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The liquidity buffer practices
of public debt managers
in OECD countries

**Pedro Cruz,
Fatos Koc**

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The liquidity buffer practices of public debt managers in OECD countries

by
Pedro Cruz and Fatos Koc*

Abstract

This paper summarises and discusses results from a survey of the liquidity buffer practices of debt managers in OECD countries. It includes detailed information on their purpose, cost, level and investment. Where possible and relevant, comparisons are made with the results of an earlier survey conducted in 2011. Country case studies for Denmark, Portugal and Turkey provide a deeper insight into liquidity buffer practices.

While the level, investment, transparency and other governance features vary, the survey results show that keeping a liquidity buffer is a common practice among debt management offices in OECD countries. Sovereign debt managers view a liquidity buffer as an effective tool to address re-financing risk and liquidity risk that may arise for reasons such as, unexpected increases in borrowing needs, short-term mismatches in fiscal cash flows or the temporary loss of market access.

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* Pedro Cruz, Trader, Markets and Portfolio Management Department, Portuguese Treasury and Debt Management Agency.

Fatos Koc, Head of the Bond Market and Public Debt Management Unit, OECD Directorate for Financial and Enterprise Affairs.

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PART I. INTRODUCTION

Liquidity buffers, often cash balances held by sovereign debt management offices (DMOs) with central banks (CBs), offer several advantages from the perspective of public debt and cash management. DMOs may face funding risks due to factors such as a temporary loss of market access, an unexpected increase in borrowing needs, or a temporary mismatch in fiscal cash flow. When funding risk materialises, it can significantly complicate management of sovereign financing. Sovereign debt management offices, which aim to fund government budgets at minimum cost over time, are regular and predictable market participants. This means that sovereign funding plans cannot be adjusted easily in response to changes in conditions. This requires the design and implementation of tools to tackle re-financing risk and liquidity risk. Many DMOs adopt contingency funding plans such as maintaining a liquidity buffer, finding funding from money markets (e.g. T-Bills), establishing overdraft facility arrangements with CBs, and setting up credit line(s) with commercial banks to manage funding risk.¹ A liquidity buffer, which is useful for enhancing market confidence and improving financial flexibility without damaging predictability, is a common practice among the OECD countries. But the benefits of a liquidity buffer come at a cost, depending on its size and investment policy. In practice, management of a liquidity buffer requires a number of strategic decisions on various aspects of the buffer including its target level, composition and transparency.

The OECD Working Party on Public Debt Management (WPDM)², in collaboration with the Turkish Treasury, first surveyed liquidity buffer practices in terms of their purpose, source of accumulation, level, cost, investment, and other governance issues in 2011. Since then, several DMOs have made operational changes to existing liquidity buffer practices, and others have introduced a liquidity buffer policy in case events limit market access. Given these developments, the Steering Committee of the OECD WPDM decided to revisit this topic and update its knowledge on liquidity buffer practices in 2017. The Portuguese Treasury and Debt Management Agency (IGCP) committed to conducting a revised version of the 2011 survey and reported the key findings at the WPDM's annual meeting in November 2017.

Against this background and based on the survey results, this paper:

- Provides an overview of liquidity buffer practices in OECD countries, including more detailed information on the common points.
- Uses case studies of Denmark, Portugal and Turkey to share practical insights as viewed through the lens of public cash and debt managers.
- Presents the main findings from the survey (Appendix A) and compares them, where possible and relevant, to the findings in the 2011 survey.
- Provides further practical insights into liquidity buffer management through selected country practices.
- Summarises the main conclusions of the survey study.

¹ Source: The 2018 edition of Sovereign Borrowing Outlook <http://dx.doi.org/10.1787/23060476>

² The OECD Working Party on Debt Management (WPDM) was set up in 1979 as a special working group of the OECD's Committee on Financial Markets. The mandate of the WPDM is to serve as a policy forum for senior government debt managers from OECD Member countries to exchange their views, experiences and policies in the field of government debt management and government securities markets.

PART II. SUMMARY OF SURVEY FINDINGS

This section presents the summary results of the 2017 OECD survey, in order to provide readers with an overview of liquidity buffer practices across countries. The survey, which contains 31 qualitative questions was distributed to the members of OECD WPDM in July 2017 (Annex 1) and all member countries (35 members as of 2017) answered the survey questions. In line with the survey structure, responses are summarised under four main themes in this paper: Purpose and source of accumulation; the level and the composition; cost considerations and investment policy; interaction with other institutions. While all of the figures presented in this section are based on responses to the 2017 survey, the results are compared to those of the 2011 survey ³ where possible and relevant.

Liquidity buffer practices: Purpose and source of accumulation

Responses to the 11 questions under this theme are useful for understanding why DMOs maintain a liquidity buffer and how they accumulate the buffer, which asset categories are included, and what type of changes took place in the recent years.

Almost all of the surveyed agencies have a dual mandate in both debt and cash management. Just three countries have a debt-management-only mandate. The overwhelming majority of countries, 83% (i.e. 29 of 35) of member countries, maintain a liquidity buffer policy (Figure 1). Since the 2011 survey, three more countries introduced a liquidity buffer policy (two of them in 2015). The responses demonstrate that keeping a liquidity buffer is a common practice among debt management offices of OECD countries including Canada, Denmark, France, Italy, Portugal, Turkey and the United States. That said, both large and small issuers with local bond markets at different development stages find the liquidity buffer policy useful.

Figure 1 – Answers to the questions “In which areas does your agency have a mandate?” (left) and “Do you have a liquidity buffer?” (right).

Source: OECD WPDM 2017 Survey on Liquidity Buffer Practices

³ 28 of 34 member countries responded to the initial survey on liquidity buffer practices in 2011.

Most DMOs (22 out of 29) maintain a liquidity buffer for both cash management and debt management purposes, reflecting their dual mandate in these areas. In the case of the cash management motivations, most countries identified all three items listed in the questionnaire as relevant. Responses show that keeping a liquidity buffer is valuable for the management of i) time differences between cash inflows and outflows; ii) revenue-based deviations; and iii) expenditure-based deviations. From a debt management perspective, the most common factors of motivation are refinancing risk management and enhancing market confidence. Clearly, the motives for adopting a liquidity buffer vary amongst the responding countries (Figure 2).

Other comments regarding the benefits highlight the role of liquidity buffers in providing flexibility to sovereign funding during stressed market conditions and a temporary loss of market access. In particular, it is frequently cited that being able to access cash in the very short-term avoids potential disruption to financing programmes (e.g. auction calendars), which in turn supports predictability in public debt management. For example, the US Treasury maintains a cash buffer to provide a cash cushion against a temporary loss of market access due to a cyber-attack, a storm or a terror attack.⁴

Figure 2 – Answers to the questions regarding cash management motivations (left) and debt management motivations (right)

Source: OECD WPDM 2017 Survey on Liquidity Buffer Practices

Note: Multiple responses were permitted

Not surprisingly, cash is a part of the liquidity buffer for the majority (93%) of countries that have one. The second major component is highly liquid assets, with 31% of countries using them; this is the first major difference compared with the 2011 survey, when 60% of countries used highly liquid assets to compose the liquidity buffer. Given that the percentage of countries that use other kinds of securities has not changed, we can conclude that the liquidity buffer is now much more of a cash buffer, perhaps due to current very low interest rate environment.

⁴ Source: The U.S. Department of the Treasury (2015), Agency Financial Report. <https://www.treasury.gov/about/budget-performance/annual-performance-plan/Documents/AFR%20FY15%20FINAL%20508.pdf>

In addition to cash, nine countries hold highly liquid assets such as foreign government T-bills and bonds as a buffer. Also, contingent credit lines are used by 25% of respondents (Figure 3), a percentage similar to the one obtained in the 2011 survey (24%).

Figure 3 - Answers to the question “What is the content of your liquidity buffer?”

Source: OECD WPDM 2017 Survey on Liquidity Buffer Practices
Note: Multiple responses were permitted

Almost all countries that have a liquidity buffer accumulate them via pre-financing (Figure 4). Budget surpluses are the second source of accumulation, followed by privatisation revenues. The cash transfers as a consequence of collateral received in derivative transactions is also one of the ways that leads to the accumulation of a liquidity buffer.

Figure 4 - Answers to the question "How do you accumulate your liquidity buffer?"

Source: OECD WPDM 2017 Survey on Liquidity Buffer Practices
Note: Multiple responses were permitted.

More than 15 countries stated there have been policy and operational changes in their liquidity buffer practices in the past 5 years. Furthermore, about a quarter of the countries are planning to modify their liquidity buffer practices in the short term. The responses indicate that once a liquidity buffer policy is designed and implemented, it may evolve over time. In general, countries adapt their level of cash reserves to changing fiscal requirements or financial market conditions. Some countries increased their

liquidity buffers due to higher funding needs, while others decreased it in response to reduced uncertainty in the market and negative interest rates in recent years. Also, most of the policy changes were oriented towards more active management of the buffer (e.g. remuneration and asset allocation).

The 2011 survey results support the findings on adaptation of liquidity buffer practices to changing conditions. In the aftermath of the global financial crisis (GFC) which posed significant challenges for sovereign debt managers, several countries noted an upward revision of cash buffers due to higher refinancing risk and liquidity risk. Also, a few DMOs reported progressive use of analytical tools to determine optimal levels of cash, as well as improvements in associated modelling works.

The level and the composition of liquidity buffers

This section adds detail to the general information in the purpose and source of liquidity buffer practices. In the second part of the questionnaire, 11 questions are asked regarding practices in calculation methodology of the level and currency composition of the liquidity buffer including determinants of the level, indicators of cash needs and modelling choices.

The main factors that are considered important to determine the level of the liquidity buffer are both expenditure and revenue based deviations and the debt redemption profile (Figure 5). Explicit and implicit contingent liabilities⁵ are considered relevant by less than half of the respondents. Given that contingent liabilities are major sources of fiscal risks – realisation of which has direct and sudden consequences on government financing needs –, it is one of the major factors that DMOs consider when setting contingency funding tools such as a liquidity buffer. Lastly, other responses highlight the size and demand of treasury auctions and the time difference between cash inflows and outflows.

Against this backdrop, and having discussed responses to the survey results during the November 2017 annual meeting of the OECD Working Party on Debt Management, a number of sovereign debt managers noted that one of the main considerations underpinning a DMO's buffer needs is the degree of access to liquid and deep financial markets. The needs inherently differ for countries with mature markets and for countries with somewhat constrained market conditions. That said, an appropriate level of liquidity buffer for credit-constrained economies with limited market access would be higher than the one for the mature market countries. Similarly, existence of other contingency funding tools such as overdraft facility arrangements with central banks, and credit line(s) with commercial banks is another factor affecting DMOs' needs for additional measures such as a prudential liquidity plan. It should be noted that depending on the severity and cause of potential funding disruptions (e.g. short-term operational interruption or ad-hoc/persistent funding pressure), each tool can be used in different circumstances. For example, the government of Canada indicates that it holds liquid financial assets in the form of domestic cash deposits and foreign exchange reserves to promote investor confidence and safeguard its ability to meet payment obligations in situations where normal access to funding markets may be disrupted or delayed. In this regard, the government holds a level of liquid financial assets that covers at least one month of net projected cash flows, including coupon payments and debt refinancing needs.⁶

⁵ Explicit contingent liabilities are contractual government commitments to make certain payments if a particular event occurs. The most common examples of such liabilities are government credit guarantees, explicit guarantee commitments under investment projects and government sponsored insurance programmes. Source: Ülgentürk, L. (2017), "The role of public debt managers in contingent liability management", OECD Working Papers on Sovereign Borrowing and Public Debt Management, No. 8, OECD Publishing, Paris. <http://dx.doi.org/10.1787/93469058-en>

⁶ Source: Annex 2 Debt Management Strategy to 2017-2018 Budget, <https://www.budget.gc.ca/2017/docs/plan/anx-02-en.html>

Figure 5 – Answers to the question “Please indicate the factors you consider important for the level of the liquidity buffer”

Source: OECD WPDM 2017 Survey on Liquidity Buffer Practices

Note: Multiple responses were permitted

Most countries (71%) with a liquidity buffer define a benchmark for its level, while only 20% of countries set benchmarks for the currency composition of the buffer. Often, benchmarks for a liquidity buffer are defined as the number of months of financing needed to meet debt servicing costs. With respect to the amount of time that the liquidity buffer would support debt repayment needs or all budget expenditures, the survey responses show a large variation from one week to one year, mainly depending on country conditions and needs (e.g. size of economy, financial structure and availability of other contingency funding tools). The most common practice is to keep a buffer level sufficient to cover budget expenditures (including debt redemptions) for one month.

Benchmarks for liquidity buffers are in almost all cases set either by the DMO or by the Ministry of Finance after consultation with the DMO. Benchmark levels are subject to regular revisions: 15 countries revise benchmarks annually; three countries twice a year and two countries quarterly. In addition, three countries reported revising them daily/constantly. Several countries mentioned the possibility of revising the benchmark more frequently if needed (ad-hoc revisions). Nevertheless, benchmark levels are often not binding. The survey results revealed that benchmarks for liquidity buffers are only binding in eight countries. Those countries that have binding benchmark targets have to impose corrective measures in case of any breach (e.g. by borrowing more). Even if the benchmark is not binding, in case of a breach of limit there is usually a reporting requirement to senior level official(s) (e.g. Secretary of the Treasury or Finance Minister).

There is a wide range of indicators to assess potential cash needs of a government and to determine a reasonable level for buffers. In this respect, various calculations aim to measure past performances and volatilities, and estimate future cash flows. The survey shows that countries generally use more than one indicator to determine the level of the liquidity buffer. The most common indicator is ‘average volume of daily cash outflows for a certain past period’ (20 countries). This is followed by ‘deviations between the forecasted and actual flows (i.e. forecast error)’ (18 countries) and ‘volatility of the cash flows’ (14 countries).

Regarding the question about the indicators, the findings of the 2017 survey differ somewhat from the ones of the 2011 survey. Overall, countries use more analytical indicators to determine the level of the liquidity buffer today than before. Also, according to the initial survey, the main indicator used was ‘deviations between the forecasted and actual flows’ (54%). This was followed by ‘average volume of daily cash outflows’ (38%) and ‘volatility of the cash flows’ (33%). A comparison of the two survey responses on choice of indicators reveals that more countries prefer to use ‘average volume daily outflows’ than before, perhaps for ease of calculations.

Figure 6 – Answers to the question “Which indicator(s) you do you use to determine the level of liquidity buffer?”

Source: OECD WPDM 2017 Survey on Liquidity Buffer Practices
Note: Multiple responses were permitted

Responses to an additional question on modelling practices demonstrate that countries usually prefer simple exercises to sophisticated analyses. The most popular model to determine the level of the cash buffer is ‘financial indicators’, followed by scenario analysis (Figure 7). To determine the currency composition, the most commonly used approach is asset liability management (ALM) models. Indeed, most countries have a liquidity buffer that contains only the local currency in line with the fact that sovereign borrowings and disbursements in the OECD area are predominantly in local currency.

Figure 7 – Answers to the questions “Please indicate the model(s) that you use to determine the level (left) and currency (right) composition of the liquidity buffer”

(Number of countries)

Source: OECD WPDM 2017 Survey on Liquidity Buffer Practices
Note: Multiple responses were permitted

The survey also investigates transparency policies regarding liquidity buffer practices. On the one hand, disclosing the level increases the transparency and market confidence; on the other hand, it may cause debt managers to lose the flexibility during bond auctions through affecting market behaviour. Against this background, almost all countries with a liquidity buffer disclose the information about the policy without providing information on the actual level of the buffer. The respondent countries acknowledge that the maintenance of the cash buffer has a positive signalling effect on market participants. More than half (57%) of the countries with a liquidity buffer disclose their actual holdings. It is noted that the main reason for public disclosure is to improve transparency of public finances.

The cost of a liquidity buffer and its investment policy

This section explores approaches on assessing the cost of keeping a liquidity buffer and to identify different investment policies associated with it. Particularly, it asks where the liquidity is held, whether the balance is remunerated and if/how the credit, liquidity and foreign exchange risks associated with the liquidity buffer are managed.

Quantification of cost of a liquidity buffer, as well as its benefits may not be a straightforward exercise. The survey shows that 13 out of 29 countries with a liquidity buffer measure its cost. Cost measures focus on cost of issuance versus implied rate of return on the liquidity buffer (i.e. cost of carry). In two cases, the implicit effect on treasury yields as a consequence of maintaining a liquidity buffer is also considered. In Denmark, a comparison of future short-term rates and current longer-dated financing cost (i.e., the term premium) is used to as an estimation for the cost over the medium-term (see Part 3.1 for details).

In order to offset its cost, the majority (77%) of the countries with a liquidity buffer have an investment policy for it. The most commonly used investment products are deposits in local currency – both time and demand deposits. These deposits are mainly held at the central bank. It should be noted that the interest earned such liquidity holdings is usually less than the cost of the additional borrowing (i.e. the cost of carry is significantly positive). That said, cost of carry should be viewed as an insurance fee. Also, a number of respondents highlight the importance of adopting a broader perspective on cost assessments and taking into account benefits – which are often difficult to quantify – besides the cost of carry.

Figure 8 – Answers to the questions “How is the liquidity buffer invested (left) and where is it held (right)?”

Source: OECD WPDM 2017 Survey on Liquidity Buffer Practices

Investing the liquidity buffer involves credit risk management. Regarding that, more than half (55%) of the countries state that they impose restrictions on the amounts and period of their investments in financial institutions (Figure 8). Mainly, these restrictions are credit rating based. A majority (74%) of the agencies mitigate credit risk by holding cash at the central bank. The use of collateralised operations is the main way to manage risk for 15% of the DMOs. Two-thirds of the countries apply the same credit risk criteria for both local and foreign financial institutions.

In general, prolonged negative rates have had an impact on the cost of carry. In this regard, countries mostly affected by negative rates reported having adjusted their liquidity buffer policies. Some of these changes are the following: i) Re-definition of the minimum level of the liquidity buffer; ii) Greater focus on active liquidity management (in order to maintain lower levels of cash balances); iii) Reduction in demand for short-term investments and increased demand for longer-term investments; iv) Diversification of eligible counterparties and investment instruments; and v) Use of cash balances to cover short-term funding needs.

Interaction with other institutions

Cash management activities involve both budgetary and monetary authorities. In this regard, efficient cash management requires timely flow of information among the relevant entities. Responses to three questions under this section demonstrate that DMOs do attach value to coordination and communication among the relevant parties and have developed various mechanisms, such as regular meetings and ad hoc interactions.

DMOs in most countries liaise mainly with the central bank, the ministry of finance and treasury clients. The reasons to coordinate with the central bank include its guaranteeing of special conditions for deposits, its understanding of the optimal way to borrow and deposit money, and its making sure that the activities of the DMO do not affect the implementation of monetary policy. DMOs coordinate with treasury clients for liquidity management, for forecasting the short-term needs or excesses of cash. Coordination with the ministry of finance is needed to devise a borrowing plan and the ministry's short-term forecasts are also useful for liquidity management. This is a two-way information flow; as such, there is a need to inform the ministry of finance of risks and costs associated with debt and liquidity management.

PART III. LIQUIDITY BUFFER PRACTICES IN DENMARK, PORTUGAL AND TURKEY

Survey results presented in the previous section of this paper summarise the general characteristics of liquidity buffer practices across the OECD area. This section aims to provide more in-depth information by presenting country examples of the Danish, Portuguese and Turkish debt management offices.

The Danish Debt Management Office

The Danish Debt Management Office (DMO) holds a liquidity buffer in cash in local currency deposited at the Danish central bank. The account is remunerated with the unsecured money market rate, which is currently negative. The main reasons for keeping a cash buffer are:

- Expected time differences between cash inflows and outflows
- Forecast errors on cash inflows and outflows (size and timing)
- Sudden large unexpected expenditures (contingent liabilities)

In Denmark, the central government borrows in kroner to cover its financing requirement, given by the current budget deficit and redemptions on the domestic debt. This funding rule supports the separation of fiscal and monetary policy. There is some flexibility within the funding rule. For example, prefunding can be aimed at strengthening the central government's liquidity buffer or aimed at keeping the yearly issuance more stable than the financing requirement.

The target range of the buffer is currently kr. 75–100 billion corresponding to 4–5 per cent of GDP. The range is disclosed to the market, but it is not binding. The relatively large buffer primarily reflects that the DMO has a small T-bill programme, no repo facilities or credit lines at commercial banks, and that currently there is no cost of holding a cash buffer.

Assessing the cost of a cash buffer

There are different ways to evaluate the cost of a cash buffer. The immediate cost can be measured by the cost of carry, which is usually positive as most DMOs issue longer-dated bonds at a higher rate than the return they receive on their cash buffer.

In Denmark, the DMO evaluates the cost over the medium term. This means that the cost of carry is less relevant. Getting an estimate of the cost over the medium term (term premium) requires having a view on future short-term rates and evaluation of these against the current longer-dated financing cost. Term premiums are normally estimated using interest-rate models. Currently most interest-rate models forecast very low or even negative term premiums for AAA-rated European issuers. Therefore, one can argue that there is no expected cost of holding a liquidity buffer over the medium term. Typically, the market risk of lower remuneration on the DMO's short-term assets is also taken into account. Currently, the Danish DMO considers this as a tail risk and assesses it to be low due to the expectation that large increases in rates are more likely than large decreases (assumption of a lower bound on interest rates).

Even in periods where the cost-risk trade-off is deemed unfavourable (e.g. if the estimated term premium is large) it is in some cases possible to eliminate the interest cost and risk of building up a cash buffer. This requires access to a liquid interest rate swap market and a swap curve with a similar slope to the government yield curve. In addition, it requires a setup in which the credit risk of a swap portfolio can be handled.

To illustrate this, a 10-year Danish government bond can be transformed into a variable rate exposure through a 10-year interest rate swap where the DMO receives a fixed rate and pays an unsecured money market rate. The variable payment in the swap is equal to the remuneration on the cash buffer at the central bank (unsecured money market rate). Hence, the strategy is risk-free and the total cost equals the 10-year swap spread which is usually negative (the DMO receives a fixed payment on the swap which is above the interest rate on the 10-year bond, see Figure 9).

Hence, the Danish DMO assesses that in the current environment there is no cost or market risk associated with the cash buffer. In addition, there is no credit risk as the cash buffer is held at the central bank.

Figure 9: Danish 10-year swap spread

Note: Spread between DGB 0.52027 and a 10-year Cita-swap rate.
Source: Bloomberg

The Portuguese Debt Management Office

The Portuguese debt management office (IGCP) has been responsible for the cash management of the Republic of Portugal since 2007, having had the mandate for debt management since its inception in 1996. Liquidity buffer policy has been a concern since the start but it was only after the limited market access experienced in the years 2011-2013 that the liquidity buffer increased to a significant amount and gained material relevance.

Determining the appropriate level for liquidity buffer

The liquidity buffer reference amount is determined by the analysis of the debt redemption profile, and expectations of both revenue and expenditure based deviations. The current indicative level is the amount that covers 40% of the gross borrowing needs of the following 12 months (excluding the rollover of T-bills). The level was reduced from close to 100% to 50% roughly two years ago, as Portugal gained a more steady access to market financing, and it was further reduced to

40% in late 2017, as Portugal regained Investment Grade status from S&P and Fitch. The liquidity buffer required to give comfort to investors and rating agencies decreased since the peak of the financial crisis, and IGCP changed its policy accordingly. The reference level for the liquidity buffer is set by the IGCP after consulting with the MoF because of the cost impact of the cash buffer. Although the reference level for the liquidity buffer is not binding, it is monitored on an ongoing basis and corrective measures are taken when necessary.

Portugal's liquidity buffer is currently composed of cash that has been accumulated since 2011 mainly through over-borrowing. One important purpose of the liquidity buffer is to enhance market confidence, which in Portugal's case is achieved through public disclosure of the liquidity buffer reference amount and future forecasts. In that respect, IGCP follows a transparent communication strategy with market participants and rating agencies regarding its liquidity buffer year-end target levels (as mentioned above, disclosure of actual instead of target levels may have undesired effects on market confidence).

The significant reduction of short-term interest rates in the euro area, that registered negative values in the past years, is a deterrent to the size of the liquidity buffer, since its composition is exclusively in euros and the cost of holding high levels is non negligible. In order to assess the cost of the liquidity buffer, the IGCP assumes the following financing scenarios: i) the liquidity buffer is financed at the average cost of all financing transactions of the current year; ii) the liquidity buffer is financed at the overall average interest rate of the debt portfolio; iii) the liquidity buffer is financed at the average cost of the T-bill portfolio.

Although there is an investment policy for the liquidity buffer allowing for demand and term deposits in local currency, with a set of limits defined in the management guidelines, in practice the IGCP has currently almost all of its cash position deposited at the central bank.

The Turkish Treasury

The Turkish Treasury defines a liquidity buffer as the level of cash and other credit allocations readily available to withstand severe liquidity strains for shorter periods. The Treasury maintains a liquidity buffer for cash and debt management purposes. For cash management purposes, the buffer is held to cope with: i) Time differences between cash inflows and outflows; ii) Revenue-based deviations; and iii) Expenditure-based deviations. For debt management purposes, it is used to reduce re-financing risk and short-term bond auction volatility. In terms of its sources, the liquidity buffer is accumulated mainly through privatisation revenues and –if the market conditions are appropriate – over-borrowing has also been used for the accumulation.

The minimum level limit for the liquidity buffer applies to the daily balances and changes on a monthly basis. The Turkish Treasury is authorised to use short-term money market instruments⁷ if the daily cash balance is projected to fall below the minimum target level. The Treasury considers a set of indicators when setting the minimum level of the liquidity buffer. Among them are the debt redemption profile, cash outflow projections of budget expenses, projections regarding primary surplus and privatisation revenues as well as past demand for the auctions. The variation of these parameters is an important factor affecting the level of the liquidity buffer.

In addition to the benchmarks set for the level of the liquidity buffer, there is also a benchmark on the level of FX reserves and their currency composition. To this end, an asset-liability management model is employed in which cash reserve and debt redemption profiles are taken into account.

⁷ For further information please see Public Debt Management Reports of 2009 and 2010, respectively (www.treasury.gov.tr).

Operational units monitor the level and composition of the liquidity buffer on daily basis whereas the risk management unit monitors and reports the liquidity buffer on a monthly basis. In case of a breach of limit due to market conditions or unexpected cash outflows, the underlying factors are reported by operational units. Benchmarks are reviewed and revised annually considering the economic and financial conditions.

The Turkish Treasury discloses that it follows a liquidity buffer policy. However, the actual benchmark level and currency composition of the liquidity buffer are kept confidential, considering that disclosing the liquidity buffer level could undermine the efficient functioning of operations as the Turkish Treasury is a major participant in the local financial markets. On the other hand, since its bank accounts are held with the Central Bank of Turkey, investors looking at the Central Bank's balance sheet can have an idea about the magnitude of the liquidity buffer.

Evolving practices of liquidity buffer

The Turkish Treasury has been following a liquidity buffer policy since 2003 as an integral part of cash and debt management. Since then, several aspects of the liquidity buffer framework have been fine-tuned to achieve a more efficient structure. As described in the following, three main adjustments have been made over the years.

In the first years of the liquidity buffer practice, a minimum limit was determined for the whole year and the monthly average cash reserve was required to be above this limit. This structure was simple, yet not flexible. Recently, the minimum level for the liquidity buffer was adjusted so that it applies to the daily balances – rather than monthly average – and it fluctuates on a monthly basis in line with estimated cash flows for the subsequent months. Since the minimum limit for the liquidity buffer changes on a monthly basis, operational units need to adjust the cash level to a new limit every month. It should be noted that accurate forecasting of the government cash flows on a daily basis is a critical and challenging task. This requires close scrutiny of cash flows and increased cooperation between operational units. Nevertheless, it makes cash management operations safer and more efficient in comparison to the previous approach. However, keeping a predetermined level of cash and adjusting it to a dynamic limit can at times become complicated. In order to alleviate this problem, the Turkish Treasury decreased the minimum amount of the monthly cash buffer which enhanced operational flexibility of the cash management units.

In order to manage associated credit risks, the Turkish Treasury holds its bank accounts, where all general budget institutions' balances are cleared daily, with the Central Bank of Turkey. It should be noted that these accounts were not remunerated until 2011. Considering the opportunity cost of holding idle cash balances, the Treasury revised its liquidity buffer investment policy. Accordingly, related regulations were revised in 2011 to enable the Central Bank to pay interest on Treasury's idle cash balances.

Lastly, recently (on March 21, 2018) the scope of the Treasury Single Account (TSA) system has been redesigned to strengthen the sovereign cash management operations. The coverage of the TSA has been extended beyond the budgetary accounts of general budget administrations in order to cover special accounts of general budget administrations and the financial resources of special budget administrations, regulatory and supervisory agencies, social security institutions, extra-budgetary funds (excluding the unemployment insurance fund), revolving funds, local administrations and state-owned enterprises (SOEs). The main motivation behind extending the coverage of the TSA is to allow public resources to be collected in a single pool and utilise them more efficiently through economies of scale. The new system enables the Treasury to manage a large pool of public financial resources centrally and reduces the need for over-borrowing to support the liquidity buffer.

PART IV. CONCLUSION

Maintaining a liquidity buffer, i.e. the precautionary holding of liquid assets for contingencies, is a widespread practice amongst DMOs of OECD countries. The 29 of 35 OECD countries that responded to this survey find liquidity buffer to be an important and effective tool to mitigate re-financing risk and liquidity risk. Country practices indicate that having an immediate access to a liquidity buffer increases financial flexibility, cushions events caused by market stress or temporary loss of market access, which in turn supports predictability of borrowing programmes and enhances market confidence.

Predominantly, DMOs build up cash reserves through over borrowing – 93% of the agencies with a liquidity buffer. In addition, slightly more than half of the respondents indicate budget surpluses as a source of their liquidity buffer. In terms of the content, cash is part of the liquidity buffer in more than 90% of the agencies that hold one. After cash, the most commonly used securities are highly liquid assets (e.g. T-Bills and T-Bonds), followed by credit lines.

The responses to the survey demonstrate the value that DMOs place on the design and implementation of a liquidity buffer policy. The DMOs target a minimum level to cover an amount of financing needs (i.e. average disbursements, cash deficits or debt service obligations) to withstand severe liquidity strains for a certain period of time (e.g. one week to one year). Although the target level varies across countries due to country specific factors (e.g. having access to liquid financial markets and existence of other contingency funding tools), the most common practice is to keep a buffer level that is sufficient to meet one month of expenditures. In order to set this target, they consider several financial indicators associated with cash flows and debt service. In addition to baseline estimations, scenario analyses are often conducted. As for the currency composition, about half of the countries carry only domestic currency in their liquidity buffer. In this regard, an asset-liability management model is commonly applied to determine currency composition.

While liquidity buffers are useful to cope with liquidity strains, they are not costless. Less than half of the participants state that they measure the cost of maintaining a liquidity buffer. For those who measure it, most compare it with the cost of funding. In response to cost-related concerns, almost all of the participants invest excess cash balances. This in turn allows policy makers to evaluate cost of carry. In terms of cost assessments, some DMOs including Denmark's highlight the importance of taking a medium term perspective and using the "term premium" as a measure of costs rather than short-term cost of carry. Furthermore, DMOs argue that any cost assessment should consider the significant benefits of holding a liquidity buffer which is seen as an insurance and improves a country's risk profile. Nevertheless, benefits from holding liquidity buffer are difficult to quantify.

In terms of investment policy, liquidity buffers are often invested in the form of demand and/or time deposits in local currency. Only a quarter of the responding countries invest in foreign currency assets. Most countries have deposits at the central bank to mitigate credit risk, while half of the countries with a cash buffer have deposits at local private banks. To manage the risk associated with investing the liquidity buffer, the most common measure is to create limits based on the counterparty ratings.

The survey highlights acknowledgement of the important role of transparency and communication for a successful cash and debt management. In terms of transparency of the cash account, more than half of the respondents with a liquidity buffer disclose their level of cash account regularly as a part of transparency of public finances. Also, their communication to market participants is important as it enhances credibility and market confidence. As there is more than one entity involved in different parts of operations, efficient management of liquidity buffers requires an effective coordination mechanism among relevant parties. One key finding of this study shows that the DMOs primarily coordinate the governance of the liquidity buffer with the ministry of finance and the central bank.

Finally, this study shows that the liquidity buffer practices have evolved over the past decade. In general, countries adapt the level of cash reserves to changing fiscal requirements, financial market conditions and access to market financing (e.g. Portugal) and there is also progress in methodologies applied (e.g. Turkey). The first survey conducted in 2011 suggested that the GFC, which put an extreme pressure on government financing needs and credit ratings, led some sovereigns to raise their buffer levels. The responses to 2017 survey indicate that three more countries have adopted a liquidity buffer policy since then, and almost 60% of the respondents affirmed that they adapted their liquidity buffer practices in the last five years. Furthermore, a quarter of the countries surveyed have plans to change their liquidity buffer practices in the future.

APPENDIX A: QUESTIONNAIRE ON LIQUIDITY BUFFER PRACTICES (2017)

A. Liquidity buffer practices

1. In which of the areas does your agency have a mandate? (double click the boxes and select 'checked')
 - Cash Management
 - Debt Management
 - Both
2. Do you have a liquidity buffer?
YES NO (Please proceed to the Q9 in this section)
3. What is the content of your liquidity buffer? Please check all that apply.
 - Cash
 - Highly Liquid Assets
 - Credit Lines
 - Allocations from IFIs (SDR Holdings etc.)
 - Other (please specify)
4. If part of your liquidity buffer is in highly liquid assets, please check all that apply.
 - Domestic securities
 - Foreign securities
 - Other short-term marketable securities including securities issued by local or foreign SOEs (state-owned entities, which can be financial or non-financial corporates). (If so, please specify):
 - Other medium-to-long term marketable securities including securities issued by local or foreign SOEs (If so, please specify):
 - Mutual funds
5. How do you accumulate your liquidity buffer? Please check all items that apply.
 - Over borrowing
 - Privatization revenues
 - Budget surpluses
 - Allocations from IFIs (SDR Holdings etc.)
 - Foreign reserves
 - Other (please specify)
6. What is your main motivation of keeping liquidity buffer? Please check all items that apply.
 - Cash Management
 - Debt Management
 - Others (please specify)

7. If one of your responses is “Cash Management” to Q6, could you please identify the main purpose(s) of keeping liquidity buffer? Please check all items that apply.

- Management of time differences between cash inflows and outflows
- Revenue-based deviations
- Expenditure-based deviations
- Other (please specify)

8. If one of your responses is “Debt Management” to Q6, could you please identify the main purpose(s) of keeping liquidity buffer? Please check all items that apply.

- Short term demand side volatilities in bond auctions
- Re-financing risk management
- Enhancing market confidence
- Other (please specify)

9. Have there been any changes in the last five years in terms of your liquidity buffer practice?

YES (what were these changes):

NO

10. If your response is “YES” to Q9, please check any area in which the changes have occurred.

- Legislative
- Policy changes
- Operational changes
- Other (please specify)

Please briefly explain the changes you mentioned:

11. Do you have any plans to change your liquidity buffer practice (even if you do not currently implement one) in the future?

YES (please explain briefly):

NO

B. The Level and the Composition of Liquidity Buffer

12. Please indicate the factors that you consider important for the level/size of the liquidity buffer. Please check all items that apply.

- Debt redemption profile
- Revenue-based deviations
- Expenditure-based deviations
- Explicit contingent liabilities such as government credit guarantees, explicit guarantee commitments under investment projects and government sponsored insurance programmes
- Implicit contingent liabilities sources from natural disasters, natural resource prices, economic downturn etc.
- Other (please specify):

13. Do you disclose the level of liquidity buffer? Why? Please explain briefly.

YES (please explain briefly):

NO

14. In the context of cash, debt and risk management framework, check if there is a specific benchmark for
- Level of liquidity buffer
 - Currency composition of liquidity buffer
 - Other (please specify):
15. Who acts as the decision maker in determining the benchmark (i.e. the appropriate level/size) for liquidity buffers
16. Please indicate how often you review/revise the benchmarks for level of liquidity buffer.
17. Please indicate if the negative interest rate environment has had any impact on your cash buffer policy –in terms of size and investment policy–.
18. To what extent, are your liquidity buffer benchmarks binding? What happens if/when the benchmarks could not be met?
19. Which indicator(s) do you use to determine the level of liquidity buffer? Please check all items that apply.
- Average volume of daily cash outflows for a certain past period (Please check all items that apply)
 - Primary expenditures
 - Debt service
 - Both
 - Deviation between the forecasted and actual cash flows (if this applies, please check the appropriate frequency that you compare forecasts and realizations)
 - Intraday deviations
 - Daily deviations
 - Weekly deviations
 - Monthly deviations
 - Volatility of cash flows
 - Other (please specify):
20. Could you please indicate the model (s) that you use to determine the level of liquidity buffer? Please check all items that apply.
- Scenario analysis
 - Indicators -such as debt redemption profile, cash reserve / debt redemption ratio-
 - Analytical models (Volatility-based models, trend analysis etc.)
 - Cost and benefit analysis
 - Other (please specify):
21. Please indicate for how long the liquidity buffer would support your needs in terms of debt re-payments or in terms of budget expenditures
22. Could you please indicate the method(s) that you use to determine the currency composition of liquidity buffer? Please check all items that apply.
- Asset Liability Management Models (Cash-flow matching etc.)
 - Indicators -such as currency profile public debt redemptions, profile of trade flows-
 - Cost and benefit analysis
 - Other (please specify):

C. Cost of Liquidity Buffer and its Investment Policy

23. Do you measure the cost of liquidity buffer?

YES NO

24. If your response is YES to Q23, please briefly explain your approach/methodology for assessing the cost of liquidity buffer.

25. Do you have an investment policy for your liquidity buffer?

YES NO

26. If your response is YES to Q25, please indicate how you invest your liquidity buffer. Please check all items that apply.

- Demand deposits in local currency
- Time deposits in local currency
- Demand deposits in foreign currency
- Time deposits in foreign currency
- Reverse repos
- Other (please specify):

27. If you invest in deposits, please specify where you hold your deposit accounts. Please check all items that apply.

- Central Bank
- Public banks
- Local private banks
- Foreign banks
- Other (please specify)

28. How do you manage the risks associated with investing your liquidity buffer? Please explain briefly. If you hold deposits in foreign financial institutions, do you apply similar credit risk criteria for local and foreign financial institutions?

D. Interaction with Other Institutions

29. Please indicate whether you coordinate liquidity management with other authorities. If so, what are the relevant coordination issues for liquidity management?

30. Please explain whether coordination mechanisms exist or what efforts are being made to ensure these issues are covered (Legal arrangements, regular/ad hoc meetings, conference calls etc.).

F. Other Information

31. Please share any additional information relating to the management of liquidity buffer in your framework:

WORKING PAPERS PUBLISHED TO DATE

This list shows all OECD Working Papers on Sovereign Borrowing and Public Debt Management published to date. They are available online at <http://oe.cd/pdmwp>.

WP8: The role of public debt managers in contingent liability management (2017)

WP7: Assessing the cost effectiveness of index-linked bond issuance - A methodological approach, illustrated using UK examples (2013)

WP6: An overview of leading practices in investor relations and communications in the OECD Area (2013)

WP5: Buyback and exchange operations: Policies, procedures and practices among OECD Public Debt Managers (2012)

WP4: A Critical Analysis of the Technical Assumptions of the Standard Micro Portfolio Approach to Sovereign Debt Management (2012)

WP3: Interactions between sovereign debt management and monetary policy under fiscal dominance and financial instability (2012)

WP2: Principles and trade-offs when making issuance choices in the UK (2011)

WP1: Regulatory reform of OTC derivatives and its implications for sovereign debt management practices (2011)