

How demanding and consistent is the 2018 stress test design in comparison to previous exercises?

Banking Union Scrutiny



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Abstract

The new 2018 EBA EU-wide stress test exercise is similar to previous exercises for what concerns the employed methodology. The major change compared to the 2016 exercise is the inclusion of the new international accounting standards, which contributes to the increased severity of the exercise. The methodology incorporates several measures to guarantee internal consistency. However, despite all the progress made in designing the exercise, there remain critical areas concerning the application of a static-balance sheet assumption, the underrepresentation of liquidity risk and the implications of the lack of a fail-pass threshold. Improvements in these areas can enhance reliability of stress test results and empower their role as external and internal communication tools.

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EXECUTIVE SUMMARY

This year, the European Banking Authority (EBA) has required 48 significant banks covering roughly 70% of total banking sector assets in the European Union (EU) to perform a stress test to assess their resilience over the period 2018-2020. The exercise is based on a common methodology and a set of templates that capture starting point data (year-end 2017 figures) and stress test results. Precisely, banks are asked to project the impact of a common macroeconomic baseline scenario and a common adverse scenario on their projected balance sheets and loan loss provisions (LLP) accounts. The final goal is that of assessing the impact of the stressed scenario on banks' capital position.

The adverse scenario is designed to ensure an adequate level of severity in all EU countries. Overall, the scenario implies a deviation of EU gross domestic product (GDP) from its baseline level by 8.3% in 2020. According to the European Systemic Risk Board (ESRB), this is the most severe stress test scenario to date for the EU.

The results will be published on November 2, 2018. As in the 2016 exercise, there is no pass-fail threshold, but results will be input to the supervisory review and evaluation (SREP) process, under which decisions are made on appropriate capital resources and forward-looking capital plans.

Similar to the 2016 exercise, the 2018 EU-wide stress test is based on common methodology and a "constrained bottom-up" approach, i.e., banks make their projections but are subject to strict constraints and simplifying assumptions.

The main novelty of the 2018 exercise is that it incorporates, for the first time, the IFRS 9 accounting standards. Accordingly, banks are requested to account for credit impairments associated with their riskier loans not only over a 12-month period, but also in a lifetime horizon.

The inclusion of the IFRS 9, together with the harsher assumptions behind the adverse scenario (namely, larger deviation for key macro-economic variables in the adverse *vis-à-vis* the baseline scenario), contributes to increase the severity of the exercise compared to previous tests.

Internal consistency seems to be granted by the application of common methodology, common baseline and adverse scenarios, as well as a set of strict constraints. Particularly, the application of the static-balance sheet rule provides stakeholders and the public with a common exercise to contrast and compare different banks from different countries under stressed conditions. Another aspect that contribute to enhance the consistency of the exercise is the close cooperation among main European banking authorities (the ECB, the EBA, the ESRB, and national supervisors) in several steps of the process, from the design of the scenario to the quality assurance of final results.

However, such a comparability comes at the expense of plausibility. The main limitation of European stress tests, in fact, is represented by the static-balance sheet assumption that, for example, does not allow banks to take into account management interventions to face adverse shocks. This may weaken the validity of the exercise as an external and internal communication tool. Moreover, the inclusion of some dynamic elements, as it occurs in the banking stress tests run by the Federal Reserve (FED) in the United States (US), would have the advantage to provide insights on aspects that are relevant under a macro-prudential perspective, e.g., whether and to what extent bank managers' reactions to stressed scenarios lead to reduced credit supply.

1. INTRODUCTION

The 2018 EU-wide stress test is part of the sequence of stress tests started in 2009 in the aftermath of the global financial crisis. Such tests have evolved substantially over time, growing in size and scope. The establishments of the EBA in 2011 and of the Single Supervisory Mechanism (SSM) in 2014 represent a milestone in the evolution process of European stress tests (see Constâncio 2015, and Petrella and Resti 2016, for a concise description and comparison of previous stress tests).

Following the introduction of the SSM, the stress test has improved both as informative and supervisory tool. In particular, the asset quality review (AQR) and the quality assurance process conducted by the ECB in 2014, made EBA stress test results more reliable, i.e. more useful as informational instruments at the advantage of market discipline.¹ Simultaneously, with the operational start of the SSM, stress test results have also become inputs to the supervisory review and evaluation process (SREP). Table 1 summarizes the main features of European stress tests since their launch in 2009 to nowadays.

The EBA launched its stress testing exercise for banks within the EU at end of January 2018. The exercise requires banks to project the impact of the baseline and the stressed case scenarios on their financial and income statements. Banks are also required to provide additional qualitative information (e.g. on the methods applied), as input of the quality assurance process that will follow the outcome of the stress test.

The objective of the exercise is to assess and compare banks' resilience to a series of financial and economic shocks. For the purposes of the exercise, for the first time, banks shall take into account the effect of the introduction of IFRS 9 into account in starting point data as well as in the projections of banks.

Banks' capital position will be challenged and the impact will be measured in terms of common equity tier 1 (CET 1) capital. Total capital, Tier 1 and leverage ratios will be also published for every year of the exercise.

Stress test results will be published at the beginning of November 2018. As already occurred in the 2016 exercise, this year stress test results will be used to assess the Pillar 2 capital needs of individual banks in the contest of the SREP. This is in sharp contrast with stress tests conducted before the establishment of the SSM in 2014, where results were expressed in terms of a "pass or fail" outcome based on a targeted level of the CET 1 ratio (i.e., 8% in the baseline scenario and 5.5% in the adverse scenario).

In the following, the paper first summarizes the main methodological aspects of the exercise, by taking a closer look at the narrative and main characteristics of the adverse scenario. Secondly, it discusses the main changes introduced by the current exercise, placing emphasis on the inclusion of the new international accounting standards. It then comments on the internal consistency and severity of the 2018 stress test. The paper concludes by discussing some criticisms and open issues of European stress tests, by focusing on the limitation of the static-balance sheet assumption.

¹ See Georgescu et al. (2017), and the literature review therein, for an analysis of the market's reaction to stress test disclosures.

Table 1: European stress test main features

Stress test	Announcement Date	Disclosure date	Sample size	Data granularity (data points per bank)	Hurdle rate
Committee of European Banking Supervisors 2009 EU Stress Test	May 2009	Oct. 2009	22 cross border banks (60% of EU banking assets)	N/A	No explicit shortfall measure
Committee of European Banking Supervisors 2010 EU Stress Test	December 2009	July 2010	91 banks (65% of EU banking assets)	27	Tier 1 (6%)
EBA 2011 EU Stress Test	January 2011	July 2011	90 banks (65% of EU banking assets)	3,456	CET 1 (5%)
EBA 2014 EU Stress Test	October 2013	Oct. 2014	123 banks (70% of EU banking assets)	About 12,000	CET 1 (5.5%)
EBA 2015 EU Stress Test	November 2015	July 2016	53 banks (70% of EU banking assets)	About 16,000	None
EBA 2018 EU Stress Test	January 2018	Nov. 2018 (expected)	48 banks (70% EU banking assets)	N/A	None

Source: Petrella and Resti (2016), EBA

2. THE 2018 EU-WIDE BANKING STRESS TEST IN SHORT

2.1 Main methodological aspects

The 2018 exercise consist in a balance-sheet based and forward-looking assessment of banks' solvency. Below, we provide details on some key features of the exercise.²

Sample banks. The exercise involve 48 significant institutions (with a minimum size threshold of 30 billion euros) from 10 EU countries; 33 of these banks belong to the euro area and, hence, are under the SSM. Overall, banks in the sample represent roughly 70% of total EU banking assets. Table 2 reports the sample banks and their provenance.

Table 2: 2018 EU-wide stress test: Sample banks and country of provenance

Bank name	Country	Number of Banks per country
Erste Group Bank AG, Raiffeisen Bank International AG	AT	2
Belfius Banque SA, KBC Group NV	BE	2
Bayerische Landesbank, Commerzbank AG, Deutsche Bank AG, DZ BANK AG Deutsche Zentral Genossenschaftsbank, Landesbank Baden-Württemberg, Landesbank Hessen-Thüringen Girozentrale AdöR, Norddeutsche Landesbank – Girozentrale, NRW. BANK	DE	8
Danske Bank, Jyske Bank, Nykredit Realkredit	DK	3
Banco Bilbao Vizcaya Argentaria S.A., Banco de Sabadell S.A., Banco Santander S.A., CaixaBank, S.A.	ES	4
OP Financial Group	FI	1
BNP Paribas, Group Crédit Mutuel, Groupe BPCE, Groupe Crédit Agricole, La Banque Postale, Société Générale S.A.	FR	6
OTP Bank Nyrt.	HU	1
Allied Irish Banks Group plc, Bank of Ireland Group plc	IE	2
Banco BPM S.p.A., Intesa Sanpaolo S.p.A. UniCredit S.p.A. Unione di Banche Italiane Società Per Azioni	IT	4
ABN AMRO Group N.V., Coöperatieve Rabobank U.A., ING Groep N.V., N.V. Bank Nederlandse Gemeenten	NL	4
DNB Bank Group	NO	1
Polska Kasa Opieki SA, Powszechna Kasa Oszczednosci Bank Polski SA	PL	2
Nordea Bank – group, Skandinaviska Enskilda Banken – group, Svenska Handelsbanken – group, Swedbank – group	SE	4
Barclays Plc, HSBC Holdings Plc, Lloyds Banking Group Plc, The Royal Bank of Scotland Group Plc	UK	4

Balance-sheet based assessment: The exercise aims to test what happens to banks' balance sheets, as an effect of the evolution of key macro-economic and financial variables, in both a baseline as well as in a more critical, "stressed" scenario. Using as starting point data their consolidated balance sheets as of December 2017, banks make projections over 2018, 2019 and 2020, given a set of common shocks

² Details are contained in the EBA's methodological note to the 2018 EU-wide stress test (EBA 2018).

and applying a common methodology. Balance sheet items are stressed and results are measured in terms of impact on the P&L account and, consequently, on banks' available capital, risk weighted exposures and regulatory capital requirements. To run the exercise, banks are bound to use common, and extremely detailed, templates provided by the EBA in the form of spreadsheets, which are also disclosed to foster market discipline.³

Baseline and adverse scenarios: The exercise is carried out against a macro-financial baseline and an adverse scenario, set out by the ECB and the ESRB. The baseline scenario has to be seen as the forecast of the most probable conditions, according to projections from the ECB and competent authorities (CAs),⁴ faced by banks over the three-year simulation period. The adverse scenario, designed by the ESRB, assumes the materialisation of the four sources of system risk that represent the "most material threats to the stability of the EU financial sector" (ESRB 2018) and that are described as follows:

- An abrupt and remarkable repricing of risk premia outside the EU financial markets spilling over to European countries, defined as the most significant risk of the fours;
- An adverse feedback loop between weak bank profitability and low nominal growth from the decline in the economic activity in the EU;
- Public and private debt sustainability concerns amongst a potential repricing of risk premia and increased political uncertainty;
- Liquidity risk in the non-bank financial sector with potential spillovers to the whole financial system.

These sources of risk are then mapped into shocks to a vast set of macro-financial and economic variables, namely: stock prices, long-term and interbank money market rates, exchange rates and corporate credit spread indices, commodity and real estate prices, unemployment and GDP growth rates. Baseline and adverse projections over 2018-2020 for each of these variables are provided for all 28 EU countries, European economies not belonging to the EU (as Norway and Switzerland), as well as for major advanced and emerging economies. However, the extent to which the adverse scenario will produce effects on banks' balance sheets and P&L, and how these effects will be translated on banks' capital depend on how shocks are converted into changes to risk parameters (e.g., in the case of credit risk, probability of default, PD, and loss given default, LGD). Such a further, crucial step depends on the characteristics, as well as on the intensity of usage, of banks' internal models, which generate the final inputs (primarily PD and LGD) to calculate risk weights and capital requirements.

Risk covered and impact: The stress test covers the following three main risk types: credit risk (including securitisation), market risk, and operational risk (including conduct risk). It also covers interest rate risk since banks are required to project the effect of the scenarios on their net interest income (NII). Finally, banks need to make projections of non-interest income and expenses, which may vary for reasons (risk types) different from credit, market, operational, and interest risks.

³ To have an idea of the amount of data granularity, an overview of key figures of 2016 stress test reports that there were up to 16,000 data points per bank required (up 12,000 in the 2014 exercise). See Table 1.

⁴ Precisely, national central banks' projections are used as baseline forecasts for EU countries; the baseline for Norway is provided by Norges Bank. For other non-EU countries, the baseline projections are based on those reported in the October 2017 IMF World Economic Outlook.

The approach: The approach is a constrained bottom-up type, i.e. banks are required to project the impact of the defined scenarios but are subject to strict constraints and simplifying assumptions, a meaningful example of which is represented by the static-balance sheet assumption.⁵ This means that a zero growth and a stable business mix is assumed over the three years, i.e., banks cannot change their business model in reaction to the shocks, and hence assets and liabilities maturing over the exercise time span need to be ideally replaced with similar instruments as at the start of the exercise. Another example of constraints imposed by the methodology is that banks' NII cannot increase over the adverse scenario.

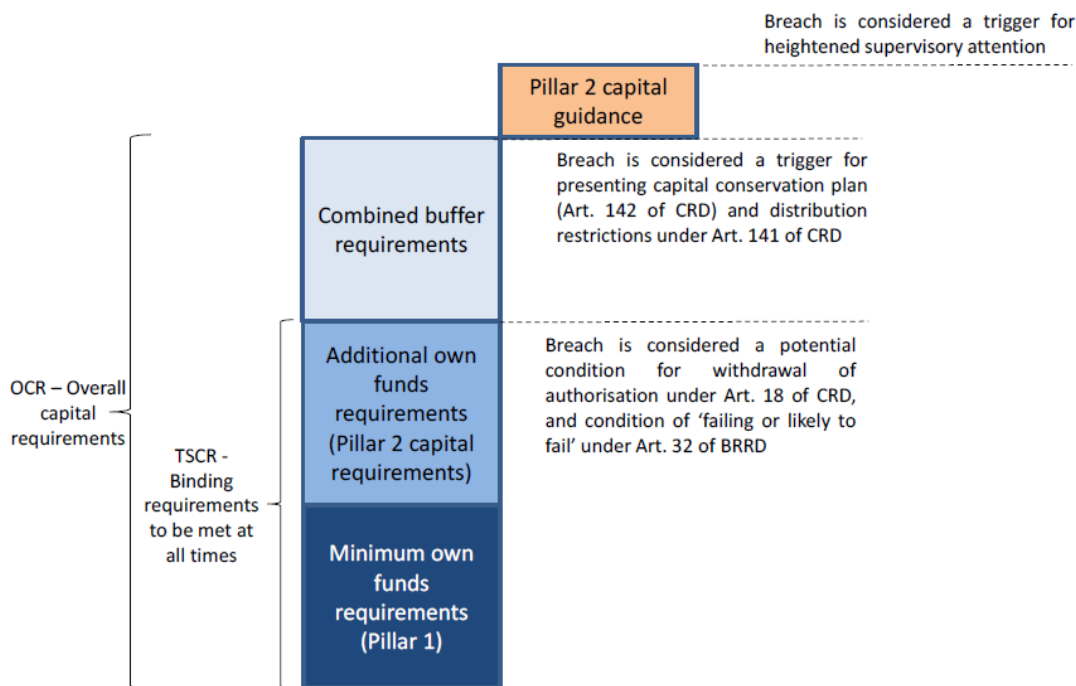
No pass-fail threshold: Banks' resilience to stressed scenarios is primarily measured in terms of impact on CET 1 ratio, the highest quality component of bank capital, which excludes additional Tier 1 instruments as well as hybrid capital. Similarly to the 2016 exercise, but differently from the stress tests conducted till 2014, there are no hurdle rates that banks need to overcome in order to pass the test. Consistently, there will not be a fail judgment as occurred, e.g., in 2014 stress test for 24 banks that failed the test by reporting a capital shortfall.

Stress test results and SREP. The stress test results will be key input to inform the SREP process. As explained by the EBA, competent authorities should use stress test results to assess whether the quantity and composition of available own funds would allow, under the assumed scenarios and severe economic conditions, an institution to meet the total SREP capital requirements, determined under the SREP capital assessment, and the impact on the overall capital requirements (EBA 2016). In terms of supervisory actions, the incorporation of the stress test results into the SREP assessments may generate a range of responses that cannot exclude the setting of Pillar 2 "capital guidance". This is an extra layer of non-legally binding capital, set above the level of binding capital (minimum and additional) and the combined buffer requirements (Figure 1).⁶

⁵ See Annex IV of the 2018 EBA's methodological note for a list of such constraints.

⁶ Pillar 2 capital guidance is a supervisory tool setting non-legally binding capital expectations at level over and above overall capital requirements based on the SREP findings. It is calculated based on (1) an assessment of the adequacy of banks' own funds (quality and quantity), in particular the ability to meet the applicable own funds requirements in stressed conditions, or (2) supervisory concerns over the (excessive) sensitivity of an institution towards scenarios assumed in supervisory stress testing (EBA 2017).

Figure 1: Capital Guidance and Total SREP Capital Requirements



Source: EBA Pillar 2 Roadmap, p. 4, 11 April 2017

Being not binding, capital guidance will not trigger the automatic restriction of the distribution and calculation of the maximum distributable amount (MDA).⁷ Banks, however, are expected to incorporate capital guidance in their capital planning and risk management frameworks.

This raises two issues. The first one is that if the stress test shows that a bank should actually increase its capital buffer, there is no mandatory built-in mechanism to achieve that. It follows that effective moral suasion, in absence of binding measures, should be the mechanism at work. The second, and more general, concern is that a bank can replenish capital shortfall without increasing retained earnings or raising new capital; the capital ratio target can be actually achieved by downsizing and reshaping the balance-sheet, a strategy that can lead to reduced lending to risky segments (including small and medium enterprises).

Authorities involved. There are several authorities involved into the process. The 2018 EU-wide stress test is run in cooperation between the EBA, which acts as coordinator, CAs including the SSM for the euro area banks in the sample, the ECB, and the ESRB. Each authority has a precise task. The EBA has developed the common methodology. The ESRB and the ECB (in cooperation with CAs and the EBA) have developed the macroeconomic adverse scenario and any risk type specific shocks linked to the

⁷ The article 141 of the Capital Requirement Directive (CRD IV) claims that banks failing to meet their combined buffer requirement must calculate, according to a pre-defined regulatory formula, the maximum amount they are allowed to pay in the form of dividends (on CET 1 instruments), discretionary coupons (on additional Tier 1 instruments) or through the creation of new obligations to pay bonuses and pensions rights.

scenario. Finally, the CAs ensure that banks correctly apply the common methodology. In particular, they assess the reliability and robustness of banks' assumptions, data, estimates and results. In doing that, they are responsible for the quality assurance process (e.g., by reviewing the models applied by banks) as well as for any resulting supervisory actions.

2.2 The "narrative" of the adverse scenario

The narrative of the adverse scenario, as set out by the ESRB, explains how the most significant systemic risk (i.e., the abrupt and sizeable repricing of risk premia in major global equity and bond markets) triggers the other ones. The narrative is illustrated in a document (see ESRB 2018) that also contains projections, in the baseline and adverse scenario and over the simulation period, of the macro-economic and financial variables mentioned in the previous section.

The triggering event raises in financial markets outside the EU and materializes as shocks to bond yields and equity prices due to changes in investors' expectations about economic policies in major (non EU) economies. As a result, in 2018 in the US, stock prices drop by 40% and long-term government bonds yield increase by 2.35% from the baseline. The shocks reverberate on the EU, where stock prices fall by about 30% and long-term interest rates increase by more than 80 basis points in 2018. Of course, fiscally weaker economies (such as Portugal, Greece, or Italy) are hit more severely and long-term rates deviate more significantly from the baseline level (+1.37, 1.31 and 1.21%, respectively, in 2018).

Other segment of financial markets are also affected. Nominal exchange rates vary remarkably, e.g., the Swiss franc appreciate by 8% against the euro in 2018 and money market rates in all EU countries rise by 55 basis points in 2018, mirroring a tightening of banks' financial conditions. Also corporates' financial conditions deteriorate.

At some point, financial shocks spillover to the real economy, by firstly influencing main emerging economies (Russia, Turkey and India) as well as non-EU countries. Expectations deteriorate in these countries reducing asset prices and depressing domestic demand. As an effect, GDP in non-EU economies deviate from the baseline level by 2020 between 2.5% (in Switzerland) and 7.4% (in Norway). In Turkey and Russia, over the three-years, the level deviation from the baseline of the domestic production is 5.6 and 4.7%, respectively. As an effect of GDP drop, foreign demand for EU exports reduces at the expense, in particular, of countries with higher degree of trade openness.

Commodity prices are also affected by the slowdown in the global economy, e.g. oil prices fall by about 10% in 2020.

Overall, as a result of the combined demand, financial and real shocks, within and outside the EU, the adverse scenario leads to:

- A reduction of EU GDP, from its baseline level, by 8.3% in 2020, corresponding to an adverse cumulative (over the three years) growth rate of -2.7%. Discrepancies across countries are motivated by the differential degree of trade openness and vulnerability of domestic real estate markets;
- Deteriorated conditions in real estate markets, as residential property prices decrease by nearly 28% below the baseline level by 2020, corresponding to a cumulative fall, over the three years, of nearly 20% at aggregate EU level;
- A fall in the Harmonised Index of Consumer Prices (HICP) in the EU under the adverse scenario below the baseline level of 1.9% in 2020.

At country level, particularly relevant stress (in terms of GDP percentage deviation from the baseline scenario in 2020) occurs in Sweden (-16%), Ireland and Luxembourg (-11%), being these countries

among the ones affected by the most adverse growth of residential real estate prices. Germany registers a GDP reduction of 8.6%, which is higher than euro area average (-7.8%), while below the average is the GDP deviation for Spain, Italy and France (-7, -6.5, and -6.4%, respectively).

The adverse scenario is designed in a well-balanced manner and in order to be internally consistent but also relevant for all countries. To this end, the assumption is that the GDP level for any single country at the end of the stress test horizon in 2020 has to be below the starting point in 2017 and hence, the cumulative GDP growth under the adverse scenario has to be negative for all countries. Consistently, the ESRB applied additional domestic real and financial shocks to some countries to increase the severity of the GDP deviation from the baseline and reach a negative cumulative GDP growth under the adverse scenario.

3. THE 2018 VS. THE 2016 EU-WIDE BANKING STRESS TEST: RELEVANT CHANGES

There are limited elements of novelty between the 2018 and the 2016 EBA stress test methodology. Almost all fundamental methodological aspects illustrated in Section 2.1 applied already to the 2016 stress tests. There are two novel elements, however, that deserve closer attention: the reduction of the sample size and the inclusion of IFRS 9.

A minor change refers to the sample size, which is now smaller. This is a minor variation because the current exercise is performed on 48 banks with a minimum of euro 30 billion in asset, compared to 51 banks in 2016, with the same size threshold and the same sample representativeness (i.e., 70% of total banking assets in the EU).⁸ In both exercises, it is a discretionary choice of CAs to include additional banks holding assets for a minimum of euro 100 billion. Compared to the previous test, troubled banks like Banca Monte dei Paschi di Siena, as well as weaker banking systems like Portugal or Greece are excluded.⁹ To compensate, the ECB will conduct its own stress tests for those significant institutions (SIs) which are not covered by the EBA stress test. This represents the vast majority of banks under the SSM, as only 33 significant banks of them (out of 118, as of 1 April, 2018) are subject to the EBA stress test. Unfortunately, results of the ECB stress tests will not be disclosed, with the exception for Greek banks. In this last respect, the ECB published the results for four significant Greek banks on May 5.¹⁰ This circumstance, in fact, leads the number of stressed banks (under the EBA methodology and scenarios, and for which results are, or will be soon, disclosed) to 52. More importantly, it guarantees public

⁸ A more remarkable sample reduction occurred in the 2016 stress test compared to 2010, 2011 and, particularly, 2014 exercises. In particular, the number of banks decreased from 123 (in the 2014 stress test, run in the anticipation of the launch of the SSM) to 53, although the sample representativeness remained basically the same. See Resti (2016) for issues related to significant sample size reduction.

⁹ Precisely, sample changes from the 2016 test consist of 8 German banks (previously 10), 4 Spanish banks (previously 6, including Banco Popular), 4 Italian banks (previously 5), 2 Polish banks (previously 1) and no Greek banks (previously 1).

¹⁰ The different timeline has been motivated by the need to have stress test results for Greek banks ready well before the end of the third European stability mechanism programme for Greece on 20 August 2018, in order to leave room for any follow-up action deemed necessary before the programme expires (Magnus and Deslandes 2018).

information on the financial conditions of banks from a country that otherwise will result completely out of scope (as it occurs for example in the case of Portugal).

The introduction of IFRS9 is the real key innovation to the 2018 stress test. For the purpose of the exercise, banks starting to report under IFRS 9 in the first quarter of 2018 need to forecast credit impairments under the adverse scenario based on the IFRS 9 framework.¹¹ The inclusion in the stress test of the new accounting standard is a relevant change in light of the fact that the negative impact on banks' capital of the new, harsher adverse scenario, will be probably driven by the IFRS9 application. This occurs for two main reasons:

- Expected, rather than incurred, loss principle. The new approach has been conceived to favour higher and timely provisioning through several mechanisms. The crucial novelty of IFRS 9 is the concept of "expected" rather than "incurred" credit losses. Specifically, the IFRS 9 requires banks to recognise expected credit losses (ECLs) before having objective evidence of impairment, that is, even if no past "triggering" events (e.g., decrease in collateral values, or past-due status) have yet occurred. Banks will then update the ECLs recognised at each reporting date to reflect changes in credit risk as estimated using a large set of historical, current, and – for the first time – forecast information, including forward-looking macroeconomic variables. The inclusion of these variable into the assessment procedure is expected to favour earlier and possibly higher provisions, since evidence shows that the determinants of credit losses (such as GDP growth) start deteriorating well before they result into cumulative delinquency.
- Lifetime, rather than 12-month, perspective. The approach establishes a distinction between three stages into which loans are classified according to their relative credit risk at the reporting date. In particular, the shift from low credit risk (Stage 1) to riskier stages (Stage 2 and 3), motivated by a "significant increase in credit risk", will entail a remarkable increase in provisions, since these will be calculated on a lifetime ECL rather than on the 12 month after the reporting date (as in Stage 1).

In light of the above, the application of the new accounting standard will reasonably worsen banks' capital positions and therefore contribute to the increased severity of the 2018 EBA stress test.¹²

4. THE 2018 EU-WIDE BANKING STRESS TEST: INTERNAL CONSISTENCY AND SEVERITY

This section aims to address two questions, namely whether the 2018 EBA stress test are (1) internally consistent and (2) more demanding than previous exercises.

¹¹ The starting values of the stock of provisions are the accounting figures as of 1 January 2018; this means that end-2017 figures need to restated according to IFRS 9.

¹² See Bruno and Carletti (2017) for details on the new accounting standards and expected impact on banks' regulatory capital.

4.1 Is the 2018 exercise internally consistent?

Ensuring internal consistency is clearly highly desirable for authorities willing to measure the resilience of a sample of potentially very heterogeneous banks, operating in various countries and under the supervision of different entities. A fundamental prerequisite for the stress test to generate reliable and comparable results lies on the ability to carry out the test in a rigorous way and on a level playing field. If, for some reasons, the methodology is perceived to create a prejudice for some entities relative to others (or for some countries relative to others), the stress test results will be considered barely meaningful, if not unreliable. The question has become even more crucial, since the stress test results will inform the SREP process and, as such, can potentially trigger supervisory actions.

Numerous elements within the 2018 EU-wide stress tests suggest that the exercise has been designed to guarantee, as far as possible, internal consistency. The aspects contributing to achieve these goals can be summarized as follows:

Sample selection: setting a high “minimum” threshold of euro 30 billion helps reduce heterogeneity within the sample. In fact, size is a characteristic that explains several (although not all) aspects of banks’ behavior, including funding and resource allocation strategies. For example, smaller institutions tend to adopt more traditional business models, i.e., more based on customer deposits (rather than wholesale funding) and more focused on lending (rather than investment banking). Or, to give another example, larger banks are more likely to use internal rating models (due to their high implementation costs), relative to smaller institutions. Besides, this size threshold is also consistent with the criterion for participation in EBA’s supervisory reporting and with the SSM definition of significant institutions.

Application of common methodology, scenarios and templates, and a set of constraints. To increase comparability, the EBA has defined common methodology and templates. The ECB (and not the European Commission, as in 2016 test) has supplied the baseline scenario, with baseline forecasts provided by national supervisors to ensure there is no prejudice against, e.g., a given country, relative to the others. The same authority, in cooperation with the ESRB, has developed the adverse scenario and any risk type specific shock linked to the scenario. All stressed banks are applied the same settings and, to limit discretionary behaviors, they are subject to constraints, such caps and floors, and other quantitative requirements that banks have to meet for the correct application of the common methodology. The static-balance sheet assumption also applies in order to provide market participants and institutions with a common exercise to contrast and compare EU banks under adverse market conditions.

The intervention of several authorities. The exercise is designed to assure close cooperation between the EBA, the national CAs and the ECB, as well as the ESRB. The EBA coordinates the exercise and provides guidance for CAs concerning the minimum quality assurance process. Further, it provides common descriptive statistics on risk parameters to allow CAs to run consistency checks and assess banks’ results. Finally, the EBA hosts a central question and answer facility and functions as a data hub for the final dissemination of the stress test results.

The CAs convey to banks the instructions on how to complete the exercise. To enhance reliability, they assume the quality assurance process (e.g. by reviewing the model applied by the banks) and are responsible for validating banks’ data and results. They also incorporate the stress test findings into the SREP and activate the supervisory reaction function, if needed. In this sense, they are in the best position to understand and use results in the most meaningful way. The intervention of CAs, for example in reviewing models applied by banks and ensuring data quality, is very important in light of the fact that, as it will be discussed in the next section, the effect of stressed scenarios on

banks is “model dependent”. i.e., it depends on the specificities of banks’ ratings models (constraints are also introduced to foster comparability). Such a close cooperation among authorities (particularly the active involvement of the ECB side by side with the national supervisors) is crucial not only to ensure consistency and comparability *among* stressed banks. It also favors equal treatment for banks *across* the EU, including those that do not fall under the stress test (the “level playing field”).

Data granularity and clarifications on the application of the IFRS 9. More accurate data than in past exercises are required.¹³ Having said that, the EBA’s methodological note provides common assumptions and clarifications on several matters, e.g., on the application of the IFRS 9. The methodological note claims, for example, that a definition of Stage 3 assets as non-performing loans should be applied for the projections.¹⁴ It also provides a precise definition on what triggers the shift from Stage 1 to Stage 2 assets, while the accounting rule makes only vague reference to “a significant increase in credit risk”.¹⁵ All these explanations are particularly welcome, as there still exists uncertainty in the industry due to the very recent introduction of the accounting standard and the lack of consolidated practices. More broadly, the EBA’s methodological note sets common assumptions and provides clarifications “for the avoidance of doubt”, to enhance comparability and internal consistency that otherwise would be compromised due to the wide range of practices across banks and countries.

In light of the above, it seems that the process has been designed in order to guarantee internally consistency and contains the elements to be considered as “a rigorous assessment of banks’ resilience under stress in a common and comparable way” (EBA 2018).

4.2 Is the 2018 stress test more demanding?

The 2018 exercise is comparable under several respects to the one carried out in 2016, but it shows a higher degree of severity, in particular because it assumes a greater deterioration in the adverse scenario compared to the baseline scenario than in the past. As claimed by the EBA, compared to the US FED Comprehensive capital analysis and review exercise run in 2017, the severity of the 2018 EU-wide stress test scenario falls between the “adverse” and “severely adverse” scenarios.¹⁶

¹³ Relative to 2016 stress test, some templates have been significantly modified (e.g., those labeled as “Credit risk-scenarios, projections for credit risk losses”) and in general further data are required in each template; others are new (such as those labeled as “Risk exposure amount - IRB approach floor”, or those for market risk); others entail minor changes (such as cells’ format and data breakdown).

¹⁴ Precisely, the EBA claims that “for the avoidance of doubt”, all non-performing exposures (as per EBA Implementing Technical Standard), defaulted exposures (as per Article 178 of the CRR), or impaired exposures (as per the applicable accounting standard) shall be classified as S3 under IFRS 9 for the stress test period. In the explanatory note, banks should comment on how this definition differs from their internally applied criteria for S3 exposure.

¹⁵ The EBA’s methodological note is, instead, rather explicit, and defines the trigger as a “threefold increase of lifetime PD”, compared with the lifetime PD value at initial recognition. See EBA (2018), p.

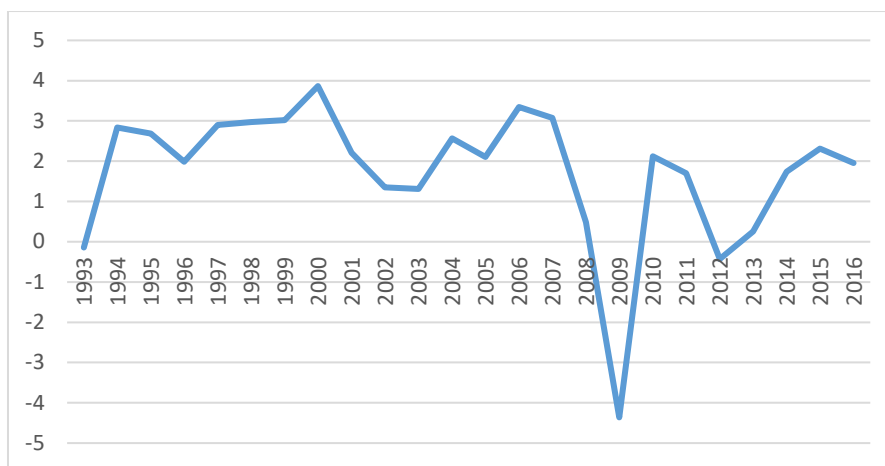
¹⁶ See the EBA “2018 EU-wide stress test: Frequently Asked Questions”, as of 31 January 2018

Precisely, as pointed out by the ESRB, the 2018 stress test sets the most severe scenario in terms of GDP deviation from the baseline level than in any previous exercise.

Is such a deterioration sufficient to make the exercise truly demanding?

If we compare the GDP growth rate in the adverse scenario (in the EU) to historical scenarios in the EU since its constitution in 1993 (Table 3), we find that the average annual real GDP growth rate is 1.74%, ranging from a minimum of -4.4% (2009, in the aftermath of the global financial crisis) to a maximum of 3.9% (in 2000).

Table 3 Annual real GDP growth rate in the EU, % (1993-2016)



Source: The World Bank

The baseline growth rate (projection made by the ECB) is 2.2% in 2018 and the most adverse growth rate is -2.2% in 2019 (corresponding to a growth rate deviation of -4.1% between the scenarios). Considering that the GDP growth in 2009 has been, by far, the most significant over decades, it can be reasonably argued that the adverse scenario is sufficiently harsh in terms of deviation from the baseline case. Yet, it seems also realistic in that the deterioration is not triggered by a specific extraordinary event, but by more general changes in market participants’ expectation about economic policies in major economies outside the EU (see Section 2.2. on the narrative of the adverse scenario)

Nevertheless, assessing the severity of the scenario is more complex than simply comparing GDP growth rates between two scenarios, for several reasons.¹⁷

First, to fully assess the actual severity of the scenario, all the shocks to macro-economic and financial variables (not only GDP growth rate) should be considered. In this respect, this year’s stress test assumes a slightly higher increase in the unemployment rates (3.3% higher in the adverse scenario vs. the baseline by 2020, +2.8% in previous stress test, although in terms of level the EU unemployment rate is 9.7% for 2020 in current stress test, against 11.6% in the 2016 stress test for 2018). Moreover, relevant differences in financial and economic shocks include those to financing conditions for EU

¹⁷ See Breuer (2014) who raises concerns on the actual possibility to provide accurate assessment of the severity of the scenario

small-medium enterprises (SMEs).¹⁸ Other remarkable stresses include residential property prices in the EU, with a drop around 28% below the levels assumed in the baseline scenario by 2020 (vs. 21.3% in previous stress test). The projected changes in long-term interest rates are, instead, comparable to the scenarios used in the 2016 exercise.

Second, both in the historical data and the adverse scenario data, there are large discrepancies across countries, which would require a punctual assessment at the country level. For example, in the adverse scenario the residential property market deterioration appears particularly severe in Sweden (with a level deviation of residential real estate prices by 2020, relative to the baseline scenario, of -56% and 42%), contributing to a GDP growth rate deviation from the baseline scenario by 2020 (nearly -16%) much higher than for the EU (-8.3%).

Third, to produce meaningful results, the adverse scenario needs not only to be severe, but also plausible. As such, assessing the severity of the stressed scenario would require simulations on different scenarios to calculate probabilities, as well as numerous assumptions if data are not fully disclosed.¹⁹

Moreover, to judge the plausibility of the stress test results it is needed to take into consideration if the scenario is realistic, given the risk profile of the banks. Although banks in the sample are all large and thus, relatively similar institutions, there may still exist discrepancies concerning the prevalent business model (e.g., whether more focused on commercial banking, as for Intesa San Paolo, rather than investment banking, as for Deutsche Bank) and the sources of risk banks are exposed to. Depending on the scenario, the results of the stress test may misrepresent the risks that a bank is actually facing, not only because the scenario is not severe or plausible enough, but also because it may not address important sources of risk faced by a bank. There are already examples of misrepresentation, if one thinks of those banks that went into troubles few months after having passed European stress tests.²⁰ The impact of the shock will depend on all these differences at the bank level that are difficult to estimate *a priori*.

Finally, in the assessment of the severity of the scenario it matters how macro variables are turned into risk parameters (namely, point-in-time PD and LGD). This means how, for example, a GDP drop turns into higher PD and then translates into higher risk weights and lower regulatory capital ratios. The EBA methodology requires banks to use their internal models (under some constraints) to this purpose. This circumstance adds discretion to the process as internal models are developed by the banks, so that it is harder to assess the actual impact of the scenario. It follows that the greater the banks' reliance on the internal models, the more complex the model (advanced vs. fundamental), the more difficult to

¹⁸ Precisely, "shocks to financing conditions of EU SMEs due to limited hedging against a rise in interest rates in some segments of the banking sector", as in ESRB note on the adverse scenario, which maps the four main stability risks into financial and economic shocks. See ESRB (2018), p. 4.

¹⁹ For example, Bonucchi et al. (2018) measure the implicit severity of the 2018 EBA stress test on Italian banks. To this end, they run stochastic simulations with their proprietary models to compensate the limitation of the lack of data.

²⁰ This has been the case of Ireland's banks in 2010, of the Franco-Belgian bank Dexia in 2011 and, more recently, of Banco Popular in 2016.

judge the severity of the scenario in the absence of accurate data.²¹ Related to this last point, however, it is important to outline that the EBA methodological note contains several measures aimed to enhance data comparability and consistency of internal models outcomes.²²

Given this, it can be reasonably argued that harsher GDP forecasts and more severe assumptions around changes in real estate prices are elements that contribute to increase severity in the stress test. It is also reasonable to expect that the negative impact on banks' capital position in the adverse scenario will be driven by the materialisation of credit risk (rather than market and operational risk) for two main reasons:

- (1) 2016 stress test showed that that nearly 60% of overall hit to banks' CET 1 resulted from credit losses in the adverse scenario (the remaining half split between market and operational risk losses);²³
- (2) expected increased loan impairments, due to the inclusion of IFRS 9, as banks for the first time have been required (1) to use forward-looking indicators (as GDP growth) to measure expected credit losses; (2) to recognise lifetime expected credit losses when assessing riskier (namely, Stage 2 and 3) loans.

In an attempt to anticipate stress tests results, all things being equal, one may expect more traditional banks to be more exposed to such a severe scenario. In relative terms, the most affected banks should be those located in countries facing an above average decline of GDP, namely Luxembourg, Sweden, Portugal and Ireland. This is also an effect of the severe shock of the real estate industry in some of these countries, which is likely to influence negatively the LGD in banks with a larger share of collateralised assets. Overall, one may expect that, relative to previous exercises, improved capital ratios at EU banks will balance the more stressful test, although with variation across banks and countries.

5. HOW TO EMPOWER EUROPEAN STRESS TESTS: OPEN ISSUES

The sections above have illustrated the main features of the 2018 EBA stress test. The overall assessment of the methodology is positive. Having said that, there is of course room for improvement and the goal of this section is to comment on those methodological aspects that may need to be further discussed, if not reviewed. Some issues raising concerns include the implication of the static balance sheet rule, the risk coverage, and the absence of pass-fail threshold.

Static-balance sheet approach. It is clear that the static-balance sheet rule helps make stress results more comparable. It is also evident, however (and the ECB is well aware of this limitation, see Constâncio 2015), that comparability comes at the expense of plausibility. The main implication of the application of this rule is that, even if the stressed scenario comes true, banks' actual balance sheets

²¹ See also Magnus and Duvillet-Margerit (2016).

²² Greater amount of data required, the application of common scenarios, assumptions and constraints, close cooperation among authorities and their active involvement in several relevant phases (including the review of banks' models in the quality assurance process) are examples of these measures.

²³ Precisely, 2016 stress test results show that the impact on the CET 1 capital ratio is driven by credit risk losses (amounting to euro 349 billion), contributing to -3.7% of the impact on the CET 1 capital ratio. Operational risk losses (for euro 105 billion) contributed to -1.10% and losses associated to market risk across all portfolios (for euro 98 billion) contributed to -1% of the impact on CET 1.

will not be the same as the stressed ones (Breuer 2014). Of course, this occurs because banks tend to react to exogenous stress, by implementing several strategies, such as deleveraging, reshaping loan and securities portfolios, or raising new capital. Any of these reactions enters into the stress test. Hence, stress test results do not incorporate assessments of bank managers' ability to deal with shocks. Indeed, the more severe the stress test, the more important it becomes to take into account management interventions. At the advantage of market discipline, it would be valuable to have more insights on management interventions. Requiring banks to clarify on potential management intervention (e.g., in the qualitative section of the exercise) may increase the predictive power of stress test results and make them a more powerful communication tool both for investors and for internal purposes. As claimed by some commentators from the industry (Thun 2012; Dietz et al. 2012), it is currently hard to use EBA stress test results for communication *within* banks (e.g., to risk managers or senior management), because they sound unrealistic in several respects. Banks under stress tests are exposed to a cumbersome activity of data collection and analysis. To make such an effort worthwhile (over and beyond micro-prudential considerations) it would be desirable that results would better mirror actual vulnerabilities of a bank's business model, as well as the transmission mechanism from scenario assumptions to potential portfolio impact.²⁴

Finally, having more details on banks' reaction to stressed scenario would help improve the macro-prudential dimension of the current stress (see Constâncio 2015 on the importance of enhancing the macro-prudential dimension of stress testing). Particularly, it could provide authorities with insights on whether and to what extent banks react to shocks by cutting bank lending. The question is relevant as empirical evidence has shown, in both the US and Europe (see, among the others, Gropp et al. 2018 for the Euro area and Acharya et al. 2017 for the US) that banks under stress test which are required to replenish their capital position, tend to do so by reducing the denominator (RWAs) rather than by increasing the numerator (regulatory capital) of capital ratios. This means that rather than raising new capital, banks prefer to undergo through deleveraging strategies that may entail reduced credit supply.

Risk coverage. The stress test is primarily a solvency assessment and results are measured in terms of the impact of adverse conditions on banks' capital. In designing the methodology and the scenarios, authorities have tried to take into account of the main threats (or risk types) to banks' solvency. A type of risk that seems to be neglected is liquidity risk. While the EBA exercise entails some liquidity stress (market liquidity or funding liquidity), it appears that a rigorous assessment on banks' liquidity position is not in the stress test scope. As a matter of fact, there is sufficient evidence that a liquidity crisis may easily turn into a solvency crisis, which is also the reason why the liquidity standards have been introduced within the Basel III framework in response of the 2008-2009 crisis. The global financial crisis has clearly shown the interconnection between liquidity and solvency shocks (Strahan 2012). More recently, Banco Popular's resolution case, in June 2017, was directly linked to liquidity problems which were not revealed by 2016 stress test (see Mesnard et al. 2016 for details). Is this interconnection that should be better taken into account, to prevent stress tests fail the mission to properly assess banks' resilience because of a misrepresentation of actual risks faced by banks.

The pass-fail threshold. In principle, a positive aspect of the choice of not including a hurdle rate is that investors are now forced to make themselves more familiar with the technicalities behind stress tests (see Resti 2016 in this respect). On the other hand, the process through which EBA stress test results will inform the SREP process remains vague to the eyes of market participants. The feeling is that bank creditors, even in the absence of a fail-pass judgment, will still try to benchmark the banks'

²⁴ Ultimately, the results of a stress test may affect the decision-making process and potentially lead to a review of a bank's current risk profile (Thun 2012).

performance in the adverse scenario, based on the variation of banks' CET 1 at the end of exercise. A further way to benchmark banks may be that of comparing the stress test result to the SREP capital requirements, when available. The decision on Pillar 2 disclosure is, in fact, a bank's choice, and there is variability across banks and countries. It has to be understood whether and to what extent investors will use this piece of information (whenever provided) to interpret EBA stress test results as well as whether the discretionary disclosure of SREP requirements can create distorted incentives or misunderstanding of actual EBA results. Alternatively, bank creditors can interpret EBA results by using, as a benchmark, the thresholds provided in the 2015 exercise.²⁵

Whatever the criterion used to benchmark banks after stress test results disclosure, it is reasonable to expect differentiation in the risk premium demanded by investors for bank liabilities. It would be interesting to understand whether this is a correct procedure or it could rather lead to distortions within the market as well as to misinterpretation of stress test results.

6. CONCLUSIONS AND EXEMPLARY QUESTIONS

The new 2018 EBA EU-wide stress test exercise is broadly similar to previous exercises for what concerns the employed methodology. However, it introduces a major change and sets a harsher adverse scenario, compared to the 2016 exercise.

By analyzing the EBA methodological note and the ESRB document on the adverse scenario, the main considerations are the following:

- The 2018 stress test made progress on previous exercises; the process has been designed in order to guarantee internal consistency and contains the elements to allow "a rigorous assessment of banks' resilience under stress in a common and comparable way";
- Internal consistency and data comparability are guaranteed by greater data granularity, common methodology, scenarios and templates for all banks, simplifying assumptions and clarifications, as well as large intervention of European and national authorities in all the critical phases of the process;
- The severity of the adverse scenario seems increased in light of two main aspects. First, a larger deviation, in the adverse vs. the baseline scenario, of key macro-economic variable, primarily GDP growth rate. Relevant shocks to macro-economic and financial variables will be then reflected into risk parameters and hence, on banks' risk weighted assets and regulatory capital ratios. Second, the inclusion of IFRS 9 standards that are likely to require banks to increase provisions against expected credit losses, with a more negative effect on banks' P&L and, therefore, on banks' available capital;
- An accurate assessment of the severity of the adverse scenario remains a hard task, also in light of the role played by banks' internal model in transposing adverse scenario into impact on banks' capital. The intervention of national competent authorities, which in charge of internal rating model validation and, within the stress test, of the quality assessment, is crucial to mitigate this concern;
- Despite all this progress, there remain critical areas that may deserve further discussion and analysis. These relate to the application of a static-balance sheet assumption, the underrepresentation of liquidity risk and the implication (unintended consequences) of the

²⁵ See Magnus and Deslandes (2018), commenting on results of the 2018 stress test of the four significant Greek banks. For those banks, the ECB frontloaded the whole exercise and already published the results on 5 May. The accelerated timetable served the purpose to have results ready before the end of the third European Stability Mechanism Programme for Greece on August 20, 2018. Apart from this aspect, the four Greek banks were subject to the same stress test under the EBA scenarios and methodology.

removal of a fail-pass threshold. Improvements in these areas can enhance reliability of stress test results and empower their role as external and internal communication tools.

In light of the above considerations, exemplary questions to raise in the Q&A part of the hearing are:

- *To which extent should elements of a dynamic scenario (without missing the benefits of the static-balance sheet assumption) be considered?*
- *How can the macro-prudential scope of stress tests be improved? (Having in mind, for instance, that some details on the possible measures to undertake in reaction to the adverse scenario will provide insights on whether and how stressed environments will impair credit supply and make stress test results more meaningful.*
- *How can the risk coverage scope of stress tests be improved? (Having in mind, in particular, the underrepresentation of liquidity risk as a potential threat to banks' solvency)*
- *To what extent do stress tests remain a powerful communication tool rather than a rigorous supervisory tool? (In light of the limitation of the static-balance sheet assumption, but also having in mind the choices of not including Portuguese banks in the current stress test and not disclosing results of ECB's stress tests carried out on significant institutions not covered by EBA's stress tests)*
- *How to make EBA stress test comparable with UK and US stress test? The methodologies employed in the different jurisdictions are indeed different and hard to compare. For example, the US FED stress tests are based on three scenarios - baseline, adverse and severely adverse -, and employ a dynamic (rather than static) balance sheet rule. Efforts to reconcile different methodologies and favour comparability among different stress test types are most welcome.*

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