

Blickpunkt Volkswirtschaft Nr. 2

Heterogenität der Kredit-Risikogewichte im europäischen Bankensektor

Risikogewichtete Aktiva bestimmen die regulatorischen Vorgaben bzgl. Eigenmittelausstattung der Banken. Seit der Einführung von Basel II im Jahr 2007 können Banken für die Bemessung ihrer Kreditrisiken sogenannte interne Modelle – nach entsprechender Genehmigung durch die Bankenaufsicht – heranziehen. Dieser sogenannte auf internen Ratings basierende (IRB) Ansatz hat zum Ziel, die Risikosensitivität der Eigenmittelausstattung der Banken zu erhöhen, wobei das zugrundeliegende Risiko in den Risikogewichten widerspiegelt werden soll. Alternativ können Banken ihre Risikogewichte nach dem einfacheren Standardansatz (StA) berechnen, wobei das Risikogewicht für eine bestimmte Forderung auf Basis von vordefinierten Zuordnungstabellen bestimmt wird. Vor allem kleinere Banken – inklusive aller Liechtensteiner Banken – wenden den StA an. In der Vergangenheit wurden immer wieder unbegründete Unterschiede im IRB-Ansatz zwischen den Implementierungsstandards der Banken gefunden, die ihre Risikogewichte so gering wie möglich ausweisen, um höhere Kapitalquoten zu erzielen. Vor diesem Hintergrund untersucht die vorliegende Ausgabe von „Blickpunkt Volkswirtschaft“ die Heterogenität der Risikogewichte im Kreditrisiko gemäss dem IRB und dem StA im europäischen Bankensystem und vergleicht sie mit den Risikogewichten des Liechtensteiner Bankensektors. Unsere Analyse zeigt, dass sich die Risikogewichte der Liechtensteiner Banken im Durchschnitt nicht merklich von anderen StA-Banken im europäischen Währungsraum unterscheiden, während IRB-Risikogewichte im Allgemeinen deutlich niedriger sind als StA-Risikogewichte. Gleichzeitig lässt sich beobachten, dass Banken in den vergangenen Jahren zwar ihre risikosensitiven Kapitalquoten aufgrund des stärkeren Aufbaus von Eigenkapital relativ zu den risikogewichteten Aktiva (RWA) erhöhen konnten, allerdings ist die Intensität des nicht-risikosensitiven Kapitalaufbaus deutlich langsamer verlaufen. Dies könnte auf eine niedrigere als angenommene Widerstandsfähigkeit des Bankensystems hinweisen.

Economics Focus No. 2

Heterogeneity of credit risk weights in the European banking sector

Executive Summary

Risk weighted assets determine the regulatory requirements regarding banks' own funds requirement. However, their comparability is often questioned due to the heterogeneity of risk weights across different banks. Since Basel II, banks are allowed – following supervisory approval – to use internal risk-based (IRB) models for estimating their regulatory capital ratio. The aim of the IRB approach was to increase the risk-sensitivity of the capital allocation, which should be adequately mirrored in banks' risk weighted assets. Alternatively, banks are allowed to use a simpler, standardized approach (StA) for calculating the risk inherent in their exposures by using a predefined risk weight table. In general, smaller and less complex banks apply the StA, including all Liechtenstein banks. Recently, a growing body of literature has found unwarranted risk weight heterogeneity in the IRB models used to assess the credit risk, which can be attributed to banks' efforts to underreport risk weights in order to overstate their capital ratios. Against this background, this issue of "Economics Focus" studies the heterogeneity of risk weights across the European Economic Area. We find that risk weights in Liechtenstein do not differ substantially from other banks using the StA, while there are strong differences between risk weights as calculated under the IRB and StA. Moreover, we observe that over the past few years, banks both increased their capital as well as their risk-weighted assets, with the former effect exceeding the latter, so that the common equity tier 1 (CET1) ratio increased noticeably. On the contrary, we also observe that the pace of the build-up of non-risk sensitive equity was substantially slower, indicating that the resilience of the banking sector against negative shocks might be lower than indicated by the commonly reported capital ratios relative to banks' risk-weighted assets.

Executive Office
Financial Market Stability / Macprudential Supervision

Dr. Sophia Döme, sophia.doeme@fma-li.li
Dr. Martin Gächter, martin.gaechter@fma-li.li

12. December 2019

Table of contents

I. Introduction and background	4
II. Data	5
III. The standardized versus the IRB approach.....	6
IV. Macroprudential measures targeting risk weights in Liechtenstein	6
V. Assessment of credit risk weights.....	7
1. Risk weights in Liechtenstein.....	7
2. Comparing StA risk weights in the European Economic Area.....	8
3. Comparing IRB vs. StA risk weights in the European Economic Area	9
4. Changes in banks' capital ratios	11
VI. Implications of risk-sensitive capital ratios	12
VII. Summary and conclusions	13
VIII. References.....	14

I. Introduction and background

The main objective of Basel II was to improve the capital adequacy framework to guarantee that banks' capital allocation is more risk sensitive. Against this background, since the introduction of Basel II in 2007, banks are permitted to use internal risk models (the so-called internal ratings-based (IRB) approach) for credit risk to calculate their capital requirements. Prior to their adoption, these risk models require supervisory approval regarding the institutions' internal assessment of their counterparties and exposures. Alternatively, since Basel II, banks are also allowed to quantify their risk inherent in their exposures for their capital requirement according to a simpler, standardized risk weight table, which is mainly used by smaller banks. The main idea behind model-based capital requirements is incentive compatibility, with a correctly structured IRB approach supplying a framework which incentivizes banks to improve their internal risk management practices (BCBS, 2001). By introducing model-based risk weights, the regulatory authorities aimed at increasing the efficiency of the credit allocation. However, these main objectives had to be balanced against banks' incentives to embellish their capital ratios by using too low internal risk estimates. Obviously, supervisors have to prevent the miss-calibration of risk weights by underreporting banks' portfolio risk to ensure an adequate amount of own funds and, thus, a stable banking sector.

Banks' capital ratio is one of the key variables in regulation and prudential banking supervision. Besides the level of own funds (i.e. equity), capital ratios also crucially depend on the risk weighted assets. Therefore, particularly from a financial stability point of view, it is necessary to ensure the comparability of risk weights and capital ratios, respectively, across different jurisdictions, as unwarranted risk weight variability could have severe consequences in the case of a financial downturn. In the context of finalizing the Basel III framework, the Basel Committee complements the initial phase of the Basel III reforms announced in 2010 to restore credibility in the calculation of risk-weighted assets (RWA) by improving the comparability of banks' capital ratios (BCBS, 2017c). In addition, some jurisdictions within Europe (e.g. Belgium, Croatia, Finland, Ireland, Luxembourg, Norway, Poland, Romania, Slovenia, Sweden and the United Kingdom) have already adopted macroprudential measures to address too low risk weights in the banking sector by establishing so-called risk weight floors (ESRB, 2018). These risk weight floors apply either on a bank-level basis or on an individual loan basis. In this context, Liechtenstein has introduced slightly higher risk weights for certain exposures secured by mortgages on immovable property instead of the risk weights indicated in Article 125(2) of the Capital Requirements Regulation (CRR) to mitigate risks from the residential real estate sector.

There is a large and growing body of literature suggesting discrepancies and unwarranted risk weight heterogeneity across banks located in different jurisdictions (see for example Behn et al. (2016), Vallascas and Hagendorff (2013), Mariathasan and Merrouche (2014), Turk-Ariss (2017) etc.). These studies show that many banks tend to overstate their capital ratios by underreporting risk weights, with severe implications for banking regulation and supervision. In this context, Döme and Kerbl (2017) quantify the main determinants

for risk weight variability across European Union countries. Interestingly, the empirical results provide evidence for unintended risk weight heterogeneity, i.e. differences in risk weights that are not due to differences in the underlying risks but rather due to differences in banks' and supervisory implementation standards that differ across jurisdictions. Most importantly, the study suggests statistically and economically significant differences with regard to the country where a bank is headquartered, even when controlling for common risk factors from the relevant literature.

Moreover, international bodies such as the Basel Committee of Banking Supervision (BCBS), the European Banking Authority (EBA) as well as the European Central Bank (ECB) also emphasize the relevance of this topic by strengthening their harmonization efforts ensuring a level playing field by making risk weights comparable across jurisdictions and to reduce unwarranted heterogeneity in RWA which are not justified by the underlying risk fundamentals. Thus, in the context of finalising the Basel III framework, the BCBS has also introduced so-called "output floors", which place a limit on the regulatory capital benefits when using internal models relative to the standardised approach. In practice, this output floor provides a backstop that limits the extent to which banks can lower their capital requirements relative to the standardised approach. On aggregate, banks' risk-weighted assets cannot fall below 72.5% of the RWA computed by the standardized approach. This limits the capital gain from using internal models to 27.5% (BCBS, 2017a; BCBS, 2017b).

In this issue of "Economics Focus", we assess and compare risk weights at the country level in the European Economic Area (EEA) both as calculated under the StA and the IRB approach. In addition, we quantify the contribution of changes in risk weighted assets and the common equity Tier 1 (CET1) capital to changes in the CET1 ratio in recent years. Last, we discuss the implications of using risk-sensitive capital ratios for financial stability.

II. Data

We base our analysis on the last four published transparency exercises of the European Banking Authority (EBA)¹. Altogether, the dataset comprises bank-specific data for 10 reference dates, representing around 70% of total EU banking sector assets (EBA, 2015). By publishing these yearly data disclosures, the EBA provides granular and comparable information for around 130 banks from 24 countries in the EU and European Economic Area (EEA) to monitor risks and to foster market discipline. The exercises include data on capital positions, risk exposure amounts, sovereign exposures as well as asset quality on the highest level of consolidation.

A considerable advantage of the dataset is its granularity – exposures and risk weights are broken down by banks, asset classes, the largest countries of counterparty, default status and calculation method (IRB vs.

¹ See <https://eba.europa.eu/risk-analysis-and-data/eu-wide-transparency-exercise/2018/results> for an overview of the data. We consider all transparency exercises since 2015.

StA) as well as time. This granularity allows us to compare bank-by-bank risk weights, which are determined by a number of factors.

We complement the EBA transparency exercises with data on the Liechtenstein banking sector. As Liechtenstein is part of the EEA, Liechtenstein banks' regulatory reporting templates are in line with those for EU banks, which are based on COREP and FINREP standards. For Liechtenstein, we are considering all banks in Liechtenstein, including the three largest banks (i.e. LGT Bank AG, Liechtensteinische Landesbank AG, VP Bank AG), which hold around 90% of total assets of the banking sector. All Liechtenstein banks are applying the StA for determining their risk weights for credit risk when calculating their capital requirement, so there was no need for the regulator so far to approve a more complex, risk-sensitive IRB approach.

III. The standardized versus the IRB approach

The pre-defined, standardized risk weight table for the StA lists the risk weights for different exposures and assigns risk weights according to the credit quality. Based on the StA, there should be little or no heterogeneity between the risk weights for the same exposure class. The Capital Requirements Regulation (CRR) distinguishes between different exposures that comply with predefined criteria. For example, retail exposures must be attributed (if a list of criteria apply to the exposure) a risk weight of 75%, unless the exposure is secured by immovable property. In this case, the risk weight decreases to 35% (under certain conditions) if it is secured by a residential property or to 50% if it is secured by commercial property.

Under the IRB approach, however, banks are allowed to use their own estimated credit risk parameters following the approval of the respective model by national supervisors. To use this approach, banks model the probability of default (PD), the loss given default (LGD) as well as the exposure at default (EAD). These variables are the main input factors to the risk weight function designed for different asset classes under the CRR. When considering IRB exposures, for the sake of simplicity, we do not distinguish between the advanced IRB (A-IRB) and the foundational IRB (F-IRB) approach.

IV. Macroprudential measures targeting risk weights in Liechtenstein

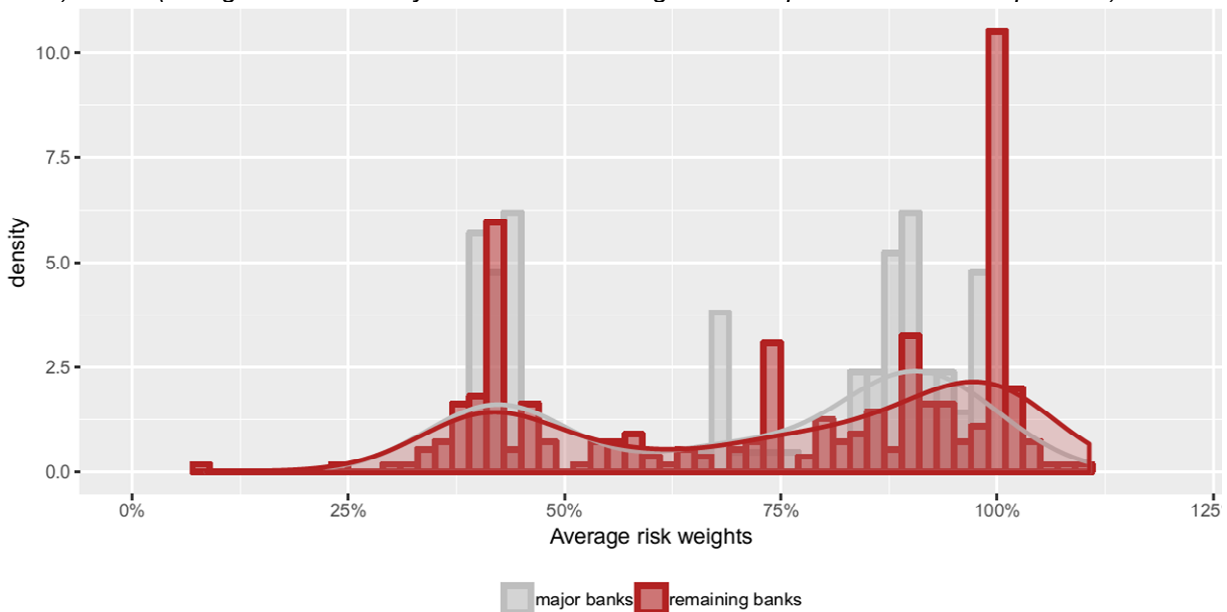
Already back in 2013, the FMA Liechtenstein has published a report on vulnerabilities in Liechtenstein's real estate and mortgage market in light of the substantial exposure of domestic banks towards the household sector, including high household indebtedness, high and still increasing house prices and substantial mortgage growth. As a result, Liechtenstein has introduced a policy mix including measures targeting owner's equity, affordability and amortization, broadly following the current legal system in Switzerland. Additionally, current policies include slightly stricter risk weights for residential real estate (RRE) mortgages instead of the risk weights indicated in Art. 125(2) of the CRR, i.e. for residential properties with an LTV be-

tween 66 2/3% and 80%, the risk weights are set at 50% (instead of 35%). Furthermore, borrower-based measures were introduced, which aim at limiting LTV ratios: the LTV ratio for mortgages for residential real estate should not exceed 80%, otherwise banks face additional reporting requirements for the respective loans (“exceptions-to-policy”). In addition, new mortgage loans have to be amortized to a maximum LTV ratio of 66% within 20 years. This RRE policy mix aims at strengthening the financial system, by making households more resilient and curbing total borrowing and house prices. Since the introduction of the measures back in 2015, Liechtenstein has experienced a significant decline in mortgage growth (FMA Liechtenstein, 2018).

V. Assessment of credit risk weights

1. Risk weights in Liechtenstein

Figure 1: Comparison of risk weights of Liechtenstein significant (major) banks vs. remaining (i.e. all other) banks (histogram and density function of risk weights for corporate and retail exposures)



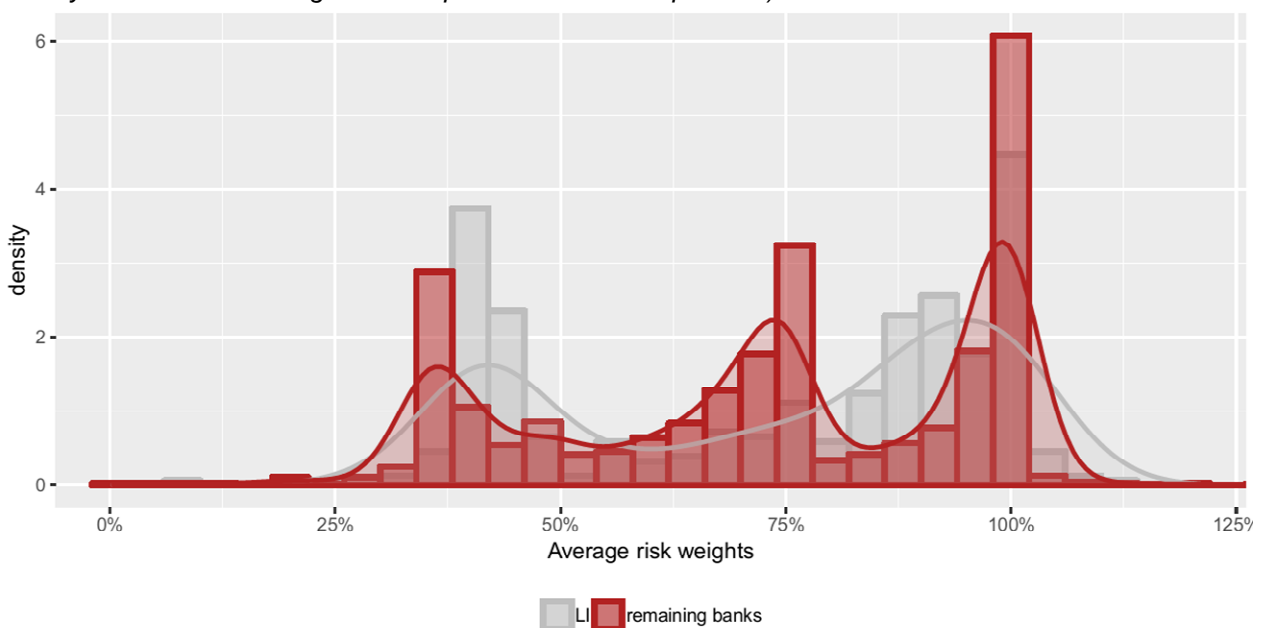
Source: FMA, own calculations.

In a first step, we look at the distribution of risk weights in Liechtenstein. As mentioned before, Liechtenstein banks only calculate risk weights based on the standardized approach (StA). We compare risk weights of the three largest (systemically important) banks – which take up around 90% of total assets – to the remaining banking sector (i.e. all other banks headquartered in Liechtenstein). Figure 1 shows histograms and kernel density estimates for corporate and retail risk weights. These densities correspond to raw, unweighted, average risk weights between December 2015 and December 2018. The density functions are almost identical for the two banking groups, suggesting that there are hardly differences in the risk inherent in banks’ exposures. The figure indicates that the risk weights peak at 35% – due to the high share

of retail exposures secured by real estate property below an LTV ratio of 66%– and at 100%, mainly for corporate exposures. The weighted² average risk weight for the three largest banks adds up to around 40% compared to 36% for the remaining banks at the end of 2018, reflecting certain (rather limited) differences in the respective profile.

2. Comparing StA risk weights in the European Economic Area

Figure 2: Comparison of StA risk weights between Liechtenstein banks and the EEA banks (histogram and density function of risk weights for corporate and retail exposures)



Source: EBA transparency exercises, FMA, own calculations.

In a second step, the StA risk weights for corporate and retail exposures in the Liechtenstein banking sector and the banks from the EBA transparency exercise are compared (i.e. banks in the EEA).

While the density function of risk weights for banks in the EBA sample additionally peak at 75% as shown in figure 2 (besides 35% and 100%), we do not observe this peak for Liechtenstein banks³, probably because most of the loans are secured either by real estate or by the respective client portfolio (i.e. lombard loans). Liechtenstein has several macroprudential policy measures in place to limit risks from the residential real estate sector and to prevent excessive credit growth and leverage within the household sector by maintaining sustainable mortgage financing. Based on these macroprudential measures, risk weights for residential real estate loans in Liechtenstein with an LTV between 66% and 80% are set at 50%, instead of the 35% defined in the CRR, while mortgages loans with an LTV ratio larger than 80% lead to risk weights of 100%

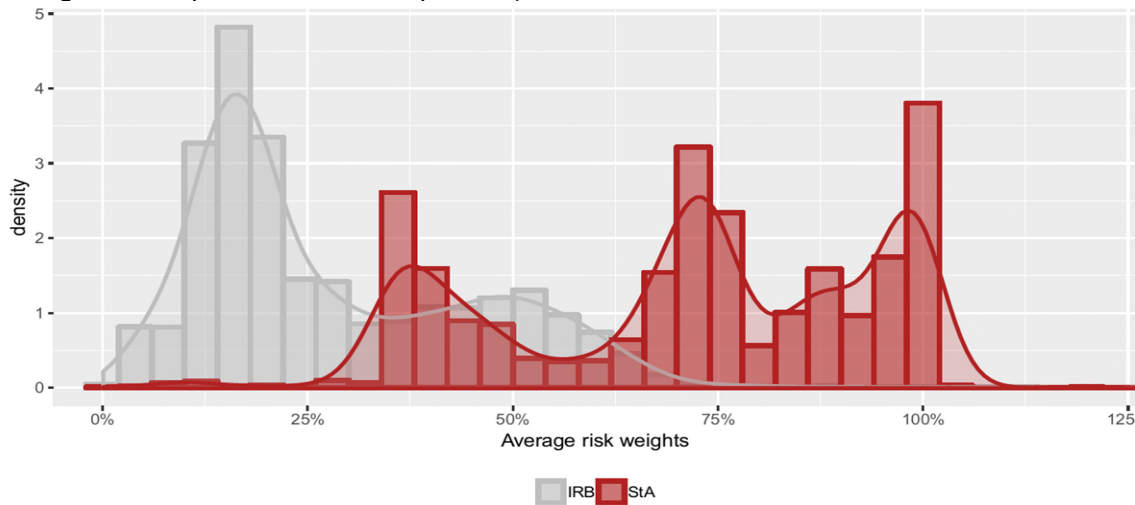
² Numbers are weighted by the exposure amount.

³ In general, private household loans receive a risk weight of 75% according to the CRR, while there are more detailed regulations for residential real estate loans. Moreover, risk weights for corporate loans vary depending on the credit assessment, but unrated corporates have a risk weight of 100%.

(in line with the CRR). It is, however, important to note that the share of loans with an LTV larger than 80% amounts to only 1.2% of all loans, while the share of loans with an LTV ratio between 66% and 80% receded from 27.3% in 2015 to 24.6% in 2018, not least due to the above mentioned higher risk weights and various borrower-based policy measures. This is another reason why Liechtenstein banks' distribution of risk weights is not characterized by a peak at 75% as in the case of other EEA banks. In addition, it is interesting to highlight that the weighted (non-weighted) average StA risk weight for all exposures of Liechtenstein banks in June 2018 was at around 40% (54%) compared to the EBA banks at 48% (74%)⁴. In general, however, the differences we observe in the density functions across the subsamples derive from the differences in bank's business models as the standardized approach does not allow for discretion.

3. Comparing IRB vs. StA risk weights in the European Economic Area

Figure 3: Comparison of StA and IRB risk weights in the EEA (histogram and density function of risk weights for corporate and retail exposures)



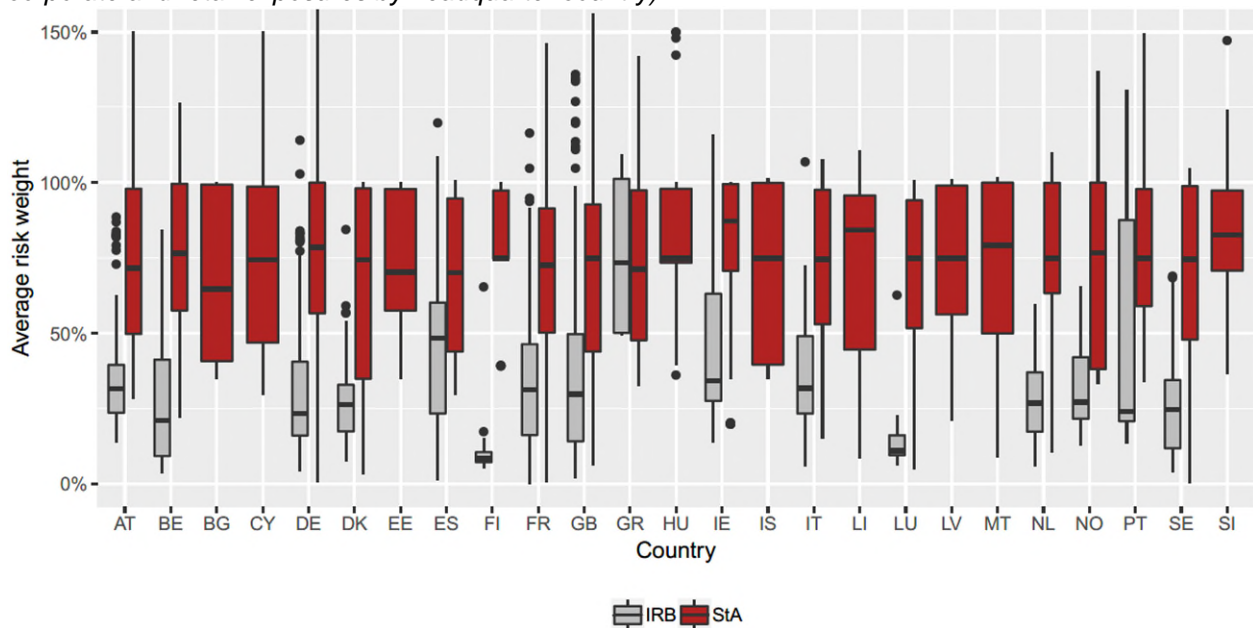
Source: EBA transparency exercises, FMA, own calculations.

In Figure 3, we compare the distribution of corporate and retail risk weights according to the IRB and the StA approach. We add both – corporate and retail – exposure classes to the graph, as there are slight definition differences between the IRB and StA approach for certain exposure classes. This figure again depicts histograms and kernel density estimates, using value-weighted kernel density estimates over the entire IRB and StA portfolios, respectively. By using a weighted distribution, a large exposure receives a higher weight in the distribution, which should prevent a skewed distribution in which banks have many small portfolios with a low risk weight. Figure 4 presents a breakdown of risk weights as calculated under the StA and IRB approach by the headquarter country (i.e. the jurisdiction which approves the IRB models). While

⁴ While the figure only shows corporate and retail exposures, these numbers refer to banks' total exposures.

most of the countries are assigned two boxplots, there are some countries (e.g. Cyprus, Estonia, Greece, Hungary, and Liechtenstein etc.) with only a red boxplot, indicating that banks headquartered in those countries do not have banks that apply the IRB approach. In addition, the grey dots represent the share of IRB exposures in the portfolio of the banks.

Figure 4: Comparison of StA and IRB risk weights in the EEA (distribution of StA and IRB risk weights for corporate and retail exposures by headquarter country)



Source: EBA transparency exercises, FMA, own calculations. Outliers are not presented in the boxplot.

We observe that while StA risk weights are concentrated around 35%, 75% and 100% (Figure 3), IRB risk weights denote a much broader range of values, which is intended by the regulatory authority. However, we additionally see that IRB risk weights are substantially lower on average than StA risk weights. In fact, for some countries there are hardly any overlaps between the two distributions. While StA distributions are very similar (with the above mentioned peaks such that the median is roughly around 75%), IRB risk weights vary substantially across countries. The overall weighted average risk weight for all exposures over all IRB banks stood at 24% in June 2018. For example, Finland and Luxembourg are denoted by the lowest weighted⁵ average IRB risk weights at around 9% and 10%, respectively, while Greece (69%), Portugal (41%) and Italy (36%) have the highest risk weights as of June 2018. It should not come as a surprise that those countries that were most severely hit by the financial crisis in 2018 have the highest risk weights when calculated under the IRB approach. Nonetheless, the most important takeaway from this simplified and stylized comparison is that banks with a higher share of IRB exposures tend to have substantially lower

⁵ For calculating the arithmetic means, we weight it by the value of the exposure amount of the portfolio per country.

risk weights and, thus, report a higher capital ratio. The difference between the average IRB risk weight⁶ (24%) and the average StA risk weight (48%) amounts to roughly 20 percentage points.

On average, the application of the IRB approach implies capital savings. Assuming a minimum regulatory capital requirement of at least 10% for large European banks⁷, the different calibration approaches would lead to an average capital saving of at least two percentage points for banks using the IRB approach when (cautiously) assuming a reduction of risk weighted assets by 20%. Obviously, such a comparison is too simplistic, but may nevertheless be helpful to understand potential implications of applying the IRB approach. Nonetheless, we infer that the intensity to which a bank is using the IRB approach partly determines the risk weight and, consequently, the capital level at least to a certain extent.

However, it seems likely that banks headquartered in Liechtenstein would benefit less strongly from IRB models relative to other EEA countries, where banks are using the StA approach. The potential capital “saving” from applying IRB models in Liechtenstein would likely be substantially lower, as the average weighted StA risk weight of Liechtenstein banks is substantially lower than the European (StA bank) average, thereby limiting the scope for a possible RWA reduction by applying IRB models.

4. Changes in banks’ capital ratios

Following the comparison of average risk weights as calculated under the IRB and the StA approach, we now focus on changes in banks’ capital ratios. Recent banks’ capital ratio increases can either result from rising capital and/or lower RWA. Banks’ CET1 ratio is defined as the CET1 capital divided by the risk-weighted assets (RWA). Thus, to understand the contributions of these two factors to banks’ CET1 ratio changes, we analyse whether European banks were able to build up CET1 capital (which we call the CET1 capital contribution, i.e. by increasing the numerator) or whether banks lowered their RWA (the RWA contribution, i.e. by decreasing the denominator). Lower RWA would, in turn, also increase banks’ CET1 ratios.

We find that in most countries the mean CET1 ratio of banks increased between December 2014 and June 2018 (Figure 5). While the mean CET1 ratio of all banks in the EBA sample⁸ stood at 12.43% in December 2014, it increased to 14.51% as of June 2018. In Figure 5, the CET1 ratio by headquarter country is depicted by the light brown (for December 2014) and black (for June 2018) dots. In addition, the bars for each headquarter country shows the contributions of changes in the CET1 capital (grey bars) and the RWA (red

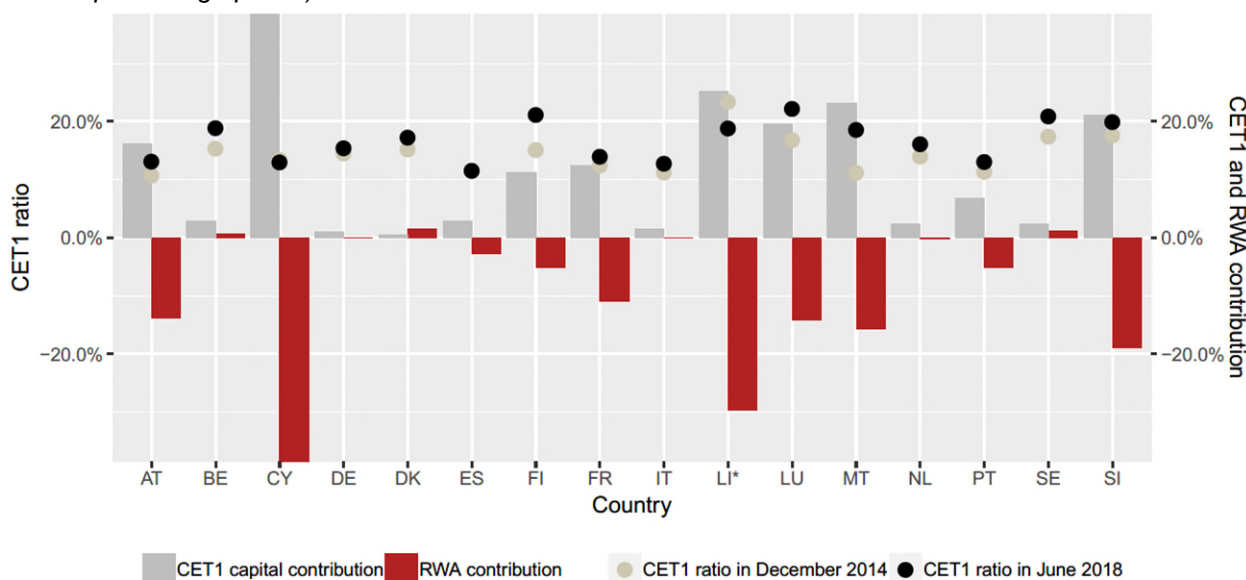
⁶ for corporate and retail exposures combined

⁷ The minimum capital requirement follows from the Basel III accords and the CRR/CRD IV. It varies between banks and jurisdictions.

⁸ This number also includes those banks not displayed in the graph. We did not include all countries in the graph, as for some countries there are insufficient reporting banks.

bars) to the overall change in the CET capital ratio, i.e. the sum of the two bars is equal to the CET1 ratio change between 2014 and 2018, so that we are now able to deduce where the capital changes result from.

Figure 5: Contributions to CET1 ratio changes between 2014 and 2018 (CET1 ratio in percent; contributions in percentage points)



Source: EBA transparency exercises, FMA, authors' calculations.

* Note: For Liechtenstein, we have used data from December 2016 and December 2018.

In the majority of the countries, banks both increased their capital as well as their RWA over the selected time period. There are only a few countries (i.e. Belgium, Denmark and Sweden) that also decreased RWA besides (marginally) increasing the capital. This development either indicates a deleveraging process in the banking sector or suggests that banks simply reduced their risk weights. A potential risk weight decrease might result from banks' incentive to use "lower" estimates than suggested by the underlying risk to embellish their capital ratios. Such an effect has been found by the related literature (i.e. Behn et al. (2016), Bruno et al. (2016)) and has already been (partly) addressed by international regulatory bodies such as the EBA, the BCBS and the ECB as well as by national supervisors by introducing respective macroprudential measures.

VI. Implications of risk-sensitive capital ratios

The analysis of risk weights and risk-sensitive capital ratios raises the question whether the resilience of the banking system in Europe has increased in the last few years. To provide some simple indication, we first consider the non-risk weighted capital ratio changes over the past few years, as reported by the leverage ratio. Based on the consolidated banking statistics database (CDB) of the European Central Bank (ECB), we observe that the leverage ratio – defined as total equity over total assets – only slightly increased for all

EU banks⁹ from 8.6% to 9.3% between 2014 and 2017. This development suggests a relatively slow build-up of total equity in non-risk weighted terms during the last few years. In the same time period, CET1 ratios increased by around 2.5 percentage points over the same time horizon between 2014 and 2017, highlighting substantial differences with respect to the dynamics in the build-up of risk-weighted and non-risk weighted capital. The slow build-up of capital in non-risk weighted terms may suggest that the resilience of the EU banking system could be lower than indicated by the commonly reported capital ratios in terms of RWA.¹⁰ In particular, in a global environment that is characterized by a deteriorating economic outlook, the still relatively low levels of non-risk weighted capital might pose certain systemic risks to financial stability. At the same time, nonetheless, capital ratios are significantly higher than prior to the global financial crisis, both in risk-weighted and non-risk weighted terms.

VII. Summary and conclusions

We assess the heterogeneity of risk weights within the EEA banking sector by using data from the EBA transparency exercise and Liechtenstein supervisory data. Step-by-step, we compare the differences of risk weights as calculated under the StA and the IRB approach by providing descriptive statistics for evaluating the risk inherent in banks' exposures.

First, we find that there are only slight differences between average risk weights when calculated according to the StA, which – as envisaged by the regulatory authority – does not allow for a great variability. This is indicated by the very similar risk weight distribution between Liechtenstein and EEA banks. Second, we see significant differences in risk weights depending on the calculation approaches. Banks using the IRB approach have notably lower risk weights, suggesting that banks might systematically use the IRB approach to embellish their capital ratios, as also suggested by previous literature. Third, we study how capital ratios have changed over the past years and examine the respective contributions to these changes, i.e. either capital build-up or RWA changes. For most countries, we observe a stronger capital increase compared to RWA, leading to a higher CET1 ratio. In addition, we also analyse the development of non-risk sensitive capital ratios to figure out whether the resilience of the banking system has overall increased. We observe a much slower build-up of leverage ratios compared to risk-weighted capital ratios, concluding that reported capital ratios (relative to RWA) might overestimate the resilience of the European banking sector.

⁹ Data are based on FINREP (IFRS and GAAP). The leverage ratio is calculated as a simple average of all EU countries' leverage ratio, without weighting by the size of the banking sector. We considered all domestic banking groups and stand-alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.

¹⁰ In this context it should be mentioned that the leverage ratio is not yet binding for financial institutions. The leverage ratio will become binding when the Capital Requirements Regulation II (CRR II) will enter into force for all EU institutions at the end of 2020.

Our descriptive findings have been confirmed in several empirical studies, which show that banks that use the IRB approach to calculate their regulatory capital tend to overstate their capital ratios by reducing risk weights (Döme & Kerbl, 2017). Another issue of using IRB models is that the estimates for the IRB models are backward looking and, hence, do not take into account a deteriorating economic cycle, which might imply severe shocks to banks' capital ratios in times of crisis. Furthermore, an important question that arises is whether micro- and macroprudential policy makers should aim at further increasing the resilience of the banking sector by also targeting non-risk sensitive leverage ratios. Based on these findings, we conclude that supervisory efforts to lower the variability in risk weights and to limit poor risk assessments should be further encouraged, particularly for banks that use the IRB approach. These measures should include, among others, capital measures, regulatory floors for model outputs as specified under the finalization of Basel III as well as other harmonization efforts to address the issue of (too) low risk weights.

VIII. References

- Basel Committee on Banking Supervision (2001), The internal ratings-based approach. Consultative document. January 2001.
- Basel Committee on Banking Supervision (2017a), High-level summary of Basel III reforms. December 2017.
- Basel Committee on Banking Supervision (2017b), Basel III: Finalising post-crisis reforms. December 2017.
- Basel Committee on Banking Supervision (2017c), Finalising Basel III in brief. December 2017.
- Behn, M., R. Haselmann and V. Vig. 2016. The limits of model-based regulation. ECB Working Paper Series 1928.
- Bruno, B., G. Nocera and A. Resti. 2016. Are risk-based capital requirements detrimental to corporate lending? Evidence from Europe. CEPR Discussion Paper 12007.
- European Banking Authority. 2015. Report – 2015 EU-wide transparency exercise. 25 November 2015.
- European Systemic Risk Board (2018), National Policy – Other measures. https://www.esrb.europa.eu/national_policy/other/html/index.en.html
- Döme, S. and Kerbl, S. (2017), Comparability of Basel risk weights in the European Union. In: Financial Stability Report, Oesterreichische Nationalbank.
- FMA Liechtenstein (2018). Financial Stability Report 2018, November.
- Mariathasan, M. and O. Merrouche. 2014. The manipulation of Basel risk weights. In: Journal of Financial Intermediation 23. 300–321.
- Turk-Ariss, R. 2017. Heterogeneity of Bank Risk Weights in the EU: Evidence by Asset Class and Country of Counterparty Exposure. IMF Working Paper 17/137.
- Vallascas, F. and J. Hagendorff. 2013. The Risk Sensitivity of Capital Requirements: Evidence from an International Sample of Large Banks. In: Review of Finance 17(6). 1947–1988.