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The effect of macroprudential policies on credit developments in Europe 1995-2017

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Abstract

The paper inspects the credit impact of policy instruments that are commonly applied to contain systemic risk. It employs detailed information on the use of capital-based, borrower-based and liquidity-based instruments in 28 European Union countries in 1995—2017 and a macroeconomic panel setup. The paper finds a significant impact of capital buffers, profit distribution restrictions, specific and general loan-loss provisioning regulations, sectoral risk weights and exposure limits, borrower-based measures, caps on long-term maturity and exchange rate mismatch, and asset-based capital requirements on credit to the non-financial private sector. Furthermore, the business cycle and monetary policy influence the effectiveness of most of the macroprudential instruments. Therein, capital buffers and sectoral risk weights act countercyclically irrespectively of the prevailing monetary policy stance, while a far richer set of policy instruments can act countercyclically in combination with the appropriate monetary policy stance.

JEL Classification: E51, E52, G21

Keywords: macroprudential policy, monetary policy, capital requirements, borrower-based instruments, liquidity requirements

Non-technical summary

This paper contributes to the discussion on the effectiveness of macroprudential policies in containing excessive credit volatility. It explores the fact that though the term 'macroprudential' has gained prominence only following the global financial crisis, many countries already have sound experience with policy measures that would come forth as macroprudential today.

The analysis uses a new database of policy measures of a macroprudential nature used across the European Union (EU) in 1995–2017 to test the effectiveness of multiple instruments in influencing the evolution of private sector credit. The Macroprudential Policies Evaluation Database (MaPPED) offers the most comprehensive source of information about macroprudential policies in Europe. In total, it covers almost 1,700 policy actions that thoroughly document the life cycle of multiple policy instruments from their introduction, through recalibration(s) to cancellation.

The assessment distinguishes 18 categories of capital-based, borrower-based or liquidity-based instruments. Furthermore, it compares three alternative definitions of policy indicators used so far in cross-country studies, and offers the first systematic evaluation of the robustness of policy conclusions to changes in just coding of policy events. The first coding standard rests on an index that counts the total number of active instruments within the same category such as e.g. capital buffers. The second coding type is a dummy variable which captures whether any instrument in a category is active or not. The last indicator counts all adjustments in policy instruments, i.e. their tightenings and loosenings, falling under one category over time.

The main findings are as follows. (i) Only a narrow subset of macroprudential instruments has an effect on credit developments that does not depend on the phase in the business or monetary policy cycle. Among these, general and possibly specific provisioning requirements, DTI and other lending standards policies such as maturity restrictions or amortisation requirements, limits on maturity and foreign exchange mismatch and large exposure limits appear to have a stable positive impact on credit growth. Else, reserve requirements and sectoral exposure limits appear to have a negative impact. (ii) The working of a far broader set of macroprudential instruments depends on the monetary policy stance, and vice versa. All borrower-based and a share of lender-based instruments, such as profit distribution restrictions, caps on long-term maturity and foreign exchange mismatch, reinforce the pass-through of monetary policy. Other lender-based instruments, including minimum capital requirements, capital buffers, specific provisioning rules, sectoral exposure limits and taxes on bank assets or activities, reduce the pass-through of monetary policy. (iii) Relatedly, though most of the macroprudential measures do not affect the procyclicality of credit on their own, they become pro- or countercyclical if considered jointly with countercyclical monetary policy. (iv) Capital buffers and sectoral risk weights can act countercyclically, while caps on LTV and limits on foreign exchange mismatch can act procyclically, irrespectively of the monetary policy stance.

Overall, the results emphasise the prominent role of macroprudential and monetary policy coordination. One way of looking at my findings is that the current and expected monetary policy stance should be among determinants of each choice of a macroprudential policy instrument. A more far-reaching conclusion would be that the coordination of macroprudential and monetary policy enlarges the set of policies that are effective in controlling credit growth at any juncture. For instance, a full spectrum of borrower-based measures can moderate credit growth if applied jointly with a tightening of the monetary policy stance.

1 Introduction

An essential element of the international response to the global financial crisis was the Basel III package, which among other aspects, equipped national authorities with a set of capital and liquidity instruments designed to control systemic risks. Many had challanged whether this move had been fully matched by evidence on the effectiveness of the new instruments. It triggered a lively academic discussion on the transmission mechanisms of these policies summarised by Galati and Moessner (2013) and Galati and Moessner (2018).

However, neither the awareness of systemic risks nor the availability of tools that can address the latter is new in fact. For instance, many emerging economies have used reserve requirements or profit distribution restrictions to control prevailing systemic risks at the eve of the last crisis. For advanced economies, the most intense use of these measures dates back to inter- and post-war periods. Authorities in some of the latter economies experimented with borrower-based instruments and limits on selected banks activities or exposures also in more recent decades. Few have called these instruments macroprudential, and there was little push to harmonise them to the degree they are today. Still, these experiments can help us understand the impact of the macroprudential toolbox as we know it today.

This paper uses over 20 years of data on the use of measures with a macroprudential character in 28 European countries to assess the impact of macroprudential policies on credit to the non-private financial sector. It employs a series of cross-country panel regressions where real credit to the non-financial private sector is related to macroprudential policy indicators. The indices represent seven broad categories of measures: minimum capital requirements, capital buffers including caps on bank leverage, sectoral risk weights, loan-loss provisioning standards, lending standards, exposure limits, and taxes on financial institutions and activities. The paper looks at the effect of these macroprudential measures on credit growth and its procyclicality, along with their interactions with monetary policy.

The data on regulatory measures stem from Macroprudential Policies Evaluation Database (MaPPED) Budnik and Kleibl (2018). MaPPED offers a comprehensive source of data on regulatory policies of a macroprudential nature targeting the banking sectors in the EU member states from 1995 to 2017. Importantly, the database documents these policies along with two dimensions. For each policy action, it tracks whether it involved the introduction, recalibration or deactivation of an instrument, and separately, whether it implied tightening, loosening or no change in policy stance. On these grounds, the database allows deriving different types of policy indices used so far in the literature.

The choice of cross-country panel specfication addresses the rareness of the use of individual macroprudential instruments. Most of the national supervisory agencies used only a subset of macroprudential instruments (Budnik and Kleibl (2018)) and adjusted their policies at far lower intervals than routinely done for monetary policy. Against this backdrop, the panel methodology has a definite advantage of exploring both time-series and cross-sectional variation. The application of Pesaran (2006) and Chudik and Pesaran (2015) Dynamic Common Correlated Effect (CCE) estimator ensures the consistency of panel estimates in the presence of cross-sectional dependence in regression residuals.

The main findings are as follows. (i) Only a narrow subset of macroprudential instruments has a stable effect on credit developments, irrespective of the phase in the business or monetary policy cycle. Among these, general and possibly specific loan-loss provisioning requirements, DTI and other lending standards policies such as maturity restrictions or amortisation requirements, limits on maturity and foreign exchange mismatch and large exposure limits appear to have a positive impact on credit growth. Else, reserve requirements and sectoral exposure limits appear to have a negative impact. (ii) The effect of many more macroprudential instruments depends on the monetary policy stance, and vice versa. All borrower-based and various lender-based instruments, such as profit distribution restrictions, caps on long-term maturity and foreign exchange mismatch, reinforce the pass-through of monetary policy. Other lender-based instruments, including minimum capital requirements, capital buffers, specific provisioning rules, sectoral exposure limits and taxes banks' assets or activities, hinder the pass-through of monetary policy. (iii) Relatedly, though most of the macroprudential measures do not affect the procyclicality of credit on their own, they become pro- or countercyclical if considered jointly with countercyclical monetary policy. (iv) Importantly, capital buffers and sectoral risk weights can act countercyclically also in the absence of supporting monetary policy, while caps on LTV and limits on foreign exchange mismatch act procyclically in similar conditions.

This paper relates to several streams of literature. It is closest to the analysis of Lim *et al.* (2011), Cerutti *et al.* (2017), Akinci and Olmstead-Rumsey (2018), Kuttner and Shim (2016), with which it shares the methodology and the focus on the comparative assessment of individual macroprudential measures. Lim *et al.* (2011) considers 10 macroprudential instruments and credit developments in 49 countries over 2000–2010. They find that LTV and DTI limits, loan-loss dynamic provisioning rules, reserve requirements, and ceilings on credit growth, can tame credit procyclicality. Cerutti *et al.* (2017) analyse the effectiveness of 12 macroprudential tools in 119 countries over 2000–2013. They observe that borrower-based policies, dynamic provisioning and reserve requirements reduce credit dynamics in the full sample of countries. However, in a subsample of developed countries (described as more open and with a more sophisticated financial system) none of these instruments can curb credit growth. Akinci and Olmstead-Rumsey (2018) analyse 6 macroprudential instruments in 57 countries over 2000—2013, and Kuttner and Shim (2016) 9 non-interest rate policy tools in 57 countries over 1980–2012, in stabilising housing credit and house prices. They find that LTV and DSTI caps, exposure limits to the housing sector and housing-related taxes can contain the growth of housing credit. However, when Kuttner and Shim (2016) use mean group and panel event study methods, only DSTI caps appear to have a significant negative effect on credit developments.

A series of similar cross-country panel studies focus on specific regions. Vandenbussche *et al.* (2015) consider the impact of macroprudential measures on housing markets in the Central, Eastern, and Southeastern European countries in 1997 – 2011. They find that only changes in minimum capital requirements and asset-based reserve requirements have an impact on household credit growth. Geršl and Jašová (2014) also look at 11 Central and Eastern Europe countries in the pre-crisis period 2003–2007 and conclude that out of all macroprudential instruments used by national authorities in this period, only asset classification and provisioning rules along with LTV/LTI criteria might have been effective in taming bank credit growth. Bruno *et al.* (2017) provides an assessment of the effectiveness of both domestic macroprudential policies and capital flow management policies in 12 Asia-Pacific economies over 2004–2013. The authors fail to detect any significant impact of macroprudential measures, pooled together in one policy indicator, on bank credit.

Several further studies employ panel techniques and multiple macroprudential policy indicators to bank-level datasets. For instance, Claessens *et al.* (2013) compare the impact of a rich set of macroprudential measures on the growth of bank-level assets. Bruno *et al.* (2017) show a tampering effect of domestic macroprudential policies on bank-level asset growth and bank-level leverage ratios. Morgan *et al.* (2019) uses a bank-level panel to analyse the effect of the use of LTV on the growth rate of mortgage loans.[1]

[1]Empirical works based on cross-country panels nest in a far broader literature on the credit impact of macroprudential policies. Among empirical works worth mention are case studies that focus on specific policy episodes. Jiménez *et al.* (2017) study the effectiveness of dynamic provisioning in Spain in taming credit supply cycles by

Finally, the paper contributes to the literature investigating the interaction between macroprudential and monetary policy. The literature on the topic is abundant but bent towards the analysis of costs and benefits of monetary policy targeting financial stability goals (e.g. Angelini *et al.* (2014), Quint and Rabanal (2014) or Svensson (2017)). In contrast, this paper tries to answer a narrower question: does monetary policy affect the transmission of macroprudential policies, and vice versa, do macroprudential policies affect the transmission of monetary policy? To this end, the paper follows the direction of empirical studies on the bank lending channel of monetary policy such as Buch *et al.* (2014) and Budnik and Bochmann (2017) who find that higher capital and liquidity ratios make U.S. and euro area banks less responsive to monetary policy interventions. Kashyap and Stein (1994), Ehrmann *et al.* (2001) reached similar conclusions on the role of bank liquidity for the transmission of monetary policy, and Kishan and Opiela (2000) on the corresponding effectof bank capitalisation.

The analysis adds to this literature along three dimensions. First, it focuses on a set of advanced European economies. The existing literature relies heavily on the experience of developing countries, while as evidenced by Cerutti *et al.* (2017), the effectiveness of same macroprudential instruments in advanced and developing economies may differ. The analysis dedicated to relatively homogenous developed economies is a pertinent contribution. Second, the paper systematically tracks the interactions of macroprudential instruments with economic activity and monetary policy.[2] As regards the latter, the paper relies directly on the variation in macroprudential instruments rather than in the intermediary targets of macroprudential policies, such as banks' capitalisation or liquidity. And further, it expands beyond capital- and liquidity-based policies, delivering fresh evidence on the interactions between monetary policy and borrower- or exposure-based instruments.

Third, the paper looks in more depth into the problem of coding macroprudential policies in cross-country comparative studies. These studies commonly struggle with the limited affinity

employing the loan-level data from the credit register. Auer and Ongena (2019) looks at the Swiss experience with the use of the countercyclical capital buffer imposed on residential mortgages. Another stream of the literature are studies based on macro data that concentrate on single country experience and a limited set of instruments. For instance, Igan and Kang (2011) looks at the impact of LTV and DTI limits on mortgage credit growth in Korea, while Budnik and Rünstler (2020) look at the impact capital requirements and mortgage underwriting standards on credit volumes in the U.S.

[2] Cerutti *et al.* (2017) and Bruno *et al.* (2017) run a complementary analysis of the usage of macroprudential instruments depending on the evolution of credit and policy rates. Cerutti *et al.* (2017) find positive correlations between credit growth and the usage of caps on LTV ratios and reserve requirements, speaking for their countercyclical usage by national authorities. Beyond, LTV caps were used in several countries together with higher policy rates, possibly to achieve complementary objectives. Alike, Bruno *et al.* (2017) reports that authorities often introduce macroprudential policies during periods of monetary tightening.

of measures applied in various jurisdictions. Depending on specific features of policy datasets, different authors propose policy indicators that focus on the enforcement of a particular type of an instrument or on the 'intensity' of policy actions. Three coding co-exist in the literature: a binary coding scheme that captures whether an instrument of a specific type is activated, the scheme that takes account of the number of active policy instruments of the type in place, or a cumulative index of policy of tightenings and easings of the policy stance. By comparing the workings of these three indicators, the paper assesses to which degree the measurement of macroprudential policy can matter in statistical inference.

The remainder of the paper is structured as follows. Section 2 selects and classifies macroprudential policy instruments and discusses the construction of policy indicators. It also shortly describes remaining macro-financial data employed in the analysis. Section 3 summarises the main facts about the sample and Section 4 introduces the empirical strategy. Section 5 presents the results, while Section 6 additionally discusses the implications of using alternative policy indicators, and more general robustness of the main findings. Section 7 concludes.

2 Data

2.1 Macroprudential policies

The analysis rests on the new Macroprudential Policies Evaluation Database (MaPPED). MaPPED offers a comprehensive source of information on regulatory policy actions involving instruments of a macroprudential nature used in 28 EU member states over the period 1995–2017. A prudential policy instrument refers to any quantitative restrictions on the structure of banks' assets or liabilities (e.g. minimum capital requirements) or on banks' activities (e.g. the prohibition of foreign exchange loans). A policy action refers to an event of activating, changing the level or scope, or deactivating of such a policy instrument.

The database covers eleven categories and 53 subcategories of regulatory instruments, and almost 1,700 related policy actions. Policy instruments included in the database must have "a macroprudential character", meaning that it fulfills at least one of the four conditions. (i) They have been dubbed as macroprudential either by the relevant legislation or by the authority applying the instrument; (ii) they had a specific macroprudential goal; (iii) their conceptual design or transmission channels are comparable with those of present macroprudential measures (e.g. minimum capital requirements that share broad similarity with macroprudential capital buffers); (iv) they are likely to have a system-wide impact on the banking sector.

For this analysis, the relevant policy instruments from MaPPED are compressed into 18 instrument groups under four headline categories. These are summarised in Table 1 and briefly introduced below. Budnik and Kleibl (2018) provide a more detailed description of instrument types.

Capital-based tools include instruments that target banks' own funds or loan-loss reserves. The category of minimum capital requirements involves limits on *gone concern* own funds, that have to be met by banks at all times. Capital buffers are a miscellaneous category that includes chiefly but not exclusively limits on *going concern* own funds. The category includes the Basel III capital buffers such as a countercyclical capital buffer (CCyB), buffers targeting specific exposures, e.g. to foreign residents or mortgages, and regulatory leverage ratios. Sectoral risk weights cover supervisory controls under the standardised approach, as well as floors and caps on the parameters entering the calculation of risk weights under advanced approaches. The category includes primarily capital charges on exposures backed by residential or commercial real estate, but also various country-specific risk weight requirements, e.g. relating to foreign currency exposures, exposures guaranteed by regional and local authorities.

The dividing line between specific and general loan-loss provisioning requirements is whether the resulting reserves seek to absorb incurred or expected loan losses. Specific provisioning requirements focus on impaired individual loans and usually apply based on criteria such as the time elapsed since the last interest or principal payment. In contrast, general provisioning rules refer to allowances that provide backup for expected losses in loan portfolios. The latter will also cover dynamic loan-loss provisioning.

Borrower-based instruments focus on borrowers' repayment capacity by setting limits on loan size, overall indebtedness or maximum loan maturity. Such limits apply on a loan or bank loan portfolio level. The category of debt-to-income and debt-service-to-income ratios will also include other limits that apply to debt servicing costs (e.g. set on interests, fees, insurance premiums) and interest rate stress-testing. Other lending standards related to the income of a debtor include remaining conditions on the repayment capacity of a borrower related to her income, e.g. floors on the disposable income or permanent income source requirement. Other lending standards include any further borrower-based instruments such as limits on maximum loan maturity, amortisation restrictions, limits on interest rates, or measures targeting unhedged borrowers with loans in foreign currency.

Table 1: Categories of macroprudential policy instruments

Capital-based	Minimum capital requirements ($MINCAP$)
	Capital buffers ($CAPBUF$)
	Profit distribution restrictions ($PROFIT$)
	Sectoral risk weights (RW)
	Regulatory specific provisioning rules ($SPECPROV$)
	Regulatory general provisioning rules ($GENPROV$)
Borrower-based	Loan-to-value caps (LTV)
	Debt-to-income and debt-service-to-income ratios (DTI)
	Other lending standards related to the income of a debtor ($INCOME$)
	Other lending standards ($LENDSTD$)
Liquidity-based	Asset-based reserve requirements ($ABRR$)
	Liability-based reserve requirements (RR)
	Limits on longer-term maturity mismatch ($LIQLR$)
	Limits on short-term maturity mismatch ($LIQST$)
	Limits on foreign exchange mismatch ($FXLIM$)
Other instruments	Limits on large exposures ($LAREXP$)
	Limits on exposures to sectors ($SECEXP$)
	Taxes on financial institutions and activities (TAX)

Liquidity-based instruments include two types of reserve requirements and two types of caps on maturity mismatch. Asset-based reserve requirements commonly target excessive lending and ask banks to deposit additional reserves or buy central bank bills if the growth rate of certain assets, e.g. credit to the non-financial private sector, exceeds a specified threshold. Liability-based reserve requirements refer to standard marginal minimum reserve requirements else used for monetary policy purposes. Then, limits on longer-term maturity mismatch aim at curbing banks' over-reliance on short-term liabilities to finance long-term assets. The category covers long-term supervisory caps on the funding structure of banks such as loan to deposit ratios or the Basel III Net Stable Funding Ratio (NSFR). Limits on short-term maturity mismatch focus on banks' ability to meet financial obligations as they come due in less than a year. The latter category includes country-specific minimum cash ratios, maturity ladders and the Basel III Liquidity Coverage Ratio (LCR).

Under other instruments, there are limits on exposures and taxes on banks or their activities. Limits on large exposures place a quantitative ceiling on exposures to a single client or a group of clients. Conversely, limits on sectoral exposures restrict bank's exposure to a specific sector or asset classes, e.g. exposures to other banks, investment firms or the real estate sector.

2.2 Policy indices

An ideal policy indicator would capture both timing and intensity of policies. And yet comparing policy intensity across multiple jurisdictions must result in doubtful precision. Especially ahead of the introduction of Basel III standards, macroprudential instruments remained highly country-specific, with their scope often evolving over time. For instance, the definitions of own funds for the setting of capital-based instruments, or collateral for the setting of LTV caps, differ wildly across jurisdictions. Then, many macroprudential instruments regularly involve exemptions that selectively benefit institutions, sectors, or exposure types. Finally, even identical measures may not be equally biting in two jurisdictions, e.g. when banks in the two jurisdictions hold different voluntary capital buffers.

Accordingly, most of cross country comparative studies rely on indicators that emphasise the timing and to a lower or no degree policy intensity. The authors will unify the instances of instrument use into dummy type units corresponding with the use of a macroprudential instrument. This paper compares three types of macroprudential policy indicators used so far in the literature.

The benchmark policy indicator counts the number of instruments in a category that are active in the reference period. To a certain degree the benchmark indicator captures the intensity of regulation and in regression analysis it will seize the average "treatment effect" of an instrument in the category. More specifically, indicator $D^j_{i,t}$ will denote the number of all policy instruments of type j that are active in country i at time t. For example, if three types of minimum capital requirements apply to banks in country i, capital adequacy ratio (CAR), Tier 1 and Core Tier 1 ratios, $D^{MINCAP}_{i,t}$ will equal 3. If there is no active policy instrument of type j in country j at time t, then $D^j_{i,t}$ is 0.

$$D^j_{i,t} = \begin{cases} n, & \text{number of active policy instruments of type } j \\ 0, & \text{otherwise} \end{cases}$$

The first alternative indicator is a simple dummy indicator d defined as in Lim *et al.* (2011) or Claessens *et al.* (2013). This indicator will take value of 1 if at least one policy instrument of

Table 2: A stylised example of the life-cycle of an LTV cap

Date	Policy event
1996Q1	Introduction of an LTV limit on mortgage loans of 90% for second-home buyers
1998Q2	Introduction of a stricter LTV limit of 80% for FX mortgage loans for first-and second-home buyers
1999Q1	Tightening of the LTV limit on FX loans to 70% and extending the LTV limit on domestic currency loans to second-home buyers
2003Q1	Allowing for 10% of loans in bank portfolio can be exempted from the limits
2008Q2	Removing LTV limit on FX currency loans
2014Q4	Removing LTV limit on mortgage loans in domestic currency

type j is active in country i at time t, and 0 otherwise:

$$d^j_{i,t} = \begin{cases} 1, & \text{at least one policy instrument of type } j \text{ is active} \\ 0, & \text{otherwise} \end{cases}$$

The second alternative indicator tracks single policy actions rather than the lifetime of an instrument. It follows Akinci and Olmstead-Rumsey (2018), Kuttner and Shim (2016) and Bruno *et al.* (2017). Here, the indicator hinges on the MaPPED question whether a policy action implied tightening, loosening or no change in macroprudential policy stance. Though the question introduces a degree of subjective judgment, it can accommodate the information whether a measure was binding at the moment intervention. Policy changes resulting from the activation, deactivation of recalibration of policy instruments $s^j_{i,t}$ are coded as:

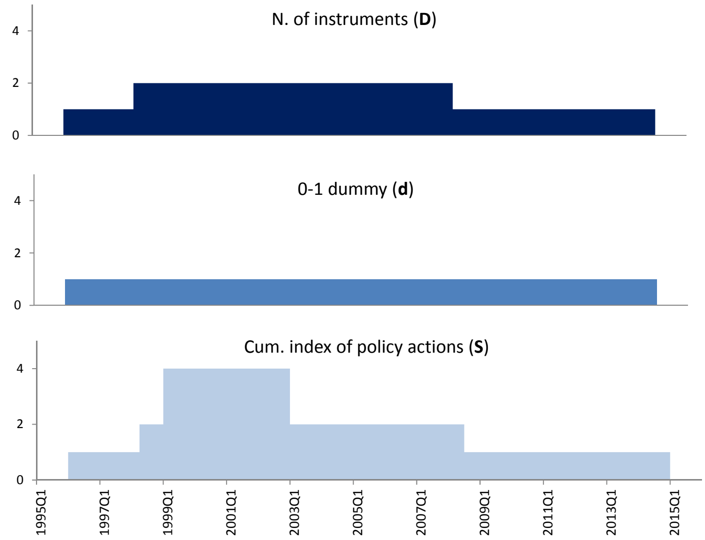
$$s^j_{i,t} = \begin{cases} 1, & \text{if policy instrument of type } j \text{ is tightened} \\ -1, & \text{if policy instrument of type } j \text{ is loosened} \\ 0, & \text{otherwise} \end{cases}$$

Then the net tightness policy index $S^j_{i,t}$ is defined as follows:

$$S^j_{i,t} = \sum_{q=0}^{t} s^j_{i,q} \tag{2.1}$$

A stylised example in Table 2 illustrates why the three policy indicators can differ, none being

Figure 1: LTV policy indicators in the stylised example



a priori most fitting to perform an empirical analysis. The example concerns LTV policies and, though stylised, is inspired by actual policy actions from MaPPED database. In this stylised example, the correlation between the alternative indices coding the same sequence of policies is high and positive (between d and D indicator 69%, and between S and D 82%) but not perfect. Figure 1 illustrates the diverging paths of the indicators.

2.3 Data on credit and other macro-financial aggregates

The data on bank credit to the domestic non-financial private sector stems from ECB Statistical Data Warehouse (SDW) and Bank of International Settlements (BIS). If needed, data from national central banks and the International Monetary Fund (IMF) supplements these sources. Same sources provide information on the two subcomponents of domestic bank credit: credit to non-financial corporations (NFC), and to households, including non-profit organisations serving households. Real credit volumes derive from dividing the nominal credit volumes by GDP deflator (for total and corporate bank credit) or CPI index (for household credit).

The remaining variables, namely GDP, GDP deflator, CPI index and monetary policy interest rates, stem from Eurostat, ECB SDW, BIS, with casual references to national sources. Monetary policy rates are expressed in real terms (using CPI inflation) in order to better represent the evolution of monetary policy stance. Appendix A provides more details on data sources and on performed statistical adjustments.

3 Summary statistics

Table 3 shows descriptive statistics on credit, GDP growth and real monetary policy interest rates. Next to the standard information on empirical distributions, the Table reports p-values of the CD test statistic by Pesaran (2004). These p-values validate the presence of significant cross-sectional dependence between cross-sectional units for all macro-financial variables. Complementing Table 3, Appendix B reports the year-on-year growth rate of bank credit in all 28 EU countries, and Appendix C the evolution of the year-on-year growth rate of GDP and of real interest rates.

Most of European countries experienced a marked moderation in credit growth following the last global crisis. Otherwise, the mean growth rate and general volatility of credit series appear already more country specific. In Western European countries credit dynamics evolved relatively smoothly, with only occasional periods of strong credit contractions, e.g. in Belgium during the crisis, or excessive credit expansions, e.g. in Denmark and Finland in early 2000s. Average annual growth of credit is highest in the Central, Eastern and Southeaster region, especially in the Baltics, where it dwindled above 50% for extended time intervals. In all countries, the dynamics of household credit often decoupled from corporate and total credit, marking the episodes of housing booms and busts.

Most countries experienced a sharp contraction in output during the last crisis and witnessed a secular decrease in the level of real interest rates. However, the data informs also about a sufficient number of country specific episodes. These include a sharp contraction in output in Cyprus and Greece during the European debt crisis, and in Romania at the beginning of the sample period. Real interest rates exhibit pronounced cross-country heterogeneity especially in the Central, Eastern and Southeaster region. Interest rates remained record low for extensive periods in currency board countries such as Baltics or Bulgaria, and very high e.g. during the disinflation period in Poland.

Table 4 summarizes the use of macroprudential policy instruments on a country-by-country basis. The first observation is that countries differ in the breadth of use of policy instruments. Greece, Croatia and Latvia applied instruments falling into 15 out of 18 categories, while Cyprus and the Czech Republic used only a third out of 18. The second observation is that some instruments are utilised more commonly than others. Among most popular instruments are minimum capital requirements, sectoral risk weights and limits on large exposures; each of which operated in all EU countries due to their prominent role in Basel accords and EU directives. 24 out of 28 European countries at some point set limits on short-term maturity mismatch, and 22 introduced capital buffers. More than half of the countries have implemented specific provisioning restrictions, selected borrower-based standards, limits on exposures to sectors or taxes on financial institutions and activities.

Table 5 provides summary statistics of the baseline and alternative policy indicators and compiles the sample correlation coefficients between them. In addition, Appendix D documents the evolution of the three types of indicators for capital-, borrower-, liquidity-based, and other instruments over time. For a substantial share of instruments, there is a high positive correlation between the three types of indicators. The correlation coefficients between indicators of profit distribution restrictions and large exposure limits are above 90%, followed by over 80% correlation coefficients for capital buffers, DTI, caps on short-term maturity and foreign exchange mismatch, sectoral exposure limits and taxes and levies. For the remaining categories, the correlation coefficients between baseline D and dummy indicators d stay above or around 70%, but the corresponding coefficients between the baseline and cumulative S indicators are significantly lower. This holds especially for income-based lending standards (the correlation coefficient between the baseline and cumulative S indicators below 0%) and to a lesser degree for risk weights, LTV and both types of reserve requirements (below 50%).

Finally, Table 6 documents the positive correlation between the use of different policy instruments as measured by the baseline indicators. The Table evidences that instruments within capital-based and borrower-based clusters are very often used jointly. There is also a substantial positive correlation between the use of caps on maturity mismatch and minimum capital requirements or between supervisory limits on specific versus general loan-loss provisioning. Though not reported, similar correlation patterns hold for the two alternative indicators.

4 Methodology

The empirical analysis rests on a series of cross-country panel regressions of the following form:

$$\Delta C_{i,t}^{s} = \alpha_i^0 + \alpha_i^c \Delta C_{i,t-1}^{s} + \beta^0 I_{i,t}^V + \beta^y I_{i,t}^V \Delta y_{i,t} + \beta^r I_{i,t}^V r_{i,t} + \tau_i^y \Delta y_{i,t} + \tau_i^r r_{i,t} + \tau_i X_{i,t} + \epsilon_{i,t} \quad (4.1)$$

The left-hand side variable is the quarter-on-quarter growth rate of real credit to the non-financial sector $\Delta C^s_{i,t}$, where i is a country and t a time index, while s stands for the type of credit aggregate: total, corporate or household credit.

On the right-hand side there is a standard set of credit demand controls. Among these, $\Delta y_{i,t}$ stands for quarter-on-quarter growth rate of output, and $r_{i,t}$ for real monetary policy interest rate. α^0_i are country fixed effects that absorb time-invariant cross-country heterogeneity, α^c_i captures the inertia in the evolution of credit and $\epsilon_{i,t}$ is a random component.

Each regression validates the individual impact of a macroprudential instrument and of its interactions with real interest rate and output growth. $I^V_{i,t}$ represents a policy index of one of the instruments categories V in Table 1. In baseline regressions, I will represent the sum of active macroprudential instruments D, while in the robustness section it will stand for either d or S indicators. $X_{i,t}$ is a matrix of other control variables that always includes an index representing all other macroprudential policies in place, and the same index as interacted with real interest rate and output. Including the information on other active macroprudential policies aims to account for the substantial intercorrelation between the use of various capital or liquidity policies discussed in section 3. The slope coefficients of all control variables are country-specific.

In order to conclude on the impact of a macroprudential instrument, I first test the joint statistical significance of β^0, β^y and β^y, and then look at the sign and statistical significance of each of the coefficients separately. A negative estimate of β^0 informs about a persistent negative effect of an instrument on credit growth, whereas a positive estimate informs about a persistent stimulating effect. A negative estimate of β^y signifies a countercyclical, while a positive estimate, a procyclical impact of an instrument on credit growth. Finally, a negative estimate of β^r suggests that a macroprudential instrument reinforces the transmission of monetary policy into credit growth, i.e. there are positive interactions between macroprudential and monetary policies. Correspondingly, a positive estimate of β^r suggests that a macroprudential instrument weakens the transmission of monetary policy into bank credit.

All regressions are estimated with the Pesaran (2006) and Chudik and Pesaran (2015) Dynamic Common Correlated Effect (CCE) estimator that accounts for cross-sectional dependence in regression residuals.[3] The presence of the latter in a large share of credit regressions is vali-

[3]The regressions have significantly larger time (around 90 quarters) compared to cross-country (28 countries) dimension which allows ignoring the lack of strict exogeneity of $\Delta C^S_{i,t-1}$ (its dependence on the past realisations of $\epsilon_{i,t}$). It contrasts with the analysis of Akinci and Olmstead-Rumsey (2018) or Cerutti *et al.* (2017) who consequently apply Arellano and Bond (1991) and Arellano and Bover (1995) estimator. As shown by Hahn and

dated by the CD test proposed by Pesaran (2004) and in these cases the standard fixed-effect panel estimators would become inconsistent. Accordingly, regression residuals are modelled as:

$$\epsilon_{i,t} = \gamma_t + \sum_{p=0}^{P}\sum_{k=1}^{K} \gamma_{i,p}^k F_{t-p}^k + \nu_{i,t} \tag{4.2}$$

where γ_t stands for time-effects and F_{t-p}^k is a p–th lag of k-th common factor.[4]

Last, a set of instrumental variables address the endogeneity of the right-hand side variables. The contemporaneous values of GDP, interest rates and policy indicators, as well as their interactions, are instrumented with their own lagged values and additionally with lagged values of CPI inflation (in all cases I use two lags) and of credit growth (three lags).

5 Results

This section discusses the baseline regressions with D-type policy indicators counting the number of activated instruments. Table 7 details the regression results. Though not reported, all control variables, namely GDP and real monetary policy interest rate, enter the regressions with the expected sign and are statistically significant. A 1pp increase in GDP growth rate leads to an expansion of credit to the non-financial private sector by around 0.9%; therein of corporate credit by around 2.2% and of household credit by around 0.7%. A 1pp increase in real monetary policy interest rates decreases the growth rate of total credit by around 0.5%, mostly by reducing the growth of credit to households (by 0.7%). The results for the headline groups of policy instruments are commented one after another below.

5.1 Capital-based measures

Most of capital-based instruments, therein capital buffers, profit distribution restrictions, sectoral risk weights and specific provisioning requirements, enter the regressions of total credit significantly at a 10% confidence level. All these instruments excluding capital buffers, but including general provisioning requirements, enter significantly also the regressions of corporate

Kuersteiner (2002) and Alvarez and Arellano (2003) OLS estimator generates an asymptotic bias proportional to $1/T$, while Arellano and Bond (1991) and Arellano and Bover (1995) estimator to $1/N$. It means that the latter estimator is advisable only in cases where $N << T$.

[4] Fixed time effects γ_t are commonly included in panel specifications e.g. by Lim *et al.* (2011). However, only as long as $\gamma_{i,p}^k = \gamma_{j,p}^k$ for any pair of countries i and j then adding a set of fixed time effects remove the time-effects. In contrast, when slopes $\gamma_{i,p}^k$ are heterogeneous across countries, differencing the equation does not guarantee the consistency of estimates.

or household credit. Only minimum capital requirements do not appear statistically significant in any of the regressions.

Capital buffers and sectoral risks weights reduce the procyclicality of credit. The interaction terms between both policy instruments and output growth enter the regressions of total and corporate credit negatively and statistically significant. There is also some empirical support for positive interaction between capital buffers and monetary policy regarding their impact on total credit.

The interaction terms between profit retention policies and interest rates, and sectoral risk weights and interest rates, are statistically significant and negative in the regressions of total and household credit. This suggests that sectoral risk weights and profit distribution policies can act countercyclically when put in tandem with countercyclical monetary policy.

Else, specific and general loan-loss provisioning have a positive and statistically significant impact on the growth rate of total and corporate credit. A positive estimate of β^0 in the corresponding regressions suggests a more general, over-the-cycle, stabilising impact of loan-loss provisioning on total credit growth.

These results compare favourably to earlier cross-country studies on the effectiveness of capital-based policies in controlling credit growth. Lim *et al.* (2011) validate the countercyclical effect of countercyclical capital requirements on credit, but fail to confirm a similar impact of profit distribution restrictions or risk weights. Claessens *et al.* (2013) or Cerutti *et al.* (2017) find no evidence of the impact of capital buffers on credit dynamics in advanced economies. On the other hand, findings regarding a negative impact of the interactions between capital buffers and monetary policy square well to earlier micro-data based evidence on the impact of bank capitalisation on the pass-through of monetary policy (e.g. Kishan and Opiela (2000), Buch *et al.* (2014) and Budnik and Bochmann (2017)).

5.2 Borrower-based measures

All four loan eligibility standards appear to influence credit growth and interact positively with monetary policy. The interaction terms between borrower-based instruments and real interest rate enter all regressions of total and household credit negatively, and are most of the time statistically significant. LTV standards have an additional procyclical effect on total credit, as suggested by the positive coefficient estimate of their interactions with output growth. The latter result can relate to the inherent procyclicality of collateral value. Beyond, other lending standards, such as maturity restrictions or amortisation requirements, appear to have a positive impact on total credit growth.

These results echo the findings of Lim *et al.* (2011), Cerutti *et al.* (2017) and Akinci and Olmstead-Rumsey (2018). All these authors report a negative or countercyclical impact of DTI and LTV caps on housing credit. Additionally, Claessens *et al.* (2013) and Cerutti *et al.* (2017) evidence a weak negative impact of DTI caps on housing credit, even if they find no analogous impact of LTV caps.

5.3 Liquidity-based measures

Asset-based reserve requirements, caps on short- and long-term maturity and exchange rate mismatch are all statistically significant in regressions for total or sectoral credit. On the contrary, there is no supporting evidence for a credit impact of liability-based reserve requirements.

Asset-based reserve requirements appear effective in moderating the growth rate of total and household credit. Their pronounced effect on household credit can relate to selective application of asset-based reserve requirements in a share of sample cases such as in Greece where, depending on the period, they targeted either housing or consumer credit. A negative over-the-cycle impact of asset-based reserve requirements parallels with earlier findings of Lim *et al.* (2011), Claessens *et al.* (2013) and Cerutti *et al.* (2017), though neither of the authors separated asset- from liability-based reserve requirements. A less intuitive result, which vanishes however in all robustness checks, is a positive estimate of the interaction term between asset-based reserve requirements and output growth.

Caps on long-term maturity and exchange rate mismatch bolster the transmission of monetary policy and have a positive over-the-cycle impact on the growth rate of total and corporate credit. The positive interactions with monetary policy, especially for long-term maturity caps, contrast with findings in earlier studies (e.g. Budnik and Bochmann (2017)) but can be justified on more general grounds. Both instruments are likely to strengthen the relationship between banks' assets and the domestic monetary base by asking banks to either back a sufficient fraction of their assets by domestic consumer deposits or by domestic currency denominated debt. In doing so the instruments limit the degree to which banks can finance loan expansion via international wholesale markets or by foreign-denominated liabilities. This in turn is likely to gives more leverage to domestic monetary policy and reinforce the domestic interest rate channel.

Regarding caps on short-term maturity mismatch, the regressions of corporate credit are again suggestive about the positive interactions between the caps and monetary policy. The related regressions for household credit regressions provide some support for a negative impact of the caps on over-the-cycle credit dynamics.

The outcomes for caps on foreign exchange rate mismatch add to generally mixed evidence on the impact of these instruments. Claessens *et al.* (2013) and Cerutti *et al.* (2017) provide some backing for their negative impact on credit growth. At the same time Cerutti *et al.* (2017) find no evidence of their impact on credit dynamics in developed economies, and Lim *et al.* (2011) no evidence of their impact on credit in either developed or emerging economies.

5.4 Other measures

Along with empirical estimates, large exposure limits increase the growth rate of total credit, while limits on sectoral exposures reduce the growth rate of household credit. The transmission of sectoral exposure limits into credit depends negatively on monetary policy stance. This effect is evidenced by positive and statistically significant estimates of the corresponding interactions terms in all credit regressions. Taxes and levies act countercyclically, simultaneously counterbalancing monetary policy actions.

The earlier evidence on the effectiveness of all these instruments in controlling credit growth is so far limited. Cerutti *et al.* (2017) looks at the impact of limits on interconnectedness and concentration, which would match the two exposure limit policies considered here. They find some evidence of their negative credit impact in the full panel of countries, though no similar evidence for a subset of developed countries.

6 Robustness checks

This section first reports the comparison between regression results using the baseline versus two alternative types of policy indicators. Later, it summarises the outcomes of other robustness checks, including the role of backcasting of selected macro series.

6.1 Alternative policy indicators

Departing from the baseline policy indicators leaves many of the baseline results qualitatively unscathed. It holds especially for the impact and interactions of profit distribution restrictions, sectoral risk weights, general provisioning, asset-based reserve requirements, caps on long-term maturity and exchange rate mismatch, as well as exposure limits, taxes and levies. However, in a share of cases, substituting the baseline indicators affects the statistical significance and sometimes also the sign of regression coefficients. These cases are summarised below in more detail.

6.1.1 Capital-based measures

Both alternative indicators substantiate negative interaction between minimum capital and buffer requirements and monetary policy. This effect was present in the baseline regressions of total and household credit but was either weakly or not at all statistically significant. Other than that, the use of alternative policy indicators signifies the relevance of the negative interactions between specific provisioning requirements and monetary policy regarding their impact on total and household credit.

6.1.2 Borrower-based measures

The two alternative policy indicators give less support than the baseline indicator to the reinforcing role of LTV caps in monetary policy transmission. Instead, the alternative specifications suggest that the caps have a sustained negative effect on total and corporate credit growth. For non-DTI income-based and other lending standards the interaction term with output growth becomes statistically significant and negative prompting the conclusion on the countercyclical effect of these instruments on total credit.

6.1.3 Liquidity-based measures

Employing the alternative policy indicators corroborates a negative impact of liability-based reserve requirement on credit growth. The remaining results on liability-based reserve requirements are hard to read. The coefficients on interaction of liability-based reserve requirements with monetary policy and the business cycle become significant but flip their signs depending on a policy indicator.

Alternative policy indicators do not sustain the conclusion on the procyclical credit effect of asset-based reserve requirements. If anything, the alternative specifications suggest that asset-based reserve requirements could have a countercyclical impact on corporate credit.

The outcomes for short-term liquidity caps are again difficult to interpret. The regressions support the positive impact of short-term liquidity caps on total and corporate credit growth which was absent in the baseline regressions. Moreover, the cumulative policy indicator, suggests that caps on short-term maturity mismatch can act countercyclically. However, the positive interactions with monetary policy detected in the baseline regressions do not reappear in the alternative specifications.

6.2 The effect of backcasting

Around 9% of observations are affected by backcasting of at least one time series entering regressions. Backcasting concerns earlier sample periods and inter alia credit series for Bulgaria and Romania, output and GDP deflator series for Malta, and GDP deflator for Croatia.[5] Table 9 reports the regressions based on the sample excluding these period-country observations.

In close to all cases, the estimates based on the trimmed sample concur with the baseline findings. Profit distribution restrictions and sectoral risk weights preserve their dependence on monetary policy stance and the business cycle, and appear to have an additional negative over-the-cycle impact on the growth rate of total credit. The negative interaction term between general provisioning requirements and monetary policy stance enters significantly the trimmed regression of total credit. And last, caps on short-term maturity mismatch lose their statistical significance in all credit regressions.

6.3 Other robustness checks

Additional versions of estimated regressions tested for the impact of adding a banking crisis dummy[6] to control variables, as in (Cerutti *et al.* 2017), changing the definition of monetary policy instrument from real to nominal central bank interest rate, and excluding a country at a time from the sample. Neither of the tested modifications would significantly affect the main conclusions.[7]

[5] Appendix A summarises such cases and the method of backcasting.

[6] The source of information about crisis events was the European financial crisis database described in Lo Duca *et al.* (2017).

[7] The detailed results of these robustness checks are not reported but are available upon request from the author.

7 Conclusions

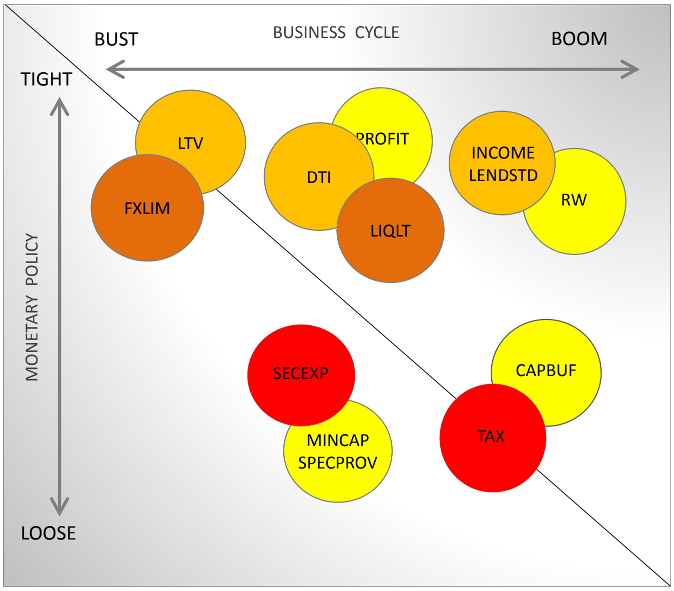
The paper evaluates a rich set of European macroprudential policy actions covering 20 years of experience from 28 countries to infer the impact of 18 distinct types of instruments on credit growth. Unlike many earlier cross-country comparative studies, the collected evidence is based mostly on the experience of developed countries. The overarching conclusion from the analysis is that the existing macroprudential toolbox, though highly complex, can be effective in influencing credit dynamics.

Capital buffers, profit distribution restrictions, sectoral risk weights and caps on maturity mismatch, all of which enter the Basel III standards, can influence credit dynamics. This also holds for standard supervisory instruments such as minimum capital requirement or large exposure limits. Among the instruments outside the scope of Basel III, impactful macroprudential instruments include restrictions on loan-loss provisioning, many borrower-based instruments, asset-based reserve requirements, caps on foreign exchange mismatch, sectoral exposure limits and taxes and levies on banks or their activities. All else equal, regulatory provisioning requirements, lending standards such as maturity and amortisation restrictions, caps on long-term maturity and foreign exchange mismatch, and large exposure limits, will have a stable positive impact on credit growth, while sectoral exposure limits and reserve requirements, will reduce credit growth.

Another general takeaway is that the optimal choice of macroprudential policies depends on the phase of the business cycle and on monetary policy stance. Figure 2 summarises the central outcomes regarding the interactions of macroprudential instruments with output growth and monetary policy in the form of a cheat sheet. The cheat sheet displays the policy menu of a macroprudential authority while ignoring autonomous credit effects of instruments such as a positive impact of liquidity caps mentioned earlier. The horizontal axis spans through possible states of the real economy, from a bust in the left-hand side to a boom in the right-hand side. The vertical axis reports the monetary policy stance, tight in the upper parts of the panel, and loose in the bottom parts. As long as monetary policy remains countercyclical, the economy is most likely to move on the diagonal between the upper-right corner (high output growth and tight monetary policy) and the lower-left corner (low output growth and loose monetary policy).

The diagonal line running from upper left to lower right separates instruments that maximise the likelihood of cooling credit growth (above the diagonal) from the instruments increasing the

Figure 2: State-contingent choice of macroprudential instruments



Notes: Yellow bubbles - capital-based instruments, light orange bubbles - borrower-based instruments, dark orange bubbles - liquidity-based instruments, red bubbles - other instruments.

risk of fuelling credit growth (below the diagonal). Along with the empirical evidence in the paper, the choice of capital buffers or taxes and levies may be best aligned with the intention of moderating credit dynamics if the economy is in a good state and monetary policy remains relatively loose. The choice would shift toward sectoral risk weights, income-based or other than LTV and DTI borrower-based measures when monetary policy tightens.

Another way of reading the cheat sheet is that the ultimate effect of a macroprudential instrument on credit hinges on monetary policy. The introduction of profit distribution restrictions or borrower-based measures will reinforce countercyclical monetary policy, while capital buffers or sectoral exposure limits requirements will, if anything, reduce its effectiveness.

The last conclusion is that the method of deriving of macroprudential policy indicators can matter for empirical identification. Sample correlation between policy indicators, defined along with three alternative definitions used so far in cross-country studies, is high as a rule but at occasions even negative. Further, swapping of indicators frequently affects statistical significance (though less so the sign) of model coefficients. It calls for more careful comparisons of findings from studies applying competing definitions of policy indicators. Beyond, it encourages further efforts to develop more comprehensive and universal policy indicators.

There are several caveats and limitations of the study, many of which are common to cross-country studies. However, one caveat deserves a special mention. Focusing mostly on European economies has a flip side of looking mostly at countries with varying degrees of exchange rate fixing. Even before the adoption of the euro, most of the EU countries followed the rigid rules of ERM I, and a share of Eastern economies quickly converged into equally rigid currency board regimes. Other Easter and South European countries went through episodes of pegging their currencies or entering ERMII. This fact may influence the generality of conclusions on the interactions between macroprudential and monetary policy.

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Tables

Table 3: Summary statistics

			(1) N	(2) mean	(3) sd	(4) p10	(5) p50	(6) p90	(7) $p^{\star}(CD)$	(8) $p^{\star}(\bar{W}^t)$
Total private credit	Q-o-Q	ΔC	2,548	0.013	0.051	-0.018	0.010	0.053	0.000	0.000
Corporate credit	Q-o-Q	ΔC	2,449	0.008	0.057	-0.028	0.006	0.052	0.000	0.000
Credit to households	Q-o-Q	ΔC	2,450	0.021	0.072	-0.015	0.012	0.069	0.000	0.000
GDP	Q-o-Q	Δy	2,548	0.006	0.014	-0.006	0.007	0.019	0.000	0.000
Monetary policy rate	%	r	2,548	0.005	0.086	-0.019	0.006	0.042	0.000	0.000

Notes: Column 7 reports the p-value of CD test statistic of Pesaran (2004). The null hypothesis of the test is that the cross-sectional units are independent. Column 8 reports the p-value of Im *et al.* (2003), $\bar{W}^t$ unit-root test statistics. Cross-sectional means are substracted from the series and the the number of lags chosen on the basis of Akaike criteria. The null hypothesis of the test is that all the panels contain a unit root.

Table 4: Policy instruments by countries

	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GB	GR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK
MINCAP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CAPBUF	X	X	X		X			X	X		X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X
PROFIT			X										X	X				X	X	X			X				X	X
RW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SPECPROV		X	X	X	X			X	X	X			X	X	X	X		X		X	X		X		X		X	X
GENPROV			X		X				X				X	X	X				X				X	X				
LTV				X			X			X			X	X	X			X		X		X	X		X	X	X	X
DTI				X								X	X	X	X			X		X		X	X		X			
INCOME			X									X	X		X					X								
LENDSTD	X		X				X			X			X	X	X		X	X	X	X		X	X	X	X		X	X
ABRR			X				X						X	X													X	
RR			X					X						X				X		X							X	X
LIQLT	X					X	X								X	X	X						X	X			X	X
LIQST	X	X	X	X		X	X			X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
FXLIM				X							X			X				X		X			X					
LAREXTPX	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
SECTEXP			X	X			X				X		X	X		X	X	X	X	X	X		X	X	X		X	X
TAX	X	X		X		X				X	X	X	X		X	X				X		X		X	X	X	X	X

Table 5: Summary statistics: policy incides

	D				d					S				
	mean	sd	min	max	mean	sd	min	max	corr(d,D)	mean	sd	min	max	corr(S,D)
MINCAP	1.407	0.881	0	6	0.993	0.0838	0	1	0.776***	3.060	2.005	0	13	0.891***
CAPBUF	0.744	1.170	0	6	0.410	0.492	0	1	0.811***	0.748	1.397	0	9	0.833***
PROFIT	0.138	0.359	0	2	0.133	0.339	0	1	0.981***	0.149	0.415	0	4	0.928***
RW	1.281	1.097	0	4	0.653	0.476	0	1	0.921***	0.364	1.383	-4	5	0.370***
SPECPROV	0.837	0.899	0	3	0.503	0.500	0	1	0.952***	1.016	1.800	-2	10	0.571***
GENPROV	0.287	0.514	0	2	0.257	0.437	0	1	0.958***	0.217	0.674	-1	2	0.704***
LTV	0.399	0.798	0	4	0.246	0.431	0	1	0.888***	0.264	0.989	-1	9	0.480***
DTI	0.238	0.623	0	3	0.160	0.367	0	1	0.891***	0.328	1.031	0	7	0.898***
INCOME	0.171	0.746	0	7	0.105	0.306	0	1	0.686***	-0.219	1.650	-11	1	−0.036***
LENDSTD	0.776	1.434	0	10	0.354	0.478	0	1	0.759***	0.357	1.461	-4	13	0.599***
ABRR	0.297	0.596	0	3	0.0361	0.187	0	1	0.810***	0.193	1.232	-4	9	0.267***
RR	0.055	0.374	0	6	0.228	0.420	0	1	0.930***	0.594	2.742	0	21	0.361***
LIQLT	0.279	0.792	0	6	0.121	0.327	0	1	0.950***	0.301	1.001	-2	6	0.666***
LIQST	3.696	0.901	0	7	0.679	0.467	0	1	0.835***	3.799	1.611	-1	7	0.907***
FXLIM	0.684	1.097	0	6	0.148	0.356	0	1	0.862***	0.648	1.255	0	8	0.798***
LAREXP	0.146	0.416	0	2	0.999	0.0343	0	1	0.936***	0.151	0.506	-1	5	0.906***
SECEXP	1.472	1.411	0	6	0.400	0.490	0	1	0.822***	1.895	2.511	-2	17	0.797***
TAX	0.209	0.476	0	2	0.179	0.383	0	1	0.946***	0.305	0.891	-2	7	0.758***

Notes: D is the benchmark policy indicator that counts the number of instruments in a category that are active at a certain point in time. d is a simple dummy indicator that takes value of 1 if at least one policy instrument in a category is active at a point in time. S is the net tightness indicator that cumulates events of policy tightening coded as 1 and loosening coded as -1. Individual significance of estimated correlation coefficients marked by stars: *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Correlation of benchmark policy indices D

	MINCAP	CAPBUF	PROFIT	RW	SPECPROV	GENPROV	LTV	DTI	INCOME	LENDSTD	ABRR	RR	LIQLT	LIQST	FXLIM	LAREXP	SECEXP
CAPBUF	0.65***																
PROFIT	0.27***	0.16***															
RW	0.38***	0.40***	0.11***														
SPECPROV	0.07***	0.04**	0.24***	−0.02													
GENPROV	0.11***	−0.01	0.10***	0.07***	0.23***												
LTV	0.23***	0.10***	0.14***	0.37***	0.11***	−0.06***											
DTI	0.34***	0.24***	0.21***	0.30***	0.13***	0.02	0.59***										
INCOME	0.03	0.02	0.39***	0.12***	0.04**	0.02	0.12***	0.00									
LENDSTD	0.29***	0.23***	0.31***	0.38***	0.16***	0.04**	0.45***	0.27***	0.56***								
ABRR	−0.04**	−0.03	0.20***	0.09***	0.01	0.02	0.13***	0.00	0.60***	0.32***							
RR	−0.06***	−0.04**	0.33***	−0.16***	0.30***	−0.07***	0.02	−0.04*	−0.05**	0.10***	0.02						
LIQLT	0.32***	0.08***	0.16***	0.15***	0.13***	0.05**	0.38***	0.26***	0.01	0.33***	0.03	0.15***					
LIQST	0.38***	0.33***	0.29***	0.39***	−0.11***	−0.07***	0.31***	0.27***	−0.02	0.15***	−0.00	0.15***	0.06***				
FXLIM	−0.03	−0.02	0.21***	−0.05***	0.05**	−0.139***	0.18***	0.01	−0.03	−0.10***	−0.01	0.24***	−0.11***	0.23***			
LAREXP	−0.08***	−0.06***	0.03*	−0.05***	−0.09***	0.29***	−0.12***	−0.12***	0.01	0.01	0.01	0.09***	0.10***	−0.15***	−0.15***		
SECEXP	0.08***	0.16***	0.17***	0.20***	0.08***	−0.04*	0.04*	0.07***	0.01	0.10***	0.08***	0.28***	0.25***	0.26***	0.07***	0.02	
TAX	0.46***	0.42***	−0.01	0.30***	−0.10***	−0.11***	0.18***	0.22***	−0.03	0.15***	−0.03*	−0.04**	0.14***	0.30***	0.16***	−0.19***	0.06***

Notes: Individual significance of estimated correlation coefficients marked by stars: *** p<0.01, ** p<0.05, * p<0.1.

Table 7: The effect of policy instruments on credit to private sector

Outcome variable	Real credit to private sector (Q-o-Q)		
	Total	NFC	Households
MINCAP			
I^{MINCAP}	0.000486	0.00162	0.000740
	(0.00315)	(0.00412)	(0.00272)
$I^{MINCAP} \times \Delta y$	0.133	-0.389	0.489**
	(0.161)	(0.333)	(0.210)
$I^{MINCAP} \times r$	0.0413	0.215	0.0266
	(0.215)	(0.131)	(0.163)
R^2	0.086	0.033	0.195
$p^{\star}(rk)$	0.0264	0.0368	0.0277
$p^{\star}(J)$	0.418	0.382	0.259
$p^{\star}(CD)$	0.137	0.00329	0.00459
$p^{\star}(F)$	0.785	0.330	0.117
CAPBUF			
I^{CAPBUF}	-0.000312	-0.00175	0.00256
	(0.00267)	(0.00265)	(0.00213)
$I^{CAPBUF} \times \Delta y$	-0.278*	-0.338*	0.0278
	(0.149)	(0.177)	(0.134)
$I^{CAPBUF} \times r$	0.139*	-0.0891	0.0490
	(0.0796)	(0.110)	(0.113)
R^2	0.060	0.049	0.113
$p^{\star}(rk)$	0.0384	0.0215	0.0225
$p^{\star}(J)$	0.409	0.303	0.664
$p^{\star}(CD)$	0.104	0.00549	0.0341
$p^{\star}(F)$	0.0941	0.162	0.644
PROFIT			
I^{PROFIT}	0.00202	-0.00284	-0.00752
	(0.00799)	(0.00845)	(0.00748)
$I^{PROFIT} \times \Delta y$	0.0792	0.261	0.840**
	(0.527)	(0.684)	(0.399)
$I^{PROFIT} \times r$	-0.894***	-0.507	-0.504**
	(0.318)	(0.366)	(0.231)
R^2	0.042	0.027	0.132
$p^{\star}(rk)$	0.0804	0.0984	0.0740
$p^{\star}(J)$	0.602	0.444	0.438
$p^{\star}(CD)$	0.0987	0.00320	0.179
$p^{\star}(F)$	0.0186	0.387	0.0172
RW			
I^{RW}	0.00231	0.000125	-0.00270
	(0.00373)	(0.00328)	(0.00372)
$I^{RW} \times \Delta y$	-0.271***	-0.480***	-0.195*
	(0.0846)	(0.148)	(0.112)
$I^{RW} \times r$	-0.239***	-0.00504	-0.0727
	(0.0749)	(0.0604)	(0.0599)
R^2	0.059	0.042	0.107
$p^{\star}(rk)$	0.0124	0.0240	0.0302
$p^{\star}(J)$	0.0415	0.0531	0.109
$p^{\star}(CD)$	0.0685	0.00344	0.0472
$p^{\star}(F)$	2.26e-05	0.0126	0.108
SPECPROV			
$I^{SPECPROV}$	0.0115**	0.0127	0.00363
	(0.00542)	(0.0132)	(0.00542)
$I^{SPECPROV} \times \Delta y$	0.0964	0.350	-0.0865
	(0.161)	(0.304)	(0.167)
$I^{SPECPROV} \times r$	0.0848	-0.364	0.0383
	(0.0691)	(0.279)	(0.0688)
R^2	0.064	0.024	0.062
$p^{\star}(rk)$	0.00554	0.00968	0.00712
$p^{\star}(J)$	0.422	0.220	0.123
$p^{\star}(CD)$	0.00837	0.00173	0.142
$p^{\star}(F)$	5.45e-06	0.0833	0.712

Table 7: (continued)

Outcome variable	Real credit to private sector (Q-o-Q)		
	Total	NFC	Households
GENPROV			
$I^{GENPROV}$	0.0333**	0.0276**	0.0125
	(0.0143)	(0.0132)	(0.00781)
$I^{GENPROV} \times \Delta y$	-0.156	-0.757	0.00198
	(0.338)	(0.544)	(0.217)
$I^{GENPROV} \times r$	0.148	-0.260	0.0846
	(0.207)	(0.220)	(0.138)
R^2	0.049	0.118	0.025
$p^\star(rk)$	0.0162	0.0731	0.0263
$p^\star(J)$	0.573	0.464	0.152
$p^\star(CD)$	0.0695	0.00347	0.115
$p^\star(F)$	0.133	0.0596	0.260
LTV			
I^{LTV}	0.00368	-0.00369	0.00359
	(0.00381)	(0.00535)	(0.00433)
$I^{LTV} \times \Delta y$	0.433***	0.199	-0.201
	(0.157)	(0.238)	(0.156)
$I^{LTV} \times r$	-0.210**	-0.133	-0.0428
	(0.0904)	(0.0872)	(0.114)
R^2	0.069	0.032	0.149
$p^\star(rk)$	0.00482	0.0894	0.0363
$p^\star(J)$	0.407	0.473	0.198
$p^\star(CD)$	0.0176	0.00143	0.0240
$p^\star(F)$	0.00249	0.298	0.520
DTI			
I^{DTI}	0.00536	0.00663	-0.00321
	(0.00375)	(0.00487)	(0.00315)
$I^{DTI} \times \Delta y$	-0.127	0.227	0.336
	(0.220)	(0.337)	(0.294)
$I^{DTI} \times r$	-0.429***	-0.405**	-0.439***
	(0.129)	(0.164)	(0.160)
R^2	0.065	0.034	0.227
$p^\star(rk)$	0.00591	0.0160	0.0153
$p^\star(J)$	0.494	0.473	0.623
$p^\star(CD)$	0.0383	0.00228	0.0182
$p^\star(F)$	0.00326	0.0270	0.0319
INCOME			
I^{INCOME}	-0.00530	-0.00445	-0.00627
	(0.0114)	(0.00758)	(0.0100)
$I^{INCOME} \times \Delta y$	-0.305	-0.0653	0.303
	(0.731)	(0.466)	(0.327)
$I^{INCOME} \times r$	-0.491*	0.123	-0.482***
	(0.261)	(0.141)	(0.161)
R^2	0.056	0.033	0.146
$p^\star(rk)$	0.0287	0.0488	0.0242
$p^\star(J)$	0.487	0.388	0.397
$p^\star(CD)$	0.0632	0.00123	0.0455
$p^\star(F)$	0.153	0.663	0.0235
LENDSTD			
$I^{LENDSTD}$	0.00656**	0.00244	0.00205
	(0.00297)	(0.00246)	(0.00270)
$I^{LENDSTD} \times \Delta y$	-0.0910	-0.358*	-0.0453
	(0.112)	(0.184)	(0.128)
$I^{LENDSTD} \times r$	-0.178**	-0.0158	-0.0948*
	(0.0719)	(0.0573)	(0.0565)
R^2	0.062	0.024	0.155
$p^\star(rk)$	0.00896	0.0211	0.0118
$p^\star(J)$	0.431	0.200	0.259
$p^\star(CD)$	0.562	0.00378	0.0598
$p^\star(F)$	0.0246	0.256	0.200

Table 7: (continued)

Outcome variable	Real credit to private sector (Q-o-Q)		
	Total	NFC	Households
RR			
I^{RR}	0.00199	-0.00593	-0.00117
	(0.00605)	(0.0131)	(0.00538)
$I^{RR} \times \Delta y$	0.0931	0.238	-0.0691
	(0.170)	(0.344)	(0.239)
$I^{RR} \times r$	-0.160	-0.00859	0.0403
	(0.122)	(0.111)	(0.114)
R^2	0.094	0.108	0.062
$p^\star(rk)$	0.000291	0.00457	0.00434
$p^\star(J)$	0.539	0.328	0.733
$p^\star(CD)$	0.200	0.00418	0.199
$p^\star(F)$	0.528	0.870	0.968
ABRR			
I^{ABRR}	-0.0337***	-0.00894	-0.0328***
	(0.00911)	(0.00817)	(0.00987)
$I^{ABRR} \times \Delta y$	0.845**	-0.0780	1.044*
	(0.416)	(0.576)	(0.590)
$I^{ABRR} \times r$	0.506	0.205	0.389
	(0.316)	(0.241)	(0.279)
R^2	0.078	0.029	0.194
$p^\star(rk)$	0.0198	0.0459	0.0290
$p^\star(J)$	0.203	0.129	0.614
$p^\star(CD)$	0.0550	0.00102	0.0962
$p^\star(F)$	0.00294	0.679	0.00492
LIQLT			
I^{LIQLT}	0.0128***	0.00955*	0.00897**
	(0.00438)	(0.00517)	(0.00369)
$I^{LIQLT} \times \Delta y$	0.368	-0.304	-0.0788
	(0.235)	(0.364)	(0.262)
$I^{LIQLT} \times r$	-0.409***	-0.499***	0.0934
	(0.115)	(0.187)	(0.211)
R^2	0.077	0.026	0.164
$p^\star(rk)$	0.504	0.516	0.479
$p^\star(J)$	0.454	0.270	0.668
$p^\star(CD)$	0.0346	0.00265	0.150
$p^\star(F)$	0.000358	0.0472	0.0261
LIQST			
I^{LIQST}	-0.00675	0.00613	-0.0110**
	(0.00474)	(0.00506)	(0.00446)
$I^{LIQST} \times \Delta y$	0.0203	-0.0175	0.300**
	(0.150)	(0.199)	(0.118)
$I^{LIQST} \times r$	0.0738	-0.0835**	0.0929
	(0.0763)	(0.0400)	(0.0799)
R^2	0.086	0.049	0.091
$p^\star(rk)$	0.00258	0.00849	0.0126
$p^\star(J)$	0.260	0.213	0.589
$p^\star(CD)$	0.0293	0.00169	0.0122
$p^\star(F)$	0.290	0.0460	0.0359
FXLIM			
I^{FXLIM}	0.0189**	0.0208***	0.00640
	(0.00853)	(0.00789)	(0.00663)
$I^{FXLIM} \times \Delta y$	0.421**	0.644	0.263
	(0.163)	(0.408)	(0.295)
$I^{FXLIM} \times r$	-0.246***	-0.330**	-0.109
	(0.0703)	(0.157)	(0.138)
R^2	0.048	0.062	0.228
$p^\star(rk)$	0.0764	0.0924	0.0549
$p^\star(J)$	0.666	0.437	0.121
$p^\star(CD)$	0.0290	0.00272	0.277
$p^\star(F)$	1.49e-06	0.0339	0.699

Table 7: (continued)

Outcome variable	Real credit to private sector (Q-o-Q)		
	Total	NFC	Households
LAREXP			
I^{LAREXP}	0.0146***	0.00266	0.00563
	(0.00523)	(0.00357)	(0.00375)
$I^{LAREXP} \times \Delta y$	-0.192	-0.271	0.0135
	(0.181)	(0.263)	(0.121)
$I^{LAREXP} \times r$	0.0899	0.0879	0.0210
	(0.0699)	(0.102)	(0.0485)
R^2	0.078	0.044	0.185
$p^\star(rk)$	0.00380	0.00878	0.0107
$p^\star(J)$	0.184	0.239	0.416
$p^\star(CD)$	0.0780	0.00699	0.00725
$p^\star(F)$	0.00612	0.623	0.483
SECEXP			
I^{SECEXP}	-0.00529	0.00352	-0.0198***
	(0.00482)	(0.00613)	(0.00566)
$I^{SECEXP} \times \Delta y$	-0.0141	-0.295	0.271*
	(0.121)	(0.337)	(0.155)
$I^{SECEXP} \times r$	0.279***	0.166**	0.238***
	(0.0610)	(0.0685)	(0.0758)
R^2	0.065	0.056	0.083
$p^\star(rk)$	0.0271	0.0613	0.0375
$p^\star(J)$	0.739	0.813	0.697
$p^\star(CD)$	0.0198	0.00803	0.0549
$p^\star(F)$	4.71e-05	0.108	0.000953
TAX			
I^{TAX}	-0.000548	0.00460	-0.00692
	(0.00474)	(0.00571)	(0.00782)
$I^{TAX} \times \Delta y$	-0.595**	-0.313	0.178
	(0.291)	(0.329)	(0.348)
$I^{TAX} \times r$	0.495**	0.376*	0.212
	(0.193)	(0.215)	(0.204)
R^2	0.086	0.029	0.119
$p^\star(rk)$	0.00613	0.0190	0.0138
$p^\star(J)$	0.400	0.268	0.250
$p^\star(CD)$	0.0141	0.00182	0.0416
$p^\star(F)$	0.0602	0.243	0.434
Observations	2,513	2,429	2,416
Number of groups	28	28	28
Number of factors	1	0	1

Notes: Regressions controled for country FE, real GDP growth rate, real interest rate and the presence of other policies (incl. their interactions with GDP growth and real monetary policy interest rates) and two quarterly dummies for Austria (2Q and 3Q04). Dynamic Common Correlated Effects estimator, with pooled (homogenous) coefficients on policy indices and their interactions. $p^\star(rk)$ - p-value of the Kleibergen and Paap (2006) rk LM test statistics of underidentifying restrictions. The null hypothesis of the test states that (excluded) instruments are not correlated with the endogenous regressors. $p^\star(J)$ - p-value of the Hansen (1982) J test statistics of overidentifying restrictions. The null hypothesis of the test states that instruments are valid and excluded instruments are correctly excluded from the estimated regression. $p^\star(CD)$ - p-value of the CD test statistic of Pesaran (2004). The null hypothesis of the test is that the cross-sectional residuals are independent. $p^\star(F)$ - p-value of the Wald statistic of joint significance of the tested policy index and its interactions with real GDP growth rate and real interest rate. For $p^\star(F) < 10\%$ estimated coefficients are shaded blue. Standard errors in parentheses. Individual significance of estimated coefficients marked by stars: *** p<0.01, ** p<0.05, * p<0.1.

Table 8: The effect of policy instruments on credit to private sector: alternative policy indicators

Outcome variable	Real credit to private sector (Q-o-Q)					
	Total		NFC		Households	
Estimator	d (0-1)	S (Cumulative)	d (0-1)	S (Cumulative)	d (0-1)	S (Cumulative)
MINCAP						
I^{MINCAP}		-0.00162		0.00346		0.00320
		(0.00244)		(0.00313)		(0.00231)
$I^{MINCAP} \times \Delta y$		-0.145		-0.335**		0.0279
		(0.0991)		(0.130)		(0.0793)
$I^{MINCAP} \times r$		0.0418		0.0228		0.165**
		(0.0730)		(0.0734)		(0.0646)
R^2		0.048		0.029		0.142
$p^\star(rk)$		0.0200		0.0292		0.0335
$p^\star(J)$		0.548		0.557		0.561
$p^\star(CD)$		0.755		0.00518		0.364
$p^\star(F)$		0.241		0.0838		0.0583
CAPBUF						
I^{CAPBUF}	0.000147	-0.00420	0.00569	-0.00417	-0.000512	0.00317
	(0.00578)	(0.00314)	(0.00851)	(0.00275)	(0.00436)	(0.00244)
$I^{CAPBUF} \times \Delta y$	-0.486**	-0.00446	-1.441**	-0.168	-0.223	0.00222
	(0.223)	(0.133)	(0.658)	(0.116)	(0.358)	(0.0912)
$I^{CAPBUF} \times r$	0.211***	0.238***	0.0501	0.0958	0.404***	0.319***
	(0.0803)	(0.0808)	(0.150)	(0.0738)	(0.0861)	(0.0914)
R^2	0.090	0.052	0.082	0.064	0.096	0.059
$p^\star(rk)$	0.00181	0.127	0.00371	0.0880	0.00768	0.0549
$p^\star(J)$	0.570	0.378	0.396	0.409	0.635	0.391
$p^\star(CD)$	0.0226	0.0334	0.000557	0.00273	0.539	0.157
$p^\star(F)$	0.00642	0.0148	0.167	0.187	6.25e-05	0.00402
PROFIT						
I^{PROFIT}	-0.00489	-0.00308	-7.85e-05	-0.00908	0.00260	0.00708
	(0.00739)	(0.00938)	(0.00837)	(0.00967)	(0.00690)	(0.00783)
$I^{PROFIT} \times \Delta y$	-0.0835	0.0132	-0.277	0.572	-0.421	0.535
	(0.452)	(0.472)	(0.517)	(0.763)	(0.518)	(0.395)
$I^{PROFIT} \times r$	-0.749***	-0.391*	-0.529	-0.406*	-0.370**	-0.256
	(0.250)	(0.203)	(0.343)	(0.235)	(0.178)	(0.199)
R^2	0.033	0.050	0.040	0.031	0.198	0.188
$p^\star(rk)$	0.0247	0.0788	0.0376	0.0734	0.0358	0.0697
$p^\star(J)$	0.782	0.762	0.580	0.723	0.518	0.442
$p^\star(CD)$	0.472	0.131	0.00830	0.00478	0.911	0.849
$p^\star(F)$	0.0144	0.146	0.434	0.0710	0.107	0.214
RW						
I^{RW}	0.00827	0.00537**	0.00832	-0.00295	-0.00427	0.000735
	(0.00791)	(0.00270)	(0.00841)	(0.00330)	(0.0133)	(0.00346)
$I^{RW} \times \Delta y$	-0.771***	-0.181**	-1.090	-0.176*	-0.715**	0.0739
	(0.280)	(0.0712)	(0.672)	(0.0980)	(0.314)	(0.0764)
$I^{RW} \times r$	-0.293**	-0.0365	0.0460	-0.0363	-0.101	0.0623
	(0.132)	(0.0494)	(0.171)	(0.0559)	(0.141)	(0.0572)
R^2	0.084	0.063	0.095	0.027	0.289	0.309
$p^\star(rk)$	0.0621	0.0496	0.0260	0.0802	0.0339	0.0507
$p^\star(J)$	0.290	0.600	0.538	0.539	0.386	0.573
$p^\star(CD)$	0.213	0.0221	0.00532	0.00177	0.0918	0.200
$p^\star(F)$	0.00731	0.00571	0.325	0.190	0.0988	0.531
SPECPROV						
$I^{SPECPROV}$	0.00976	0.0112**	0.0228	0.00324	0.0167	0.00606
	(0.00808)	(0.00554)	(0.0182)	(0.00658)	(0.0110)	(0.00433)
$I^{SPECPROV} \times \Delta y$	-0.134	0.0548	0.173	0.0104	-0.424	-0.0715
	(0.254)	(0.0910)	(0.554)	(0.0805)	(0.262)	(0.0627)
$I^{SPECPROV} \times r$	0.546***	0.129**	-0.539	-0.118	-0.0281	0.211***
	(0.149)	(0.0536)	(0.385)	(0.0841)	(0.176)	(0.0611)
R^2	0.056	0.051	0.059	0.029	0.065	0.191
$p^\star(rk)$	0.0209	0.127	0.00636	0.0634	0.0218	0.0729
$p^\star(J)$	0.539	0.630	0.214	0.329	0.169	0.767
$p^\star(CD)$	0.0142	0.0109	0.00180	0.00346	0.0966	0.674

Table 8: (continued)

Outcome variable	Real credit to private sector (Q-o-Q)					
	Total		NFC		Households	
Estimator	d (0-1)	S (Cumulative)	d (0-1)	S (Cumulative)	d (0-1)	S (Cumulative)
$p^{\star}(F)$	0.000304	0.000816	0.254	0.485	0.249	0.00250
GENPROV						
$I^{GENPROV}$	0.0282*	0.0341***	0.0257*	0.0320***	0.0115	0.0471**
	(0.0144)	(0.0124)	(0.0137)	(0.0112)	(0.00765)	(0.0187)
$I^{GENPROV} \times \Delta y$	0.0325	0.666**	-0.832*	0.517	0.0240	0.146
	(0.263)	(0.325)	(0.502)	(0.462)	(0.242)	(0.194)
$I^{GENPROV} \times r$	-0.123	-0.0626	-0.328	-0.340*	-0.135	0.237**
	(0.121)	(0.105)	(0.307)	(0.186)	(0.122)	(0.0960)
R^2	0.049	0.048	0.142	0.019	0.044	0.237
$p^{\star}(rk)$	0.0154	0.103	0.0113	0.0872	0.0115	0.0341
$p^{\star}(J)$	0.495	0.504	0.369	0.295	0.354	0.342
$p^{\star}(CD)$	0.140	0.0653	0.00691	0.00133	0.203	0.0706
$p^{\star}(F)$	0.153	0.0106	0.0657	0.0182	0.312	0.00377
LTV						
I^{LTV}	0.00228	-0.0137***	-0.00295	-0.00700***	0.00653	-0.00321
	(0.00558)	(0.00284)	(0.00708)	(0.00257)	(0.00671)	(0.00374)
$I^{LTV} \times \Delta y$	0.264	0.371*	-0.457	0.237	-0.572*	0.0107
	(0.246)	(0.198)	(0.671)	(0.258)	(0.315)	(0.139)
$I^{LTV} \times r$	-0.00915	0.128	-0.117	0.00540	0.431**	0.0872
	(0.171)	(0.0877)	(0.197)	(0.0871)	(0.212)	(0.106)
R^2	0.066	0.062	0.028	0.034	0.223	0.299
$p^{\star}(rk)$	0.0393	0.164	0.133	0.204	0.109	0.194
$p^{\star}(J)$	0.520	0.591	0.372	0.652	0.383	0.331
$p^{\star}(CD)$	0.0336	0.0524	0.00485	0.00419	0.279	0.273
$p^{\star}(F)$	0.713	1.48e-05	0.739	0.0503	0.0854	0.796
DTI						
I^{DTI}	0.00964	0.00182	0.0149**	0.00702*	-0.00926	-0.00286
	(0.00646)	(0.00303)	(0.00691)	(0.00361)	(0.00675)	(0.00412)
$I^{DTI} \times \Delta y$	-0.0698	0.429**	-0.903*	0.202	0.0786	0.452
	(0.288)	(0.218)	(0.530)	(0.278)	(0.322)	(0.282)
$I^{DTI} \times r$	-0.330**	-0.0309	-0.407**	-0.125	0.145	0.0209
	(0.160)	(0.160)	(0.173)	(0.0868)	(0.230)	(0.0983)
R^2	0.068	0.064	0.037	0.034	0.274	0.307
$p^{\star}(rk)$	0.109	0.0227	0.483	0.0321	0.476	0.0178
$p^{\star}(J)$	0.724	0.610	0.457	0.604	0.621	0.372
$p^{\star}(CD)$	0.0244	0.0376	0.00744	0.00345	0.171	0.589
$p^{\star}(F)$	0.171	0.106	0.0368	0.0489	0.513	0.457
INCOME						
I^{INCOME}	-0.00895	-0.00684	-0.0176*	0.00126	-0.0138	-0.000550
	(0.0121)	(0.00907)	(0.00992)	(0.00837)	(0.00877)	(0.00828)
$I^{INCOME} \times \Delta y$	-0.923*	-0.394	-0.177	-0.458	1.275**	-0.0495
	(0.498)	(1.109)	(0.771)	(0.688)	(0.592)	(0.699)
$I^{INCOME} \times r$	-0.870***	-0.0701	-0.164	0.165	-0.852***	-0.337*
	(0.304)	(0.239)	(0.199)	(0.192)	(0.254)	(0.181)
R^2	0.037	0.082	0.025	0.048	0.172	0.133
$p^{\star}(rk)$	0.0197	0.0979	0.0353	0.107	0.0398	0.0562
$p^{\star}(J)$	0.709	0.455	0.559	0.434	0.609	0.302
$p^{\star}(CD)$	0.126	0.922	0.00248	0.00285	0.581	0.844
$p^{\star}(F)$	0.000981	0.616	0.159	0.763	0.00662	0.253
LENDSTD						
$I^{LENDSTD}$	0.0147***	-1.45e-05	0.0121*	0.00304	0.0178***	-0.000633
	(0.00558)	(0.00202)	(0.00659)	(0.00196)	(0.00561)	(0.00282)
$I^{LENDSTD} \times \Delta y$	-0.625**	-0.290	-0.828	-0.261	-0.152	0.0566
	(0.282)	(0.180)	(0.545)	(0.176)	(0.365)	(0.122)
$I^{LENDSTD} \times r$	-0.0523	0.111	-0.0526	0.0935	0.0367	0.0132
	(0.214)	(0.102)	(0.263)	(0.0787)	(0.237)	(0.0722)
R^2	0.046	0.052	0.012	0.039	0.126	0.284
$p^{\star}(rk)$	0.000720	0.0137	0.00399	0.0228	0.00521	0.0120
$p^{\star}(J)$	0.626	0.608	0.559	0.526	0.443	0.271

Table 8: (continued)

Outcome variable	Real credit to private sector (Q-o-Q)					
	Total		NFC		Households	
Estimator	d (0-1)	S (Cumulative)	d (0-1)	S (Cumulative)	d (0-1)	S (Cumulative)
$p^{\star}(CD)$	0.115	0.718	0.00870	0.00216	0.237	0.596
$p^{\star}(F)$	0.0184	0.307	0.256	0.314	0.00627	0.958
RR						
I^{RR}	-0.0245*	-0.00832	-0.0693*	-0.00594	-0.0241	-0.00886**
	(0.0138)	(0.00574)	(0.0358)	(0.00399)	(0.0226)	(0.00353)
$I^{RR} \times \Delta y$	0.210	-0.369***	1.029*	-0.436**	0.609	-0.243**
	(0.248)	(0.113)	(0.561)	(0.187)	(0.412)	(0.116)
$I^{RR} \times r$	-0.336**	0.178***	-0.291**	0.0456	-0.285*	0.0969**
	(0.136)	(0.0681)	(0.135)	(0.0643)	(0.159)	(0.0391)
R^2	0.101	0.057	0.185	0.054	0.050	0.138
$p^{\star}(rk)$	0.000613	0.372	0.000596	0.389	0.000595	0.566
$p^{\star}(J)$	0.811	0.630	0.636	0.695	0.548	0.379
$p^{\star}(CD)$	0.489	0.127	0.00612	0.00170	0.565	0.131
$p^{\star}(F)$	0.0284	0.00217	0.0705	0.00850	0.145	0.000560
ABRR						
I^{ABRR}	-0.0257**	-0.00193	-0.0107	-0.00157	-0.0411***	-0.00716**
	(0.0125)	(0.00212)	(0.0110)	(0.00256)	(0.0145)	(0.00340)
$I^{ABRR} \times \Delta y$	1.226*	-0.0298	-0.900*	-0.245*	-0.307	-0.144
	(0.673)	(0.0516)	(0.519)	(0.129)	(0.427)	(0.0949)
$I^{ABRR} \times r$	0.329	0.0400	0.281	-0.0124	0.584	0.0960**
	(0.402)	(0.0301)	(0.287)	(0.0294)	(0.399)	(0.0398)
R^2	0.046	0.035	0.045	0.023	0.155	0.315
$p^{\star}(rk)$	0.00469	0.0959	0.000169	0.0994	0.00128	0.0583
$p^{\star}(J)$	0.549	0.507	0.205	0.434	0.445	0.399
$p^{\star}(CD)$	0.0504	0.305	0.000709	0.00434	0.281	0.450
$p^{\star}(F)$	0.201	0.293	0.289	0.00869	0.0329	0.0266
LIQLT						
I^{LIQLT}	0.0113	0.00595	0.0131*	0.00472	0.00402	-0.00304
	(0.00706)	(0.00426)	(0.00682)	(0.00438)	(0.00445)	(0.00551)
$I^{LIQLT} \times \Delta y$	-0.0333	0.490	-0.437	0.0737	-0.109	-0.300
	(0.247)	(0.330)	(0.508)	(0.279)	(0.262)	(0.272)
$I^{LIQLT} \times r$	-0.352**	-0.347**	-0.506**	-0.453**	0.225	-0.126
	(0.164)	(0.145)	(0.221)	(0.188)	(0.250)	(0.197)
R^2	0.066	0.059	0.025	0.026	0.207	0.256
$p^{\star}(rk)$	0.663	0.345	0.649	0.326	0.706	0.269
$p^{\star}(J)$	0.569	0.356	0.366	0.225	0.660	0.272
$p^{\star}(CD)$	0.191	0.0634	0.00628	0.00319	0.709	0.918
$p^{\star}(F)$	0.0591	0.00582	0.00974	0.0189	0.594	0.417
LIQST						
I^{LIQST}	0.00826	0.00830**	0.0114	0.00888***	0.00189	0.00107
	(0.00620)	(0.00350)	(0.0108)	(0.00278)	(0.00703)	(0.00153)
$I^{LIQST} \times \Delta y$	0.0361	-0.387***	0.119	-0.291**	0.255	0.142
	(0.314)	(0.121)	(0.507)	(0.113)	(0.328)	(0.0983)
$I^{LIQST} \times r$	0.0559	0.0124	0.196*	0.00725	0.262	0.103**
	(0.212)	(0.0580)	(0.114)	(0.0222)	(0.182)	(0.0462)
R^2	0.103	0.061	0.080	0.026	0.135	0.091
$p^{\star}(rk)$	0.0121	0.119	0.00369	0.166	0.00233	0.0884
$p^{\star}(J)$	0.530	0.566	0.481	0.612	0.709	0.698
$p^{\star}(CD)$	0.0852	0.195	0.00285	0.00324	0.367	0.232
$p^{\star}(F)$	0.557	0.0139	0.201	0.00628	0.333	0.0975
FXLIM						
I^{FXLIM}	0.0339***	0.00681**	0.0538***	0.0109*	0.0273**	0.0106*
	(0.0124)	(0.00282)	(0.0135)	(0.00625)	(0.0139)	(0.00632)
$I^{FXLIM} \times \Delta y$	0.636**	0.277**	1.063*	0.512	0.535	0.185
	(0.288)	(0.118)	(0.639)	(0.449)	(0.468)	(0.171)
$I^{FXLIM} \times r$	-0.495***	-0.0422	-0.747***	-0.205	-0.156	-0.0555
	(0.170)	(0.0470)	(0.231)	(0.152)	(0.229)	(0.122)
R^2	0.052	0.031	0.063	0.041	0.107	0.295
$p^{\star}(rk)$	0.0453	0.101	0.0651	0.0986	0.0623	0.0645

Table 8: (continued)

Outcome variable	Real credit to private sector (Q-o-Q)					
	Total		NFC		Households	
Estimator	d (0-1)	S (Cumulative)	d (0-1)	S (Cumulative)	d (0-1)	S (Cumulative)
$p^{\star}(J)$	0.858	0.664	0.468	0.466	0.408	0.374
$p^{\star}(CD)$	0.124	0.142	0.00631	0.00684	0.853	0.574
$p^{\star}(F)$	0.000666	0.000221	0.000261	0.334	0.0978	0.155
LAREXP						
I^{LAREXP}		0.00753***		0.00657**		0.00540**
		(0.00212)		(0.00323)		(0.00254)
$I^{LAREXP} \times \Delta y$		-0.0693		-0.113		0.0960
		(0.0761)		(0.150)		(0.0767)
$I^{LAREXP} \times r$		0.0674		0.0152		0.0284
		(0.0411)		(0.0528)		(0.0297)
R^2		0.096		0.049		0.106
$p^{\star}(rk)$		0.0972		0.0607		0.0901
$p^{\star}(J)$		0.606		0.526		0.206
$p^{\star}(CD)$		0.0278		0.00680		0.0633
$p^{\star}(F)$		5.38e-05		0.209		0.0160
SECEXP						
I^{SECEXP}	-0.0105	-0.00468	0.00446	-0.00255	0.00558	-0.00847*
	(0.00999)	(0.00570)	(0.0218)	(0.00695)	(0.0113)	(0.00448)
$I^{SECEXP} \times \Delta y$	0.500	0.330**	-1.058	0.161	-0.221	0.199*
	(0.367)	(0.163)	(1.105)	(0.302)	(0.430)	(0.111)
$I^{SECEXP} \times r$	0.454***	0.181***	0.396**	0.100	0.240	0.129**
	(0.145)	(0.0474)	(0.176)	(0.0668)	(0.190)	(0.0592)
R^2	0.049	0.070	0.051	0.049	0.122	0.073
$p^{\star}(rk)$	0.00218	0.792	0.00547	0.790	0.00716	0.683
$p^{\star}(J)$	0.796	0.770	0.767	0.769	0.622	0.515
$p^{\star}(CD)$	0.00225	0.00905	0.00252	0.00525	0.300	0.293
$p^{\star}(F)$	0.00407	0.000334	0.119	0.404	0.614	0.0324
TAX						
I^{TAX}	0.00178	-0.00244	0.0100	0.00644	-0.00195	-0.00957*
	(0.00544)	(0.00313)	(0.00618)	(0.00413)	(0.00886)	(0.00497)
$I^{TAX} \times \Delta y$	-0.754***	-0.196	-0.824*	-0.294	-0.411	0.244
	(0.264)	(0.182)	(0.447)	(0.210)	(0.337)	(0.243)
$I^{TAX} \times r$	0.291*	0.105	0.132	0.0342	0.240	0.115
	(0.171)	(0.0912)	(0.182)	(0.0958)	(0.225)	(0.102)
R^2	0.062	0.037	0.027	0.024	0.122	0.239
$p^{\star}(rk)$	0.124	0.0257	0.101	0.0327	0.0933	0.0125
$p^{\star}(J)$	0.706	0.544	0.502	0.342	0.514	0.505
$p^{\star}(CD)$	0.138	0.0264	0.00482	0.00263	0.726	0.581
$p^{\star}(F)$	0.0348	0.400	0.167	0.222	0.354	0.139
Observations	2,513	2,513	2,429	2,429	2,416	2,416
Number of groups	28	28	28	28	28	28
Number of factors	1	1	0	0	1	1

Notes: Regressions controled for country FE, real GDP growth rate, real interest rate and the presence of other policies (incl. their interactions with GDP growth and real monetary policy interest rates) and two quarterly dummies for Austria (2Q and 3Q04). Dynamic Common Correlated Effects estimator, with pooled (homogenous) coefficients on policy indices and their interactions. $p^{\star}(rk)$ - p-value of the Kleibergen and Paap (2006) rk LM test statistics of underidentifying restrictions. The null hypothesis of the test states that (excluded) instruments are not correlated with the endogenous regressors. $p^{\star}(J)$ - p-value of the Hansen (1982) J test statistics of overidentifying restrictions. The null hypothesis of the test states that instruments are valid and excluded instruments are correctly excluded from the estimated regression. $p^{\star}(CD)$ - p-value of the CD test statistic of Pesaran (2004). The null hypothesis of the test is that the cross-sectional residuals are independent. $p^{\star}(F)$ - p-value of the Wald statistic of joint significance of the tested policy index and its interactions with real GDP growth rate and real interest rate. For $p^{\star}(F) < 10\%$ estimated coefficients are shaded blue. Standard errors in parentheses. Individual significance of estimated coefficients marked by stars: *** p<0.01, ** p<0.05, * p<0.1.

Table 9: The effect of policy instruments on credit to private sector: the effect of backcasting

Outcome variable	Real credit to private sector (Q-o-Q)		
	Total	NFC	Households
MINCAP			
I^{MINCAP}	-0.00352	0.00434	-4.30e-05
	(0.00264)	(0.00444)	(0.00267)
$I^{MINCAP} \times \Delta y$	-0.0562	-0.432	-0.0563
	(0.136)	(0.357)	(0.195)
$I^{MINCAP} \times r$	-0.0566	0.0910	0.00350
	(0.125)	(0.168)	(0.130)
R^2	0.128	0.033	0.104
$p^{\star}(rk)$	0.0539	0.0849	0.0596
$p^{\star}(J)$	0.711	0.794	0.204
$p^{\star}(CD)$	0.0289	0.0269	0.110
$p^{\star}(F)$	0.216	0.566	0.992
CAPBUF			
I^{CAPBUF}	-0.000737	-0.00331	-0.000452
	(0.00246)	(0.00287)	(0.00217)
$I^{CAPBUF} \times \Delta y$	-0.333***	-0.398**	-0.177
	(0.106)	(0.167)	(0.128)
$I^{CAPBUF} \times r$	-0.0415	-0.0602	0.201**
	(0.0921)	(0.0778)	(0.0942)
R^2	0.102	0.041	0.113
$p^{\star}(rk)$	0.00958	0.0339	0.0310
$p^{\star}(J)$	0.642	0.685	0.631
$p^{\star}(CD)$	0.0348	0.0164	0.169
$p^{\star}(F)$	0.0118	0.0263	0.0914
PROFIT			
I^{PROFIT}	-0.0200**	-0.000185	0.000565
	(0.00969)	(0.0111)	(0.00946)
$I^{PROFIT} \times \Delta y$	0.538	-0.0558	0.166
	(0.366)	(0.553)	(0.346)
$I^{PROFIT} \times r$	-0.700***	-0.620*	-0.447**
	(0.190)	(0.363)	(0.224)
R^2	0.149	0.058	0.074
$p^{\star}(rk)$	0.0847	0.0911	0.0566
$p^{\star}(J)$	0.822	0.674	0.354
$p^{\star}(CD)$	0.00229	0.0308	0.153
$p^{\star}(F)$	0.00253	0.138	0.133
RW			
I^{RW}	-0.00474*	-0.00429	-0.00671*
	(0.00284)	(0.00334)	(0.00405)
$I^{RW} \times \Delta y$	-0.213**	-0.450***	-0.187*
	(0.0924)	(0.145)	(0.112)
$I^{RW} \times r$	-0.120**	-0.00677	0.195**
	(0.0531)	(0.0509)	(0.0876)
R^2	0.088	0.035	0.084
$p^{\star}(rk)$	0.0236	0.0307	0.0472
$p^{\star}(J)$	0.0916	0.155	0.207
$p^{\star}(CD)$	0.0434	0.0143	0.165
$p^{\star}(F)$	0.000219	0.00355	0.103
SPECPROV			
$I^{SPECPROV}$	-0.00207	0.00103	-0.00637
	(0.00552)	(0.0105)	(0.00746)
$I^{SPECPROV} \times \Delta y$	0.134	0.257	-0.0353
	(0.117)	(0.245)	(0.127)
$I^{SPECPROV} \times r$	0.201**	-0.372	0.0640
	(0.0932)	(0.267)	(0.0808)
R^2	0.071	0.023	0.059
$p^{\star}(rk)$	0.00285	0.00501	0.00590
$p^{\star}(J)$	0.522	0.434	0.0675
$p^{\star}(CD)$	0.0308	0.0108	0.0763
$p^{\star}(F)$	0.0388	0.104	0.738

Table 9: (continued)

Outcome variable	Real credit to private sector (Q-o-Q)		
	Total	NFC	Households
GENPROV			
$I^{GENPROV}$	0.0453***	0.0369**	0.0289**
	(0.0119)	(0.0176)	(0.0134)
$I^{GENPROV} \times \Delta y$	-0.146	-1.003*	-0.211
	(0.270)	(0.522)	(0.250)
$I^{GENPROV} \times r$	-0.299***	0.170	0.102
	(0.115)	(0.242)	(0.206)
R^2	0.061	0.023	0.077
$p^{\star}(rk)$	0.0118	0.0296	0.00858
$p^{\star}(J)$	0.673	0.417	0.0301
$p^{\star}(CD)$	0.0422	0.0291	0.165
$p^{\star}(F)$	8.89e-06	0.0130	0.177
LTV			
I^{LTV}	-0.000729	-0.00748	0.000472
	(0.00371)	(0.00481)	(0.00414)
$I^{LTV} \times \Delta y$	0.626***	0.206	0.188
	(0.140)	(0.268)	(0.177)
$I^{LTV} \times r$	-0.161**	0.0775	0.306***
	(0.0782)	(0.116)	(0.110)
R^2	0.128	0.051	0.124
$p^{\star}(rk)$	0.00778	0.0523	0.0146
$p^{\star}(J)$	0.550	0.654	0.245
$p^{\star}(CD)$	0.00550	0.0273	0.152
$p^{\star}(F)$	7.02e-05	0.443	0.0133
DTI			
I^{DTI}	0.00220	0.00986**	0.00107
	(0.00361)	(0.00466)	(0.00337)
$I^{DTI} \times \Delta y$	-0.00920	-0.245	-0.284
	(0.243)	(0.322)	(0.210)
$I^{DTI} \times r$	-0.451**	-0.123	-0.241*
	(0.216)	(0.201)	(0.129)
R^2	0.155	0.057	0.098
$p^{\star}(rk)$	0.127	0.367	0.355
$p^{\star}(J)$	0.585	0.386	0.714
$p^{\star}(CD)$	0.0168	0.0317	0.0659
$p^{\star}(F)$	0.109	0.176	0.0678
INCOME			
I^{INCOME}	-0.0109	-0.00419	0.00199
	(0.00811)	(0.00813)	(0.0100)
$I^{INCOME} \times \Delta y$	-0.0381	-0.519	0.509
	(0.411)	(0.490)	(0.446)
$I^{INCOME} \times r$	-0.116	0.304*	-0.164
	(0.119)	(0.171)	(0.118)
R^2	0.097	0.039	0.015
$p^{\star}(rk)$	0.0226	0.0237	0.00493
$p^{\star}(J)$	0.721	0.734	0.258
$p^{\star}(CD)$	0.0205	0.0354	0.0887
$p^{\star}(F)$	0.302	0.311	0.412
LENDSTD			
$I^{LENDSTD}$	0.00467**	0.00513**	0.00171
	(0.00201)	(0.00259)	(0.00190)
$I^{LENDSTD} \times \Delta y$	-0.0560	-0.432**	-0.0340
	(0.0859)	(0.190)	(0.140)
$I^{LENDSTD} \times r$	-0.185***	0.0405	-0.112*
	(0.0666)	(0.0685)	(0.0642)
R^2	0.087	0.001	0.044
$p^{\star}(rk)$	0.0104	0.0117	0.00622
$p^{\star}(J)$	0.681	0.469	0.110
$p^{\star}(CD)$	0.0793	0.0408	0.0781
$p^{\star}(F)$	0.000306	0.0648	0.304

Table 9: (continued)

Outcome variable	Real credit to private sector (Q-o-Q)		
	Total	NFC	Households
RR			
I^{RR}	0.00507	0.0102	0.0245***
	(0.00974)	(0.0151)	(0.00865)
$I^{RR} \times \Delta y$	0.407***	0.490	-0.113
	(0.153)	(0.431)	(0.179)
$I^{RR} \times r$	0.141	0.0424	0.104
	(0.144)	(0.109)	(0.127)
R^2	0.093	0.018	0.020
$p^\star(rk)$	0.0498	0.0603	0.0914
$p^\star(J)$	0.752	0.547	0.841
$p^\star(CD)$	0.00836	0.0426	0.225
$p^\star(F)$	0.0193	0.563	0.0238
ABRR			
I^{ABRR}	-0.0141**	-0.0175**	-0.0375***
	(0.00586)	(0.00792)	(0.0126)
$I^{ABRR} \times \Delta y$	-0.0119	0.0155	0.507
	(0.350)	(0.547)	(0.561)
$I^{ABRR} \times r$	0.263	0.370*	0.769*
	(0.231)	(0.192)	(0.406)
R^2	0.171	0.063	0.099
$p^\star(rk)$	0.0154	0.0237	0.0124
$p^\star(J)$	0.369	0.208	0.531
$p^\star(CD)$	0.0163	0.0152	0.0929
$p^\star(F)$	0.0335	0.0679	0.0259
LIQLT			
I^{LIQLT}	0.0178***	0.00971*	0.0128***
	(0.00425)	(0.00506)	(0.00458)
$I^{LIQLT} \times \Delta y$	0.323*	-0.312	-0.0975
	(0.190)	(0.387)	(0.315)
$I^{LIQLT} \times r$	-0.496***	-0.440**	0.334
	(0.141)	(0.194)	(0.244)
R^2	0.169	0.039	0.101
$p^\star(rk)$	0.581	0.570	0.559
$p^\star(J)$	0.758	0.614	0.779
$p^\star(CD)$	0.00120	0.0504	0.232
$p^\star(F)$	1.26e-06	0.0979	0.000972
LIQST			
I^{LIQST}	-0.00342	0.00309	-0.00270
	(0.00326)	(0.00410)	(0.00294)
$I^{LIQST} \times \Delta y$	-0.0989	-0.107	0.108
	(0.0958)	(0.157)	(0.0829)
$I^{LIQST} \times r$	0.0893	-0.0474	-0.0734
	(0.0569)	(0.0504)	(0.0844)
R^2	0.055	0.072	0.050
$p^\star(rk)$	0.00114	0.00242	0.00229
$p^\star(J)$	0.0989	0.0524	0.00551
$p^\star(CD)$	0.00978	0.0305	0.0688
$p^\star(F)$	0.142	0.768	0.478
FXLIM			
I^{FXLIM}	0.0102*	0.0155*	0.0141
	(0.00557)	(0.00906)	(0.0105)
$I^{FXLIM} \times \Delta y$	0.315***	0.327	0.355*
	(0.121)	(0.275)	(0.212)
$I^{FXLIM} \times r$	-0.191***	-0.273	-0.0660
	(0.0708)	(0.174)	(0.174)
R^2	0.179	0.053	0.075
$p^\star(rk)$	0.106	0.124	0.0922
$p^\star(J)$	0.825	0.625	0.152
$p^\star(CD)$	0.0681	0.0283	0.171
$p^\star(F)$	0.00133	0.243	0.210

Table 9: (continued)

Outcome variable	Real credit to private sector (Q-o-Q)		
	Total	NFC	Households
LAREXP			
I^{LAREXP}	0.0122**	0.0108**	0.00950**
	(0.00510)	(0.00444)	(0.00404)
$I^{LAREXP} \times \Delta y$	-0.103	-0.309	-0.0109
	0.130)	(0.212)	(0.107)
$I^{LAREXP} \times r$	-0.0531	-0.137	0.0160
	0.0648)	(0.109)	(0.0818)
R^2	0.180	0.049	0.046
$p^{\star}(rk)$	0.00396	0.00588	0.00647
$p^{\star}(J)$	0.376	0.693	0.115
$p^{\star}(CD)$	0.00920	0.0813	0.0512
$p^{\star}(F)$	0.0950	0.0221	0.106
SECEXP			
I^{SECEXP}	-0.00261	0.00731	-0.0154***
	(0.00417)	(0.00686)	(0.00477)
$I^{SECEXP} \times \Delta y$	0.0782	-0.539	0.0844
	(0.148)	(0.384)	(0.112)
$I^{SECEXP} \times r$	0.280***	0.141	0.113**
	(0.0860)	(0.0955)	(0.0492)
R^2	0.121	0.029	0.031
$p^{\star}(rk)$	0.0127	0.0205	0.0112
$p^{\star}(J)$	0.908	0.792	0.842
$p^{\star}(CD)$	0.0154	0.0828	0.538
$p^{\star}(F)$	0.00405	0.394	0.00564
TAX			
I^{TAX}	0.00191	0.00856	-0.0115
	(0.00491)	(0.00565)	(0.00805)
$I^{TAX} \times \Delta y$	-0.887***	-0.540	-0.184
	(0.225)	(0.355)	(0.314)
$I^{TAX} \times r$	0.389**	0.332	0.186
	(0.182)	(0.233)	(0.198)
R^2	0.194	0.053	0.115
$p^{\star}(rk)$	0.00792	0.0132	0.0109
$p^{\star}(J)$	0.623	0.582	0.270
$p^{\star}(CD)$	0.00290	0.0219	0.112
$p^{\star}(F)$	0.000807	0.160	0.0988
Observations	2,293	2,238	2,219
Number of groups	28	28	28
Number of factors	1	0	1

Notes: Regressions controled for country FE, real GDP growth rate, real interest rate and the presence of other policies (incl. their interactions with GDP growth and real monetary policy interest rates) and two quarterly dummies for Austria (2Q and 3Q04). Dynamic Common Correlated Effects estimator, with pooled (homogenous) coefficients on policy indices and their interactions. $p^{\star}(rk)$ - p-value of the Kleibergen and Paap (2006) rk LM test statistics of underidentifying restrictions. The null hypothesis of the test states that (excluded) instruments are not correlated with the endogenous regressors. $p^{\star}(J)$ - p-value of the Hansen (1982) J test statistics of overidentifying restrictions. The null hypothesis of the test states that instruments are valid and excluded instruments are correctly excluded from the estimated regression. $p^{\star}(CD)$ - p-value of the CD test statistic of Pesaran (2004). The null hypothesis of the test is that the cross-sectional residuals are independent. $p^{\star}(F)$ - p-value of the Wald statistic of joint significance of the tested policy index and its interactions with real GDP growth rate and real interest rate. For $p^{\star}(F) < 10\%$ estimated coefficients are shaded blue. Standard errors in parentheses. Individual significance of estimated coefficients marked by stars: *** p<0.01, ** p<0.05, * p<0.1.

A Appendix: Data sources

Credit (to non-financial private sector): *bank credit to the domestic non-financial private sector in national currency* adjusted for breaks in the currency. Sources: BIS statistics, ECB SDW, national MFI statistics. Notes: For Luxembourg, the BIS credit data are before 1Q 2003 supplemented with the national MFI statistics on credit to the non-financial private sector. For Bulgaria, Croatia , Cyprus, Estonia, Latvia, Lithuania, Malta, Slovakia, Slovenia SDW data are supplemented with the national MFI statistics on bank credit (or *bank loans to the non-financial private sector*) to the domestic non-financial private (before 2Q 2016 Bulgaria, 4Q 2015 Croatia, 3Q 2005 Cyprus, 4Q2007 Estonia, 2Q 2010 Latvia, 1Q 2004 Lithuania, 4Q 2004 Malta, 4Q 2005 Slovakia, 4Q 2003 Slovenia). For Bulgaria the loan data are additionally supplemented with the credit to non-financial private sector data from IMF Monetary, Depository Corporations Survey before 3Q 1995. For Romania SDW data are before 2Q 2016 supplemented with the national statistics on *credit to non-governmental sector*, and before 1Q 1997 on *total indebtedness of non-financial companies and households.*

Real credit (to the non-financial private sector): nominal bank credit volume as above divided by GDP deflator. Source: own calculations.

Credit to non-financial corporations (NFC): *bank credit to the non-financial private sector in national currency* adjusted for breaks in the currency. Sources: BIS statistics, ECB SDW, national MFI statistics. Notes: For Austria, Ireland and Luxembourg, the Netherlands, Poland, Spain, the BIS credit data are supplemented with the national MFI statistics on credit to the non-financial private sector (or *bank loans to the non-financial private sector*) (before 1Q 2005 Austria, 1Q 2003 Ireland and Luxembourg, 3Q 1998 the Netherlands, 3Q 1996 Poland, 2Q 1997 Spain). For Bulgaria, Croatia, the Czech Republic, Denmark, Romania, Sweden, the United Kingdom SDW data are supplemented with the national MFI statistics on bank credit (or loans) to the domestic non-financial private (before 2Q 2016 Bulgaria, 4Q 2015 Croatia, 3Q 2005 Cyprus, 4Q2007 Estonia, 2Q 2010 Latvia, 1Q 2004 Lithuania, 4Q 2004 Malta, 4Q 2005 Slovakia, 4Q 2003 Slovenia).

Real credit to non-financial corporations (NFC): nominal credit volume as above divided by GDP deflator. Source: own calculations.

Credit to households: *bank credit to households incl. NPISH in national currency* adjusted for breaks in the currency. Sources: BIS statistics, ECB SDW, national MFI statistics. Notes: For Austria, Ireland and Luxembourg, the Netherlands, Poland, Spain, the BIS credit data are supplemented with the national MFI statistics on credit to households incl. NPISH (or *bank loans to households incl. NPISH*) (before 1Q 2005 Austria, 1Q 2003 Ireland and Luxembourg, 3Q 1998 the Netherlands, 3Q 1996 Poland, 2Q 1997 Spain). For Bulgaria, Croatia, the Czech Republic, Denmark, Romania, Sweden, the United Kingdom SDW data are supplemented with the national MFI statistics on bank credit (or loans) to households incl. NPISH (before 2Q 2016 Bulgaria, 4Q 2015 Croatia, 3Q 2005 Cyprus, 4Q2007 Estonia, 2Q 2010 Latvia, 1Q 2004 Lithuania, 4Q 2004 Malta, 4Q 2005 Slovakia, 4Q 2003 Slovenia).

Real credit to households: nominal credit volume as above divided by CPI. Source: own calculations.

Gross Domestic Product (GDP): *GDP at constant prices (*$2010 = 100$*) ESA2010*, seasonally and working day adjusted. Source: Eurostat, national sources. Notes: For Austria, the Czech Republic, Bulgaria, Poland, the Eurostat ESA2010 data are supplemented with Eurostat ESA1995 GDP at constant prices (before 1Q1996 Austria and the Czech Republic, 1Q 2001 Bulgaria, 1Q 2002 Poland) and for Croatia with IMF ESA1995 GDP at constant prices before 1Q 2000. For Ireland the Eurostat ESA2010 data are supplemented own calculations of the Central Bank of Ireland before 1Q 1997. For Malta the Eurostat ESA2010 data are backcasted using the information on nominal GDP in Mio before 2Q 1999. EUR available on a quarterly frequency (provided by the Central Bank of Malta), CPI on a quarterly frequency, and real GDP in Mio. EUR. on an annual frequency.

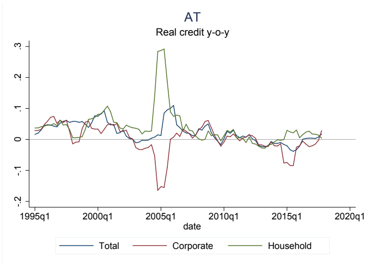
Nominal GDP: *GDP at market prices in national currency ESA2010*, seasonally and working day adjusted. Source: Eurostat, national sources. Notes: For Austria, Bulgaria, Poland, the Eurostat ESA2010 data are supplemented with Eurostat ESA1995 GDP at market prices in national currency ESA2010 (before 1Q1996 Austria, 1Q 2001 Bulgaria, 1Q 2002 Poland). For Ireland the Eurostat ESA2010 data are supplemented own calculations of the Central Bank of Ireland before 1Q 1997. For Malta the Eurostat ESA2010 data are backcasted using the information on nominal GDP in Mio. EUR available on a quarterly frequency (provided by the Central Bank of Malta), CPI on a quarterly frequency, and real GDP in Mio. EUR. on an annual frequency before 2Q 1999. For Croatia the Eurostat ESA2010 data are backcasted using the information on annual nominal GDP in Mio. of national currency ESA95, World Bank, CPI on a quarterly frequency, and GDP at constant prices ESA95, on a quarterly frequency, World Bank, before 1Q 2000.

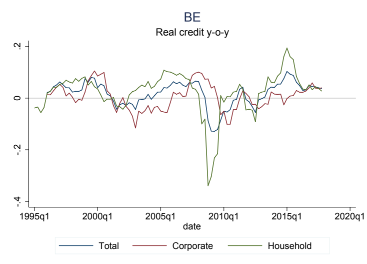
GDP deflator: derived by dividing nominal via real GDP as above. Source: own calculations.

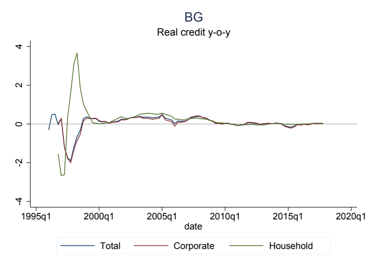
Consumer Price Index (CPI): Consumer Price Index. Source: ECB SDW.

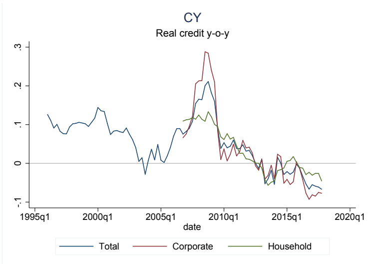
Monetary policy interest rates: *the quarterly average of core central bank interest rates.* Source: national central banks, BIS statistics. Notes: For Austria until 4Q1998 the National Bank of Austria's discount rate, from 1Q 999 the ECB main refinancing rate. For Belgium: until 4Q 1998 the National Bank of Belgium's rate on open market operations, repurchase agreements, all tenders, from 1Q 1999 the ECB main refinancing rate. For Cyprus until 4Q 2007 the official interest rate on the marginal lending facility, from 1Q 2008 the ECB main refinancing rate and 1995 the discount rate of the central bank on treasury bills. For Finland until 4Q 1998Q4 the Bank of Finland's tender rate, from 1Q 1999 the ECB main refinancing rate. For France until 4Q 1998 the Central Bank of France's rate on repurchase agreement transactions, from 1Q 1999 the ECB main refinancing rate. For Germany until 4Q 1998 the Bundesbank's repo rate, from 1Q1999 the ECB main refinancing rate. Italy: until 4Q1998 the Bank of Italy's repo rate, from 199Q1 the ECB main refinancing rate. For Ireland until 4Q1998 the Central Bank of Ireland's short-term facility rate, from 1Q 1999 the ECB main refinancing rate. For Latvia until 4Q 2013 the Bank of Latvia's refinancing interest rate for repurchase agreements, from 1Q1999 the ECB main refinancing rate. For Luxembourg until 4Q 1998 the National Bank of Belgium, from 1Q 1999 the ECB main refinancing rate. For Malta until 1Q1998 the Central Bank of Malta's discount rate, from 1Q 1998 until 4Q 2007 the Central Bank of Malta's central intervention rate, from 1Q 2008 the ECB main refinancing rate. For the Netherlands until 4Q 1998 the central bank's rate for special loans (the interest rate at which additional funds were supplied to credit institutions subject to the cash reserve arrangement), from 1Q 1999 the ECB main refinancing rate. For Slovakia until 4Q 2008Q4 the National Bank of Slovakia's two week repo tender limit rate, from 1Q 2009 the ECB main refinancing rate. For Slovenia until 2Q 2000 the Bank of Slovenia's discount rate, from 2Q 2000 until 4Q 2006 the Bank of Slovenia's main refinancing rate, from 1Q 2007 the ECB main refinancing rate. For Spain until 4Q1998 the interest rate for the ten-day auction of the Bank of Spain, from 1Q 1999 the ECB main refinancing rate. For Bulgaria: Bulgarian National Bank's Base Interest Rate. Up to 31 January 2005 the BIR was determined by the average annual yield on the three-month government securities achieved in the primary market at day-count convention. Effective as of 1 February 2005 the BIR equals the simple average of the values of the LEONIA reference rate for the business days of the preceding month (base period). Effective as of 1 July 2017 LEONIA is replaced by the LEONIA Plus reference rate as the basis for the calculation of the BIR. For the Czech Republic until 3Q 1995 the simple average of the Czech Central Bank's Lombard and discount rates, from 3Q 1995 the Czech Central's 2-week repo rate (the official main policy rate since 1998). For Romania before until 4Q2001 the National Bank of Romania's discount rate, from 1Q2002 the National Bank of Romania's interest rate on main open-market operations (with a maturity of one week executed in the form of tenders at a fixed interest rate). For Croatia, Denmark, Hungary, Poland, Sweden, the United Kingdom the definitions of interest rates can be found under BIS's central bank policy rates dataset.. For Estonia, Greece, Lithuania and Portugal data in interest rates are backcasted: for Estonia before 4Q 2010, for Greece before 4Q 1996, for Lithuania before 1Q 2000 (and for 1Q 2004–2Q 2004) and Portugal before 4Q 1998. Estonia: backcasting based on the information on the central bank policy rate from Oxford Economics available for years 2006–2010, and daily information on the overnight Estonian money market rate. For years 1995–2006 the interest margin between the derived policy rate and the overnight rate of 0.3pp assumed to be constant and at the level observed at the end of 2006. For 2007–2008 the interest rate margin is assumed to vary with liquidity risk in EUR market in line with simple regression estimates (the Estonian interest rate margin on the spread on EUR interest rates). For the margin on policy rate is assumed to follow the same function as above but the weight of it is decreasing, whereas the weight of the constant margin increasing. For Greece until 4Q 2000 the Bank of Greece's interest rate on the overnight deposit facility, from 1Q 2001 the ECB main refinancing rate. Backcasting of the interest rate on the overnight deposit facility is based on the information on the discount facility rate assuming a constant 4pp margin between the two rates. For Lithuania until 4Q2014 the Bank of Lithuania's overnight repurchase rate, from 1Q 2015 the ECB main refinancing rate. Backcasting of the Bank of Lithuania's overnight repurchase rate is based on the interbank 1M rate, with a constant 4.5pp (linearly decreasing from 2.8pp to 1.3pp) margin assumption. For Portugal until 4Q 1998 the Bank of Portugal's interest rate on occasional (fine-tuning) liquidity absorption operations, from 1Q 1999 the ECB main refinancing rate. Backcasting of the liquidity absorption interest rate is based on the discount rate of the Bank of Portugal, assuming 0.25pp margin between the two interest rates.

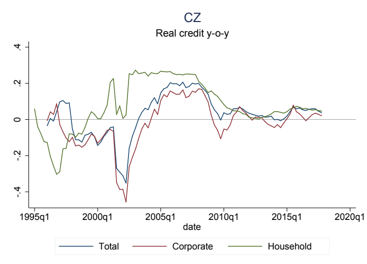
B Appendix: Real credit growth

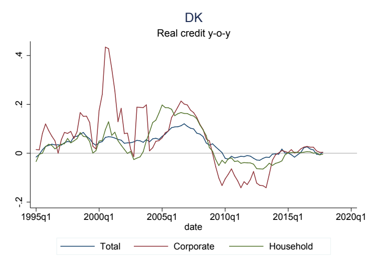


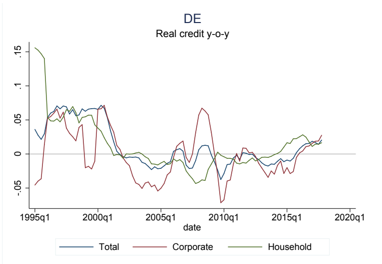


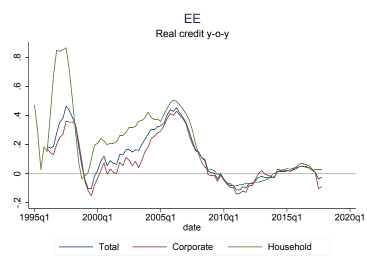


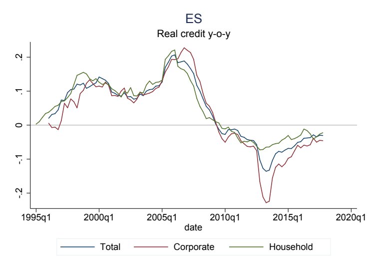


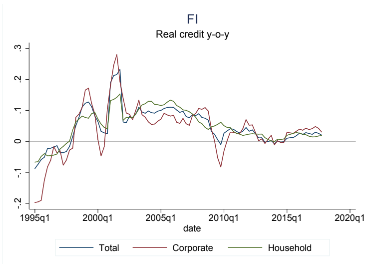


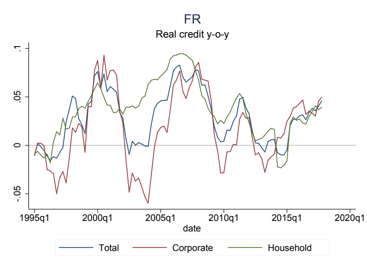


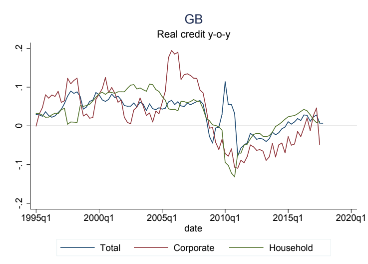


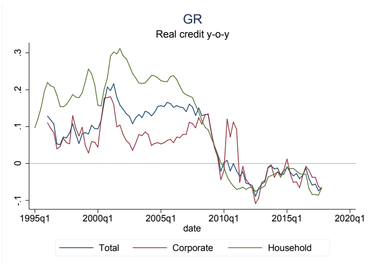


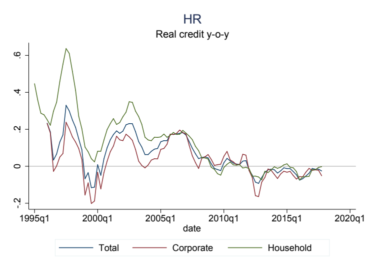


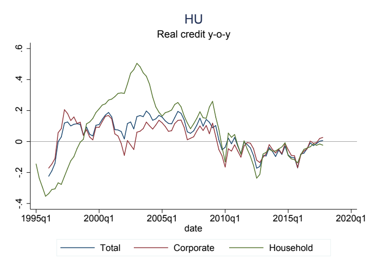












Notes: Real private sector credit growth (year-on-year change). Sources: BIS, ECB, and IMF.

C Appendix: Real GDP growth and real interest rates

Notes: Real GDP growth (year-on-year change) and interest rates Sources: BIS, ECB, IMF and national authorities.

D Appendix: Policy instrument indices

Figure 2: Policy instrument indices

(a) D (b) d (c) S

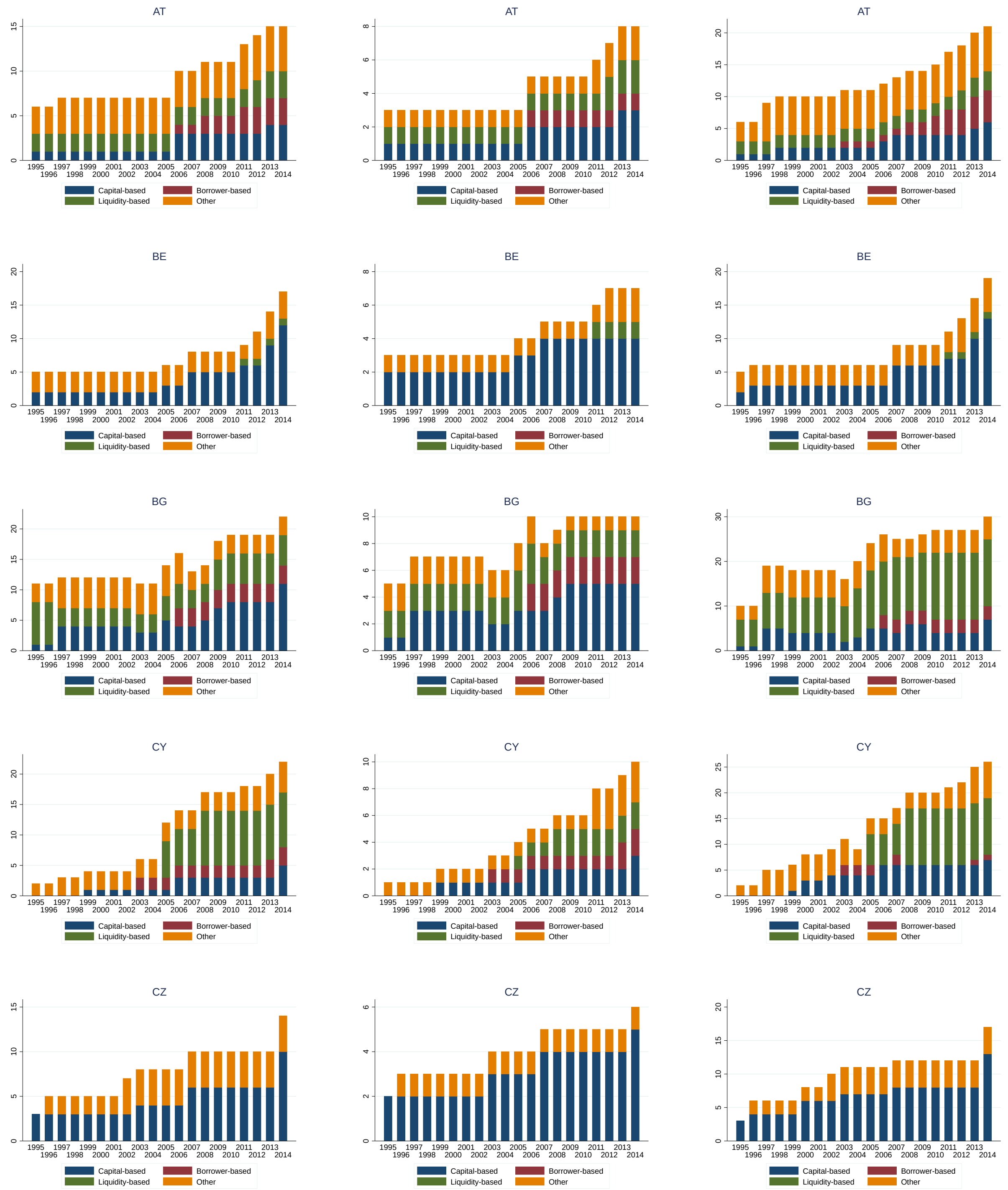


Figure 2: Policy instrument dummy (cont'd)

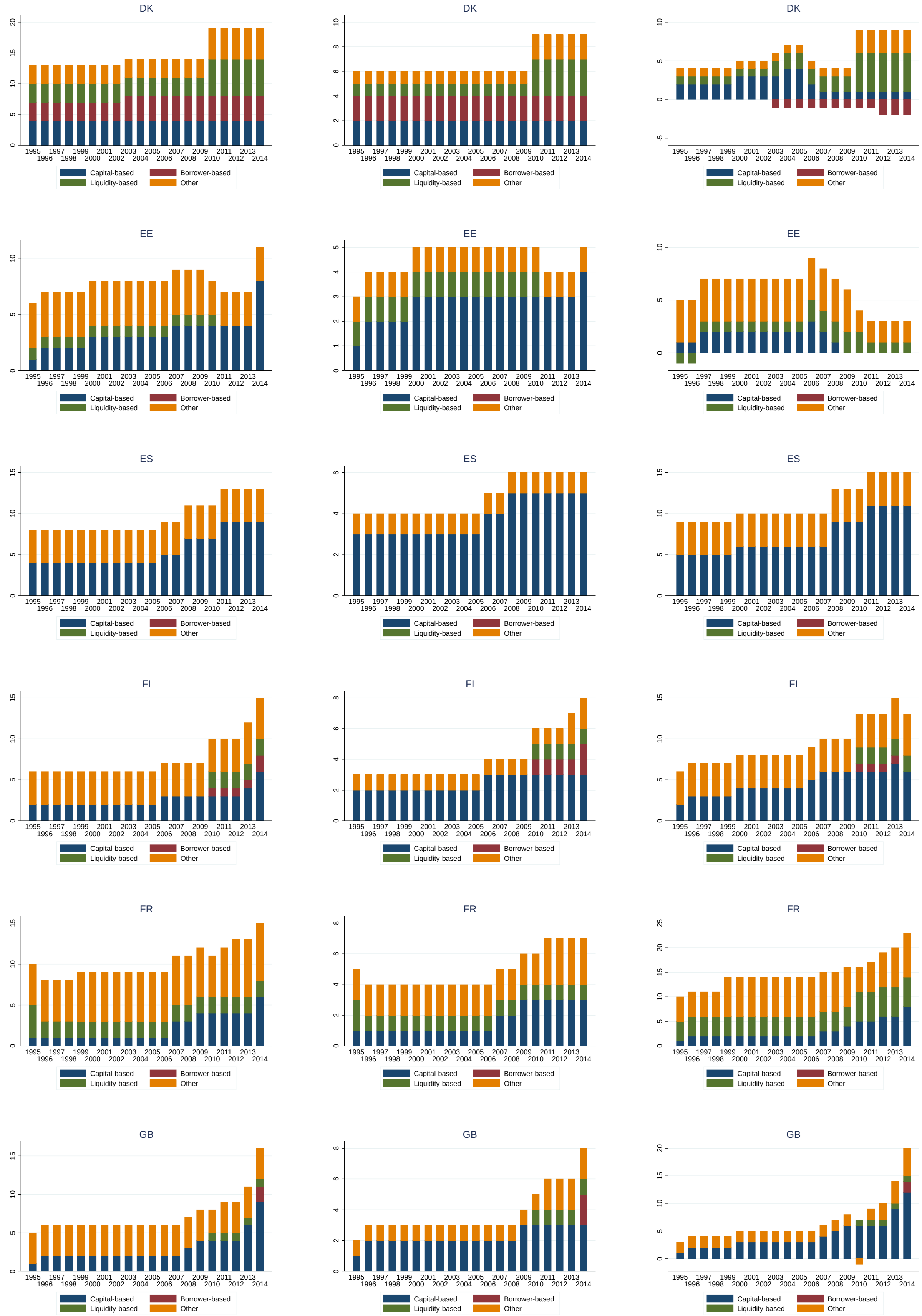


Figure 2: Policy instrument dummy (cont'd)

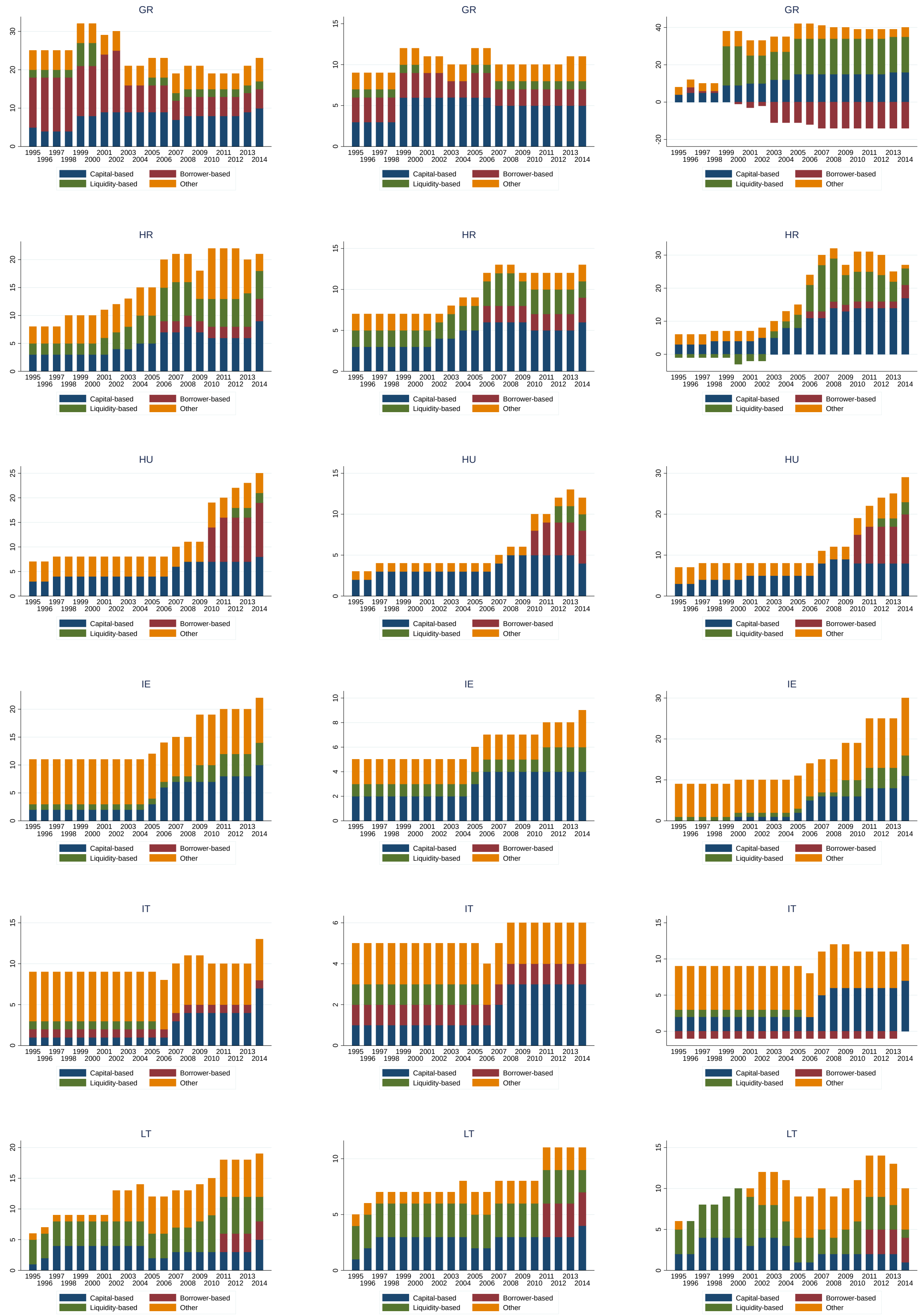


Figure 2: Policy instrument dummy (cont'd)

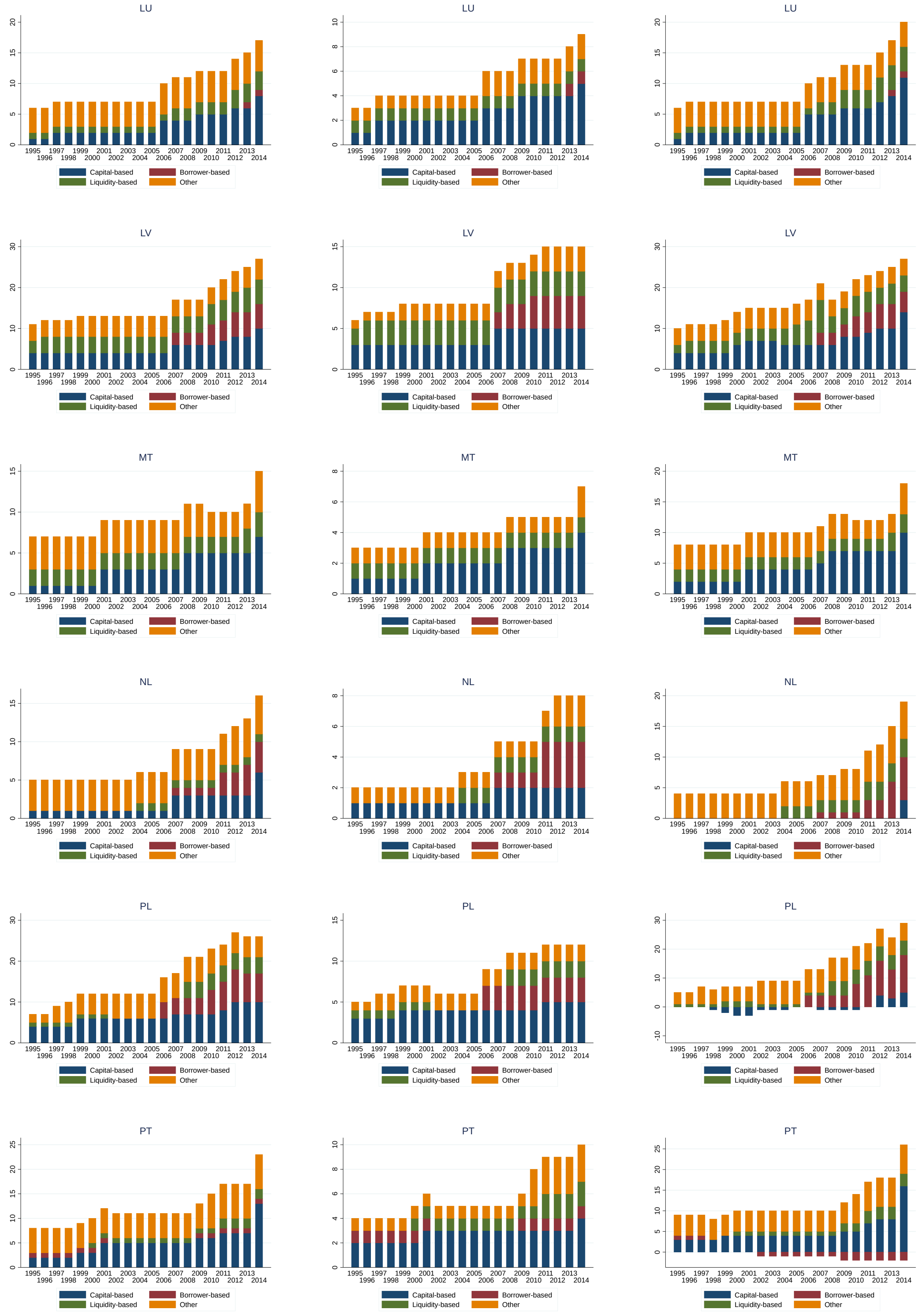
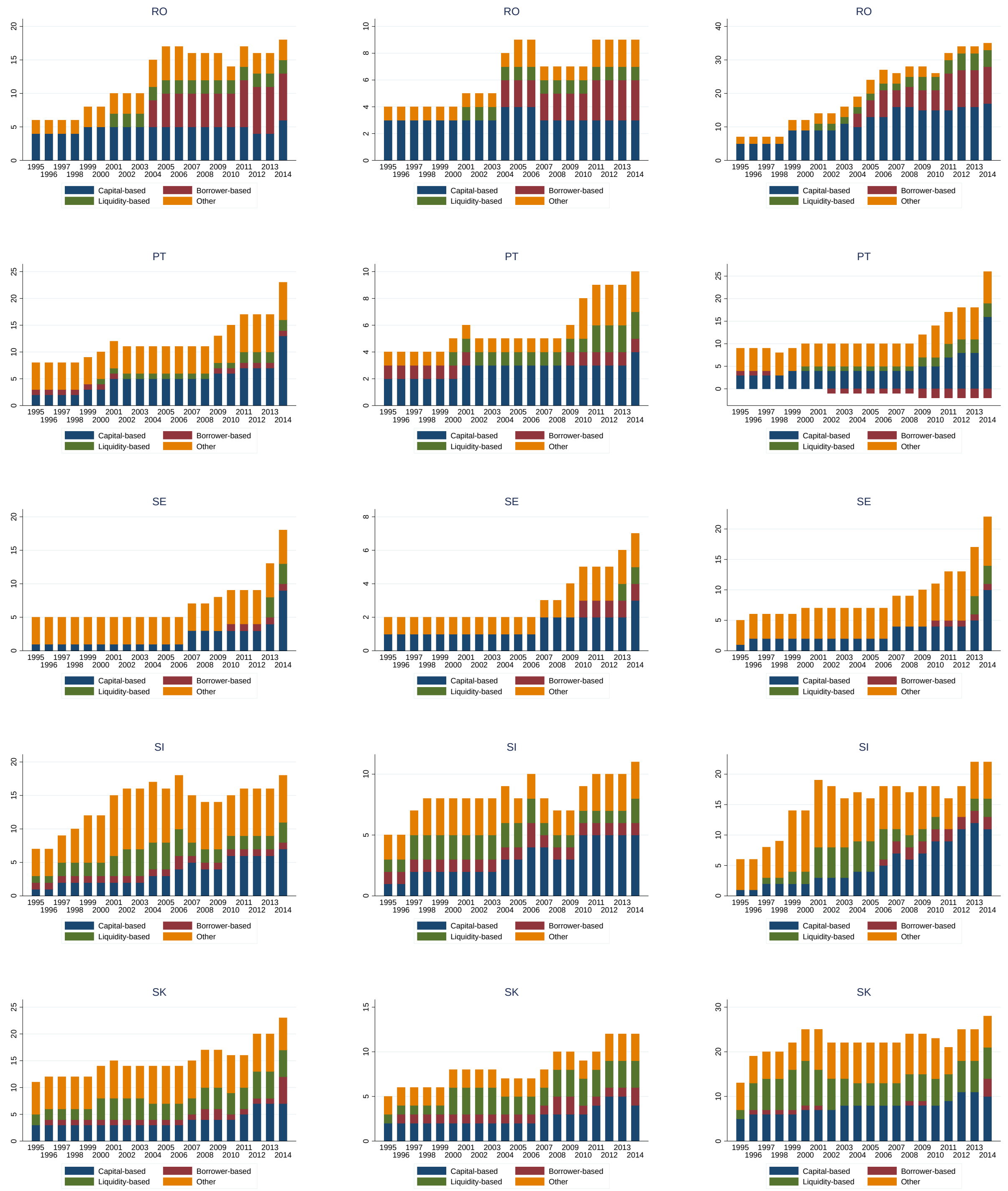


Figure 2: Policy instrument dummy (cont'd)



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