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Technical Paper

Systemic risk buffer and residential real estate loans: the steering effect of sectoral buffer application

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Non-technical summary

Since the implementation of CRD V in German law (*Risk Reduction Act*), the capital buffer for systemic risks (SyRB) can be used not only with regard to the total risk exposure amount but also explicitly for certain exposures. This paper assesses ex ante the potential effects of such a sectoral SyRB (sSyRB) compared with more broad-brushed macroprudential tools such as the countercyclical capital buffer (CCyB). Specifically, it aims at answering the question of how capital measures that relate to different parts of the loan portfolio change the regulatory induced incentives. To illustrate the effects of sectoral capital buffers, this analysis uses the exposure to residential real estate (RRE) loans as an example, which also has been part of recent macroprudential policy measures in Germany (Deutsche Bundesbank (2022)).

Due to its targeted application, the sSyRB can be used to build up loss absorption capacity proportionally to the corresponding exposure. Measured against the total risk-weighted assets (RWA) of German banks, an sSyRB on domestic RRE exposure of 2.00% (3.00%) results in a 0.18 percentage point (0.28pp) increase in capital requirements. This value is higher for credit institutions that have issued a relatively large amount of RRE loans. As an alternative to the sSyRB, a general capital buffer (CCyB, SyRB), where the capital requirement is a percentage of total (domestic) RWA, could be calibrated in such a way that the aggregated capital requirements are identical. However, this would also weigh on other types of exposures such as corporate loans. Since corporate loans usually have higher risk weights than RRE loans, the impact on this exposure type could even be particularly negative.

In contrast, the sSyRB implicitly increases only the risk weight of the RRE exposure. Since the relative risk weight (RRE vs. corporate loans) determines the relative cost of equity, a shift in the relative risk weight should have an impact on the banks' portfolio composition. Hence, the ability to implicitly influence the relative risk weight via the sSyRB also exerts a steering effect on lending. This paper finds evidence for such a steering effect and attempts to quantify ex ante the portfolio shift. It exploits the fact that the relative risk weight of RRE and corporate loans differs among banks and varies over time, particularly for banks using internal rating-based models (IRB banks). According to the applied fixed-effects regression models, the estimated decrease in the RRE share is between 4.7 and 1.0 percentage points if the sSyRB is set to 2.00 %. Yet, it is possible that due to the partly endogenous changes in the relative risk weight, the effects on the portfolio composition are biased and tend to be underestimated.

Nichttechnische Zusammenfassung

Seit der Umsetzung der CRD V in deutsches Recht (Risikoreduzierungsgesetz) kann der Kapitalpuffer für systemische Risiken (SyRB) nicht nur bezogen auf die Gesamtrisikoposition, sondern auch explizit für bestimmte Teilexposure herangezogen werden. Dieses Papier bewertet ex ante die potenziellen Auswirkungen eines solchen sektoralen SyRB (sSyRB) im Vergleich zu breiter angelegten makroprudenziellen Instrumenten wie dem antizyklischen Kapitalpuffer (CCyB). Konkret versucht es die Frage zu beantworten, wie Kapitalmaßnahmen, die sich auf unterschiedliche Teile des Kreditportfolios beziehen, die regulatorischen induzierten Anreize ändern. Um die Auswirkungen sektoraler Kapitalpuffer zu veranschaulichen, verwendet diese Analyse beispielhaft das Wohnimmobilienkredit-Exposure, welches auch Gegenstand der jüngsten makroprudenziellen Maßnahmen in Deutschland war (Deutsche Bundesbank (2022)).

Zunächst kann durch den gezielten Einsatz des sSyRB die Verlustabsorptionsfähigkeit proportional zum entsprechenden Exposure aufgebaut werden. Gemessen an den gesamten risikogewichteten Aktiva (RWA) deutscher Banken führt ein sSyRB auf das inländische RRE-Exposure von 2,00 % (3,00 %) zu einer Erhöhung der Kapitalanforderungen um durchschnittlich 0,18 Prozentpunkte (0,28 PP). Dieser Wert ist bei Kreditinstituten, die relativ viele Wohnimmobilienkredite vergeben haben, höher. Alternativ zum sSyRB könnte ein allgemeiner Kapitalpuffer (CCyB, SyRB), der auf die gesamten (inländischen) Risikopositionen abstellt, so kalibriert werden, dass die aggregierten Kapitalanforderungen identisch mit dem sSyRB sind. Dies würde jedoch auch andere Risikoarten wie Unternehmenskredite belasten. Da Unternehmenskredite in der Regel höhere Risikogewichte aufweisen als Wohnimmobilienkredite, wäre diese Forderungsart sogar besonders negativ betroffen.

Stattdessen erhöht der sSyRB implizit nur das Risikogewicht der RRE-Position. Da das relative Risikogewicht (RRE vs. Unternehmenskredite) auch die relativen Eigenkapitalkosten bestimmt, sollte sich eine Verschiebung des relativen Risikogewichts auf die Portfoliozusammensetzung der Banken auswirken. Somit hat die Erhebung eines sSyRB über die relativen Risikogewichte auch eine steuernde Wirkung bei der Kreditvergabe. Dieses Papier findet Belege für einen solchen potentiellen Lenkungseffekt und versucht, die Portfolioumschichtung ex ante zu quantifizieren. Es nutzt dabei die Tatsache, dass das relative Risikogewicht von Wohnimmobilien- und Unternehmenskrediten von Bank zu Bank unterschiedlich ist und im Laufe der Zeit variiert – insbesondere bei Banken, die interne Rating-basierte Modelle (IRB-Banken) verwenden. Gemäß den angewandten Fixed-Effects-Regressionsmodellen beträgt die geschätzte Abnahme des RRE-Anteils bei einem sSyRB von 2,00 % zwischen 4,7 und 1,0 Prozentpunkten. Allerdings ist es möglich, dass aufgrund der teilweise endogenen Veränderungen des relativen Risikogewichts die Effekte auf die Portfoliozusammensetzung verzerrt und tendenziell unterschätzt sind.

Systemic risk buffer and residential real estate loans: the steering effect of sectoral buffer application

Sebastian Geiger[1]

Abstract

This paper describes the effects of the sectoral application of the systemic risk buffer (SyRB) within the German banking system. The analysis compares a general capital buffer (e.g. CCyB) to the sectoral SyRB (sSyRB) in the context of addressing the risks resulting from residential real estate (RRE) loans. It finds that the sSyRB works in a targeted manner and spares other exposure types (e.g. corporate loans) from disproportionally higher capital charges. By using regression techniques, the paper also quantifies ex ante the expected relative reduction of RRE loans in the banks' portfolios. Specifically, the models find statistically significant evidence that the RRE loan share (relative to corporate loans) could decline by between 1.1 and 4.7 percentage points if the sSyRB is set to 2.00 %.

Keywords: residential real estate, loan portfolio, systemic risk buffer, macroprudential policy, Germany
JEL-Classification: D22, G11, G21, G28, R21

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1 Introduction: The steering effect of the sectoral SyRB

Since the implementation of CRD V in the German Banking Act (KWG), the capital buffer for systemic risks (SyRB) can also be explicitly used for certain sectoral exposures (Deutsche Bundesbank (2022)). This unique feature differentiates the SyRB from other macroprudential capital buffers (e.g. CCyB). Various favourable economic effects can result from addressing only certain exposures instead of all risk positions at the same time. For example, according to economic price theory, a levy on the cost of capital in the form of a capital buffer on a certain sub-portfolio (e.g. residential real estate loans) has a certain steering effect on lending. In other words, the higher capital requirements affect the equity cost of lending and thus the relative asking prices (i.e. changes in relative interest rates). As a result, there may be both intrabank and interbank shifts in lending.

The intrabank steering effect refers to the idea that a credit institution will grant relatively more loans outside the residential real estate (RRE) segment after a sectoral SyRB (sSyRB) on RRE loans has been imposed (Auer et al. (2021)). This effect can be intentional if the risk assessment for the residential real estate sector indicates higher risks than for other economic sectors. This means that an sSyRB can help to curb the rise in lending for residential real estate in a risky environment of inflated prices (Basten/Koch (2015)).

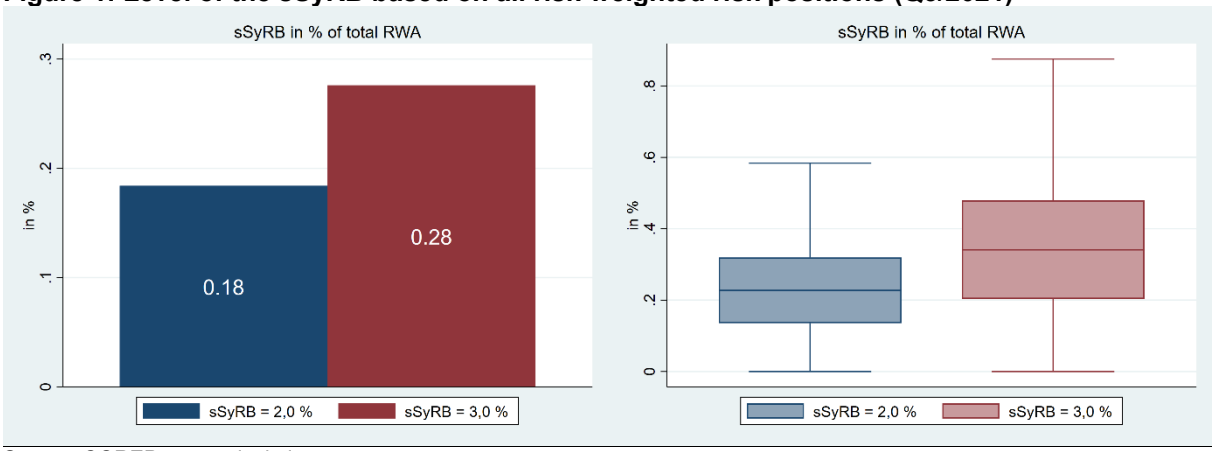
In addition, interbank shifts in the banks' shares of RRE lending are to be expected. This reallocation occurs when banks with low capitalisation raise their mortgage lending rates relatively more than their peers with higher unencumbered management buffers. Moreover, there is empirical evidence that banks that have issued a large amount of residential property loans raise their RRE interest rates relatively more when additional capital requirements are introduced (Basten (2019)). Both interbank effects lead to a redistribution of RRE risks to banks that are more resilient to a shock in the RRE market or macroeconomic stress in general.

It is difficult to quantify ex ante the steering effect of a sectoral SyRB on residential real estate loans. Nevertheless, this note provides initial evidence for a potential steering effect of the sectoral SyRB in Germany. To this end, it first examines which effects result from the sectoral rather than the general application of the capital buffer (Chapter 2). Chapter 3 empirically estimates the extent to which there is a link between the relative risk weight of residential real estate and corporate loans on the one hand and the relative size of the residential real estate portfolio on the other. The quarterly data used in Chapter 2 and Chapter 3 cover the period from March 2014 to September 2021. The last section provides a brief summary and an outlook (Chapter 4).

2 Effects of the sectoral buffer application

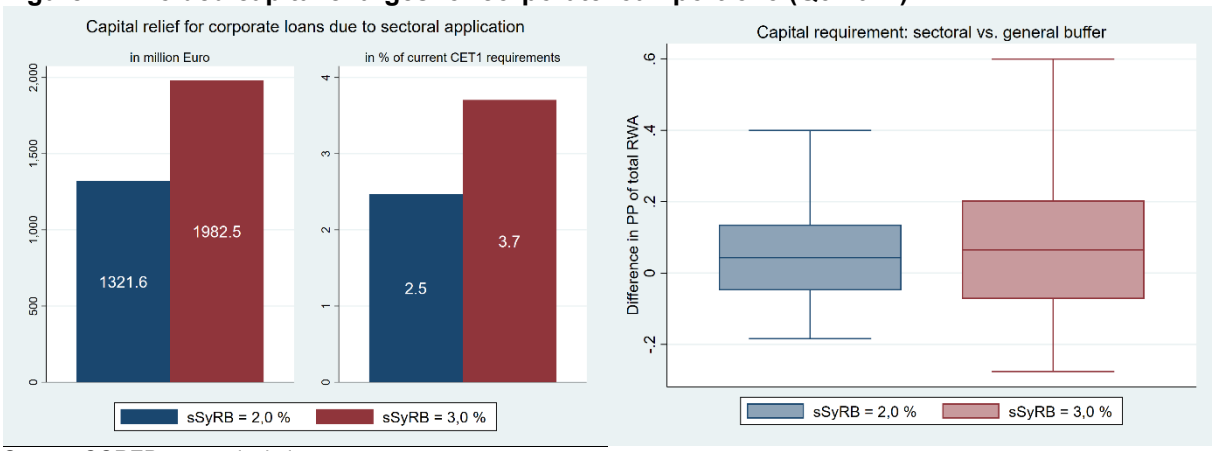
Due to the targeted application to a specific sectoral exposure only, a relatively high nominal sSyRB rate is associated with a comparatively low capital requirement in relation to total risk-weighted assets (RWA). In addition, the risk weights with which the RRE loans are assessed before applying the capital buffers are relatively low (cf. Figure 7 in the appendix). As domestic loans secured by RRE make up a large portion of German banks' loans, there is still a noticeable increase in the CET1 requirements for the banking system in terms of total RWA (Figure 1, lhs). Due to the design of the sectoral buffer, the expansion of the loss absorption capacity is particularly high for institutions with high RRE exposures (Figure 1, rhs).

Figure 1: Level of the sSyRB based on all risk-weighted risk positions (Q3/2021)



Source: COREP, own calculations

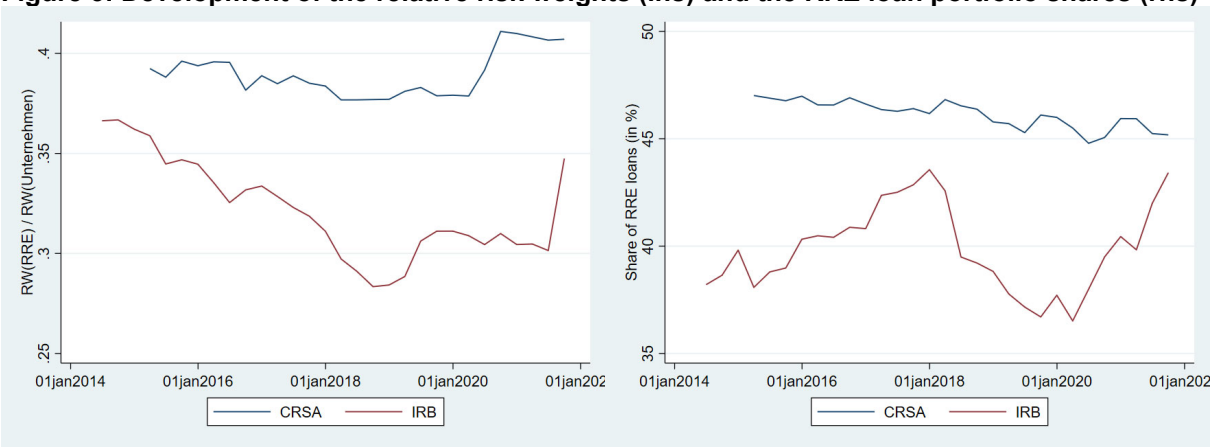
Figure 2: Avoided capital charges for corporate loan portfolio (Q3/2021)



Source: COREP, own calculations

Furthermore, due to the possibility of sectoral application, capital requirements for other portfolios, such as corporate loans, can be avoided (Figure 2, lhs). With an sSyRB of 2.00%, this corresponds to an avoided capital charge on corporate loans of EUR 1.3 billion in the form of Common Equity Tier 1 (CET1). In terms of the current aggregated CET1 requirements for the corporate loan portfolio, this corresponds to an avoided increase of 2.5%. In the light of the comparatively high risk weights of corporate loans not secured by real estate (cf. Figure 7 in the appendix), this appears to be a central argument for using the sectoral systemic risk buffer as opposed to addressing the specific RRE risk using a general buffer (e.g. counter-cyclical capital buffer, CCyB). Figure 2 (rhs) illustrates that, as a result of the sectoral calibration, some have to build up more (positive sign) or less (negative sign) capital than would be the case with a buffer calibrated in terms of total RWA. The median is in the positive range of the graph, as many relatively small banks display an above-average proportion of real estate loans and thus experience higher RRE risk.

Figure 3: Development of the relative risk weights (lhs) and the RRE loan portfolio shares (rhs)



Source: COREP, own calculations

3 Steering effect: Relative risk weights and lending

The ratios of the risk weights of RRE versus corporate loans, referred to as relative risk weights throughout this article, differ both between banks and within each bank over time (Figure 3, lhs). At the same time, the share of RRE loans[2] also varies between banks and over time (Figure 3, rhs). The following empirical analysis makes use of this fact as, by means of relative cost of equity, the relative risk weight should also affect the share of RRE loans. It is precisely this relative risk weight that can be implicitly influenced by means of a sectoral capital buffer.

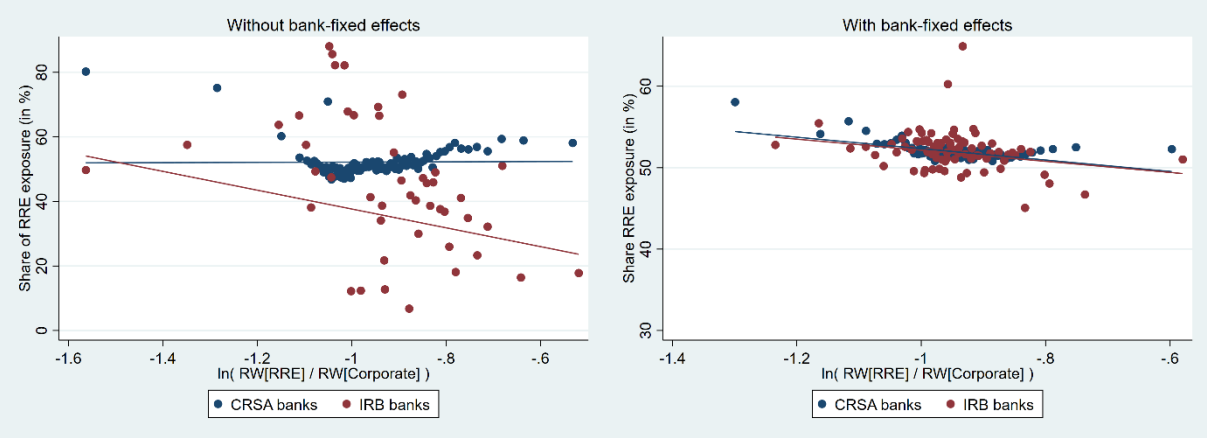
Figure 4 shows the correlation between the logarithmic[3] relative risk weight (RRW) and the RRE loan share (%) without (lhs) and with fixed effects at the bank level (rhs). Focusing first on the correlation without fixed effects, it is noticeable that there is neither a positive nor a negative correlation among the institutions using the credit risk standardised approach (CRSA). Although the RRW differ between the banks, the RRW do not appear to have any significant functional relationship to the RRE share.[4] The situation is different with the banks using internal rating-based models (IRB). There is considerable scatter here both in the RRW and in the RRE loan shares. Nevertheless, there is a statistically and economically significant negative correlation between the two variables (see also model 1 in Table 1). In other words, the higher the risk weight for RRE loans compared to corporate loans, the smaller the portfolio share of RRE loans. This is the expected effect, which can be interpreted as evidence for the existence of a potential steering effect of the sSyRB. The picture becomes clearer if one also takes into account fixed effects at the bank level. Here, a negative and statistically significant relationship between the RRW and the RRE share can be identified even for CRSA banks. The use of bank-fixed effects also greatly reduces the variation around the regression line for the IRB banks (i.e. the model's error becomes smaller).

[2] For the purpose of this analysis, the share of RRE is the percentage of RRE loans relative to the sum of RRE loans and corporate loans. Other loan types were excluded in order to obtain results that are easier to interpret.

[3] The functional relationship between the relative risk weight and the RRE credit share was examined on the basis of the available empirical observations. The level-log specification turns out to be the most suitable model (see Figure 8 in the appendix).

[4] The different relative risk weights at CRSA banks are mainly due to the different ratings for borrowers in the corporate loan portfolio. Better ratings allow for a lower risk weight in the credit risk standard approach (CRSA). In principle, exposures secured by residential real estate receive a privileged risk weight of 35% within the CRSA, while the basic weight for corporate loans is 100%.

Figure 4: Correlation between relative risk weights and RRE share, pooled vs. FE



Source: COREP, own calculations[5,6]

For a closer evaluation of the empirical relationship already explored graphically, various versions of the following regression equation were estimated:

$$RE_{i,t} = \alpha + \beta_1 \ln(RRW_{i,t-1}) + \beta_2 \ln(RRW_{i,t-1}) * (\mathrm{C}_{i,t-1} - 4{,}5) + \beta_3 \ln(RRW_{i,t-1}) * I(IRB = 1)_{t-1} + \beta_4 \ln(RRW_{i,t-1}) * I(IRB = 1)_{t-1} * (\mathrm{C}_{i,t-1} - 4{,}5) + \theta_1 I(IRB = 1)_{t-1} + \theta_2(\mathrm{C}_{i,t-1} - 4{,}5) + \theta_3 I(IRB = 1)_{t-1} * (\mathrm{C}_{i,t-1} - 4{,}5) + \gamma_i + \tau_t + Z_{i,t-1}\delta' + \varepsilon_{i,t} \quad (1)$$

with:

$$RE_{i,t} = \frac{LE[RRE]_{i,t}}{LE[RRE]_{i,t} + LE[Corp.]_{i,t}} * 100 \quad (2)$$

$$RRW_{i,t-1} = \frac{RW[RRE]_{i,t-1}}{RW[Corp.]_{i,t-1}} = \frac{RWA[RRE]_{i,t-1}/LE[RRE]_{i,t-1}}{RWA[Corp.]_{i,t-1}/LE[Corp.]_{i,t-1}} \quad (3)$$

$$Z_{i,t-1} = \frac{X[RRE]_{i,t-1}}{X[Corp.]_{i,t-1}} \quad (4)$$

Here, $RE_{i,t-1}$ indicates the relative exposure of bank i at time t, where the volume of residential real estate (RRE) or corporate loans ($Corp.$) is derived from the associated leverage ratio exposure (LE).[7] $RRW_{i,t-1}$ represents the relative risk weight in the previous quarter $(t-1)$. The effects of the relative risk weight depend on the respective bank-specific CET1 capital requirements $C_{i,t-1}$.[8] In conjunction with the indicator variable $I(IRB = 1)_{t-1}$ for IRB banks, the effect of the relative risk weight can be estimated separately for CRSA banks ($\beta_1 + \beta_2(C - 4{,}5)$) and IRB banks ($\beta_1 + \beta_3 + (\beta_2 + \beta_4)(C - 4{,}5)$. The coefficients θ are the remaining effects of the interaction variables, which, however, are not related to the effect of the relative risk weight. γ_i and τ_t represent bank-fixed and time-fixed effects, respectively. The matrix $Z_{i,t-1}$ contains a number of control variables, each calculated as a ratio of RRE to corporate loans. $\varepsilon_{i,t}$is the error term of the regression.

[5] Single observations were summarised and the average of these observations is presented for better visual representation and anonymisation. Risk weights with a lag of 1 quarter.

[6] In Figure 9 (see appendix), instead of the relative risk weight, the product of the relative risk weight and capital requirements is correlated with the RRE share. The implications of this interaction term are discussed below.

[7] The leverage ratio exposure essentially corresponds to the unweighted exposure. However, it also includes loan commitments that have not been paid out (off-balance-sheet exposure).

[8] The CET1 requirements consist of the minimum rate, the capital conservation buffer (CCoB) and - if applicable - the buffer for systemically important institutions (OSIIB + GSIB), the countercyclical capital buffer (CCyB), the systemic risk buffer (SyRB) as well as the Pillar 2 requirements (P2R). In the regression equation, the requirements were shifted parallelwise to the left by 4.5 percentage points (minimum CET1 rate). This transformation improves the interpretability of the coefficient β_1, as it now displays the marginal effect for a more realistic case (CET1 requirement = 4.5%). Without this centring, the isolated coefficient β_1, would represent the unrealistic case of 0% capital requirements.

Table 1: Relationship between relative risk weights and RRE loan portfolio shares

RRE loan share (in %)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
AME(RRW))	-1.76***	-12.03***	-6.57***	-11.96***	-11.85***	-17.8***	-8.65*	-20.02***
AME(RRW), CRSA		-5.93***			-9.85***	-21.03***		-26.37***
AME(RRW), IRB		-19.54***			-12.62***	-13.79***		-13.32***
ln(RRW)	-6.719***	12.757***	-6.358***	-7.709***	-9.856***	-21.939***	-7.882	-25.911***
	(1.240)	(1.580)	(0.494)	(0.249)	(0.452)	(3.966)	(8.667)	(4.960)
ln(RRW) * centred CET1 requirement	3.775***	-11.380***	-0.161	-2.591***	0.001	0.288	-0.200	-0.144
	(0.730)	(1.081)	(0.249)	(0.053)	(0.265)	(1.585)	(2.113)	(1.987)
ln(RRW) * IRB(=1)		-34.551***			1.777***	12.529***		18.433***
		(1.676)			(0.554)	(4.117)		(5.135)
ln(RRW) * centred CET1 requirement * IRB(=1)		12.755***			-2.765***	-1.675		-1.682
		(1.108)			(0.271)	(1.606)		(2.011)
Centred CET1 requirement (%)	-17.579***	-3.726***	1.059	0.160*	4.257***	-3.236**	-3.969	-4.501**
	(1.855)	(1.175)	(0.820)	(0.085)	(0.312)	(1.640)	(3.006)	(2.049)
Centred CET1 requirement * IRB(=1)		9.413***			-3.356***	-0.417		-0.160
		(1.113)			(0.273)	(1.618)		(2.023)
IRB bank (=1)		-44.762***			3.519***	11.066**		18.981***
		(1.689)			(0.709)	(4.896)		(6.056)
Interest rate ratio (RRE / Corporate)						0.000*	-0.018	0.002
						(0.000)	(0.017)	(0.002)
PD ratio (RRE / Corporate)							7.035**	
							(2.899)	
Share of unsecured loans (RRE / Corporate)								0.000
								(0.000)
Constant	37.446***	63.091***	47.707***	36.526***	34.176***	31.039***	41.854***	25.885***
	(1.607)	(1.672)	(0.673)	(0.269)	(0.521)	(4.383)	(11.616)	(5.465)
No of observations	33415	33414	33415	33415	33414	11213	100	7916
R^2	0.014	0.149	0.040	0.180	0.186	0.230	0.521	0.258
Bank-fixed effects	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Time-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weighting	No	Yes	No	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses, levels of significance: p < 0.1, ** p < 0.05, *** p < 0.01
Source: COREP, AnaCredit, own calculations

Since β are regression coefficients from a level-log model, they indicate approximately how many percentage points/100 the dependent variable (RRE portfolio share) increases/decreases by when the independent variable (relative risk weight) changes by 1%. Due to the numerous interaction effects, the sum of the β-coefficients is sometimes difficult to interpret. For this reason, the (combined) average marginal effect (AME) of the relative risk weight is also calculated (see Table 1). In some cases, the regression models were weighted with the average sum of RRE and corporate loans per bank over the observation period, so that larger banks have a greater influence on the result of the estimation. The weighting ensures that the effect on the banking system as a whole is displayed.

While all models differ in terms of the control variables[9] and in the specification of the fixed effects, the AME of the risk weight is negative in all cases. This provides robust evidence for the existence of the expected steering effect or relative risk weights, which will be affected by the application of a sectoral SyRB. The magnitude of the AME varies between -1.76 in the

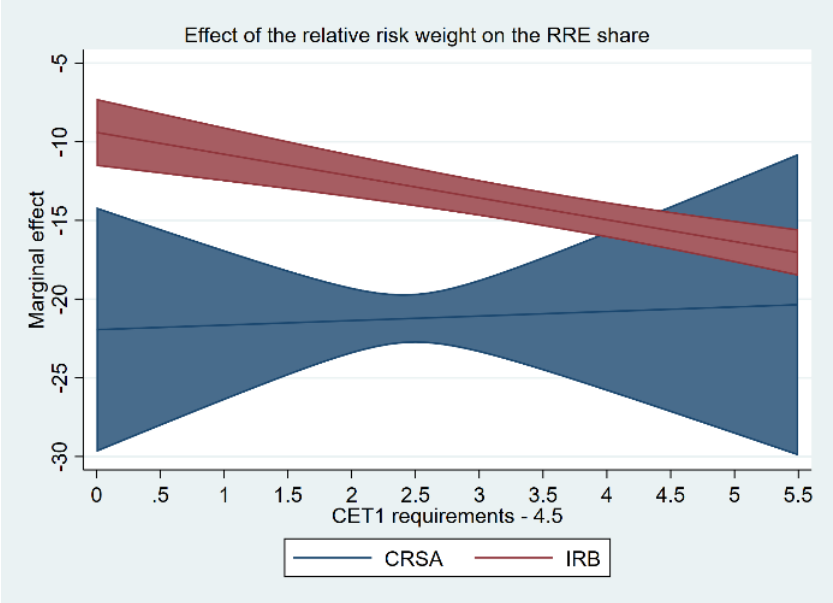
[9] The control variables are designed to control for differences in yield (interest rate ratio) and default risk (PD ratio, unsecured loan ratio). The relative yield reflects the fact that it is not just the capital requirements that determine the supply of loans, but also the interest rate that can be enforced (i.e. the potential yield). The default risk variables are intended to take account of the fact that the risk weight – especially in the case of CRSA banks – only partially reflects the possible defaults (i.e. negative earnings). The PD ratio is only available for IRB banks. Unfortunately, the control variables at the bank level are not available for private residential real estate financing, as private households are not included in AnaCredit. For this reason, these control variables only relate to the sub-exposure of commercial residential real estate loans (e.g. loans of housing companies). Although a correlation between commercial and private RRE characteristics is to be expected, the effects of the control variables should not be overinterpreted due to the suboptimal data basis.

simple model 1 and -20.2 in the more comprehensive model 8. Except for model 7, which includes significantly fewer observations because the PD control variable is only available for IRB banks, all AMEs are statistically significant at least at the 1% level; this further strengthens the evidence for the potential steering effect.

The AME was calculated separately for CRSA and IRB banks in some models. While the steering effect in the cross-sectional models (i.e. without bank-fixed effects) is clearly stronger for IRB banks, the steering effect for CRSA institutions is more pronounced when fixed effects and other control variables are included. A possible explanation for this finding could be that the relative risk weights between the banks hardly fluctuate or fluctuate for "external" reasons (e.g. business model). If, on the other hand, fixed effects are used, these unobservable differences are controlled for and even smaller changes in the relative risk weight can have a greater impact. This leads to the conclusion that there is also a potential steering effect of the sSyRB for CRSA banks. This is relevant because in Germany savings banks and cooperative banks are heavily involved in RRE lending and often use the CRSA.

As mentioned above, the marginal effect of the relative risk weight depends on the bank's respective capital requirement. This is because the incentive to steer the portfolio composition with regard to the relative risk weight is particularly large when the capital requirements are comparatively high. Figure 5 illustrates this effect for the preferred model 6, separately for CRSA and IRB banks. The coloured areas in the graph represent the 95% confidence interval of the marginal effect. It is noticeable that the marginal effect is more dependent on the level of capital requirements in the case of IRB banks. This could be due to the fact that the IRB banks, which tend to be larger, can control their loan portfolio in a more targeted manner.

Figure 5: Marginal effect as a function of the capital requirements, model 6



Source: COREP, AnaCredit, own calculations

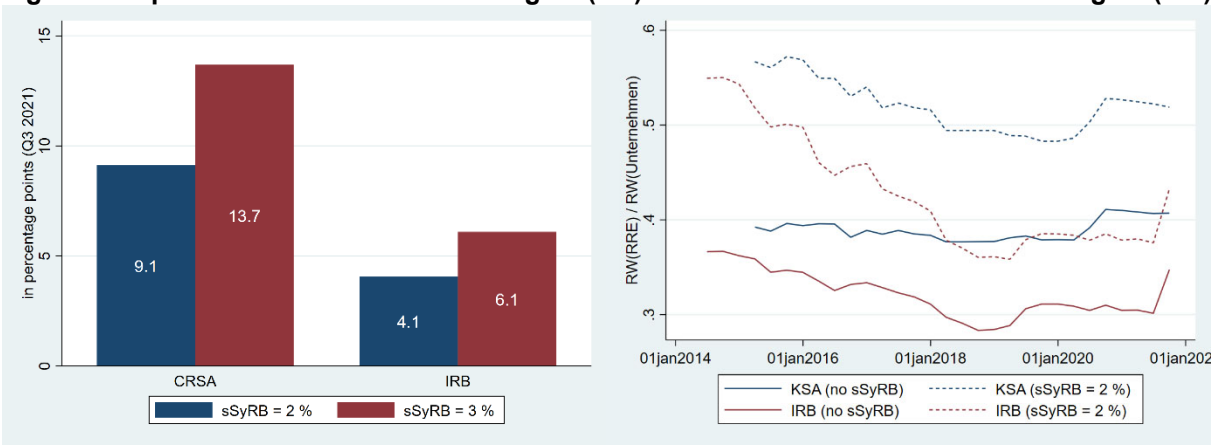
While the regression coefficients show how much the RRE share changes when the relative risk weight varies, the AMEs do not provide direct information about how much the RRE share changes when a sectoral capital buffer is enforced. By implementing a sectoral buffer, the relative risk weight between the charged exposure (RRE) and the unaffected portfolio (corporate) is modified. In order to derive the changes in the RRE share caused by a capital buffer on RRE loans, the effect of the sSyRB must be translated into a change in the relative risk

weights. The first step is therefore a calculation of how much the risk weight would have to increase so that the capital ratio remains implicitly constant despite the additional sSyRB capital ($\Delta\text{CapReq} = \text{sSyRB} * RWA[RRE]$):

$$\frac{\text{CapReq} + \Delta\text{CapReq}}{RWA + \Delta RW[RRE] * LE[RRE]} = \frac{\text{CapReq}}{RWA}$$
$$\Leftrightarrow \Delta RW[RRE] = \text{sSyRB[RRE]} * \frac{RWA[RRE]}{LE[RRE]} * \frac{RWA}{\text{CapReq}} \quad (5)$$

This formula can then be combined with equation (3) to calculate the implied relative risk weight as used in the regression function.[10] Figure 6 depicts the implicit increase in RRE risk weights (lhs) and the counterfactual relative risk weights given a 2% sSyRB for RRE exposures. It is evident that an sSyRB on RRE exposure would lead to a sizeable increase in both the implicit RRE risk weights and the relative risk weight. More specifically, the increase would more than compensate for the fall in risk weights during the observation period. The fact that the increase caused by the sSyRB would have been even higher in previous years is due to the higher risk weights and the lower overall capital requirements in these years (see equation 5). The impact on CRSA banks is higher because these banks have generally lower capital requirements.

Figure 6: Implied increase in RRE risk weights (lhs) and counterfactual relative risk weights (rhs)



Source: COREP, AnaCredit, own calculations

In connection with the marginal effects from the regression results in Table 1 for the relative risk weight (β), the change in the RRE share in percentage points (Figure 7, lhs) can be estimated. Additionally, the counterfactual share of RRE loans with a sectoral buffer can be obtained (Figure 7, rhs).

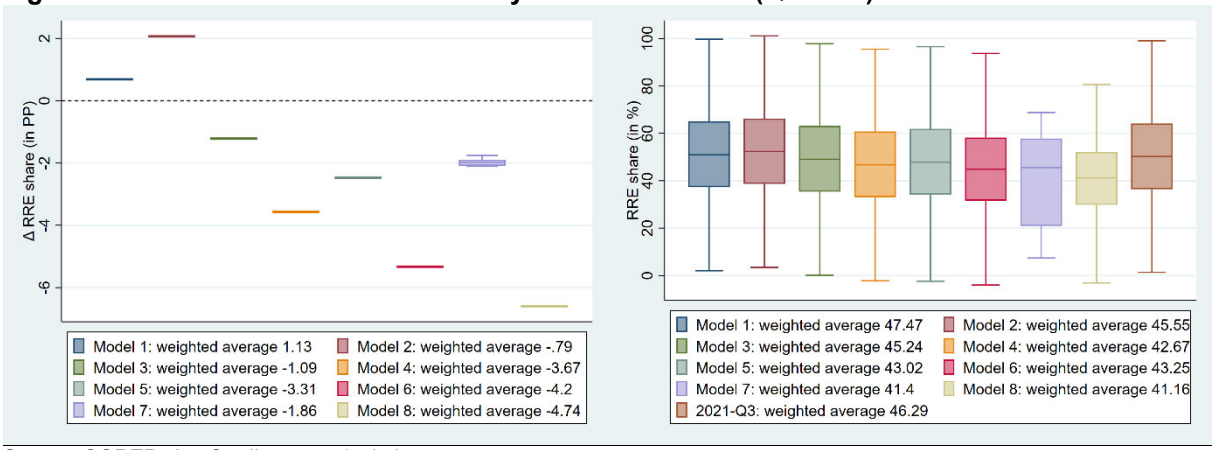
Depending on the model, the RRE share changes to differing extents. In the first two models, some banks even increase the RRE share. However, this is most likely due to the fact that the pooled models (i.e. without bank-fixed effects) do not capture all relevant characteristics and the coefficients are therefore biased (omitted variable bias). In the models with fixed effects, the estimated RRE share decreases on average by between 1.1 and 4.7 percentage points in case of a 2.00% sSyRB.[11]

[10] Since this is a level-log regression, the change in the implicit relative risk weight is technically displayed in in log units.

[11] The difference between the RRE percentage before and after the sSyRB survey does not necessarily correspond to the indicated change. This is due to the fact that the RRE share can be calculated for all banks before the buffer is calculated, whereas the share after the buffer is calculated was only calculated for those banks that could be included in the respective regression model (listwise deletion if variable value is missing).

When interpreting the results, however, it should be noted that the relative implied risk weight has so far not been subject to any exogenous changes caused by a macroprudential measure. In the past, there have been a small number of exogenous changes in the (relative) risk weights due to, for example, microprudential adjustments of the support factor for small and medium-sized enterprises (SME) or the so-called targeted review of internal models (TRIM). Most of the time, however, the relative risk weight of IRB banks changes endogenously while the relative risk weight of CRSA banks is almost fixed. It is therefore quite conceivable that the adjustment effect will be stronger than could be shown in this ex ante study. It would therefore be the task of future (ex-post) studies to reassess the steering effect of the sSyRB.

Figure 7: Estimated RRE share at 2% sSyRB for RRE loans (Q3 2021)



Source: COREP, AnaCredit, own calculations

4 Conclusion and outlook

The analysis shows how the activation of the sectoral systemic risk buffer (sSyRB) for residential real estate loans (RRE) may affect German banks. Unlike a general buffer (e.g. CCyB), banks would be subject to different capital requirements depending on the relative size of their RRE loan portfolio. This has the advantage that banks with a high RRE exposure would also have to provide more loss absorption capacity. In addition, the note quantifies the avoided capital charge for corporate loans compared to a general buffer with identical aggregated capital requirements.

The fact that a sectoral buffer implicitly changes the relative risk weight is then used for various regression analyses that estimate the expected steering effect of the sSyRB ex ante. A steering effect is the potentially intended reduction in the share of residential real estate loans relative to total loans through the use of a capital buffer. This may be desirable in order to slow down new lending in a particular segment and, in this way, to avoid the build-up of excessive credit risks at banks. In the case of RRE, this could ultimately also have repercussions for the price development of the financed objects. The fixed effects regression models estimate that the average decrease in the RRE share is between 1.1 and 4.7 percentage points at a 2% sSyRB rate. Yet, it is possible that due to the partly endogenous changes in the relative risk weight, the effects on the portfolio composition are biased and tend to be underestimated.

5 References

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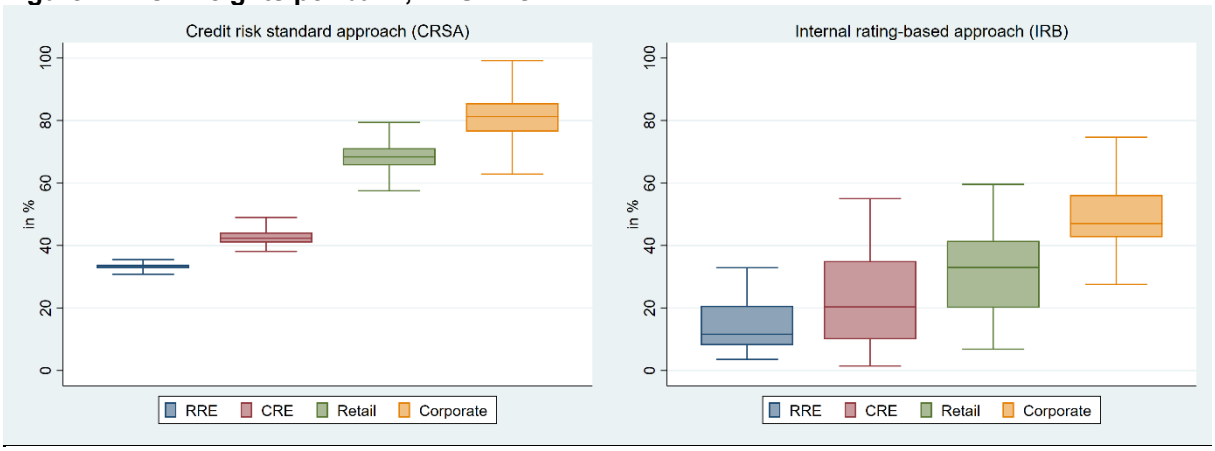
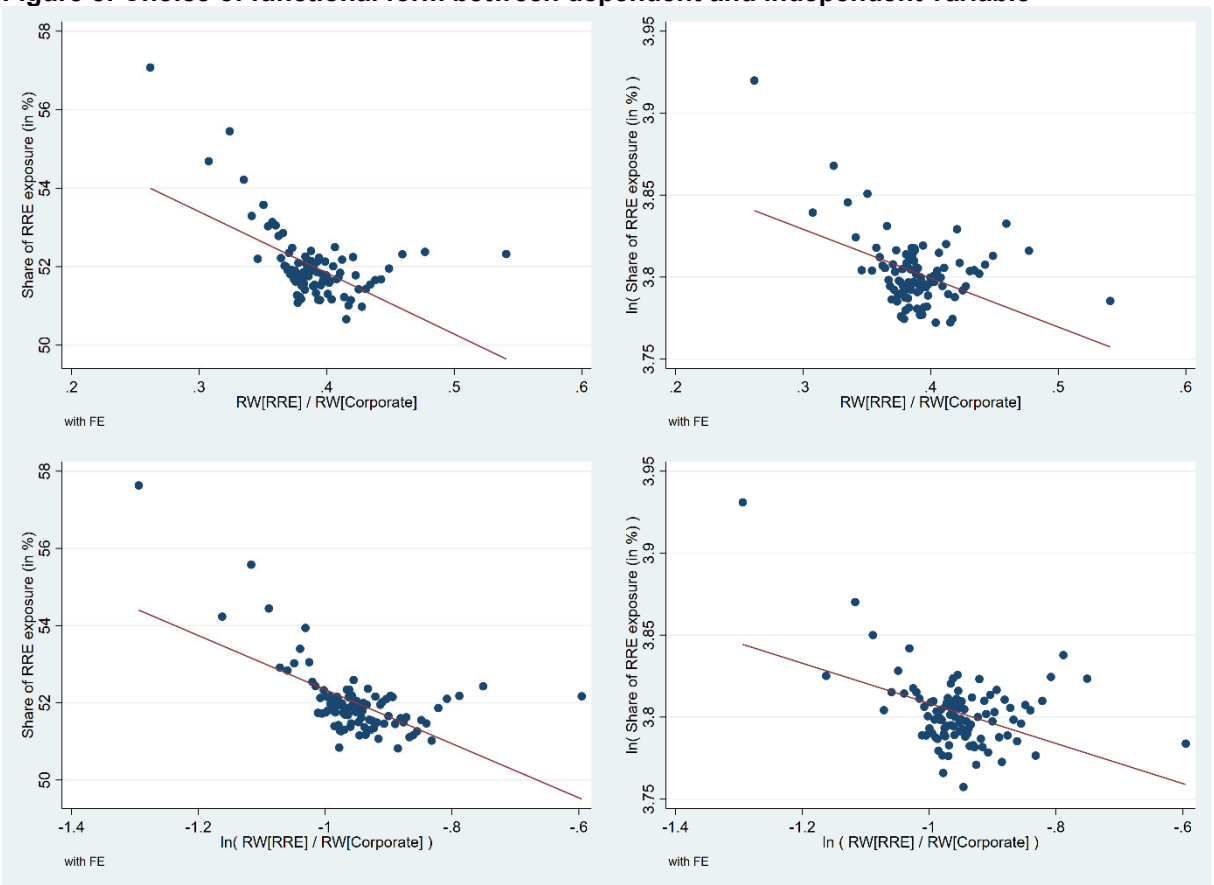
6 Annex

Figure 7: Risk weights per bank, CRSA vs. IRB



RRE = residential real estate; CRE = commercial real estate
Source: COREP, own calculations

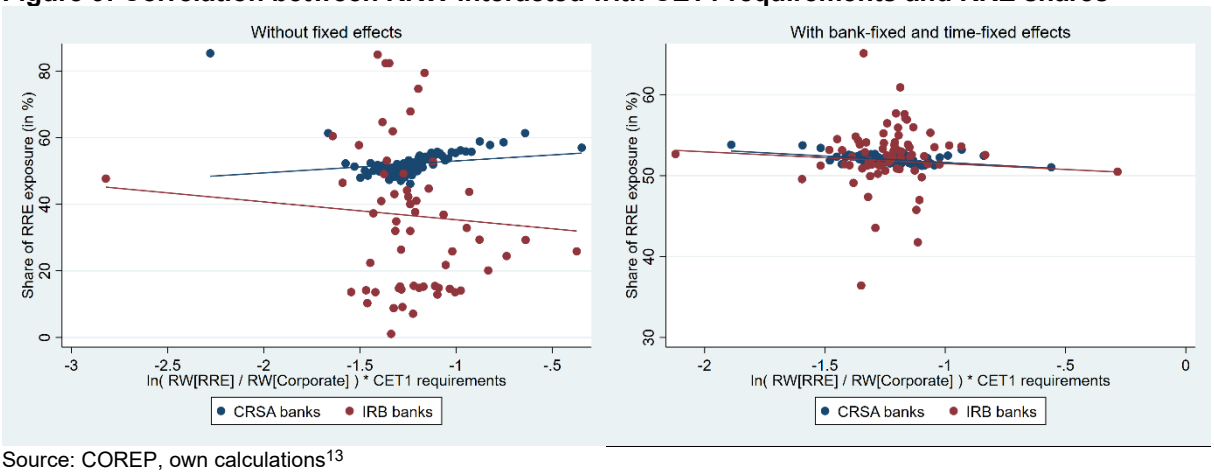
Figure 8: Choice of functional form between dependent and independent variable



RW = risk weight; RRE = residential real estate
Source: COREP, own calculations[12]

[12] Single observations were summarised and the average of these observations was presented for better visual representation and anonymisation. Risk weights with a lag of 1 quarter.

Figure 9: Correlation between RRW interacted with CET1 requirements and RRE shares



Source: COREP, own calculations[13]

[13] Single observations were summarised and the average of these observations was presented for better visual representation and anonymisation. Risk weights and CET1 requirements with a lag of 1 quarter.