BOX 2: REVERSE STRESS TESTS[1]

Introduction

Stress tests rely on pre-set hypothetical stressed scenarios and quantify the outcome or impact of this scenario on a particular bank or a group thereof. In an RST, the outcome is pre-determined, and the adversity of the hypothetical scenario keeps changing until the target outcome is reached. This outcome could be a breach of capital requirements, exhausting liquidity buffers or any other events that could cause significant cost to an institution. Hence a failure or a negative outcome for a bank always occurs at the end of an RST. In other words, an RST seeks to discover what it would take for a particular bank to fail or to breach a regulatory target. The aim is to then strengthen banks' resilience through a backward analysis of the vulnerabilities that could lead to this outcome.

RSTs are nowadays embedded in risk management, initially as part of the measures adopted in Regulation (EU) 575/2013 on capital requirements in response to the Great Financial Crisis, and thereafter in any guidelines on best practices. In the respective guidelines issued by the ECB in 2018 on the *Internal Capital Adequacy Assessment Process* and *Internal Liquidity Adequacy Assessment Process*, RSTs are not only a tool to assess vulnerabilities but also act as the starting point for assessing the viability of recovery plans.

This box considers two sets of RSTs that build on the PDW framework to identify the break-point withdrawal rate that would cause banks to run out of their CBC. The first set of scenarios assumes withdrawals from deposits held by households, NFCs and/or financial institutions – both in isolation and combined – to detect the severity of bank-run scenario necessary to cause systemic risks. The second set of scenarios assumes withdrawals from deposits sourced from ODPs to assess the risk that these funds may be temporary in nature, whereby depositors do not roll-over their investment but instead deposit these funds elsewhere after maturity.

RST 1: Depletion of CBC from withdrawals of short-term deposits

The first set of RSTs presented in this box assumes as outcome that banks run out of the CBC as defined in the PDW framework upon consequent deposit withdrawals. The aim is to work backwards the breakpoint run-off rate from different clusters of depositors that would cause banks to deplete their liquidity buffer. The analysis focuses on short-term deposits, that is sight and term deposits fixed for less than three months, as these can be withdrawn with relative ease.

Figure 1 is composed of five gauges, with the top row showing results for the withdrawals by the three depositor clusters in isolation and the bottom row showing their combined impact. Each gauge represents buckets of withdrawal rates (from below 10% till up to 100%) and the gauge's needle indicates the breakpoint withdrawal rate at which the first bank would run out of CBC.

The top left gauge in panel A shows the impact from withdrawals of short-term household deposits, which amount to 58% of total deposits. The withdrawal of 22% of short-term household deposits would cause the first bank to run out of CBC. Increasing this rate to 44% would cause up to three banks to run out of their respective CBC (red segment of gauge). Out of the 17 banks subject to the RST, there are eight banks that would be able to withstand the full withdrawal of household deposits without depleting the CBC (pink segment). The latter banks have high-levels of CBC that would be able to withstand the full withdrawal of their respective short-term household deposits. A further two banks in the sample would not be impacted, as these do not hold any deposits sourced from households (grey segment). This implies that these two banks do not rely on short-term household deposits as a source of funding.

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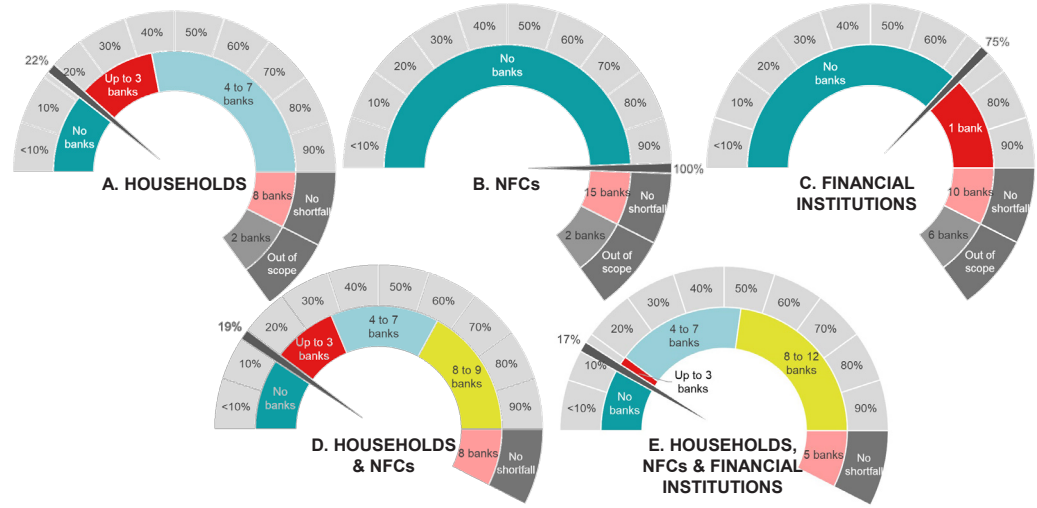
Figure 1
RST – BREAKPOINT WITHDRAWAL RATE FOR FIVE GROUPS OF DEPOSITORS



Source: Central Bank of Malta.

Panel B shows the results for the RST applied to deposits by NFCs which amount to 14% of total deposits. In this case, none of the banks would run out of the CBC as 15 banks have a CBC that is greater than the volume of short-term NFC deposits, in addition to two banks that do not have any deposits placed by NFCs.

Panel C shows instead the results for the RST applied to deposits placed by financial institutions which amount to 15% of total deposits. In this case one bank would run out of CBC with run-off rates of 75% or higher, ten banks would not deplete their CBC even assuming a full withdrawal of deposits from financial institutions and five banks do not have deposits sourced from this sector.

Panel D shows the impact from withdrawals of deposits by households and NFCs which amount to 72% of total deposits. Nevertheless, the picture is not substantially different from the impact of households alone as only 20% of these deposits originate from NFCs. The breakpoint run-off rate stands at 19% (instead of 22%), affecting up to three banks at run-off rates at 37% (red segment) and up to seven banks at run-off rates of at least 66% (light blue segment).

Finally, panel E shows the combined impact from withdrawals of short-term deposits by households, NFCs and financial institutions, which combined amount to 87% of total deposits.[2] The run-off rates required to deplete the CBC are lower at 17% for the breakpoint, 20% for up to the three banks (red segment) and 54% for up to seven banks (light blue segment). The higher impact in this scenario can once again be attributed to the larger deposit base being considered, as the volume of outflows are not substantially different than those in panel A with withdrawals from household deposits only. Consequently, the resulting breaking point is lowered further from 22% to 17%. The only exception in which deposits withdrawals are higher than those for household only, is for one of the ten banks that could withstand, in isolation, the full withdrawal of either deposits by NFCs or financial institutions as well as over 65% of deposit withdrawals by households; but would experience a breakpoint run-off rate of around 20% in this scenario combining all three groups of depositors.

[2] The RST focuses on three clusters which combined amount to 87% of total deposits. The remaining 13% are mainly long-term deposits or additional short-term deposits to other clusters of depositors.

The results therefore show that banks have a higher reliance on short-term household deposits as a main source of funding amounting to 59% of total deposits or 82% of household deposits, i.e. only 18% of household deposits are fixed for a term beyond three months. However, under the severe scenarios of combined withdrawals from NFCs and more so with financial institutions, banks could experience additional liquidity strains to fund these outflows. Therefore, to account for this sensitivity to financial institutions, the PDW framework regularly tests the bank-run scenario targeting mainly households and NFCs but also assuming the full withdrawal of interbank and intragroup funding to assess the resilience of credit institutions in isolation. This would be one of the more extreme assumptions in the PDW framework, which is essential for the detection of any underlying systemic risks.

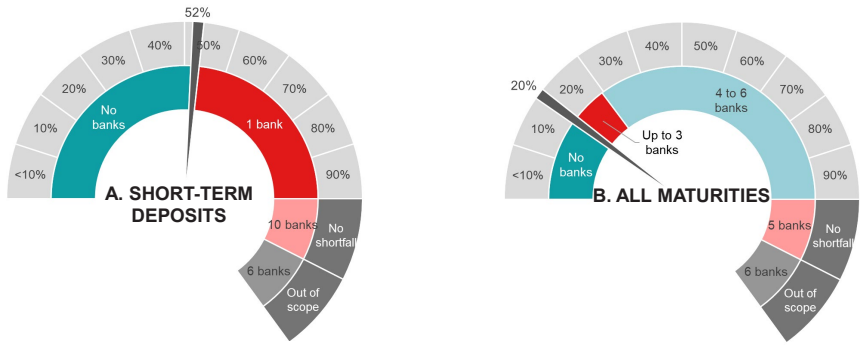
RST 2: Depletion of CBC from withdrawal of deposits sourced from ODPs

The second set of RSTs assumes as outcome that any deposits sourced from ODPs would be withdrawn. The severe outcome being assessed here is roll-over risk, with potentially one of the sources of funding for banks being discontinued. The risk of immediate withdrawal is highest for short-term deposits (sight deposits and term deposits fixed for up to three months). As at June 2024, only 10% of total deposits from ODPs, or 1% of total deposits, are short-term. The remaining 90% of deposits sourced from ODPs, or 7% of total deposits, have a fixed term beyond three months. The risk of immediate withdrawals can be extended to all maturities by assuming that clients want immediate access to their funds and are willing to incur any costs associated with early withdrawal of term deposits. If upon maturity banks retain a similar composition of CBC, the latter scenario can also be interpreted as an assessment for roll-over risk whereby these depositors would move their funds elsewhere upon maturity, reflecting the temporary nature of deposits sourced from ODPs.

Figure 2 presents the outcome of the exercise for short-term deposits (sight and term deposits fixed for up to three months) and across all maturities.

There are 11 banks that source deposits from ODPs, ranging between 1% and 30% of their total deposits. As shown in panel A of Figure 2, only one bank would run out of CBC if at least 52% of short-term deposits were withdrawn. Moving to panel B and assuming withdrawals across all maturities, the number of banks with CBC in excess of deposits sourced from ODPs goes down from ten to five (pink segment in both panels), with run off rates of 20% for the breakpoint shown by the speedometer's needle, 30% for the first three banks (red segment) and higher for the remaining banks (light blue segment). However, since most of these deposits are fixed for a term exceeding three months, banks would have enough time to plan ahead for these maturities and ensure alternative sources of funding.

Figure 2
RST – BREAKPOINT WITHDRAWALS FROM ODPs



Source: Central Bank of Malta.