ECO FLASH

16 July 2018

US money market funds and US dollar funding

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- **US money market fund reforms in 2014 led to a massive reallocation of cash from funds invested in private debt (prime funds) to funds invested in public debt (government funds).**
- **Foreign banks, that were most dependent on prime money funds for funding, were deprived access to US dollars while the US Treasury and federal mortgage guarantee agencies attracted fund inflows.**
- **Over time, the crowding out of the private sector has been mitigated. The surplus savings collected by government funds have been lent to banks, in the form of secured funding, both direct (repos backed by public-sector debt securities) and indirect through Federal Home Loan Banks (FHLBs).**
- **However, the loss of funding caused by the withdrawal of prime funds has not been fully offset for foreign banks. Overall, the reforms have led to a transfer of liquidity from foreign banks to US banks.**
- **The extension of the chain of intermediation through which savings are collected by money market funds and lent to banks (via FHLBs), along with the change in the nature of financing granted (higher share of secured funding), has been positive for banks' liquidity coverage ratios (LCRs).**
- **However, those two developments conflict with the objective of the money market fund reforms to promote the financial stability. The reforms expose money market funds, on the one hand, to financial institutions (FHLBs, Fannie Mae and Freddie Mac) that are heavily exposed to mortgage risk and that carry out a lot of maturity transformation, and, on the other hand, to the repo market, which is relatively opaque.**

On 16 September 2008, the Reserve Primary Fund – one of the main US money market funds (MMFs, see box 1), which was highly exposed to Lehman Brothers – announced that it would be unable to maintain its constant net asset value (CNAV). That led to a run on MMFs, causing the commercial paper market – to which MMFs provided liquidity – to dry up. Mistrust of short-term private-sector debt instruments and concerns about the quality of collateral behind repurchase agreements (repo)[1] spread, causing asset fire-sales and brutal deleveraging. The financial crisis highlighted the systemic risk created by MMFs which, alongside the banks, play a major role in the circulation of liquidity.

In 2014, the Securities and Exchange Commission (SEC), keen to eliminate the chances of another run, adopted reforms to limit the scope of US CNAV MMFs[2]. Money market funds that invested in public debt (government funds) or were intended for individual investors (retail funds) retained the ability to provide a guarantee to investors that they would recover all of their original investment. Other funds that were invested in private debt and intended for institutional investors (institutional prime funds) had to abandon their CNAV model and become floating net asset value (VNAV) funds. In other words, the value of their units has fluctuated since October 2016, when the reforms came into force, in line with the market value of the securities in which they invest. Their managers were also authorised to charge exit fees and

[1] A repo consists of transferring securities in return for a transfer of cash (for a relatively short period, generally one day) and then carrying out the reverse transfers plus the payment of interest on the cash deposit.

[2] Measures to toughen regulations applicable to MMFs (stricter standards in terms of the maturity of assets held, fund liquidity and credit risk, the obligation to carry out monthly reporting and stress tests, and the authority to suspend redemptions if a fund is unable to maintain its CNAV) adopted by the SEC in 2010 reduced the risks to which funds were exposed, but did not address the risk of a systemic run.

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impose restrictions on investors wanting to sell their units (redemption gates), in order to remove the risk of large-scale withdrawals.

A reallocation of savings between money market funds

In the year before the reforms came into force, there was a massive reallocation of cash from prime funds to government funds. Between October 2015 and October 2016, the portfolios of government funds swelled by almost USD 1,180 bn, while those of prime funds shrank by USD 1,220 bn[3] (shaded area of chart 1).

The reforms have therefore caused substitution within the MMF sector, with no notable effect on its overall size (reduction of USD 40 bn out of a total of around USD 2,800 bn[4]). However, they have caused a major change in the structure of the overall MMF portfolio.

By definition, prime funds invest mainly in the debt securities of private-sector issuers, such as commercial paper and certificates of deposit, which account for 80% of their portfolios on average and of which 65% are foreign securities (chart 2). Until the reforms, they were a preferred way for European and Asian banks in particular to access US dollars. Government funds, meanwhile, are solely exposed to US public debt, either by directly holding public debt securities[5] (71% of their portfolios on average) or via repo agreements backed by public debt securities with US or foreign financial institutions.

Before the reforms, the structure of MMFs' aggregate portfolio (excluding repos with the Federal Reserve)[6] showed a good balance between US and foreign counterparties (chart 3). The reforms changed that balance by shifting the savings invested in MMFs towards government funds at the expense of prime funds, i.e. towards the debt of US public-sector borrowers at the expense of foreign private-sector borrowers.

[3] Our analysis is based on the US MMF monitoring tool developed by the Office of Financial Research using SEC data. We take into account work done by Z. Pozsar, *Excess Reserves and Global Dollar Funding*, Credit Suisse, Global Money Notes 9, April 2017 (based on ICI data, which do not distinguish between counterparties on the basis of nationality) and by K. Anadu and V. Baklanova, *The intersection of US money market mutual fund reforms, bank liquidity requirements, and the Federal Home Loan Bank System*, OFR Working Paper, October 2017 (analysing the reforms' impact on US banks only, based on SEC data).
[4] This note does not take into account tax-exempt funds, which are smaller in size.
[5] This category includes Treasuries, securities issued by US mortgage refinancing agencies (debt securities and mortgage-backed securities) and repurchase agreements with the Federal Reserve.
[6] To make the chart easier to understand, we have excluded repo transactions backed by public-sector securities carried out by the Federal Reserve with MMFs since the end of 2013 (as part of the Reverse Repo Facility or RRF). We excluded those transactions, which are particularly large at the end of each quarter, because taking them into account led to erratic movements in portfolios. Choulet C., *QE and bank balance sheets: the American experience*, BNP Paribas, Conjoncture, July 2015.

The reforms have inflated some funds and deflated others

— Investment portfolios of US money market funds (USD bn, lhs)
of which — Government funds (rhs) — Prime funds (rhs)

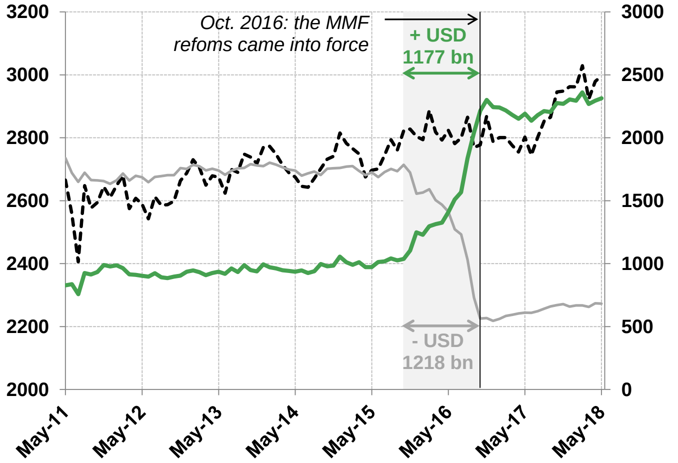


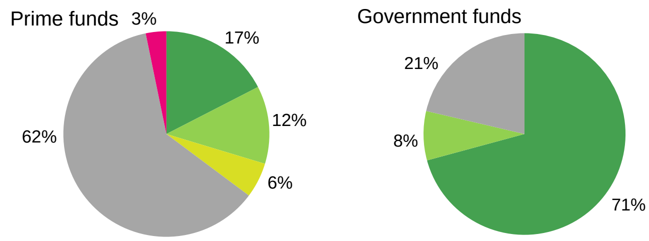
Chart 1 Source: SEC

Comparative exposure of money market funds

Portfolio structure (2011-2018 average)

US borrowers: — Treasury, mortgage agencies (GSE), Fed — Banks — Non-financial corporations (NFCs) and local authorities

Foreign borrowers: — Banks — NFCs



Foreign banks deprived access to US dollars

The reforms temporarily crowded out foreign banks[7], the traditional counterparties of US prime funds. In the space of a year, between October 2015 and October 2016, US MMFs reduced their exposure to foreign bank debt by USD 491 bn or 40% (chart 4). Dollar funding obtained from MMFs fell by around USD 242 bn for European banks (-33%), and USD 93 bn for both Canadian banks (-43%) and Asian banks (-42%). Funds raised by US banks from MMFs also fell, but to a lesser extent, i.e. USD 82 bn (-28%).

[7] The nationality of a bank here refers to that of its parent company. Branches and subsidiaries of foreign banks in the USA are included in the "foreign banks" group.

MMFs' increased exposure to GSEs

The shift from prime funds to government funds between October 2015 and October 2016 was accompanied by increased holdings of USD 381 bn of Treasuries (up 85%, chart 4) and of USD 197 bn of Agencies[8] (up 39%) within MMFs' aggregate portfolio.

During the period, MMFs increased their exposure to the short-term debt of Federal Home Loan Banks (FHLBs) by USD 168 bn[9]. The FHLBs mainly used the funds thus obtained to increase lending to their members, i.e. US banks (+USD 106 bn between the third quarter of 2015 and the fourth quarter of 2016, chart 5). Those borrowings, driven primarily by the introduction of the LCR requirement (see box 2) compensated for the decline in funding granted directly by MMFs to US banks (-USD 82 bn, see above).

The FHLBs also increased their lending to the federal funds market (+USD 18 bn between the third quarter of 2015 and the fourth quarter of 2016). Although Federal Reserve data do not identify the MMFs' direct counterparties, they show an increase, during the same period, of around USD 7 bn in federal funds borrowing by US branches of foreign banks, and USD 3 bn by US banks[10].

The combination of the MMF reforms and the adoption of the LCR requirement caused the balance sheets of the FHLBs to grow, and caused increased maturity transformation within their balance sheets[11].

In the end, the chain of intermediation through which savings are collected by money market funds and lent to banks has been extended. That has resulted in MMFs having greater exposure to the debt of the Federal Home Loan Banks, which are highly exposed to US mortgage risk. At the end of 2017, MMFs financed 50% of the FHLBs' balance sheet (versus 31% at the end of 2014, see chart 6), while debt securities issued by the FHLBs represented 20% of MMFs' assets (versus 10%).

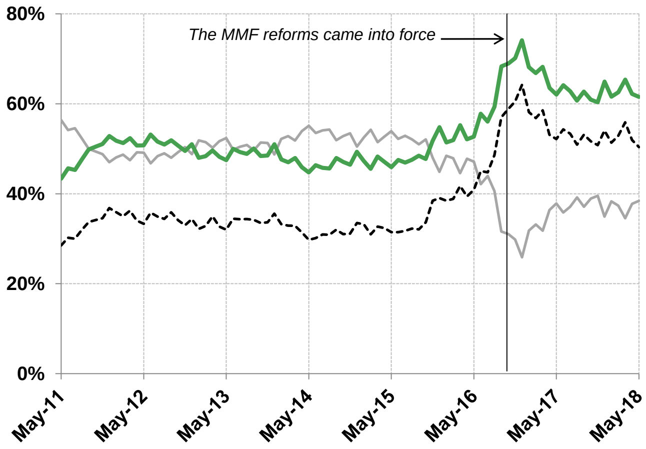
[8] Agencies are debt securities and mortgage-backed securities issued by Ginnie Mae and Government-Sponsored Enterprises (GSEs). GSEs are mortgage refinancing agencies (Fannie Mae, Freddie Mac and the Federal Home Loan Banks).
Choulet C., *The fate of Fannie Mae and Freddie Mac is not yet sealed*, BNP Paribas, Conjoncture, March 2018
[9] FHLBs have the same status as Fannie Mae and Freddie Mac. The advances they make to their members are financed by debt securities issued at low interest rates. The collateral for those advances consists mainly of residential and commercial mortgages. Major US banks are the main recipients of advances from the FHLBs. In 2017, 21% of the FHLBs' advances went to JP Morgan, Wells Fargo and Citigroup.
[10] The SEC's "foreign banks" category cannot be reconstituted from Fed data. The Fed's published financial accounts are prepared on a parent-company basis, and according to the residence principle. US subsidiaries of foreign banks are placed in the same category as US banks; US branches of foreign banks make up a separate category; parent companies, subsidiaries or branches of foreign banks located abroad, along with other non-resident agents, make up the "Rest of the World" category.
[11] At the end of 2017, short-term liabilities (with a remaining term of less than one year) accounted for 75.8% of the FHLBs' liabilities.

A shift in the balance since the reforms

Structure of MMFs' aggregate portfolio (excluding RRF)

— Claims on US counterparties — of which US "government" debt

— Claims on foreign banks



More public debt, less private debt

Change in MMFs' portfolios between Oct 2015 and Oct 2016 (USD bn):

Government funds   Prime funds   — Net

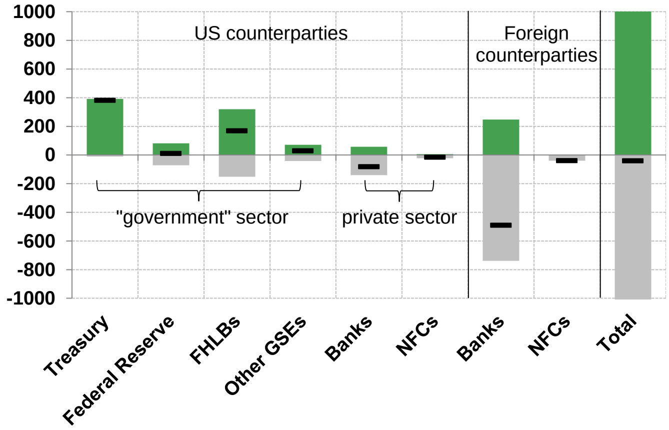


Chart 4 Sources: SEC, BNP Paribas

A transfer of funds to US banks

At end-May 2018, money market funds had almost fully rebuilt their previous exposure to US and foreign banks (USD 1,414 bn versus USD 1,550 bn in October 2015)[12]. That was accompanied by a reversal in the funds' hierarchy:

[12] The upturn in T-bill issuance in the first quarter of 2018 has pushed short-term interest rates higher, particularly in the tri-party repo market. That has prompted MMFs to lend liquidity in that market rather than taking part in the Fed's reverse repo facility (RRF): the spread between the TGCR and the RRF rate has averaged 18 basis points since February 2018.

government funds accounted for 63% of funding obtained by banks from MMFs versus only 18% before the reforms.

Overall, liquidity allotted directly or indirectly by MMFs to foreign banks fell by USD 130 bn or 10% between October 2015 and May 2018 (chart 7), while funds allotted to US banks increased by USD 125 bn or 43%[13].

As a result, the MMF reforms have led to a redistribution of liquidity within the financial system: from prime funds to government funds, and from foreign banks to US banks. They have also resulted in a change in the type of financing provided.

Reforms more helpful for US banks' liquidity ratios

Since the reforms, within MMFs' portfolios, secured financing (repos) collateralised by public debt (65% by Treasuries and 35% by MBS issued by Ginnie Mae and GSEs) has overtaken unsecured financing (commercial paper and certificates of deposit, chart 8).

That development has enabled banks to improve their liquidity coverage ratios (LCRs, see box 2). Borrowing money secured by high-quality liquid assets (HQLAs), is less burdensome in terms of the LCR than carrying out unsecured financing, even if the liquid assets tied up as collateral can no longer be included in the ratio's numerator. By strengthening the FHLBs' role as direct lenders, the reforms have been even more positive for US banks' LCRs: borrowing money from the FHLBs is not penalised and has enabled banks to increase their holdings of HQLAs (LCR's numerator).

The reforms have also increased the MMFs' exposure to mortgage-backed securities (MBS) issued by Fannie Mae and Freddie Mac. Admittedly, their MBS have enjoyed a federal government guarantee since the two agencies were placed into conservatorship. However, they face significant financial difficulties and their future is uncertain (see note 8).

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The FHLBs are lending more to US banks

Collateralised loans by the Federal Home Loan Banks to US banks, USD bn

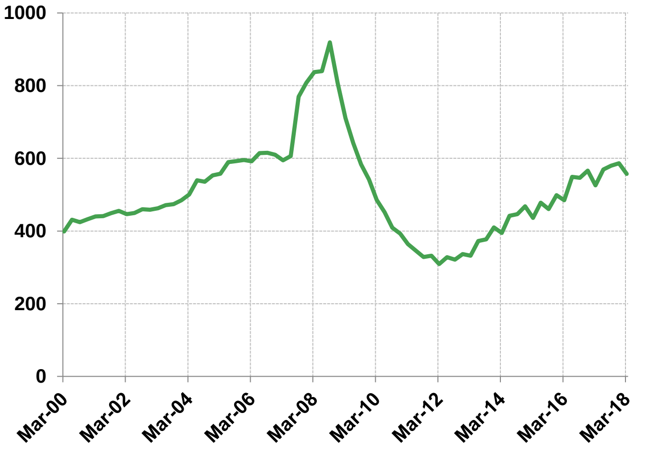


Chart 5 Source: Federal Reserve

... while borrowing from MMFs

MMFs' exposure to FHLB debt (lhs, USD bn)

Government funds — Prime funds

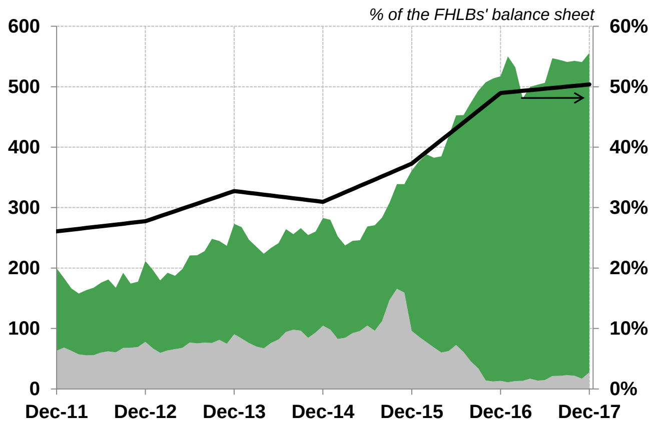


Chart 6 Sources: SEC, FHFA, BNP Paribas

[13] US banks can have used these funds to lend to foreign banks in the forex swap market.

Money market funds

Money market funds are fixed income mutual funds that invest in highly liquid short-term debt securities (commercial paper, certificates of deposit, T-bills) and carry only limited credit risk. Money invested in MMFs can be accessed instantly but, unlike bank deposits, are not insured by the Federal Deposit Insurance Corporation. Funds are subject to specific rules in terms of the maturity and liquidity of securities, credit quality and concentration.

Before the 2014 reforms, prime funds were based on a constant net asset value (CNAV) model and their portfolios were measured at amortised cost. Dividends were paid monthly to unitholders in order to keep the value of units constant, generally at USD 1. When the amortised-cost value of securities portfolios became lower than their market value, funds were forced to take remedial action, or else they would have to devalue their units ("break the buck"). Measuring MMFs' portfolios at amortised cost meant that it was not possible to reflect a decrease in the value of the debt securities held in the fund's net asset value, and so the latter became overvalued. The first investors to redeem their units in the fund would effectively receive too much money, adversely affecting the investors who kept their money in the fund. As a result, there was an incentive to withdraw money from the fund as soon as any difficulties arose, increasing the risk of a run.

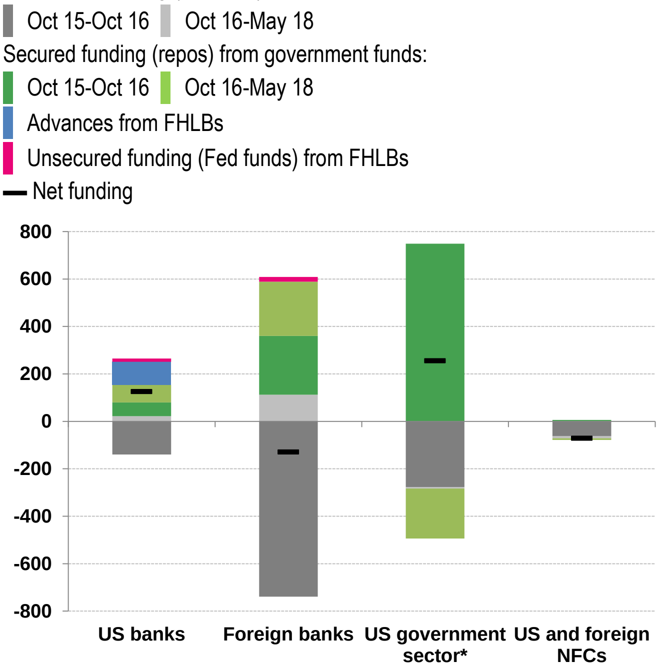
There are three main types of MMF in the USA. They differ mainly according to the types of assets in which they are authorised to invest.

- Government funds invest mainly in public debt. At least 99.5% of their assets must be made up of cash, Treasuries, securities issued by federal agencies and/or repurchase agreements backed by those securities. At 31 May, the value of their portfolios amounted to more than USD 2,300 bn. These funds have maintained their CNAV model.
- Prime funds can invest in a broader range of debt instruments: public-sector securities, commercial paper, certificates of deposit and other instruments issued by private-sector US and foreign issuers (denominated in dollars). At 31 May, the value of institutional prime funds' portfolios – with variable net asset value (VNAV) since the 2014 reforms – totalled USD 422 bn, and those of retail prime funds (CNAV) USD 260 bn.
- At least 80% of the assets of municipal funds (or tax-exempt funds) must be invested in securities issued by US States and local authorities whose interest is exempt from federal and/or state income taxes. At 31 May, the value of institutional municipal funds' portfolios – with variable net asset value (VNAV) since the 2014 reforms – totalled USD 11 bn, and those of retail municipal funds (CNAV) USD 131 bn.

Box 1

A transfer of liquidity from foreign banks to US banks

Funding (direct and indirect) from MMFs between October 2015 and May 2018 (USD bn)



* Net of Federal Home Loan Banks' advances to banks

Chart 7 Sources: SEC, Federal Reserve, BNP Paribas

Strong growth in secured financing

Main financial assets of US money market funds (USD bn)

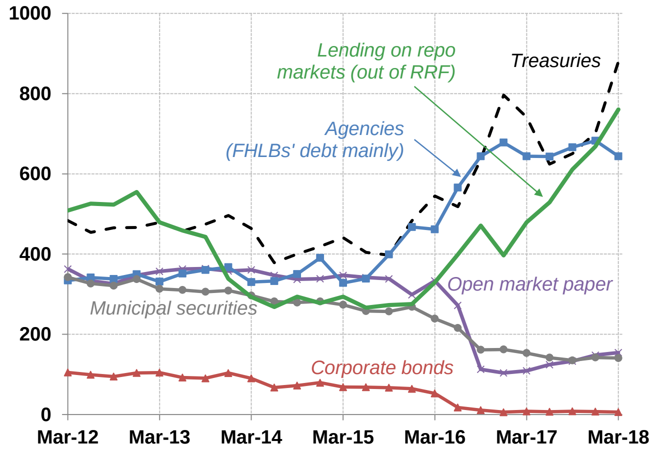


Chart 8 Sources: Federal Reserve, SEC, BNP Paribas

Short-term liquidity ratio LCR

The LCR – established by the Basel Committee – requires that banks must hold enough unencumbered high-quality liquid assets (HQLAs, the numerator of the LCR) to deal with 30 days of net liquidity outflows caused by a serious liquidity crisis (the denominator of the LCR). In the USA, the final rule regarding the LCR was adopted in September 2014 and it was introduced gradually between January 2015 and January 2017.

Among the assets regarded as the most liquid – those that can be turned into liquidity in the private markets while losing little or none of their value – are reserves held at the central bank and claims on – or guaranteed by – public issuers such as Treasuries or agency securities. Treasuries are classed as level-1 HQLAs, so their value is not subject to any discount. Because the GSEs (Fannie Mae, Freddie Mac and the Federal Home Loan Banks) have had an "effective" government guarantee[14] since they were placed under conservatorship, debt securities and MBS issued by the GSEs (excluding preferred shares) are included in level-2A liquid assets. A 15% discount is applied to them.

In the denominator of the LCR, the measurement of net liquidity outflows is based on a cash flow scenario predefined by the regulator. Cash outflows consist of withdrawals of deposits and the non-renewal of other short-term funding. Cash inflows consist of maturing debt instruments and contractual interest payments from performing assets alone expected over a 30-day period. They are deducted from theoretical outflows up to a limit of 75% of outflows. In other words, a bank must hold liquid assets representing at least 25% of cash outflows simulated during a crisis period.

In general, a debt is especially likely to be renewed – and so the cash outflow is likely to be especially low – if the counterparty and/or collateral is of good quality. The withdrawal rate applied to unsecured wholesale funding from other financial institutions (e.g. issues of commercial paper to MMFs) is 100%. Funding secured by level-1 assets is assumed to be renewed and to give rise to no cash outflows (e.g. a repo collateralised by Treasuries). A 15% discount is applied when the transaction is secured with level-2A assets (a repo collateralised by an agency), regardless of the counterparty. The withdrawal rate applied to secured funding backed by assets that are neither level-1 nor level-2A (level-2B or non-HQLA) whose counterparty is the central government or a GSE (e.g. collateralised loans made by the FHLBs to their members) is 25% where their residual maturity does not exceed 30 days, and 0% otherwise.

Box 2

[14] Distinct from the "explicit" and unconditional guarantee enjoyed by Treasuries and securities issued by federal agencies such as Ginnie Mae

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