regression with and without interactions of bank control and macroprudential measure (Int)

VARIABLES	(1) FE without Int	(2) FE with Int	(3) GMM without Int	(4) GMM with Int
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	2.414	-12.73	-1.688	5.258
MaP_t	-0.8259	-4.3813	-2.1655	-28.0192
MaP_{t-1}	-1.7832	-8.4057	-2.7715	16.0796
MaP_{t-2}	1.6695	1.0971	0.7967	24.9208
MaP_{t-3}	3.3538***	-1.0415	2.4525**	-7.7231
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} SIZE_{t-1}$		1.171		-2.414
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} LIQ_{t-1}$		0.0610		-0.786
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CAP_{t-1}$		-0.0149		-0.0215
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} DEP_{t-1}$		0.0164		0.680
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CtA_{t-1}$		-0.111		0.241
$SIZE_{t-1}$	-1.4526	-1.9004	10.0339**	15.7699***
LIQ_{t-1}	-0.0075	-0.0166	0.0174	0.3947**
CAP_{t-1}	-0.0139	-0.0112	-0.0435	-0.0413
DEP_{t-1}	0.0479	0.0369	-0.1461	-0.7135**
CtA_{t-1}	-0.6921***	-0.6866***	-0.1150	0.2339
Oil_growth_{t-1}	0.0126	0.0120	0.0200	0.0339**
Δkey_rate_{t-1}	-0.8571***	-0.8458***	-0.8114***	-0.6936**
GDP_growth_{t-1}	0.2099	0.2360	0.2808	0.0267
$\Delta REER_{t-1}$	0.0033	-0.0029	0.0934	0.0515
Q1	-3.9232***	-3.8611***	-5.5412***	-5.4927***
Q2	-3.3465***	-3.3720***	-3.9532***	-3.7350***
Q3	1.5315	1.5953	0.5170	0.6726
Y_{t-1}			0.0461	0.0134
Constant	17.1075	22.8948	-101.9451***	-147.8330***
Observations	8024	8024	8011	8011
Groups	649	649	648	648
R^2_{overall}	0.000438	0.000422		
R^2_{between}	0.0186	0.0214		
R^2_{within}	0.0234	0.0259		
Sargan p-value			0	0
Hansen p-value			0.198	0.151
N of instrument			55	205
AR(1)			0	1.35e-07
AR(2)			0.844	0.393

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Regression with deeper lags of bank controls

VARIABLES	(1) FE_ni	(2) FE_int	(3) GMM_ni_t	(4) GMM_i
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	0.769	-8.302	-1.218	37.43
MaP_t	-2.1421	-2.9534	-1.6037	11.6733
MaP_{t-1}	-2.1280	-7.0862	-3.1017	-68.6721**
MaP_{t-2}	2.3233*	2.4037	0.9176	-1.4259
MaP_{t-3}	2.7160***	-0.6657	2.5700**	95.8528**
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} SIZE_{t-4}$		0.897		-2.247
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} LIQ_{t-4}$		0.0497		-1.414*
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CAP_{t-4}$		-0.0376		0.224
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} DEP_{t-4}$		0.00520		0.477
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CtA_{t-4}$		-0.284**		-0.0611
$SIZE_{t-4}$	-3.6742*	-3.9823*	9.8058**	16.6362***
LIQ_{t-4}	0.0339	0.0267	0.0413	0.4089**
CAP_{t-4}	-0.0454*	-0.0397**	0.0491	0.0238
DEP_{t-4}	-0.0236	-0.0317	-0.1524	-0.6813**
CtA_{t-4}	-0.4779***	-0.4630***	-0.0134	0.1403
Oil_growth_{t-1}	0.0012	0.0006	0.0057	0.0180
Δkey_rate_{t-1}	-1.0003***	-1.0068***	-0.6681***	-0.8415***
GDP_growth_{t-1}	0.7511	0.8040	0.8406	0.4820
$\Delta REER_{t-1}$	0.1224	0.1190	0.0350	0.0408
Q1	-3.0493***	-2.9855***	-3.3333***	-4.0628***
Q2	-1.9293*	-1.9423*	-2.7148*	-2.1702*
Q3	1.9906	2.0841	1.5886	2.2606
Y_{t-1}			-0.1140	-0.1046
Constant	42.9101*	46.7383**	-105.6603**	-162.8835***
Observations	7426	7426	7414	7414
Groups	620	620	619	619
R^2_{overall}	0.00107	0.000920		
R^2_{between}	0.00759	0.00842		
R^2_{within}	0.0209	0.0242		
Sargan p-value			0	0
Hansen p-value			0.137	0.267
N of instrument			55	205
AR(1)			0.262	0.158
AR(2)			0.380	0.0671

*** p<0.01, ** p<0.05, * p<0.1

Table 9: Clusters on CtA

	(1)	(2)	(3)
VARIABLES	GMM_ni_Cl_1	GMM_ni_Cl_2	GMM_ni_Cl_3
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	-2.814	5.665*	5.747
MaP_t	-3.035	1.819	-0.642
MaP_{t-1}	-2.863	1.538	1.380
MaP_{t-2}	0.356	0.691	4.249*
MaP_{t-3}	2.727	1.617	0.761
$SIZE_{t-1}$	10.244*	2.366	-0.427
LIQ_{t-1}	0.104	-0.030	0.188
CAP_{t-1}	0.033	-0.003	-0.102
DEP_{t-1}	-0.081	0.265	-0.106
CtA_{t-1}	1.806**	0.277	0.259
Oil_growth_{t-1}	0.020	0.016	0.009
Δkey_rate_{t-1}	-0.884**	0.173	-0.529
GDP_growth_{t-1}	0.379	-0.264	-0.057
$\Delta REER_{t-1}$	0.086	-0.114	0.197*
Q1	-5.927***	-4.381***	-2.305
Q2	-4.321***	-5.350***	-0.408
Q3	-0.022	-1.474	1.577
Y_{t-1}	-0.008	0.134***	0.255***
Constant	-121.553**	-45.341*	-2.335
Observations	4546	2512	953
Groups	367	199	82
Sargan p-value	0	0	0
Hansen p-value	0.380	0.831	0.338
N of instrument	55	55	55
AR(1)	1.57e-09	1.66e-07	0.0279
AR(2)	0.335	0.294	0.306
Mean	2.470	13.341	38.964
SD	2.304	4.003	22.107
min	0	7.928	22.308
max	7.790	21.695	90.490

*** p<0.01, ** p<0.05, * p<0.1

Table 10: Clusters on kb

	(1)	(2)	(3)
VARIABLES	GMM_ni_Cl_1	GMM_ni_Cl_2	GMM_ni_Cl_3
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	-2.344	0.247	-10.81
MaP_t	-0.780	1.721	-6.902*
MaP_{t-1}	-3.162	-3.118	-6.919
MaP_{t-2}	0.178	-1.696	0.952
MaP_{t-3}	1.420	3.341	2.061
$SIZE_{t-1}$	4.819	23.530**	15.023**
LIQ_{t-1}	-0.034	-0.030	0.075
CAP_{t-1}	-0.003	0.195	0.015
DEP_{t-1}	-0.202	-0.097	-0.081
CtA_{t-1}	0.186	0.761	-0.012
Oil_growth_{t-1}	0.026	-0.030	0.045
Δkey_rate_{t-1}	-0.865***	-0.433	-1.009
GDP_growth_{t-1}	0.282	1.356	0.135
$\Delta REER_{t-1}$	0.065	0.030	0.112
Q1	-4.603***	-4.803**	-5.843***
Q2	-4.005***	-4.425**	-4.706**
Q3	1.760	1.383	0.426
L.d_log_loans	0.083	-0.030	0.019
Constant	-45.761	-254.758**	-142.472**
Observations	3982	1919	2110
Groups	332	149	167
Sargan p-value	0	0	0
Hansen p-value	0.484	0.511	0.338
N of instrument	55	55	55
AR(1)	1.70e-05	0.0141	4.15e-05
AR(2)	0.447	0.227	0.661
Mean	2.874	11.037	38.764
SD	1.882	2.742	30.273
min	-4.87	6.966	16.43
max	6.93	16.63	276.04

*** p<0.01, ** p<0.05, * p<0.1

Table 11: Comparison of different macroprudential measures, without interactions

VARIABLES	(1) GMM_ni_F_Ap	(2) GMM_ni_S_Ap	(3) GMM_ni_F_D	(4) GMM_ni_S_D
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	-1.688	0.0963***	-4.327**	-0.0367
MaP_t	-2.1655	0.0024	-0.807	-0.009
MaP_{t-1}	-2.7715	0.0125	-2.001***	-0.027*
MaP_{t-2}	0.7967	0.0382**	-1.267	-0.000
MaP_{t-3}	2.4525**	0.0433***	-0.252	0.000
$SIZE_{t-1}$	10.0339**	7.7330*	13.778***	12.492***
LIQ_{t-1}	0.0174	0.0110	0.054	0.040
CAP_{t-1}	-0.0435	-0.0409	-0.054	-0.062
DEP_{t-1}	-0.1461	-0.0465	-0.276	-0.244
CtA_{t-1}	-0.1150	0.3055	-0.506	-0.482
Oil_growth_{t-1}	0.0200	0.0204	0.042**	0.023
Δkey_rate_{t-1}	-0.8114***	-0.6472***	-0.590**	-0.457*
GDP_growth_{t-1}	0.2808	-0.0789	-0.332	-0.262
$\Delta REER_{t-1}$	0.0934	0.0984	0.044	0.047
Q1	-5.5412***	-4.8738***	-4.783***	-4.738***
Q2	-3.9532***	-4.1108***	-5.843***	-6.119***
Q3	0.5170	-0.2490	-1.288	-1.655*
Y_{t-1}	0.0461	0.0512	0.032	0.037
Constant	-101.9451***	-86.7891**	-131.926***	-119.477***
Observ	8011	8011	8011	8011
Groups	648	648	648	648
Sargan p-value	0	0	0	0
Hansen p-value	0.198	0.448	0.194	0.150
N of instrument	55	55	55	55
AR(1)	0	0	0	0
AR(2)	0.844	0.885	0.693	0.741

*** p<0.01, ** p<0.05, * p<0.1

Table 12: Comparison of different macroprudential measures, with interactions

VARIABLES	(1) GMM_i_F_Ap	(2) GMM_i_S_Ap	(3) GMM_i_F_D	(4) GMM_i_S_D
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	5.258	0.156	-2.557	0.0220
MaP_t	-28.0192	-0.2274	-9.572	-0.166
MaP_{t-1}	16.0796	0.2065	-0.754	0.075
MaP_{t-2}	24.9208	0.3863	1.344	0.053
MaP_{t-3}	-7.7231	-0.2094	6.425	0.060
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	5.258	0.156	-2.557	0.0220
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} SIZE_{t-1}$	-2.414	-0.0219	-0.137	-0.00351
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} LIQ_{t-1}$	-0.786	-0.00138	-0.0140	-0.00222
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CAP_{t-1}$	-0.0215	0.000133	-0.0464	-0.000148
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} DEP_{t-1}$	0.680	0.00253	0.0417	0.00113
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CtA_{t-1}$	0.241	0.00229	-0.0311	-0.00161
$SIZE_{t-1}$	15.7699***	10.0249*	17.615**	16.079**
LIQ_{t-1}	0.3947**	0.1896	0.204	0.234
CAP_{t-1}	-0.0413	-0.0918	-0.111	-0.169
DEP_{t-1}	-0.7135**	-0.4701	-0.648	-0.690**
CtA_{t-1}	0.2339	0.2978	-1.527*	-1.395*
Oil_growth_{t-1}	0.0339**	0.0607***	0.042**	0.031
Δkey_rate_{t-1}	-0.6936**	-0.4398**	-0.383*	-0.273
GDP_growth_{t-1}	0.0267	-1.0143	-1.151**	-1.150**
$\Delta REER_{t-1}$	0.0515	0.0472	-0.065	-0.076
Q1	-5.4927***	-4.5929***	-4.129***	-4.028***
Q2	-3.7350***	-3.1674***	-5.778***	-6.195***
Q3	0.6726	-0.0918	-1.196	-1.626*
L.d_log_loans	0.0134	0.0506	-0.017	-0.025
Constant	-147.8330***	-90.7636**	-145.364**	-127.022**
Observations	8011	8011	8011	8011
Groups	648	648	648	648
Sargan p-value	0	0	0	0
Hansen p-value	0.151	0.283	0.134	0.209
N of instrument	205	205	203	203
AR(1)	1.35e-07	9.82e-10	4.42e-07	3.98e-06
AR(2)	0.393	0.672	0.308	0.342

*** p<0.01, ** p<0.05, * p<0.1

Table 13: Regression with the use of market share

VARIABLES	(1) FE_ni	(2) FE_int	(3) GMM_ni_t	(4) GMM_i
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	3.111	-8.925	-1.845	26.77
MaP_t	-0.7136	-3.0745	-2.7360	-20.4888
MaP_{t-1}	-1.6628	-8.4693	-2.6881	27.7023
MaP_{t-2}	1.8572*	2.1910	0.9670	33.7108
MaP_{t-3}	3.6301***	0.4280	2.6121**	-14.1556
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} SIZE_{t-1}$		0.583		-2.773
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} LIQ_{t-1}$		0.0509		-0.723
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CAP_{t-1}$		0.0115		-0.0739
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} DEP_{t-1}$		0.0513		0.445
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CtA_{t-1}$		0.529		3.265
$SIZE_{t-1}$	-1.1496	-1.4505	6.1995	26.1732***
LIQ_{t-1}	0.0434	0.0356	0.0374	0.4875**
CAP_{t-1}	-0.0120	-0.0131	-0.0347	-0.0060
DEP_{t-1}	0.0510	0.0357	-0.0912	-0.9563**
CtA_{t-1}	-1.0062	-1.9811*	-0.2513	-7.7898*
Oil_growth_{t-1}	0.0103	0.0096	0.0232	0.0159
Δkey_rate_{t-1}	-0.8598***	-0.8478***	-0.8439***	-0.8141***
GDP_growth_{t-1}	0.4140	0.4388	0.1659	-0.3019
$\Delta REER_{t-1}$	0.0180	0.0122	0.1297*	0.0420
Q1	-3.9453***	-3.8872***	-5.9209***	-5.2343***
Q2	-3.2183***	-3.2488***	-3.4079***	-5.1250***
Q3	1.5119	1.5624	0.7305	0.1912
Y_{t-1}			0.1738**	-0.0625
Constant	5.5717	10.2971	-64.0237	-248.2012***
Observ	8024	8024	8011	8011
Groups	649	649	648	648
R^2_{overall}	0.00110	0.000398		
R^2_{between}	0.00532	0.00717		
R^2_{within}	0.0158	0.0179		
Sargan p-value			0	0
Hansen p-value			0.314	0.125
N of instrument			55	203
AR(1)			1.33e-06	0.0395
AR(2)			0.439	0.217

*** p<0.01, ** p<0.05, * p<0.1

Table 14: Regressions for share of uncollateralized consumer credits given during one quarter

VARIABLES	(1) FE without Int	(2) FE with Int	(3) GMM without Int	(4) GMM with Int
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	-1.165	-33.70***	-0.702	-24.40*
MaP_t	-0.4667	-11.1626***	-0.0966	-8.6981
MaP_{t-1}	-1.0080	-10.6603***	-0.2520	-2.6653
MaP_{t-2}	0.5458	-5.5259*	0.2643	-6.0319
MaP_{t-3}	-0.2365	-6.3554**	-0.6175	-7.0009
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} SIZE_{t-1}$		1.907***		1.356**
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} LIQ_{t-1}$		-0.0120		0.0885
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CAP_{t-1}$		0.104**		0.0668
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} DEP_{t-1}$		0.122**		0.0618
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CtA_{t-1}$		0.166***		0.0913
$SIZE_{t-1}$	-1.6523	-2.6428**	0.4423	1.6506
LIQ_{t-1}	-0.0122	-0.0032	-0.0005	-0.0327
CAP_{t-1}	0.0114	-0.0046	-0.0285	-0.0293
DEP_{t-1}	0.0547*	0.0052	-0.0429	-0.0023
CtA_{t-1}	-0.3414***	-0.4301***	-0.2258	-0.6292*
Oil_growth_{t-1}	0.0132*	0.0105	0.0143*	-0.0197
Δkey_rate_{t-1}	-0.3124**	-0.1698	-0.1017	-0.0896
GDP_growth_{t-1}	-5.9793	7.5234	-26.2432	26.9947
$\Delta REER_{t-1}$	0.0091	-0.0007	0.0090	0.0086
Q1	1.4484***	1.3982**	0.7901	1.6508**
Q2	-1.2285***	-1.0711**	-2.5731***	-2.3069***
Q3	2.0202***	1.6320**	1.4029	1.6689*
Y_{t-1}			0.3912***	0.4108***
Y_{t-2}			0.1657*	0.0330
Constant	29.8865**	44.4708***	6.0514	-5.5668
Observations	7916	7295	7705	7102
Groups	648	619	642	612
R^2_{overall}	0.000323	0.00123		
R^2_{between}	0.00147	0.00649		
R^2_{within}	0.0229	0.0336		
Sargan p-value			1.15e-05	9.30e-10
Hansen p-value			0.206	0.357
N of instrument			48	213
AR(1)			0.000279	1.82e-06
AR(2)			0.527	0.445

*** p<0.01, ** p<0.05, * p<0.1

Table 15: Regressions for the growth rate of new loans

VARIABLES	(1) FE without Int	(2) FE with Int	(3) GMM without Int	(4) GMM with Int
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	-24.99**	13.88	-58.37***	-43.81
MaP_t	-3.5087	-15.3546	-10.4627	-55.5595
MaP_{t-1}	-14.7812	-39.8763	-22.3330**	-39.2161
MaP_{t-2}	-2.9054	-22.8812	-9.4672	-19.5485
MaP_{t-3}	-3.7905	91.9877**	-16.1042***	70.5098
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} SIZE_{t-1}$		3.793		6.374
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} LIQ_{t-1}$		-0.0843		1.802
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CAP_{t-1}$		-0.573		-1.460
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} DEP_{t-1}$		-1.158*		-1.803
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CtA_{t-1}$		-0.519		1.515
$SIZE_{T-1}$	-9.5360	-13.0501	46.1818**	37.9124***
LIQ_{T-1}	0.3563*	0.5129*	0.5724	0.2289
CAP_{T-1}	0.0654	0.1642	-0.1258	0.5498
DEP_{T-1}	-0.5654**	-0.2727	-2.5579**	-0.9949
CtA_{t-1}	-3.1862***	-3.5673***	-1.4731	-0.6940
Oil_growth_{t-1}	0.0777	0.2588	0.1162	0.1434
Δkey_rate_{t-1}	-4.1550***	-2.2912	-3.3173	-3.1007**
GDP_GROWTH_{T-1}	-317.3717	-441.4115	73.7042	-191.9072
$REER_{T-1}$	0.2837***	0.0977	0.1972*	0.1486
Q1	18.2255**	11.2065	4.8274	5.8002
Q2	-28.0799***	-27.3400***	-31.1297***	-27.2513***
Q3	45.6095***	39.1040***	16.3495	13.3468
Y_{t-1}			-0.5478***	-0.5638***
Y_{t-2}			-0.1088	-0.2843**
Y_{t-3}			-0.0948*	-0.1094**
Constant	151.4163*	171.6627*	-353.1723*	-370.1925**
Observations	6815	6260	5768	5768
Groups	605	574	537	537
R^2_{overall}	0.00240	0.00235		
R^2_{between}	0.0157	0.00481		
R^2_{within}	0.0414	0.0494		
Sargan p-value			7.79e-09	0
Hansen p-value			0.217	0.131
N of instrument			54	219
AR(1)			0.0601	0.00194
AR(2)			0.193	0.622

*** p<0.01, ** p<0.05, * p<0.1

Table 16: Regressions for the change in the average risk-weight

VARIABLES	(1) FE without Int	(2) FE with Int	(3) GMM without Int	(4) GMM with Int
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	3.890***	13.12	6.795***	33.26
MaP_t	-1.6031***	-5.7776	0.0012	-20.4402
MaP_{t-1}	4.7736***	11.0411**	5.8936***	92.0143***
MaP_{t-2}	1.6136***	11.8618***	1.6559***	-10.1707
MaP_{t-3}	-0.8941*	-4.0055	-0.7554	-28.1390
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} SIZE_{t-1}$		-0.579		0.925
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} LIQ_{t-1}$		-0.0429		-0.281
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CAP_{t-1}$		-6.25e-05		0.268
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} DEP_{t-1}$		0.00989		-0.537
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CtA_{t-1}$		0.0251		0.0551
$SIZE_{T-1}$	10.1768***	11.3935***	-1.8188	1.4862
LIQ_{T-1}	0.1328***	0.1364***	0.0065	0.1423
CAP_{T-1}	0.0911***	0.1060***	-0.0178	0.0504
DEP_{T-1}	0.0212	0.0079	0.3216**	0.6020***
CtA_{t-1}	-0.1239**	-0.1573**	-0.4429	-0.9453**
Oil_growth_{t-1}	0.0191**	-0.0038	0.0059	-0.0932***
Δkey_rate_{t-1}	0.7828***	0.6927***	0.6755***	0.6878***
GDP_GROWTH_{T-1}	-130.9750***	-112.0182***	-131.8951***	15.9446
$\Delta REER_{T-1}$	-0.0048	0.0099	0.0042	0.0127
Q1	-2.9312***	-2.1694**	-1.6682**	0.5217
Q2	1.2113**	1.1347*	1.6443***	2.4232***
Q3	-2.4921***	-2.1739**	-2.8609***	-3.2206***
Y_{t-1}			-0.1097	0.0530
Y_{t-2}			-0.2085***	-0.1492***
Y_{t-3}			-0.1131***	-0.0697**
Constant	-120.0964***	-133.7502***	5.3771	-53.6125*
Observations	8933	8247	8054	8054
Groups	707	671	664	664
R^2_{overall}	0.0102	0.00953		
R^2_{between}	0.0301	0.0138		
R^2_{within}	0.0819	0.0962		
Sargan p-value			6.96e-07	0.143
Hansen p-value			0.114	0.769
N of instrument			56	193
AR(1)			2.52e-08	9.57e-07
AR(2)			0.165	0.158

*** p<0.01, ** p<0.05, * p<0.1

Table 17: Regressions for the change in the capital cushion

VARIABLES	(1) FE without Int	(2) FE with Int	(3) GMM without Int	(4) GMM with Int
$\Sigma_{j=0}^{3}\beta_j \Delta MaP_{t-j}$	2.001**	-16.87**	-1.104**	-25.66**
MaP_t	0.7236*	-6.3202***	-0.6463***	-15.6989**
MaP_{t-1}	-0.0289	-3.4294	-0.5996	-1.9714
MaP_{t-2}	0.6016*	-4.9074**	0.3110	3.6164
MaP_{t-3}	0.7050**	-2.2147	-0.1689	-11.6016**
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} SIZE_{t-1}$		0.647**		0.929*
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} LIQ_{t-1}$		0.00542		-0.0191
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CAP_{t-1}$		0.229**		0.129
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} DEP_{t-1}$		0.0548		0.187***
$\Sigma_{j=0}^{3}\delta_j MaP_{t-j} CtA_{t-1}$		-0.000555		-0.0155
$SIZE_{T-1}$	-0.6585	-1.4827***	0.6030	0.6918
LIQ_{T-1}	0.0374	0.0527**	0.0070	0.0099
CAP_{T-1}	-0.2165***	-0.3014***	-0.0208	-0.0482
DEP_{T-1}	-0.0002	-0.0062	0.0059	-0.0380
CtA_{t-1}	-0.0216	0.0130	-0.0520	-0.0680
Oil_growth_{t-1}	-0.0104**	-0.0059	0.0003	-0.0007
Δkey_rate_{t-1}	-0.0799	-0.2905**	-0.1264	-0.1237*
GDP_GROWTH_{T-1}	27.1805**	13.5709	-3.4174	-4.9722
$\Delta REER_{T-1}$	0.0044	0.0140**	0.0043	0.0091
Q1	0.6909**	0.6300	0.5322**	0.5826**
Q2	0.3547	0.2573	0.2129	0.2389
Q3	0.7364	1.2683*	0.4443	0.5033
Y_{t-1}			0.0418	0.0665
Y_{t-2}			0.0860***	0.0243
Y_{t-3}			-0.0726**	-0.0656*
Y_{t-4}			0.0968***	0.1054***
Constant	11.5732**	23.2584***	-6.1823	-3.7093
Observations	8953	8264	7341	7341
Groups	711	673	645	645
R^2_{overall}	0.143	0.158		
R^2_{between}	0.123	0.125		
R^2_{within}	0.237	0.292		
Sargan p-value			0	0
Hansen p-value			0.347	0.125
N of instrument			93	258
AR(1)			6.48e-08	1.95e-05
AR(2)			0.595	0.897

*** p<0.01, ** p<0.05, * p<0.1

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