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COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT REPORT

Accompanying the documents

Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) No 575/2013 on prudential requirements for credit institutions as regards requirements for credit risk, credit valuation adjustment risk, operational risk, market risk and the output floor

Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2013/36/EU as regards supervisory powers, sanctions, third-country branches, and environmental, social and governance risks, and amending Directive 2014/59/EU

{COM(2021) 663 final} - {SEC(2021) 380 final} - {SWD(2021) 321 final}

ANNEX 6: SPECIFIC IMPACTS OF PREFERRED POLICY OPTIONS

1. Impact on administrative and operational costs

The different policy proposals included in this legislative initiative would impact administrative and operational costs in different ways.

Improving the current framework for calculating risk-based capital requirements would mainly lead to one-off operational cost to develop the new systems required to calculate the revised capital requirements introduced by the final elements of the Basel III reform. Furthermore, it would lead to moderate variations in running operational and administrative costs related to the prudential framework, as explained in this section.

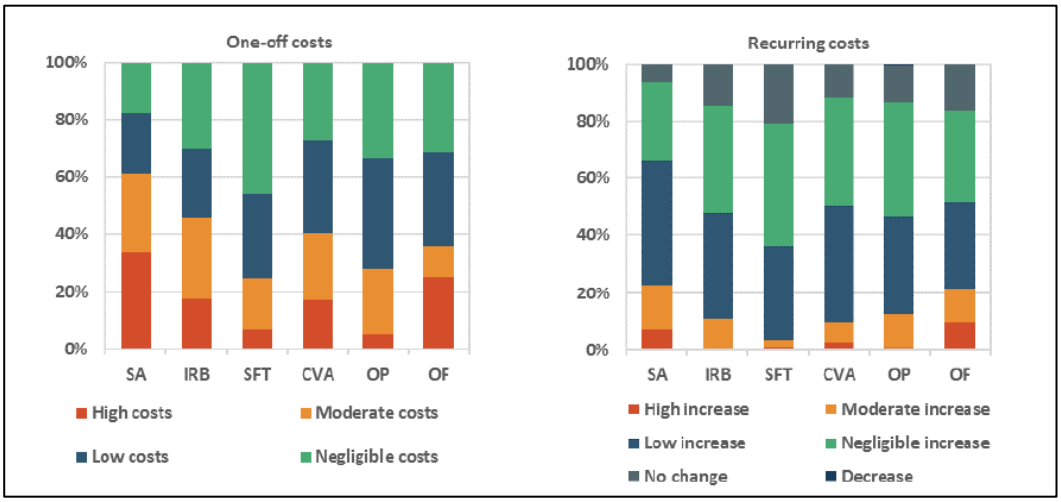
Quantitative estimates to appropriately assess operational and administrative costs of those processes is not available[1].The qualitative survey conducted by the EBA as part of their first response to the Commission Call for Advice[2] (CfA) highlights that the EU banks' estimates of their operational costs of implementing the Basel III reforms are rather heterogeneous across the different elements of these reforms.

As shown in *Figure 1* below, banks participating in the survey consider that the implementation of reforms related to the credit risk framework (both the standardised and the internal model approaches) and the introduction of the output floor would lead to higher one-off operational cost than the implementation of reforms related to CVA risk, operational risk and the minimum haircut floor framework for SFTs. According to the survey, the estimated one-off operational costs would mainly be caused by adaptations to IT systems and by staff costs.

Figure 1 shows that the impact of the implementation of the final elements of the Basel III reform on recurring operational and administrative costs is considered to be low, negligible or even negative (i.e. a decrease in costs) for the vast majority of EU banks participating in the survey. In fact, the recurring operational and administrative costs of those reforms should even be lower than indicated in the survey since the survey did not take into account the EU specific adjustments[3] proposed under the preferred option.

[1] No comprehensive estimates of those costs have been provided by EU banks via the public consultations launched by the Commission on the final elements of the Basel III reform.
[2] Basel III reforms: impact study and key recommendations, EBA, August 2019.
[3] Some of those adjustments would further reduce the recurring operational and administrative costs by reducing the operational burden to calculate capital requirements, for instance in the area of operational risk with the historical loss component set to 1 or in the area of the CVA risk by maintaining the exemptions introduced in CRR.

Figure 1: One-off and recurring operational costs of the implementation of the final Basel III framework (% of total responses), by risk category



Source: Basel III reforms: impact study and key recommendations, EBA, August 2019

The actual impact on recurring operational and administrative costs would largely depend on whether EU banks would (be able to) continue to use the internal models to calculate their capital requirements under the revised prudential framework (those will be mainly the largest EU banks that already use internal models under the current prudential framework). Internal models are usually more costly to maintain than standardised approaches since they require more complex IT systems, more data processing from both internal sources and third-party service providers and more qualified staff to analyse the results of the models. Banks using internal models would likely see an increase in their recurring operational and administrative costs due to the introduction of the OF because the reform would require them to carry out additional calculations, namely of the risk-based capital requirements using the standardised approaches.

Banks that are currently using the internal models that would no longer be available under the new framework[4] would see a reduction of their recurring costs. There would also be a corresponding reduction in costs of supervisors for approving and controlling those models. To the extent that banks would choose to abandon some of the models that would still be allowed under the new framework, those costs would be reduced even further. By contrast, banks that currently do not use internal models (the vast majority of small and medium-sized EU banks) would likely see no material change in recurring operational costs.[5]

[4] The reform would limit the use of internal models for credit risk, and would no longer allow the use of internal models for operational risk and CVA risk.

[5] To the extent that a bank that currently does not use internal models would choose to do so under the new framework (this may happen because the new rules would make it possible to introduce credit risk internal models for just certain types of asset classes), this would of course create one off and recurring costs for the bank. However, that would be the result of a conscious decision of the bank.

Incorporating ESG risks in the prudential framework would result in one-off administrative and operational costs for EU banks in order to set up the new processes associated with the monitoring and management of those risks. The increase in recurring costs, by contrast, would largely depend on the availability and format of the necessary information that banks would need to collect: the more easily available the information would be and the more friendly its format from a point of view of allowing automated collection and processing of that information, the lower the recurring costs for banks would be (and vice versa). By the time the revised framework would be in place and applicable, it is likely that the effects of some of the ongoing reforms in the ESG area (e.g. the revision of the Non-Financial Reporting Directive, the Taxonomy Regulation) would have put in place the necessary conditions to keep the costs of information collection contained.

Improving the consistency in the application of supervisory and sanctioning powers would increase to some extent the administrative and operational costs of EU banks since they would need to develop new procedures to comply with the requests of their supervisors that would be granted with new powers. However, a number of EU banks would already have developed such procedures since they operate in Member States that have already introduced similar powers in their national laws. The costs of cross-border banking groups would likely decrease as a result of the initiative as they would be subject to the same rules and procedures across Member States. Similarly, the initiative would also decrease the administrative and operational costs of supervisors in the SSM, since they would no longer have to apply 19 different national laws when exercising those powers. On sanctioning powers, no material new costs would be involved.

Centralising banks' disclosures at the level of the EBA based on the supervisory data collected in the context of the EUCLID would relieve small and non-complex banks from the administrative burden associated with mandatory disclosures, while having no cost impact for other banks. At the same time, it would reduce search costs for market participants.

In light of the above considerations, this legislative initiative would mainly entail one-off operational costs, due to the implementation of the new requirements, but would overall reduce the recurring administrative costs.

2. Impact on competitiveness

This section presents the impacts of the implementation of the final elements of the Basel III reform in Union law on the competitiveness of EU banks within the EU banking sector as well as between EU banks and their international peers. The other measures proposed in this legislative initiative have a smaller impact[6] on competitiveness of EU banks since they mainly affect certain banks' compliance costs, which remain overall

[6] The measures related to supervisory and sanctioning powers would level the playing field for banks located in Member States that have given their competent authorities powers beyond those in the list contained in the CRD and banks in those Member States that have not done it.

contained, and they do not directly affect their ability to provide financial services to the real economy.

Impacts of the final Basel III reforms on competitiveness across EU banks

To understand better the profile of EU banks that would be impacted by the final elements of the Basel III reform, the updated EBA analysis provided a number of more granular impacts of the reform in addition to the overall impacts shown in Section 6.1. Three criteria[7] have been used by the EBA to differentiate the impacts across EU banks: size, business model and geographical location (i.e. the Member States in which the bank is established). In order to identify the drivers of the impacts across the different criteria, a breakdown of the impacts of the reforms per risk category[8] is also included (the impact of each risk category is expressed as the percentage change in the total capital requirement (MRC) resulting from the implementation of the final elements of the Basel III reform related to this risk category).

This section compares the impacts of two implementation options across the above three criteria: the full alignment with the final Basel III reform option (option 1 in Section 5.2.1) and the preferred policy option (option 3[9] in Section 5.2.1). The results of this analysis need to be interpreted taking into account a number of caveats:

- limited sample of EU banks in the updated impact analysis: the sample of banks included in the updated EBA impact analysis based on Q4 2019 data has been significantly reduced as compared to the original EBA impact analysis based on Q2 2018 data. As shown in Annex 7, certain categories across the three criteria did not include a sufficient number of EU banks to lead to representative results for these categories and are therefore not presented in the analysis of this section. The corresponding banks are nevertheless included in the overall impacts presented in Section 6.1. In addition, the impacts based on geographical location should be interpreted in light of the representativeness of the EU banks included in the EBA sample in terms of the total banking assets of its Member States, provided in Annex 7;
- limited recognition of the EU specific adjustments: while the Commission has broadly estimated the overall impact of the EU specific adjustments proposed under the preferred policy options on all EU banks that have not been quantified by the EBA (see ***Error! Reference source not found.*** in section 6.1), it was not

[7] More details about the definition of those criteria, and the breakdown of banks for each related category, are provided in Annex 7.

[8] This breakdown include the following risk categories: credit risk under the standardised approach (SA), credit risk under the internal model approach (IRB), market risk (MKT), operational risk (OP), CVA risk (CVA), other risks including banks' exposure to central counterparties, securitisation risk and the effect on the leverage ratio (Other), and the introduction of the output floor (OF)

[9] As explained in Section 6.1, the impact of option 3 is the same as option 2 also presented in Section 5.2.1, the only difference being the implementation period, which is 2 years longer for option 3 as compared to option 2.

possible to reflect those impacts at more granular level due to the lack of the necessary information. The more granular impacts contained in this section under the preferred policy option therefore only include those EU specific adjustments that have been quantified by the EBA. As a consequence, the mitigating effects of the preferred policy option on the increase in capital requirements are underestimated;

- limited analysis provided by the EBA in its report: the EBA provided limited qualitative analysis on the drivers of the impacts depending on the different characteristics of EU banks. Therefore, the EBA qualitative analysis was complemented with the Commission service's own qualitative analysis, which could not benefit from access to individual banks' data.

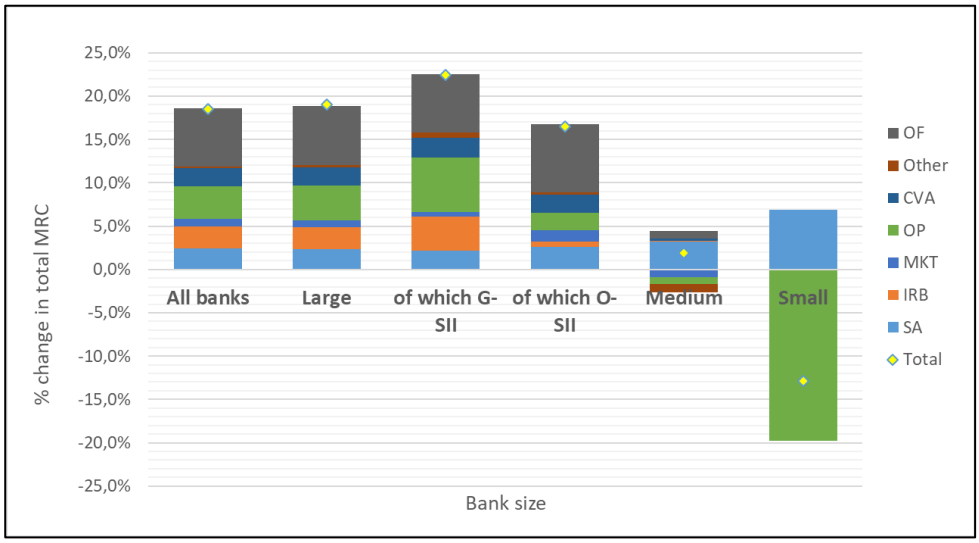
As illustrated in *Figure 2* and *Figure 3* below, the main observations of the estimated impacts of the final Basel III reform across EU banks' size include:

- the impact of the reform would be materially higher for large banks, with the highest overall impact on G-SIIs, than for medium-sized and small banks under the full alignment option. This is mainly explained by a higher reliance of large banks on internal models to calculate capital requirements. The higher impact would be due to changes to internal models (e.g. the introduction of input floors or more conservative calibrations of those floors), the removal of the possibility to use internal models for certain types of risk (e.g. operational risk) or for certain types of exposures under the credit risk framework (e.g. equity), and the introduction of the OF;
- Medium-sized banks would, on average, incur a small increase in capital requirements, mostly due to the revised standardised approach for credit risk under the full alignment option, while small banks would, on average, an overall decrease of capital requirements, mostly due to the changes to the operational risk rules. These findings corroborate the low impact of the final Basel III reforms observed in the previous EBA impact analysis, based on a wider sample of small and medium-sized banks;
- the introduction of EU specific adjustments under the preferred policy option would mitigate the overall impact of the reform on capital requirements to a greater extent for large banks than for small and medium-sized banks[10], which are less impacted by the reform to begin with.

[10] This observation should also be true for all the EU specific adjustments under the preferred policy option for which impacts have not been quantified by the EBA (see the list in ***Error! Reference source not found.***) and hence not reflected in *Figure 3* (since large banks, especially G-SIIs, tend to be more active in specialised lending, CIU, derivative and SFT markets which are all targeted by those adjustments). The preferred policy option would therefore have lower impacts for large banks, especially G-SIIs, than shown in *Figure 3*.

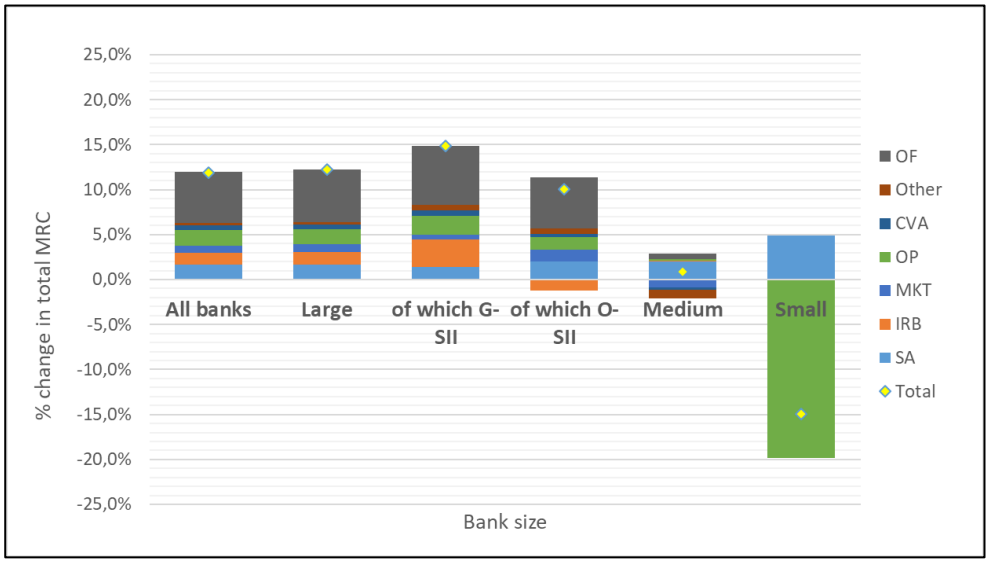
The advantage in terms of capital requirements that banks using internal models currently enjoy (because the use of internal models results, on average, in lower capital requirements than the use of standardised approaches), would be partly eroded under the preferred option. This would increase the relative competitiveness of banks not using internal models (mostly small and medium-sized banks) when compared to banks using those models (mostly large banks).

Figure 2: Breakdown of the impacts under the full alignment option in 2028 per risk category and per bank size.



Sources: Basel III reforms impact study, EBA, December 2020; Commission, DG FISMA.

Figure 3: Breakdown of the impacts under the preferred policy option in 2030 per risk category and per bank size.



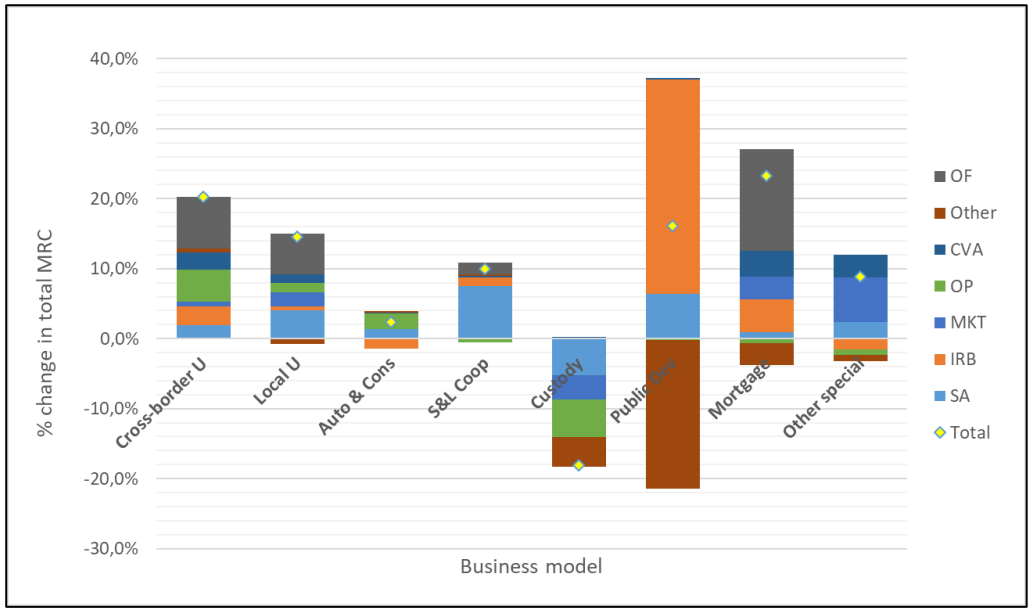
Sources: Basel III reforms impact study, EBA, December 2020; Commission, DG FISMA.

As illustrated in *Figure 4* and

Figure ***5***, the impact of the reforms would affect various EU banks' business models, with some noticeable differences:

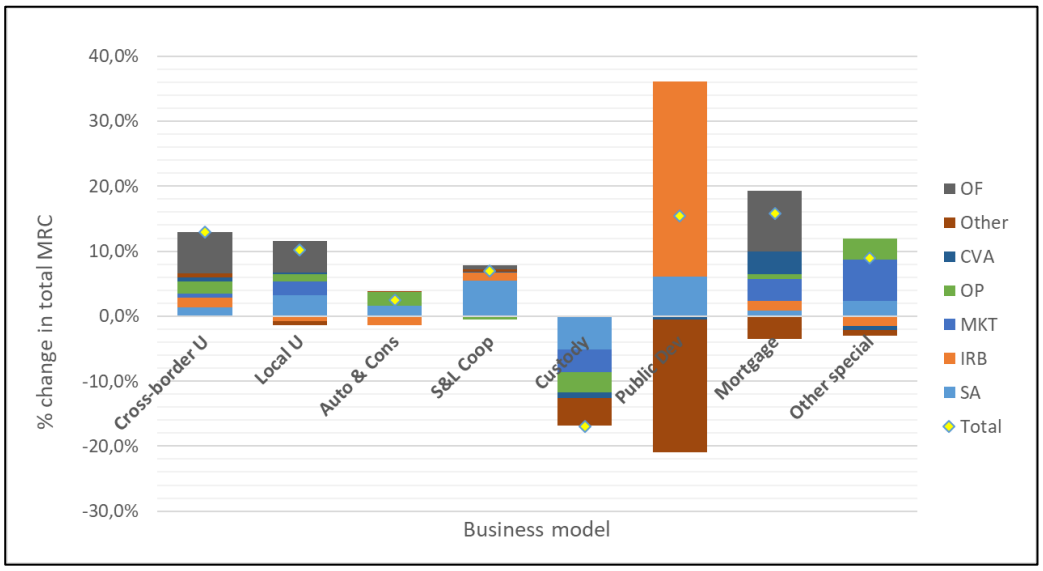
- for mortgage banks, cross-border universal banks and local universal banks the full alignment option would result in high increases in overall capital requirements, mostly driven by the output floor, the modifications to the rules on the internal model approaches for credit risk and for operational risk. It is likely that most of the large banks have this business model, so the above explanations of the reasons behind the impact would also apply here;
- public development banks would also incur a high impact from the full alignment option, mostly due to the changes related to the internal model approach for credit risk. As the result, those banks would be less bound by the leverage ratio than currently, as demonstrated by the large decrease in the risk category "other";
- the other business models considered would incur a lower impact under the full alignment option (e.g. custodian banks would see a decrease in capital requirements);
- the preferred policy option would mitigate the impact across all business models, with the exception of public development banks, where the impact would remain unchanged. Importantly, under this option the impact would be better aligned across those business models which provide similar financial services (for instance on cross border universal banks, local universal banks and mortgage banks which all provide mortgages to their clients), maintaining a level playing field across those business models.

Figure 4: Breakdown of the impacts under the full alignment option in 2028 per risk category and per business model.



Sources: Basel III reforms impact study, EBA, December 2020; Commission, DG FISMA.

Figure 5: Breakdown of the impacts under the preferred policy option in 2030 per risk category and per business model.



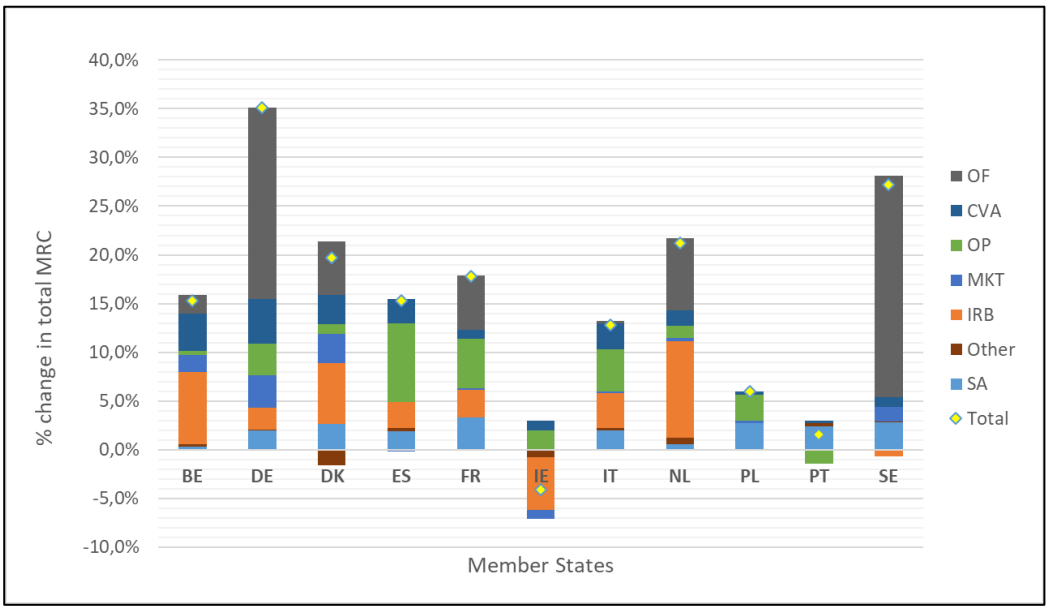
Sources: Basel III reforms impact study, EBA, December 2020; Commission, DG FISMA.

Finally, as illustrated in

*Figure **6*** and *Figure 7*, the full alignment option would have a high impact on banks in a number of Member States (BE, DE, DK[11], ES, FR, IT, NL, SE) and relatively low impact in others (IE, PL, PT). The preferred policy option would mitigate the impact of the reforms across all Member States, particularly those most affected under the full alignment option.

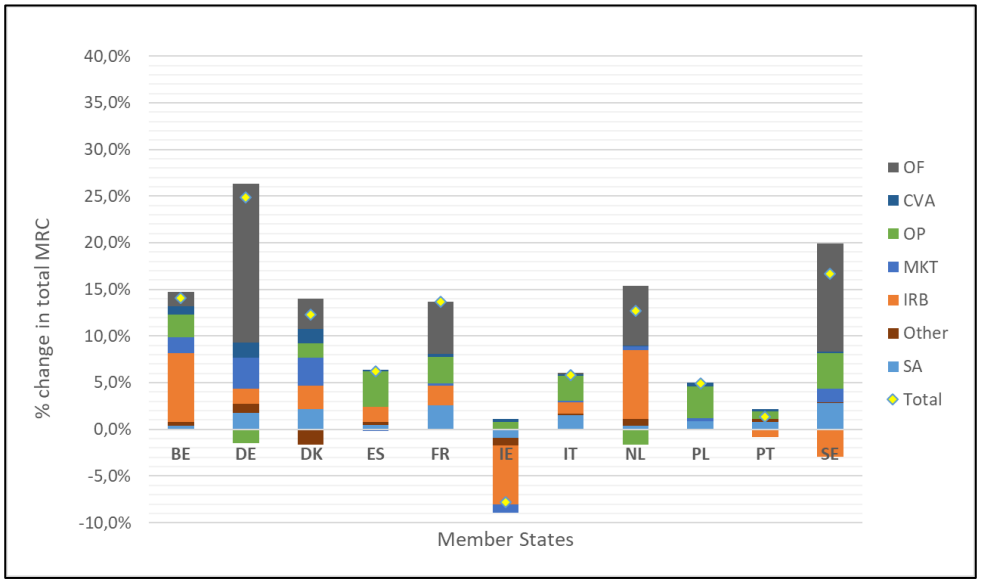
[11] On 19 February, the Danish FSA published a press release indicating that one of the DK banks that are included in the EBA updated impact study published in December 2020 realised that a significant error has been included in its data submission to the EBA (see https://www.dfsa.dk/News/Press-releases/2021/Revised_Basel_standards). Based on corrected data, the impact for DK banks would increase from 19.7% to 36.4% under the full alignment scenario, shown in *Figure **6*** and from 13.9% to 29.3% in the EU-specific scenario shown in the EBA impact study. However, the corrected data would only slightly increase the overall impacts presented in Section 6.1 which would not change the magnitude of those impacts nor the overall conclusions that can be drawn from their observations.

Figure 6: Breakdown of the impacts under the full alignment option in 2028 per risk category and per Member State.



Sources: Basel III reforms impact study, EBA, December 2020; Commission, DG FISMA.

Figure 7: Breakdown of the impacts under the preferred policy option in 2030 per risk category and per Member State.

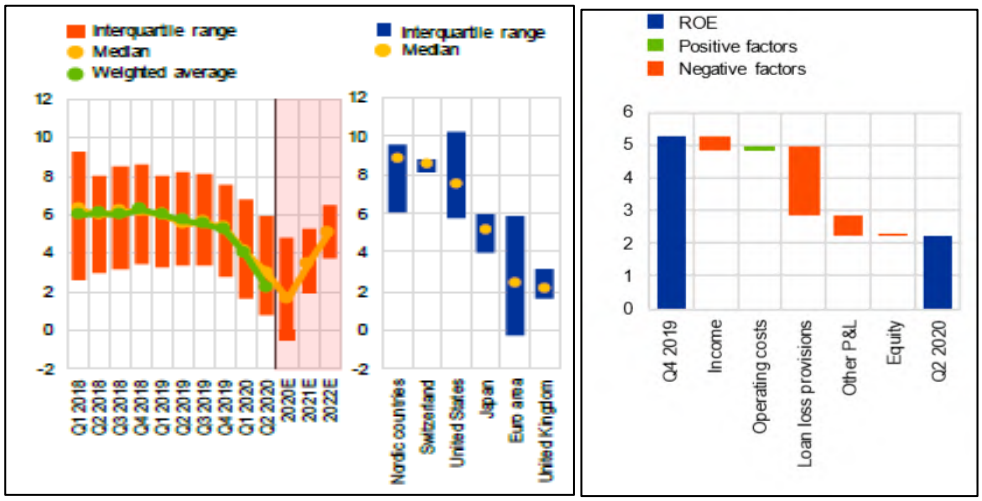


Sources: Basel III reforms impact study, EBA, December 2020; Commission, DG FISMA.

Impacts of the final elements of the Basel III reform on competitiveness between EU banks and their international peers

According to the ECB Financial Stability Review[12] published in November 2020, despite the increased resilience of EU-area banks since the GFC (as shown in Section 1), weak profitability prospects continue to weigh on bank valuations. The first half of 2020 saw a marked decline in euro area banks' return on equity (ROE), from over 5% in the Q4 2019 to just above 2% in the Q2 2020 (see *Figure 8* below**Error! Reference source not found.**) mainly because of the low interest rate environment and the relatively high costs. Looking ahead, the ECB expects that EU banks' profitability to remain weak and to recover only very gradually to levels seen before the outbreak of the COVID-19 pandemic.

Figure 8: Evolution of the distribution of EU-area significant institutions' (SI) ROE and comparison with ROEs of listed banks in other regions of the world (left-hand side) and drivers of change in EU-area SI ROE between Q4 2019 and Q2 2020 (right-hand side).



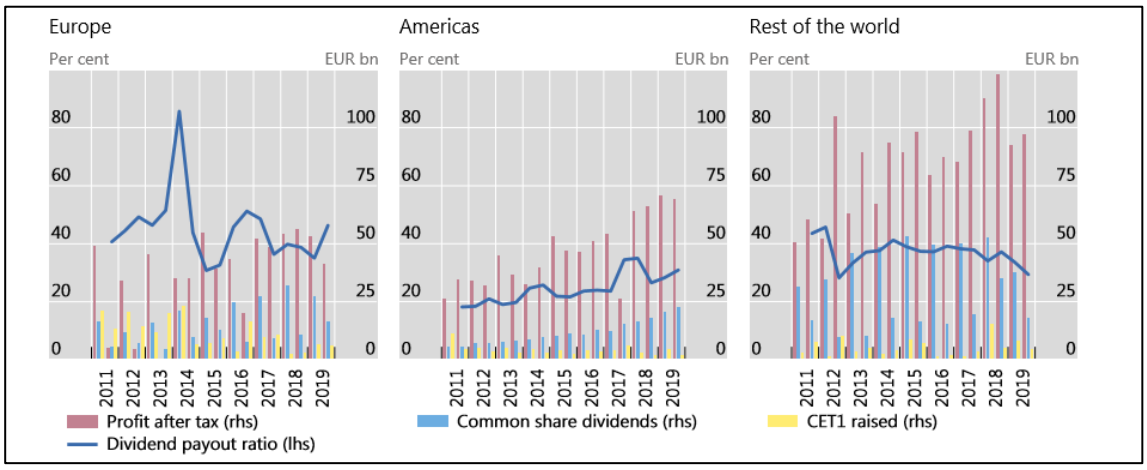
Source: European Central Bank (ECB) Financial stability review, November 2020.

The EU-area banks' profitability now ranks below that of most of their international peers (see *Figure 8*). However, while this decrease in EU-area banks' profitability as compared to international peers accelerated over the last two years, EU banks' remained relatively attractive to investors maintained higher dividend pay-out ratios across most of the last decade compared to international peers, as shown in

[12] See https://www.ecb.europa.eu/pub/financial-stability/fsr/html/index.en.html.

*Figure **9**.*

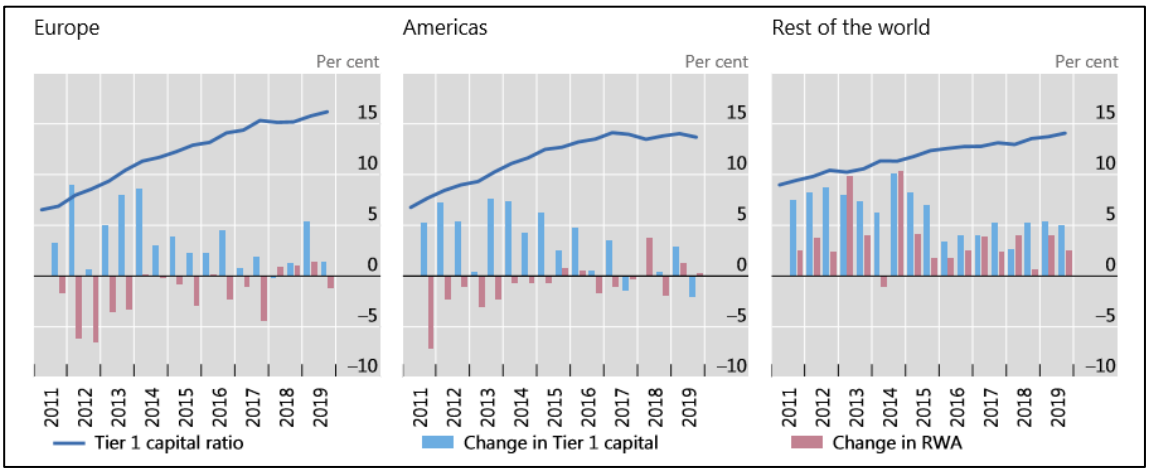
Figure 9 : Evolution between 2011 and 2019 of the profits of the largest banks, and their distributions, by region



Source: Basel III Monitoring Report as of Q4 2019, December 2020, BCBS. Note: For each region, the profit and profit's distribution indicators gather data from the Group 1 banks of the region participating to the regular Basel III monitoring exercise performed by the BCBS. The dividend payout ratio is calculated as common share dividends divided by profits after tax by using a rolling 12 months window.

In light of this context, *Figure 10* shows that EU banks have built up their capital ratios faster than their international peers over the decade following the GFC and have "closed" the decade with, on average, higher capital ratios than their international peers. Furthermore, *Figure 10* shows that EU banks achieved this by both reducing their risk weighted assets and by increasing their capital stock through retained earnings and new capital issuance.

Figure 10 : Evolution between 2011 and 2019 of the Tier 1 capital ratios of the largest banks, and drivers of that evolution, by region



Source: Basel III Monitoring Report as of Q4 2019, December 2020, BCBS. Note: For each region, the Tier 1 capital ratios gather data from the Group 1 banks of the region participating to the regular Basel III monitoring exercise performed by the BCBS. The figure shows the fully phased-in initial Basel III reforms for the data points up to and including the end of 2018 and the actual prudential framework (i.e. initial Basel III reforms with regional adjustments, if any) applicable for all the data points afterwards.

Despite their improved capital position, EU banks would still see a much higher average increase in capital requirements compared to their international peers when implementing the final Basel III reforms assuming full alignment (the average increase for US banks would be below 2%, whereas for bank from other regions of the world there would actually be a decrease in capital requirements, by more than 5% on average). This is clearly shown in the latest Basel III monitoring report[13] also based on Q4 2019 data (see

[13] See https://www.bis.org/bcbs/publ/d512.htm.

*Figure **11***). These differences in the impacts across regions could be explained by the following reasons:

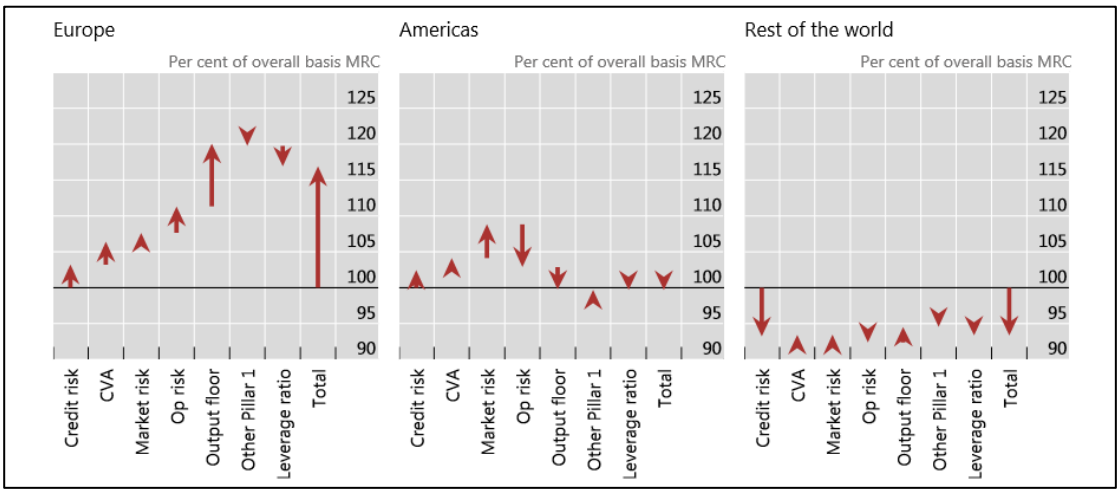
- compared to US banks, the difference likely arise due to a combination of a different financing model for US banks and the application, at least at this point in time, of stricter prudential requirements in the US compared to those contained in the final Basel III reform (and compared to those currently applied by EU banks). As shown in

- *Figure **11***, US banks would be much less impacted by the introduction of the output floor since US rules already contain a similar mechanism, introduced by US authorities after the GFC. In addition, US banks would be less impacted by the changes related to credit risk due to the wider recourse to securitisation, which allows them to remove a high portion of loans from their balance sheets. However, US banks would be more impacted by the revised market rules on trading activities than EU banks reflecting the high market share of those types of activities for US banks;
- compared to banks in other regions of the world[14], the differences likely arise due to a combination of simpler business models, dominated by credit risk exposures, an overall lower reliance on internal models to calculate capital requirements and stricter prudential requirements compared to those contained in the final Basel III reform. As shown in

[14] This conclusion is based on the overall impacts observed in *Figure **11*** for the banks in other regions of the world and does necessary apply to all the jurisdictions included in this category, for which no conclusion could be drawn in the absence of more granular data.

- *Figure **11***, those banks would see an overall decrease of capital requirements when implementing the final elements of the Basel III reform, mainly driven by the changes to the credit risk capital requirements. This observation, combined with the fact the output floor would have almost no impact on those banks, leads us to believe that those banks use the standardised approach for credit risk for the vast majority of their exposures. The impact of the reforms affecting the capital requirements for trading activities (i.e. market and CVA risks) would also be very limited, which would indicate that those types of activities account for a small portion of the overall activities of those banks.

Figure 11: Breakdown of impacts of implementing the final elements of the Basel III reform on banks' Tier 1 MRC by region.



Source: Basel Committee on Banking Supervision, Basel III monitoring exercise, October 2019. Note: These impacts show, for each region, the changes in the overall Tier 1 MRC of all Group 1 banks of the region participating to the regular Basel III monitoring exercise performed by the BCBS.

The significantly higher increase in capital requirements that would be incurred by EU banks when implementing the final elements of the Basel III reforms (under the full alignment option) would likely lead to a further increase in their cost of capital[15] and hence to a decrease in their relative[16] price competitiveness (the magnitude of the decrease would also depend on how much of the increase in the cost of capital could be absorbed by the banks, and not passed on to their clients). It may also lead to a temporary decrease in the attractiveness of EU banks to investors in case banks decided to retain a high portion of their profits to build up the necessary capital to meet the increased requirements (although it is also possible that banks would actually keep dividend payments high in order to attract investors to buy new capital the banks would issue to meet those requirements).

Note that the change in the relative price competitiveness of EU bank will also depend on the exact way in which the other jurisdictions will implement the final elements of the Basel III reform. For example, it is not necessarily the case that those jurisdictions that currently apply to their banks stricter requirements than those included in the final Basel III standards would decide to lower the level of their existing requirements to the level foreseen in those standards.

[15] According to the Modigliani-Miller theorem, under certain conditions, an increase in the cost of equity would be offset by a corresponding decrease in the cost of debt, resulting in an unchanged cost of capital. However, since those conditions are usually not met in the real world (e.g. because of the preferential tax treatment of debt), this offset would not be perfect, and the increased cost of equity for EU banks would result in an increase in their overall cost of capital.

[16] The competitiveness of EU banks would deteriorate in relative term, but not necessarily in absolute terms (e.g. to the extent that EU banks currently have a more competitive price for a certain service, the gap with the prices offered by non-EU banks may close, but not necessarily reverse).

To ensure that there would not be a significant deterioration in the competitive position of EU banks as compared to their international peers the preferred policy option would introduce a number of EU specific adjustments that would reduce the increase in capital requirements due to the implementation of the final elements of the Basel III reform (as shown in Section 6.1). For example, the preferred policy option would allow adjusting capital requirements for trading activities, for which EU banks directly compete with their international peers on the global financial markets, in case other jurisdictions would significantly lower the capital requirements for those activities in their local implementation of the Basel III reform. Although the adoption of the preferred policy option would significantly reduce the impact of the reform on EU banks, the impact in terms of capital requirements may still remain higher than in other member jurisdictions implementing the Basel III reform. Also for this reason the preferred policy option would give EU banks 2 additional years to comply with the revised capital requirements than recommended by the BCBS.

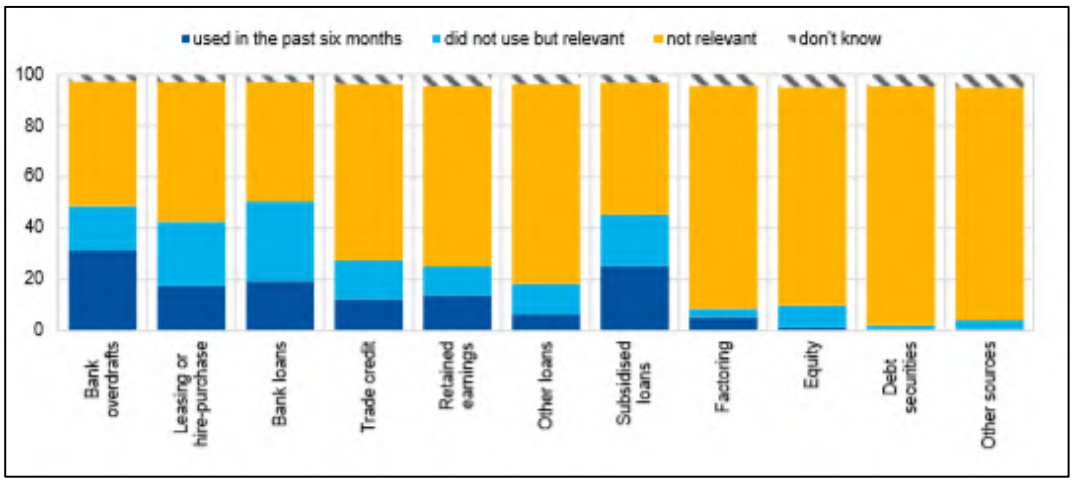
The strengthened capital position of EU banks resulting from the reforms, as implemented under the preferred policy option, would restore the market confidence in the EU banking sector and thus increase its attractiveness for investors.

3. Impact on SMEs

As shown in *Figure 12*, SMEs rely heavily on banks to finance their business. It is therefore important to ensure that the implementation of the final elements of the Basel III reform does not result in a material deterioration in the banks' ability to finance SMEs.

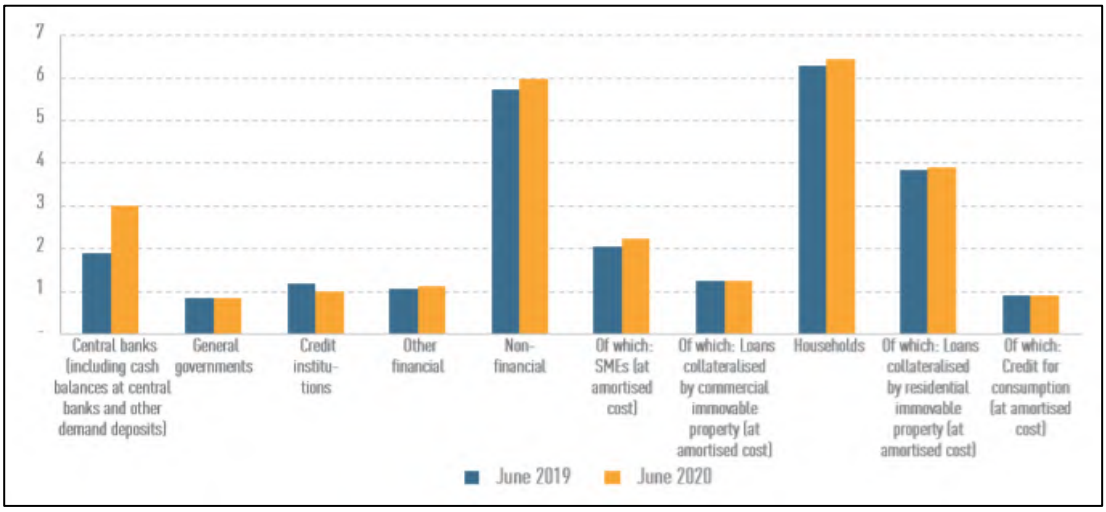
As illustrated by *Figure 13* in EU banks' loans and advances to SMEs occurred between June 2019 and June 2020.

Figure 12: Relevance of various financing sources of euro area SMEs.



Source: Survey on the Access to Finance of Enterprises in the euro area (SAFE survey), ECB, November 2020. The sources of SMEs financing are gauged by the number of responses from participating SMEs to the SAFE survey conducted by the ECB between April and September 2020.

Figure 13: Evolution of EU banks loans and advances (in EUR trillions), by segment, between June 2019 and June 2020



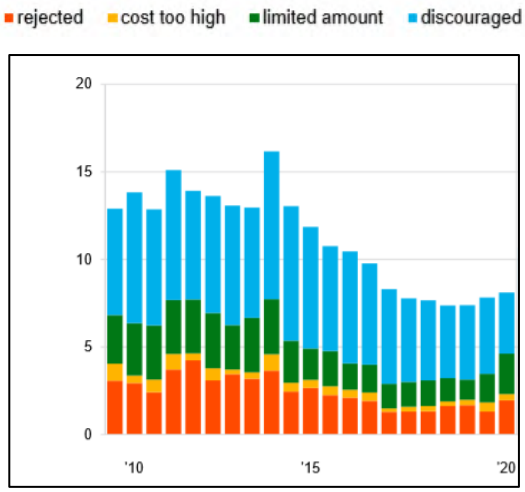
Source: Risk Assessment of the European banking system, EBA, December 2020

As observed in

*Figure **14**,* the obstacles to EU banks' financing of SMEs have been progressively reduced during the second half of the previous decade. It is likely that this was mainly due to the easing of the financing conditions spurred by the economic recovery during that period (after the severe recession during the previous years). However, it is possible that this trend may also have been influenced[17] by the introduction of policy measures in the CRR seeking to reduce the overall banks' capital requirements for SMEs' exposures (e.g. the introduction of the SME supporting factor and the exemption of derivatives transactions with non-financial companies from the capital requirement for CVA risk).

[17] While there isn't sufficient empirical evidence to claim that those measures have actively facilitated the easing of financing conditions for SMEs, it may be said that they likely contributed to preventing a deterioration in those conditions (by limiting increases in banks' capital cost associated with SME finance following the implementation of the initial Basel III reform in the EU).

Figure 14: Obstacles to receiving a bank loan by euro-area SMEs (by % of SME responses)



Source: Survey on the Access to Finance of Enterprises in the euro area (SAFE survey), ECB, November 2020.

The potentiation deterioration of EU SMEs' financial situation as a consequence of the COVID-19 crisis [18] may lead to an increase in SME defaults and consequently in higher capital requirements for EU banks (non-performing exposures are subject to higher capital requirements compared to performing ones). This effect would, in turn, tighten the future financing conditions for the remaining SMEs (decrease the availability of credit or increase the cost of credit).

In this context, the implementation of the final Basel III standards has been carefully assessed in order to ensure it would not disrupt banks' financing to SMEs. To that end, the preferred option contains proposes a number of adjustments to the Basel standards:

- the existing SME supporting factor as well as the existing exemption of derivative transactions with non-financial companies (including SMEs) from the capital requirement for CVA risk would be maintained. ;
- for banks using internal models for credit risk, a transitional treatment for unrated companies under the output floor would be introduced. This would reduce the capital requirement for credit risk related to SMEs exposures under the output floor (the vast majority of EU corporates, including SMEs, are unrated);
- long-term equity holdings in unlisted SMEs would not be considered as speculative holdings. Hence, these equity holdings would benefit from the ordinary treatment of equities, which entails lower capital requirements than speculative equity holdings.

The individual impacts of the above measures, as estimated by the EBA, are provided in Section 6.1.

[18] In its latest SAFE survey, the ECB has already observed this trend (see https://www.ecb.europa.eu/stats/ecb_surveys/safe/html/ecb.safe202011~e3858add29.en.html)

The other policy measures that would be included in the legislative proposal would affect banks' overall day-to-day risk management and supervision, and would therefore not have a direct impact on banks' financing to SMEs.

4. Macro-economic costs and benefits analysis

This section presents the macroeconomic costs and benefits analysis of the implementation of the final elements of the Basel III reform in Union law. Other measures included in this legislative initiative were not included in the analysis because of lack of quantitative data. Nevertheless, those measures are expected to have a positive macroeconomic impact since they are aimed at improving banks' risk management, supervision and market discipline.

The analysis of the macroeconomic impacts of the implementation of the Basel III reform has been conducted by the ECB, in collaboration with the EBA, at the request of the Commission. The study updated[19] the ECB macroeconomic costs and benefits analysis included in the EBA's second impact study on the final Basel III reforms published in December 2019[20].

The ECB analysis relies on a semi-structural macroeconomic model that links the individual balance sheets of around 100 of the largest EU banks, their capital requirements based on a given prudential framework (either the current prudential framework applicable under the CRR or the final Basel III framework using certain implementation options) and a given set of forecasted macroeconomic indicators (including the annual EU Gross Domestic Product (GDP) growth) using a set of dynamic assumptions. The full description of the model and its specifications is included in Section 2 of Annex 7.

The ECB has enhanced its previous analysis presented in the EBA's second impact study with two major improvements. First, the updated ECB analysis presented results under two different implementation options for the final elements of the Basel III reforms considered in Section 5.2.1, specifically the full alignment option (option 1) and the preferred policy option (option 3). Second, in order to respond to the Commission's request to reflect the potential consequences of the COVID-19 pandemic on the impact of implementing the final elements of the Basel III reform, the ECB analysis has been performed under two different sets of forecasted macroeconomic indicators[21]. The first set has been estimated based on Q4 2019 data, i.e. before the outbreak of the pandemic[22]

[19] In this updated analysis, the ECB was able to reflect the latest available estimates of banks' individual impacts of the Basel III reforms, consistent with the overall EBA impacts shown in Section 6.1, as well as the recent ECB macroeconomic projections for the EU economy, including amid COVID-19 pandemic.
[20] See EBA second impact study on the final Basel III reforms, December 2019
[21] The forecasted macroeconomic indicators are consistent with the economic forecasts published by the Commission (see https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-forecasts_en).
[22] For the complete set of ECB macroeconomic projections, see https://www.ecb.europa.eu/pub/projections/html/ecb.projections201912_eurosystemstaff~c7a91336cb.en.html

(pre-COVID scenario). The second set has been estimated based on Q2 2020 data, i.e. after the first wave of the pandemic[23] (COVID scenario).

Every year starting from one year after the envisaged date of application of the final elements of the Basel III reform, the ECB analysis has produced two main macroeconomic metrics to assess the macroeconomic costs and benefits of implementing the final Basel III reforms:

- the **expected impact of the reform on EU GDP growth** as defined by the difference between the expected future annual EU GDP[24] growth as simulated under two prudential frameworks (i.e. the final Basel III standards under a given implementation option and the current prudential framework). A negative difference between two expected future annual EU GDPs growths would imply an expected macroeconomic cost resulting from the introduction of reforms, while a positive difference would imply a macroeconomic benefit;
- the **impact of the reform on banks' to support EU GDP growth in case of an economic downturn** as defined by the difference between a low percentile[25] of the future annual EU GDP distribution as simulated under two different prudential frameworks (see previous point). A positive difference between the same percentiles of the two future annual EU GDP growth distributions would imply a macroeconomic benefit from the introduction of the reform under an economic downturn, whereas a negative difference would imply a macroeconomic cost under an economic downturn. This approach is based on the so-called Growth-at-Risk (GaR) macroeconomic concept[26] which focuses on the lower tail of the simulated annual EU GDP growth distribution in order to assess the ability of the banking sector to uphold lending to the real economy, thereby supporting growth, during an economic downturn.

As highlighted in the objectives, the implementation of the final elements of the Basel III reform in the EU would increase the resilience of the EU banking system in the long term, while giving rise to limited transitional costs in the short term. The results of the

[23] For the complete set of ECB macroeconomic projections, see https://www.ecb.europa.eu/pub/projections/html/ecb.projections202006_eurosystemstaff~7628a8cf43.en.html

[24] In this context, the expected future EU GDP growth for a given year is the mathematical mean of the distribution of the EU GDPs growth generated by the model, for a given set of model specifications (ie given prudential framework and given set of ECB macroeconomic projections for the first three years).

[25] The ECB chose the 10th percentile of this distribution in their analysis.

[26] In its previous analysis presented in the EBA's second impact study, the ECB also used another, alternative methodology to assess the long-term benefits of the implementation of the Basel III reforms, based on the Long-term Economic Impact (LEI) framework developed by the BCBS. The results of this alternative methodology showed that the implementation of the Basel III reforms would lead to a 1.2% reduction in the probability of a banking crisis within the EU financial system once the reforms are fully applied and would translate into a long-term net benefit of around 0.6% permanent increase in the EU annual GDP. Due to time and resource constraints, the present analysis focuses on the GaR approach to assess the long-term benefits which has the advantage to be more intuitive than the LEI framework.

ECB analysis support this conclusion. Importantly, they also support the preferred policy option.

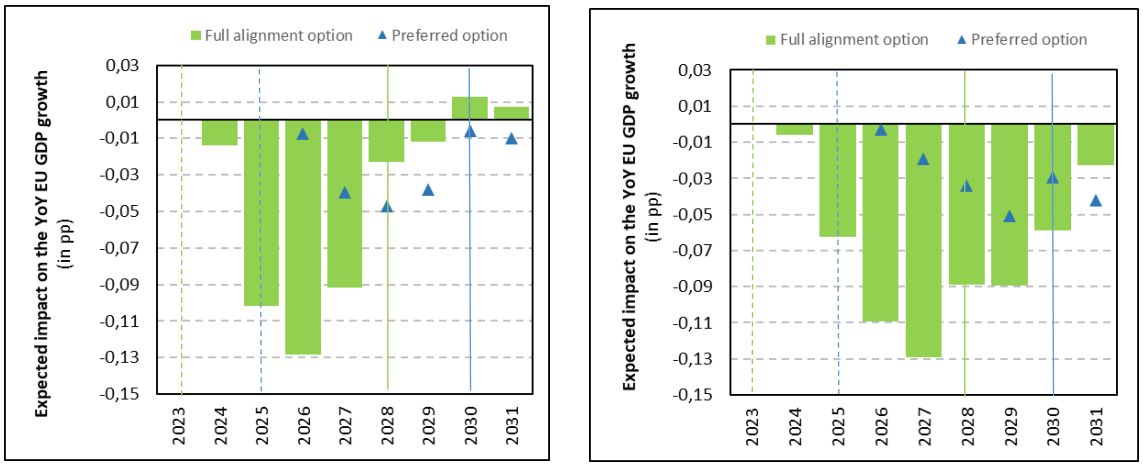
In fact, the preferred policy option appears to strike the best trade-off in terms of limiting the transitional costs in the short term while producing a reasonable permanent benefit over the long term. More specifically:

- as illustrated by *Figure 15* below, the **expected impact of the reform on EU GDP growth**, under the pre-COVID scenario and the full alignment implementation option, would amount to a moderate macroeconomic net cost in terms of the annual EU GDP growth, increasing in the first three years of application (i.e. during the transitional arrangement), with a peak size of 0.13 p.p. of annual EU GDP growth, then decreasing to less 0.025p.p of annual GDP growth at the end of the transitional arrangement when the reform would be fully applicable, and finally turning into a small benefit of 0.01 p.p. afterwards. This outcome could be explained by a limited contraction of banks' lending during the transitional arrangement while banks adjust their balance sheets. Under the more severe COVID-19 scenario, macroeconomic net costs on the annual EU GDP growth would be more pronounced for a longer period but would nevertheless remain contained, reaching a peak of 0.13 p.p. one year later than under the pre-COVID scenario, and start to slowly decrease afterwards;
- the preferred policy option would mitigate the short term macroeconomic net costs resulting from the full alignment option, first in terms of magnitude, and second, because those costs would start to affect the annual EU GDP growth later as the result of the postponement of the start of the application of the reforms to 1 January 2025. In particular, this mitigating effect reducing the cost of the reforms on the EU GDP growth as compared to the full alignment option would last longer, at least until the end of the transitional arrangement when the reforms are fully applicable. This is particularly important for the recovery of the EU economy post COVID-19 in which banks will need to play a key role.
- as illustrated by *Figure 16*, **the impact of the reform on banks' ability to support EU GDP growth during economic downturns** would be positive, with a macroeconomic benefit starting 3 years after the full application of the reform, under all the different implementation options considered. Under the pre-COVID scenario[27], the net benefit would converge in the long term to above 0.1p.p of annual EU GDP growth under the full alignment option against above 0.04% under the preferred option. These results are mainly explained by the fact that better capitalised banks (and the reform would increase capital requirements) are better equipped to keep lending in case of an economic downturn thus avoiding (or at least significantly

[27] The ECB only provided to the Commission the impacts of the reform on banks' ability to support EU GDP growth under economic downturns using the pre-COVID scenario, the difference of impacts using the COVID scenario being negligible.

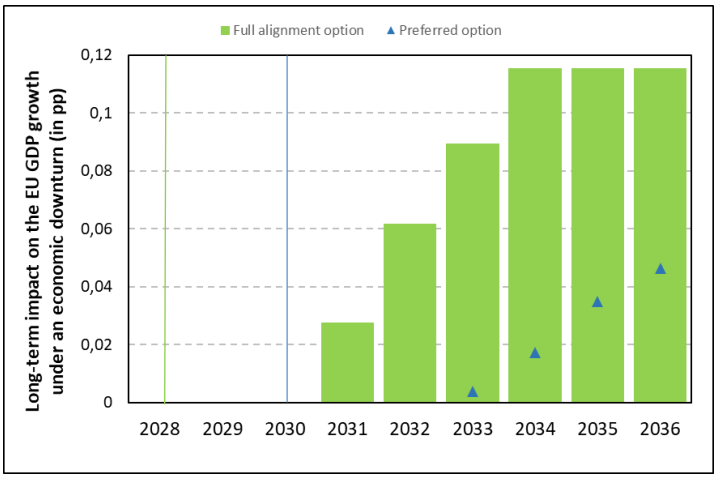
limiting) the probability of a credit crunch and the negative consequences it has on economic activity.

Figure 15: Comparison between the expected impacts on the EU GDP growth over time resulting from the implementation of the final elements of the Basel III reform under the different implementation options and under the pre-COVID scenario (left-hand-side) and COVID-scenario (right-hand side).



Source: ECB analysis of the macroeconomic costs/benefits of implementing the final Basel III reforms, 2021. Note: the green and blue (resp. dotted) lines represent the date of full (resp. partial) application of the final Basel III reforms at the end (resp. start) of the transitional arrangement under, respectively, the BCBS timelines, ie 1 January 2028 (resp. 1 January 2023), and under our preferred policy option, i.e. 1 January 2030, (resp. 1 January 2025).

Figure 16: Comparison between the impact of the reforms to support EU GDP growth under an economic downturn over time resulting from the implementation of the final elements of the Basel III reform under the different implementation options and under the pre-COVID scenario



Source: ECB analysis of the macroeconomic costs/benefits of implementing the final Basel III reforms, 2021. Note: the green and blue lines represent the date of full application of the final Basel III reforms at the end of the transitional arrangement under the BCBS timelines, ie 1 January 2028, and under our preferred policy option, ie 1 January 2030, respectively.

These results corroborate the conclusions of the previous ECB analysis on the macroeconomic costs and benefits of implementing the final elements of the Basel III reform. Despite more severe economic shocks reflected in the projected macroeconomic indicators under the updated ECB analysis, banks' improved capital ratios and the reduced impact of the final Basel III reform on individual banks as compared to the previous ECB analysis[28] .

The findings presented in the updated ECB analysis are also consistent with the conclusions of previous macroeconomic studies[29,30,31] assessing the interaction between the appropriate level of banks' capital requirements and their capacity to continue financing the real economy amid economic downturns.

For the sake of completeness, it is worth mentioning another study dedicated to the macroeconomic impact of the Basel III reform on the EU economy, showing different findings than the ECB analysis. The study[32] commissioned by the European Banking Federation and conducted by the Copenhagen Economics consultancy in 2021 concluded that EU GDP would decrease by 0.4% points on a permanent basis due to the full implementation of the final elements of the Basel III reform (the study also showed that the Basel III reforms should provide societal benefits of some 0.1% of EU GDP, bringing the total net societal costs of the package to a decrease of 0.3% of EU GDP). However, the modelling assumptions taken in this analysis appear more conservative than in the ECB analysis and do not take into account the specific measures adopted in the preferred policy options to mitigate the impacts of the Basel III reforms.

[28] Section 1 and Section 6.1 provide supporting evidence for these observations.
[29] Impact of the Capital Requirements Regulation (CRR) on the access to finance for business and long-term investment, London Economics Europe, 2016 (see https://londoneconomics.co.uk/wp-content/uploads/2016/11/Assessing-the-impact-of-the-Capital-Requirements-Regulation-CRR-on-the-access-to-finance-for-business-and-long-term-investments.pdf)
[30] Optimal Bank capital, Bank of England, 2011 (see https://www.bankofengland.co.uk/external-mpc-discussion-paper/2011/optimal-bank-capital)
[31] Do Better Capitalized Banks Lend Less?, International Finance, 2014 (see https://onlinelibrary.wiley.com/doi/full/10.1111/infi.12041)
[32] See copenhagen-economics_eu-implementation-of-the-final-basel-iii.pdf (copenhageneconomics.com)

ANNEX 7: ANALYTICAL METHODS

1. EBA impact analysis

In May 2018, the Commission requested technical advice from the EBA on the implementation of the final elements of the Basel III reform in the EU. The EBA submitted its advice in two parts, on 5 August 2019 and on 4 December 2019. The first part ('August 2019 CfA response') covered the areas of credit risk, operational risk, securities financing transactions and output floor. The second part ('December 2019 CfA response') covered the areas of market risk and credit valuation adjustment risk standards, as well as a macroeconomic impact assessment carried out by the ECB. The advice included a detailed quantitative impact analysis on the implementation of the final elements of the Basel III reform in the EU, based on data as of end-June 2028.

This sample has been reduced from the 189 banks from 18 Member States and Norway included in the previous EBA analysis published in the August 2019 and December 2019 CfA responses, which covered 86% the total banking assets of those countries. As the consequence, some Member States (see

Table **1**) and business models (see *Table 3*) were not represented in the sample used for the December 2020 CfA response, while others had a much more limited representation. In addition, the coverage in terms of small and medium-sized banks was considerably reduced (4 small banks and 22 medium-sized banks; see *Table 2*).

The level of coverage varies across jurisdictions (see ***Error! Reference source not found.*** below). It is lowest for Austria (13%) and varies from 42% to 143% of the remaining jurisdictions. The coverage reaches above 100% in those jurisdictions where some QIS participants are EU-located subsidiaries of non-EU controlled (e.g. US) groups and are therefore not included in the denominator of the coverage ratio. It should be noted that while at the EU level the reduction in coverage relative to the August 2019 and December 2019 CfA responses is not considered material, this is not the case for some countries. In particular, the coverage in Austria (from 74% to 13%), Luxembourg (from 103% to 65%) and Poland (from 88% to 42%) has dropped significantly. Therefore, for those Member States the results in the December 2020 CfA response are much less representative and are either not displayed in the country breakdowns or, if displayed, should be interpreted with caution.

In order to avoid double-counting the impacts, banks participating in the QIS data collection exercise were asked to report data at the highest level of EU consolidation. Unless stated otherwise, subsidiaries of EU parents are included in the average calculations only when impact results are presented by business model or by country, provided that they do not belong to the same business model or country as their parent entity.

Table 1: Breakdown of banks included in Q2 2018 and Q4 2019 samples of EBA quantitative impact analysis, per Member States

Member States	Number of banks		Q4 2019 sample coverage in terms of banking assets in Member States
	Q2 2018 sample	Q4 2019 QIS sample	
AT	15	5	13%
BE	7	4	93%
DE	40	24	56%
DK	8	4	89%
EE	2	0	-
ES	10	6	79%
FI	5	1	71%
FR	14	7	87%
GR	2	3	73%
HU	1	1	75%
IE	8	8	143%
IT	24	11	89%
LU	6	2	65%
MT	1	0	-
NL	12	7	89%
NO	6	2	67%
PL	9	4	42%
PT	6	4	72%
SE	11	6	84%
Total	189	99	76%

Source: Basel III reforms impact study, EBA, December 2020

Notes: Percentages higher than 100% are due to the presence of foreign-controlled (non-EU) subsidiaries in the QIS sample of certain EU Member States (e.g. subsidiaries of US institutions located in the EU

The EBA quantitative impact analysis used two other criteria to differentiate the impacts of the final elements of the Basel III reform on EU banks:

- bank size - the EBA defined three size categories: large, medium and small. The definitions of 'large' and 'small' banks were based on the respective CRR definitions[33] ('medium' banks, which are not defined in the CRR, are banks that meet neither of the CRR definitions);
- bank business model - the EBA defined thirteen business model categories: cross-border universal banks (Cross-Border U), local universal banks (Local U), automotive and consumer credit banks (Autos & Cons), building societies (Building Soc), locally active saving and loan associations/cooperative banks (S&L/Coop), private banks (Private), custody banks (Custody), central counterparties (CCP), merchant banks (Merchant), leasing and factoring banks

[33] See point 146 of Article4 of the CRR for the definition of large banks and point 145 Article 4 of the CRR for the definition of small (and non-complex) banks.

(Leasing), public development banks (Public Dev), mortgage banks[34] (Mortgage), and other specialised banks (Other special). These categories are further described in the August 2019 CfA response.

Table 2: Breakdown of banks included in Q2 2018 and Q4 2019 samples of EBA quantitative impact analysis, per size

Size	Number of banks	
	Q2 2018 sample	Q4 2019 QIS sample
Large	104	73
of which: G-SIIs	8	8
of which: O-SIIs	67	46
Medium	61	22
Small	24	4
Total	189	99

Source: Basel III reforms impact study, EBA, December 2020; European Commission estimates.

Table 3: Breakdown of banks included in Q2 2018 and Q4 2019 samples of EBA quantitative impact analysis, per size

Business Model	Number of banks	
	Q2 2018 sample	Q4 2019 QIS sample
Cross-border U	40	34
Local U	52	31
Auto & Cons	7	2
Building Soc	6	2
S&L / Coop	34	11
Private	8	2
Custody	7	3
CCP	1	1
Merchant	5	2
Leasing	1	0
Public Dev	10	4
Mortgage	8	5
Other special	10	2
Total	189	99

Source: Basel III reforms impact study, EBA, December 2020; European Commission estimates.

Methodology

The methodology used to calculate the impact estimates in terms of change in minimum capital requirements, regulatory capital ratios and shortfalls remained unchanged in relation to the estimates published in the August and December 2019 CfA responses (the full details of the methodology used is described in the respective responses).

[34] Including pass-through financing models.

The impact estimates are not directly comparable to those of the Basel III monitoring report as of the same date (i.e. based on Q4 2019) which have been published by the EBA in December 2020[35]. This is due to the fact that they are based on different samples of EU banks but also to some methodological differences, as described in the December 2020 CfA response.

In accordance with the requests of the Commission in its CfA, the impact analysis presented in this December 2020 CfA response is based on two different implementation options for the final elements of the Basel III reform in the EU.

The first implementation option (labelled 'Basel III') corresponds to the Basel III central scenario in the August 2019 and December 2019 CfA responses. It represents the situation as it would have been in Q4 2019 if the Basel III framework had already been fully implemented and the transitional period had passed. The impact estimates under this option are used to quantify the policy option 1 in Section 5.2.1.

The second implementation option (labelled 'EU-specific') considers additional EU specific adjustments requested by the Commission in its CfA, specifically:

- maintaining the supporting factor for exposures to SMEs as amended by the CRR II under both the SA-CR and the IRBA[36] (including for the purpose of the output floor calculation);
- maintaining the current CVA exemptions[301];
- reusing the eligibility criteria of the original exposure method (OEM) (see Article 273a(2) of the CRR) for the eligibility criteria of the simplified method for calculating the capital requirements for CVA risk;
- assuming that the discretion included in the final Basel III framework to set ILM equal to 1 in the SMA for operational risk would be exercised permanently for all 'bucket 2' and 'bucket 3' banks.

The impact estimates of the EU-specific scenario included in the December 2020 CfA response serve as a starting point to quantify the impact of policy options 2 and 3 in Section 5.2.1. In fact, those policy options propose a number of additional EU specific adjustments that the EBA was unable to quantify due to data constrains. Since the EU-specific scenario does not include the additional EU specific adjustments, the impacts of those policy options are overestimated. Therefore, in order to produce more realistic estimates of the actual impacts of those two policy options, the Commission services used expert judgement and additional data sources to estimate the impact of the additional EU specific adjustments. These estimates do not have the same degree of

[35] See https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2020/960797/Basel%20III%20monitoring%20report%20-%20Dec%202020.pdf.

[36] In the absence of available impact estimates for this EU specific adjustment in the end-December 2019 QIS templates, the EBA use for this EU specific adjustments a proxy impact estimates based on the Q2 2018 data

accuracy than the quantitative estimates carried by the EBA and must be interpreted with caution.

Furthermore, the analysis for the proposed approach to implement the output floor under policy options 2 and 3 in Section 5.2.1 is based on the estimates of the 'alternative approach' included in the December 2020 CfA response. This alternative approach provides a good proxy for the proposed approach to implement the output floor but it may overestimate its actual impact since the potential reduction of the P2R and the SyRB requirement as the result of supervisory action is not quantified. As explained in Section 5.2.1, such supervisory action would be proposed in order to avoid double counting aggressive modelling risk under the proposed approach.

It is also important to note that under both the Basel III and EU-specific scenarios used in the December 2020 CfA response, the impact of the final CVA framework published in July 2020 is reflected via a robust proxy (see the description of proxy in the response).

Finally, as requested by the Commission in its CfA, the EU-specific scenario also includes the effects of some support measures that have been adopted in 2020 to mitigate the effect of COVID-19 crisis on EU banks, specifically the frontloading of the prudential treatment of software assets adopted as part of the CRR quick fix package and the frontloading of the change in the P2R composition adopted by the ECB[37]. In order to assess the pure impact of the final elements of the Basel III reform under this scenario, the EBA assumed that these policy measures were already in place in Q4 2019. Therefore, the effect of these measures are not reflected under the impact estimates of the EU-specific scenario published in the December 2020 CfA response[38].

With regard to the specific analysis on the combined effect of the final elements of the Basel III reform and the potential effects of the COVID-19 crisis, the EBA had to develop several hypothetical scenarios on the potential deterioration of the financial situation of EU banks' borrowers and the effects of maintaining some support measures put in place by Member States and competent authorities should the crisis last, as requested in the Commission August 2020 CfA. All these assumptions are extensively described in the December 2020 CfA response. This combined effect has only been assessed by the EBA under the EU-specific scenario.

Limitations/Caveats

The updated impact analysis contained in the December 2020 CfA response is subject to the following limitations/caveats, which have to be taken into account when interpreting the results of the analysis:

[37] See https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200312~45417d8643.en.html.

[38] For the sake of completeness, the EBA also provided in an annex to the December 2020 CfA response a partial set of impact estimates under the EU-specific scenario in which the effects of these support measures are visible. However, for the sake of comparison with the Basel III scenario, in which these support measures are not reflected, this impact assessment uses the impact estimates of the EU-specific scenario in which the support measures are not reflected.

- limited sample: the sample of banks included in the December 2020 CfA response is significantly smaller than the sample used for the August and December 2019 CfA responses. As observed in the above description of the sample used, EU banks in some Member States are absent from the sample and the number of EU banks in certain categories is too limited to be representative;
- conservative assumptions for the impact estimates: as for the August 2019 and December 2019 CfA responses, a number of simplifying and conservative assumptions have been applied for the impact estimates in the December 2020 CfA response. These assumptions are likely to result in an overestimation of the impacts. For instance, the EBA used the assumption of a static balance sheet under which banks do not react to the revised requirements by adjusting their businesses and/or managing their regulatory capital costs. Also, the EBA used conservative proxies to estimate some impacts in the situation that the actual impacts in the Q4 2019 data were not available (e.g. for the EU specific adjustment on the SME supporting factor and for the impact of the final CVA framework);
- conservative assumptions under the COVID-19 scenarios: as explained in Section 6.1, the EBA used very conservative assumptions in its specific quantitative analysis of the combined effect on EU banks of the final elements of the Basel III reform and the potential consequences of the COVID-19 crisis. In particular, the EBA methodology uses a stress-testing approach which assumes a simultaneous deterioration in the financial situation of all borrowers of EU banks, i.e. even for borrowers that do not currently experience difficulties. Also, the most severe COVID-19 scenario assumes two cumulative shocks, one global and one sectorial, to infer the deterioration of the financial situation of EU banks' borrowers. This scenario considers that the application of a sectorial shock only would not be sufficient to assess the impacts on the sectors of the real economy that are the most affected by the COVID-19 crisis.

2. ECB macroeconomic costs and benefits analysis

The ECB macroeconomic analysis presented in this impact assessment is an update of the previous macroeconomic analysis published in the December 2019 CfA response.

Following the one-year delay for the implementation of the final elements of the Basel III reform agreed by the BCBS in the wake of the COVID-19 pandemic, the Commission asked the ECB in August 2020 to update its quantitative impact analysis with the most recent available data, considering the potential impact of the COVID-19 pandemic on the EU banking sector and the wider economy.

Data sources

The structure of banks' balance sheets is sourced from the stress test templates of the 2018 EU-wide exercise and updated with the information from FINREP / COREP based on Q4 2019 data. Estimated impacts of the final elements of the Basel III reform are based on the templates used for the regular Basel III monitoring exercise based on Q4 2019 data. The data sources are therefore consistent with the EBA impact analysis presented in the December 2020 CfA response.

The bank-level behavioural dynamics and their sensitivity to external factors (e.g. IRFS 9 parameters) are estimated with the use of FINREP / COREP data, balance sheet items (BSI) and MFI interest rate (MIR) statistics collected by euro-area central banks for monetary policy purposes, public bank-level information, and external market data. The macroeconomic dataset consists of the aggregate information from Eurostat on national accounts, price indices, interest rates and central bank assets approximating the intensity of unconventional monetary policy.

Sample of the analysis

The ECB macroeconomic impact analysis includes 100 EU banks from 19 euro-area Member States and one Norwegian bank, reporting data of sufficient quality at the highest level of consolidation. This sample covers over 70% of total euro-area banking sector assets. The country breakdown of banks included in the sample is provided in *Table 4* below. No additional information about the profiles of the banks included in the sample has been provided by the ECB. The findings of the ECB analysis included in this impact assessment relate to both the EU and Norwegian economies but only references to the EU economy have been included for the sake of simplicity.

Table 4 : Breakdown of banks included the Q4 2019 sample of ECB macroeconomic analysis, per Member States and Norway

Member States	Number of banks in the sample
AT	6
BE	6
CY	2
DE	20
DK	3
EL	4
ES	11
FI	2
FR	10
HU	1
IE	4
IT	9

LU	5
MT	2
NL	6
NO	1
PL	2
PT	2
SE	3
SI	2
Total	101

Source: ECB

Methodology

The ECB macroeconomic impact analysis relies on the Banking Euro Area Stress Test (BEAST) model which is a semi-structural macroeconomic model that links the dynamics of individual banks' balance sheets with macroeconomic indicators[39].

Using a set of dynamical assumptions, the model links the individual banks' balance sheets to their capital requirements based on a given specification for the applicable prudential framework (either the current prudential framework under the CRR or an implementation option for the final Basel III framework) and a given set of macroeconomic indicators (including the EU Gross Domestic Product (GDP) growth). For a given specification, the model generates multiple times the potential evolution of the macro-economic indicators for every year over a long time horizon, leading to a probabilistic distribution of these indicators each year. To be consistent with the official ECB forecasted macroeconomic indicators[40], the model is calibrated to match those forecasts over the first three years of the time horizon, and thereafter these indicators are generated according to the model dynamics.

On the asset side of banks' balance sheets, the model distinguishes various classes of banks' exposures and applies dynamical assumptions for the evolution of the IFRS 9 credit stages to those exposure classes (stage 1 to3) using endogenous transition rates that depend on the macroeconomic indicators. The dynamics assumptions also adjust, for each exposure class, banks' loan volumes and the interest rates charged on those loans in response to loan demand conditions, monetary policy rates and depending on their own capital position, profitability or the quality of assets.

On the liability side of banks' balance sheets, the model distinguishes various forms of deposits and their level depending on the types of banks' depositors. The dynamical

[39] For more details in about this model, see ECB Working papers series, December 2020 (https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2469~a139d2f5cd.en.pdf?a8fe33c3c9c7d0c629daa9d9c9b1e6b3).

[40] See https://www.ecb.europa.eu/pub/projections/html/index.en.html; these projections are consistent with the Commission's economic forecast.

assumptions changes banks' costs of funding depending on the macroeconomic conditions and, as regards wholesale funding, on banks' capitalisation and asset quality.

Regarding banks' profits and losses, the model recalculates banks' net interest income, loan loss provisions and net fee and commission income in details over the simulation. Certain components of P&L, such as dividend income or changes to the trading book assets, follow a simpler evolution generated by dynamic assumptions.

The model also incorporates a number of support measures adopted in light of the COVID-19 crisis, including country-specific public moratoria and guarantee schemes adopted by Member States as well as capital release measures adopted by the ECB and supervisory authorities[41].

The effects of the final elements of the Basel III reform are assessed using the same data impacts and broad methodology than the EBA analysis, although the sample of banks included in the ECB analysis is slightly different. The ECB analysis includes two implementation options for the implementation of the reform. The first implementation option is based on the full alignment with the final Basel III standards and BCBS timelines, similar to option 1 in Section 5.2.1. The second implementation option is based on the implementation of the final Basel III standards with the introduction of EU specific adjustments (these adjustments are limited to those that EBA was able to quantify; see Section 1 of this Annex). The second implementation option is also based on the same 'alternative approach' for the implementation of the output floor as in the EBA updated impact analysis. Therefore, the second implementation option could be considered as a good proxy for the impact of the preferred option in Section 5.2.1

Every year starting from one year after the envisaged date of application of the final elements of the Basel III reform, the ECB analysis produces two main macroeconomic metrics to assess the macroeconomic costs and benefits of implementing the reform:

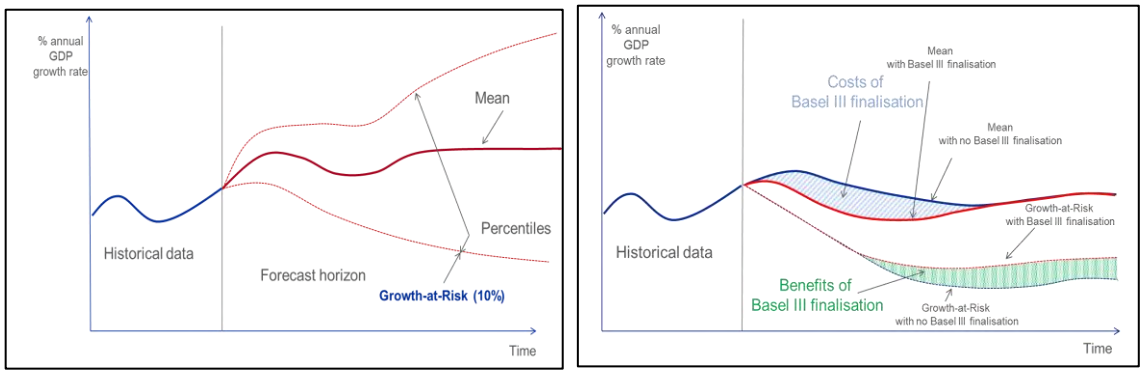
- the expected impact of the reform on EU GDP growth as defined by the difference between the expected future EU GDP[42] growth as simulated under two different set of rules for the capital requirements calculations, the first one based on one of the options considered for implementing the final elements of the Basel III reform and the second one based on the current prudential framework. A negative difference between two expected future EU GDPs growths would imply an expected macroeconomic cost resulting from the introduction of the reform, and vice versa. It is important to note that in the ECB model an increase in banks' capital requirements can lead to a reduction in bank lending, and occasionally a reduction in GDP growth;

[41] For more detailed description see Budnik et al. (2021), Policies in support of lending following the coronavirus (COVID-19) pandemic, ECB Occasional Paper, mimeo

[42] In this context, the expected future EU GDP growth for a given year is the mathematical mean of the distribution of the EU GDPs growth generated by the model, for a given set of model specifications (ie given prudential framework and given set of ECB projected macroeconomic indicators for the first three years).

- the impact of the reform to support EU GDP growth under economic downturns as defined by the difference between a low percentile[43] of the future EU GDP distribution as simulated under two different sets of rules for the capital requirements calculations, the first one based on one of the options considered for implementing the final elements of the Basel III reform and the second one based on the current prudential framework. A positive difference between the same percentiles of the two future EU GDP growth distributions would imply a macroeconomic benefit from the introduction of reforms under an economic downturn, and vice versa. This approach is based on the so-called Growth-at-Risk (GaR) macroeconomic concept which focuses on the lower tail of the simulated EU GDP growth distribution in order to assess the ability of the banking sector to keep lending to the real economy during an economic downturn, thereby supporting growth.

Figure 17: Illustration of the macroeconomic metrics produced by the ECB model.



Source: ECB

Limitations/Caveats

The ECB macroeconomic impact analysis is subject to the following limitations/caveats, which have to be carefully taken into account when interpreting the results:

- limited sample: as for the EBA updated impact analysis, the sample size used in the ECB analysis is limited to the largest banks of EU Member States and Norway. However, these banks hold the majority of banking assets in those countries;
- assumptions of the macroeconomic model: the assumptions of the ECB model tend to translate an increase in banks' capital requirements into a reduction in banks' lending and a reduction in EU GDP growth. This assumption is rather conservative and, may not be met in reality (for instance, the large increase in EU banks' capital requirements resulting from the reforms adopted post-GFC did not lead to a large reduction in bank lending);

[43] The ECB chose the 10th percentile of this distribution in their analysis.

- overestimation of the impact of the EU specific implementation option: similarly to the EBA updated impact analysis, the ECB analysis only reflected a limited number of EU specific adjustments that are proposed under options 2 and 3 of Section 5.2.1. This may lead to an overestimation (underestimation) of the macroeconomic costs (benefits) of the reform, although likely not to a significant degree.