

## Ad-hoc approaches to stress testing in the pandemic era

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**Abstract.** Recent events have updated the structure and character of stress testing of the banking sector. The adjustments implemented to better inform the policy response have however varied across the world. We review different approaches taken by the three global authorities during the pandemic year with the aim better to understand motivations for the adjustments in the regulatory framework in presence of heightened uncertainty and adverse unexpected shocks. We also provide an insight into what has changed in the design, scenarios, and communication of the stress testing results during the pandemic around the world.

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### 1 Introduction

Banking sector had been enjoying a relatively healthy period of time with reasonably comfortable levels of capital and liquidity buffers before the pandemic have changed the world. Although monetary stance has already been quite loose, shortly after the onset of the restrictions, unprecedented number of supportive measures have been taken as a response to contain the initial impact to the banking sector.

Deep economic impact of the pandemic still weakened the solvency position of banks to a considerable extent. In order to tailor the response measures adequately, or more specifically, to identify more vulnerable institutions while maintaining the accommodative prudential policy stance intact, an update in the assessment of banks resilience deemed necessary.

Such a unique shock as pandemic surely requires both revisions to the scenario design as well as to modelling approaches. In general, stress tests have been reviewed and changed in two directions. In the short run, special emphasis has been placed on what effect does the pandemic shock have on the banking sector and the economy. Such

understanding is then important in the long run to help identify eventually vulnerable institutions where targeted supervisory action would have to be taken.

Although, the main goal of general stress testing is to consider performance of the financial system in extraordinary conditions, only when such situation occurs, we better comprehend what is the necessary adjustment in this practice. Truly, financial system is a complex organism consisting of a whole set of financial institutions, financial market, and payment systems, and therefore it is not easy to put it through a comprehensive analysis (Baudino, 2020). On top of that, considering the shocks that the world has been through during the pandemic were beyond any imagination.

## **2 Design option for the rainy days**

One of the challenges to the design of stress testing exercise in the pandemic times is to take aboard new metrics related to healthcare, e.g., infection rates, speed of reproduction, hospitalizations, mortality rates etc. Yet, almost 2 years into the covid-19 crisis, general understanding of these metrics, their mutual relationships and their effect on economic variables are still not sufficiently understood. Quicker alternative therefore has usually been to perform sensitivity analysis based on existing scenario. One option is an increase in the level of stress represented by certain stress indicator. Another option is to design a new scenario encompassing some deeper story of economic contraction. This however would have to entail an assumption of the strength and duration of the shock *per se*, which as we have witnessed in the pandemic is very difficult to predict.

Consequently, there is more uncertainty around the scenario path than we have been used to accept in the past. This uncertainty makes us to accept higher number of scenarios, or to accept some variation in the stress variables, or alternatively to accept the representation of the outcome in the form of achievable ranges of results. Such sacrifice could however yield much less precise results if working with a longer horizon.

Further to the described uncertainty, inclusion of the policy response might also be necessary. Especially in case of the early massive pandemic relief that we have witnessed soon after the onset of the pandemic in late spring 2020, it would be helpful better to understand their quantitative impact.

Such early policies have also run across different policy domains. Regulatory and supervisory relief measures are different in nature to monetary easing and credit support measures, or public guarantees to absorb the borrower credit risk. They are not only different in nature, size, duration, connectedness, but also in their pass-through to the banking sector or economic activity as such.

Even if all these challenges have been answered, the models that we have been using in the past may well not be suitable for the new normal. Transmission channels may have been amended, duration of shocks changed, effects less reversible. Overall heightened uncertainty around the pandemic related stress test results may in turn affect

the decisions about the extent to which such results are disclosed. Credibility of such results might be questioned and posing a challenge to their communication.

Rich additional empirical and theoretical insights for the design and implementation of stress tests and regulators' incentives are coming from the academia. Additional measures of financial stability risks that could be incorporated into supervisory stress tests have been proposed by Chavleishvili et al. (2021). One of the very vocal approaches to measure potential source of vulnerabilities by incorporating the macro-financial feedback is the Growth-at-Risk approach, promoted further by Adrian et al. (2020). Some scholars (e.g. Shapiro and Zeng, 2020) are building theoretical models to search for optimal stress test scenarios and bank regulators incentives. They provide a nouvelle stylized framework of stress test designs, where decision makers keep the trade-off opportunities in mind, to keep the bank afloat in the stressful economic situation. In terms of communication there is a stream of literature looking at the optimal degree of transparency when a regulator conducts either an asset quality review or a stress test or both (e.g. Inostroza, 2020). In general, some new studies refer to the Covid-19 pandemic, to its impact on the economy and the potential impact on banks and their stress tests.

### 3 *Ad hoc stress test approaches*

All three main global regulatory authorities have conducted their ad-hoc stress tests in the early stage of the pandemic in 2020.<sup>1</sup> The ECB and BoE have scrapped their regular exercises and replaced them by ad-hoc stress tests in the earlier date (May and June 2020). The Fed in the U.S. has exercised their planned annual tests as they would in a business-as-usual mode but added a special sensitivity analysis published in June 2020. All three exercises took place already in the period of severely worsened economic conditions, following lockdowns in the early second quarter of 2020.

Proposed scenarios have therefore been derived from the early understanding of potential fallout in the Common Equity Tier ratio (CET1) in the respective economies. While the ECB has worked with two scenarios, one central scenario accounting for a drop of 190 basis and an alternative scenario of a severe (adverse) downfall (triple that size, 570 bps), BoE has been working with a single scenario of a downfall amounting to double the basic size of a CET1 fallout (380 bps). The Fed has been addressing the issue with one more layer of dynamics, adding different shapes of fallout and respective consequent recovery (V-, U- and W-shaped).<sup>2</sup>

Overall, approach to what policy responses have been included into the scenarios has been guided by whatever has been known to date of the respective stress tests publications. These included a regulatory relief (borrower credit relief schemes),

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1 Bank of England (BoE), European Central Bank, Banking Supervision (ECB) and the Board of Governors of the FRB (Fed), ad hoc stress testing exercised have all been conducted between May and July 2020.

2 By the date of publication, it was clear that recovery would be rather quick and strong once restriction measures were to be relaxed.

dividend restrictions, and also some monetary and fiscal policy responses limited by contemporary understanding of what the relevant measures are capable to bring (ECB 2020). On the contrary, the latter policy responses (exceptional governmental support measures e.g. in the area of unemployment insurance) have not been included in the U.S. Fed analysis.

All three authorities have communicated their results stressing higher than usual uncertainty around their scenarios and advised on taking special caution in interpreting the results. At the time, the world has been learning about the medical and social risks, vaccine rollouts were still a distant future and outlook has been referred to sailing in an uncharted territory. The main idea was to place an anchor and indicate the most likely outcome given the limited volume of information.

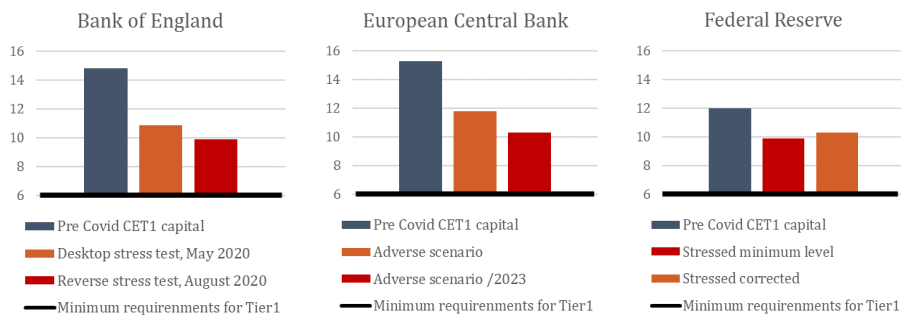
More specifically, the use of tests was to understand the implications of these eventual scenarios to bank capital and to make participating banks submit a new capital plan after the updated stress tests made public (Quarles 2020).

#### 4 Stress testing results

The background principle of the stress tests remains the same. There have been bank buffers of capital reinforced over the good times when the economy was growing, so it can be drawn from when the economy is in stress. The first result of the stress scenario is therefore the extent to which the CET1 capital ratio will be depleted considering assumptions materialized in the scenario.

The 2020 ad-hoc results did not seem to be as dramatic as the pandemic narrative would signalize. However, borrower credit relief and other significant measures are already accounted for. The downfall in the CET1 ratio therefore ranged between 2 to 5 percentage points across the global authorities. This indeed was a significant fallout, however still well above the minimum threshold of the Tier1 ratio and most importantly, vastly milder than the pandemic situation would produce if the response would remain unattended.

**Figure 1. Stress test results**



Source: BoE (2020), EBA (2020), FRB (2020)

Extra caution shall be used not only due to heightened uncertainty related to the pandemic outlook, but also due to rich properties underneath the above single projected responses of the CET1 ratios to stress.

The EU adverse scenario, for instance, reflects a subset of the financial stability risks that EU banking sector is exposed to following the forward guidance on the low level of interest rates and unsustainable levels of debt that could trigger repricing at the financial market and vulnerable position of the balance sheets. On the other hand, Bank of England purely accounted for the fallout due to restrictions government compensated by continuous credit support, government and central bank guarantee and funding schemes, and relaxed solvency requirements.

Notable differences have also been present in the outlook horizon. Although all the authorities have been reporting on the trough (maximum stress / minimum level of achieved CET1) and aggregate (corrected) effect, Bank of England was looking only at 2020-2021, while the European authorities were much more long-term oriented, looking through the events until 2023 (US Fed until end 2022).

It is of course questionable whether long term outlook has solid grounds in the period of such an uncertainty. It must be noted that it has always been important in Europe to relate stress test findings with the general economic outlook and the ECB projection exercise with the 2-3 years horizon (de Guindos 2020).

Applying long horizons could be tricky in the fast-changing environment. Having the benefit of looking back to the assumptions, we can see that adverse scenarios were framed around the freefall of asset prices.<sup>3</sup> This is a usual setup to expect asset prices to fall with fading demand, however present circumstances of advanced income and wealth inequality and reconsideration of the value of a comfortable, liveable space by households around the world during the work-from-home revolution has changed the rules of the game.

## 5 Conclusion

Stress tests are designed to provide a useful forward-looking assessment of banks resilience and provide an authority with a toolkit to assess the conditions in the banking sector under special circumstances. Current pandemic is certainly such a special circumstance when a first grasp of general understanding of a new phenomenon and its complex system-wide impact to banking sector should be studied. It helps in turn in shaping first aid policies, designing supportive measures in the credit market as well as in setting new pillars of expectations in the uncharted waters for information exchange between the participating banks and the regulator.

This short contribution has attempted to summarize the new features of stress testing exercises across the three main regulating authorities around the world, pinpoint their different approaches during the pandemic year and shed more light at their landmark

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<sup>3</sup> BoE Desktop Stress Test for instance assumed residential property drop of 16% and equity prices by 23%. In reality, residential prices have increased by more than 6% annually an equity prices by more than 14% to June 2021.

importance to the adjustments in the regulatory framework in presence of an adverse and unexpected shocks. We found that the largest global authorities have concentrated their stress testing exercises around the assumed CET1 ratio fallout rather than complex economic consequence. These exercises have been done using different horizons, while balancing between being quick in assessment (few months into the pandemic) and having an informed analysis.

The aim has therefore not been to capture the complexities of specific early pandemic stress testing exercises, but on the contrary to paint a summarizing picture of changes, challenges and guidelines that have been modified in this unprecedented historical crossroad.

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