

**Where The Money Goes and Why it Matters:
The Market and Policy Impact of
Reduced Custody-Bank Deposit Capacity**

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Key Points

- The cumulative impact of geopolitical risk, market volatility, monetary policy, and new rules for banks, investment companies, asset managers, and trading companies has created a strong, secular influx of large cash deposits at U.S. custody banks. These have risen 34% since 2011, growing to increasingly higher levels despite spikes up and down due to large crisis-driven inflows and outflows. There is thus a clear pattern of growing cash-liability demand. Substantiating this, investment funds now hold sustained volumes of cash and cash-equivalents 205% greater than those held at the depth of the crisis.
- Most excess deposits at custody banks are held at central banks, particularly the Federal Reserve, making them riskless to the bank and financial system. The leverage capital charge nonetheless applies. If it did not, then at least an additional \$182 billion in cash-deposit capacity would result, creating a safety net for flight-to-quality deposits under stress scenarios.
- Pricing flexibility is unlikely to offset regulatory costs due to U.S. price inelasticity, statutory deposit drivers, and other market factors in the current interest rate environment.
- Current market conditions are particularly volatile and illiquid, posing systemic risk. Suggestions that regulations may be waived to permit custody banks to absorb sudden deposit inflows cannot be counted upon in advance by banks or customers. Sudden unavailability of cash-deposit facilities poses operational and even systemic risk because investment companies and other entities could face a choice between violating applicable law or suddenly ceasing critical operations in the absence of cash depositories.
- Alternative deposit options pose more risk than higher custody deposit capacity because funds will likely flow outside the U.S., outside the banking system into “shadow liabilities,” or into attempts to hold larger amounts of high-quality assets at a time when market shortfalls are creating significant volatility. Structural and regulatory factors suggest these shortfalls will not quickly reverse.
- Central-bank facilities to counter liquidity transfers outside custody or other banks may force creation of market-maker-of-last-resort facilities. Absent regulation that offsets arbitrage and moral hazard, additional risk not only to the financial system, but also to taxpayers may ensue.
- The transfer of large liability balances outside the banking system could complicate monetary-policy transmission at a time when accommodative-policy tapering already poses significant challenges. Liquidity shocks exacerbated by securities “fails” or other market disruptions resulting from low cash holdings at custody banks could also adversely affect fiscal-policy execution, especially under stress scenarios.

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I. Introduction

This paper continues a series of analyses Federal Financial Analytics has undertaken in the wake of the financial crisis to assess the body of new rules and their impact on financial-market structure and stability. This work does not argue for the relaxation of any of the new rules. Beginning in 2011,¹ we instead analyzed the body of new rules to identify cumulative implications and potential perverse and unintended results. Our most recent white paper² brings this body of work current to the first quarter of 2015, validating our forecast four years before that the combined effect of complex new rules could increase risk by creating pockets of illiquidity, reducing the ability of very large banks to provide financial-market infrastructure services, and driving products and services on which markets and macroeconomic stability depend to “shadow” financial institutions largely exempt from the post-crisis regulation and resolution framework.

In the wake of recent episodes of market illiquidity and growing fears about its consequences, U.S. and global regulators have begun to recognize this challenge.³ Most recently, a report from global central bankers concluded that:

[D]ifferent regulations, considered in isolation, can have consequences that go in opposite directions. Moreover, the interaction of these regulations could add to the difficulties in predicting their overall impact. As a result, central banks will need to monitor these changes and respond to them as they manifest themselves.⁴

In this paper, we seek to support this central-bank review by focusing on a specific activity with systemic, monetary-policy, and fiscal-policy consequences: cash placed on deposit with custody banks. Although little noticed in the post-crisis debate, this activity is critical to the infrastructure of the global financial system. As shall be described in more detail below, the term “custody bank” clearly expresses the function these banks fulfill: safekeeping of assets and funds for investors, pensioners, municipalities, endowments, and other asset owners. Reflecting the very safe nature of custody banking, central banks often rely on custody banks in the implementation of their own market operations.

¹ Federal Financial Analytics, *A New Framework for Systemic Financial Regulation: Simple, Transparent, Enforceable and Accountable Rules to Reform Financial Markets* (November, 2011), available at http://www.fedfin.com/images/stories/client_reports/complexityriskpaper.pdf.

² Federal Financial Analytics, *What Hath All the Rules Wrought? Assessing the Success of the Post-Crisis Framework* (April 29, 2015), available at http://www.fedfin.com/images/stories/client_reports/Assessing%20the%20Success%20of%20the%20Post-Crisis%20Framework.pdf.

³ See [IMFC Statement by Mark Carney, Chairman, Financial Stability Board](#), [Federal Reserve Board \(FRB\) Governor Tarullo's comments on U.S. Economic Momentum](#), and [Office of Financial Research \(OFR\) Director Richard Berner's remarks on New Rules Freezing Markets](#)

⁴ Committee on the Global Financial System (CGFS), *CGFS Papers No 54: Regulatory change and monetary policy*, 1 (May, 2015), available at <http://www.bis.org/publ/cgfs54.pdf>.

This paper will address:

- The structure and function of custody banking under both normal and stress conditions. Data shall be provided to demonstrate a significant change in the manner in which customers use custody banks and the ability of custody banks to provide traditional safekeeping and administrative services;
- regulatory factors that constrain the ability of custody banks to accept cash and cash-equivalent funds;
- long-term changes in markets resulting from current restructuring in custody banking, and likely outcomes if this continues for the structure and stability of global financial markets;
- the macroeconomic impact of the changing configuration of liability holdings and potential implications for the ability of central banks to conduct monetary policy; and
- the implications for the U.S. Treasury Department regarding fiscal policy.

II. What is Custody Banking?

A. *Products and Services*

Custody banks provide an array of safekeeping, settlement, and asset-administration services on behalf of their customers. As a result, they enhance market efficiency and allow institutional investors to hold assets in a highly complex global market. Custody banks are registered as the securities holder and hold the securities instrument for the beneficial owner. This permits efficient transfers by an asset fund or pension plan on behalf of beneficial owners without the risk of holding securities in institutions that might themselves trade on information related to these securities, as well as reducing the complexity of re-registration that can slow trading.

With regard to these services as well as overall trading-and-settlement operations, the custody bank tracks matters such as tax obligations, foreign-exchange values, and corporate actions (e.g., dividend payments), ensuring that beneficial-owner interests are safeguarded. Because of the complex operations of their wholesale financial-institution customers, custody banks often service accounts in dozens of countries, handling payment, settlement, and related needs without regard to date or time zone. International business is often handled through a network of sub-custodians selected by the custodian following due diligence, with the global custodian retaining ultimate responsibility for the movement of cash and securities.

Quarter-end and other trading phenomena have significant impacts on custody-bank deposit inflows even under normal conditions. Investment Companies regulated under the Investment Company Act of 1940 ('40 Act) and similarly-regulated funds process capital-stock transactions reflecting underlying-share transactions. Volume often spikes at the end of the month or during periods of customer investment reallocations. '40 Act funds hold these transaction proceeds in custody accounts. Regulatory requirements also demand that '40 Act funds hold cash collateral in custody accounts.⁵ Private equity and hedge funds also often have large transaction balances that by the terms of their own legal

⁵ Securities and Exchange Commission (SEC), *Custody of Investment Company Assets Outside the United States*, 17 CFR §270.17(f)(5) (2000), available at <https://www.sec.gov/rules/final/ic-24424.htm>.

structure must be housed in custody accounts until beneficial owners are funded.⁶ Similar requirements cover many pension funds.⁷

Reflecting significant infrastructure and technology requirements, as well as their global reach, custody banks are highly specialized and require significant scale. The U.S. is by far the dominant player in the global custody-banking arena. US custody banks serviced 68% of the global custody market in 2014.⁸

The custody-banking business is very large in terms of key measures such as assets under custody (AUC). The most recent report from the Federal Reserve showing the AUC number for the largest U.S. custody banks (the above five banks and US Bancorp) indicates a total of \$87 trillion of AUC. As the term connotes, these assets are “under custody”—that is, they are not assets of the bank itself with which the bank may do as it likes for profit maximization.

Fee income from wholesale customers compensates the custody bank for these services. Funds held on behalf of customers are not, as noted, generally used to fund lending, trading or other bank operations. Rather, they are safeguarded through reinvestment in central-bank reserves or other very high-quality, low-risk assets. Extensive technology infrastructure not only creates barriers to entry, but also limits the ability of custody banks to reduce their AUC books in tandem with curtailed holdings of cash deposits. Fee income thus drives this business and, due to infrastructure costs and declining fees, AUC volume is critical—a recent report estimated that, for each \$1,000 of AUC, fees are down to about 2.5 cents versus 3.5 cents a decade ago and an estimated 4.5 cents two decades ago.⁹

As declining fees suggest, custody banks may not only be unable to reduce operational costs to offset the earnings impact of the capital required for placing cash deposits with a central bank, but also lack bargaining power with their large clients. AUC is the primary driver of their fee income, but to provide custody services, custody banks must accept deposits generated by transactional activities or other client activity. Because these deposits are, as noted, held in operational accounts, and can flow into the bank suddenly due to market or even stress conditions, customers demand that a custody bank have the capacity to handle large deposit inflows.

Theoretically, custody banks could price deposits to offset the difficulty they have had maintaining, let alone raising, operational fees. Limited experience with negative interest rates in the Eurozone, however, suggests limited elasticity for custody deposits, even in a market with few non-bank options for holding cash. While markets in the U.S. provide many more deposit-like assets and investment options, these options pose higher risk to the customer, increasing the risk of loss of principal to custody-bank customers. It is also possible that use of other repositories for customer funds would exacerbate growing shortages of high-quality assets resulting from factors discussed below. Market-stress situations in which customers urgently need safe-haven depositories for cash could not quickly be reconstructed in the absence of large custody banks with central-bank access.

⁶ *Id.*

⁷ Employee Retirement Income Security Act (ERISA) §403(a), 29 USC §1103 (1974), available at <http://www.gpo.gov/fdsys/pkg/USCODE-2011-title29/pdf/USCODE-2011-title29-chap18-subchapl-subtitleB-part4-sec1103.pdf>.

⁸ Based on data obtained from bank 2014 year-end annual reports.

⁹ CLSA Americas, LLC, *op. cit.*

B. Deposit Flows

Custody banks maintain their customers' principal operational accounts—that is, they hold funds customers plan to use for settlement, redemption, and other purposes. Reflecting the purpose of operational custody deposits, the Federal Deposit Insurance Corporation (FDIC) provides a different premium-assessment schedule for custody deposits for purposes of deposit-insurance charges.¹⁰

Customers are generally “wholesale”—that is, they are typically institutional investors, not individual investors. Custody-bank deposits from large financial institutions widely exceed deposit-insurance limits, and customers thus rely not on a government backstop, but rather on the safe-and-sound nature of a custody bank and the very limited uses to which it puts their deposits.

Custody deposits connected directly to facilitation of securities or other transactions are fairly stable as a function of assets under custody. As a result, the Basel Committee's final liquidity rules treat these “operational deposits” more favorably than other wholesale deposits due to their stability.¹¹

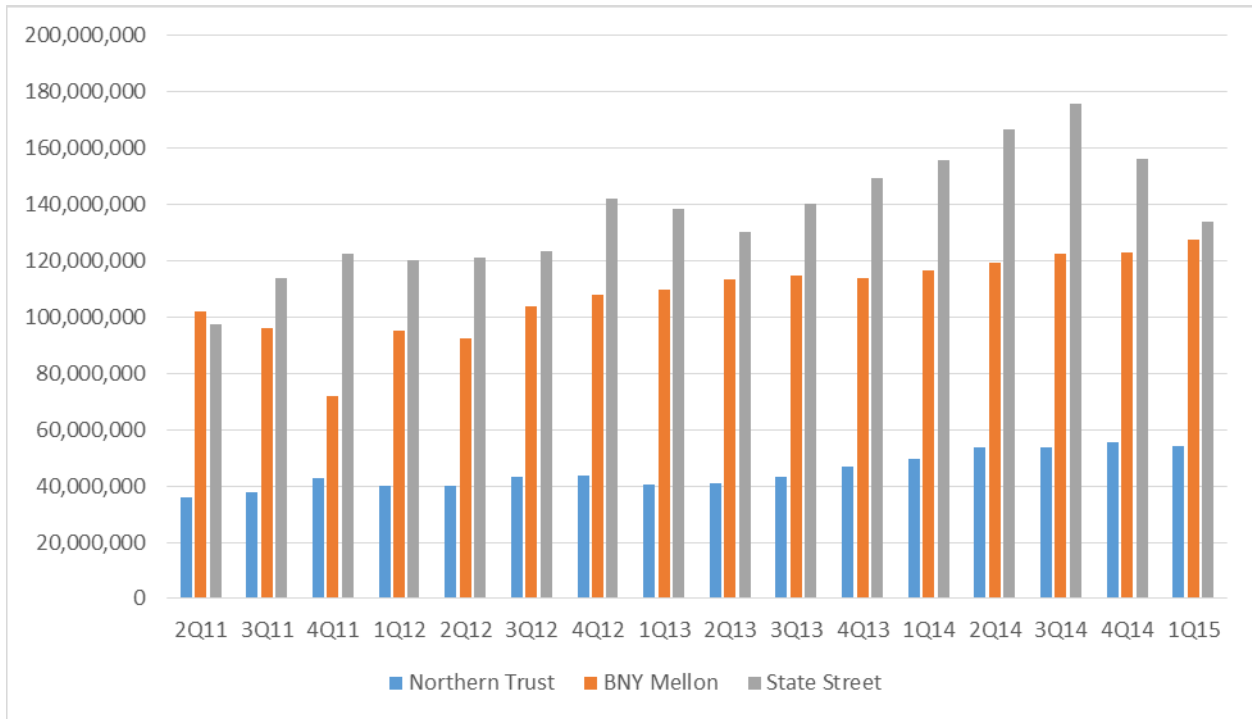
Other deposit flows are more unpredictable. Customer-deposits can vary dramatically based on factors over which a custody bank has no control—e.g., market volatility or geopolitical risk that leads mutual funds, sovereign wealth funds, hedge funds, asset managers, and similar entities to seek safekeeping for their own customers' funds until market conditions stabilize. Such non-operational deposits are often referred to as “excess” custody deposits, and are not provided the more favorable liquidity treatment referenced above. Due to their short-term nature, such deposits are typically invested by the custody banks in the most risk-less, liquid assets—primarily central bank deposits.

However, a combination of market, monetary policy, and regulatory factors appears also to be leading to a long-term increase in custody-bank holdings of cash independent of short-term volatility and idiosyncratic factors germane to individual customers and custody banks. The following graph shows custody-bank deposit flows from the second quarter of 2011 (the first year the line item was reported) to the end of the first quarter in 2015 based on call-report data for the three U.S. banks that are principally custody banks: State Street, BNY-Mellon and Northern Trust.

¹⁰ Federal Deposit Insurance Corporation (FDIC), *Assessments, Large Bank Pricing*, 76 FR 10680 (February 25, 2011), available at <https://www.fdic.gov/deposit/insurance/11RuleAD35.pdf>.

¹¹ Basel Committee on Banking Supervision (BCBS), *Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools*, (January 24, 2013), available at <http://www.bis.org/publ/bcbs238.pdf>.

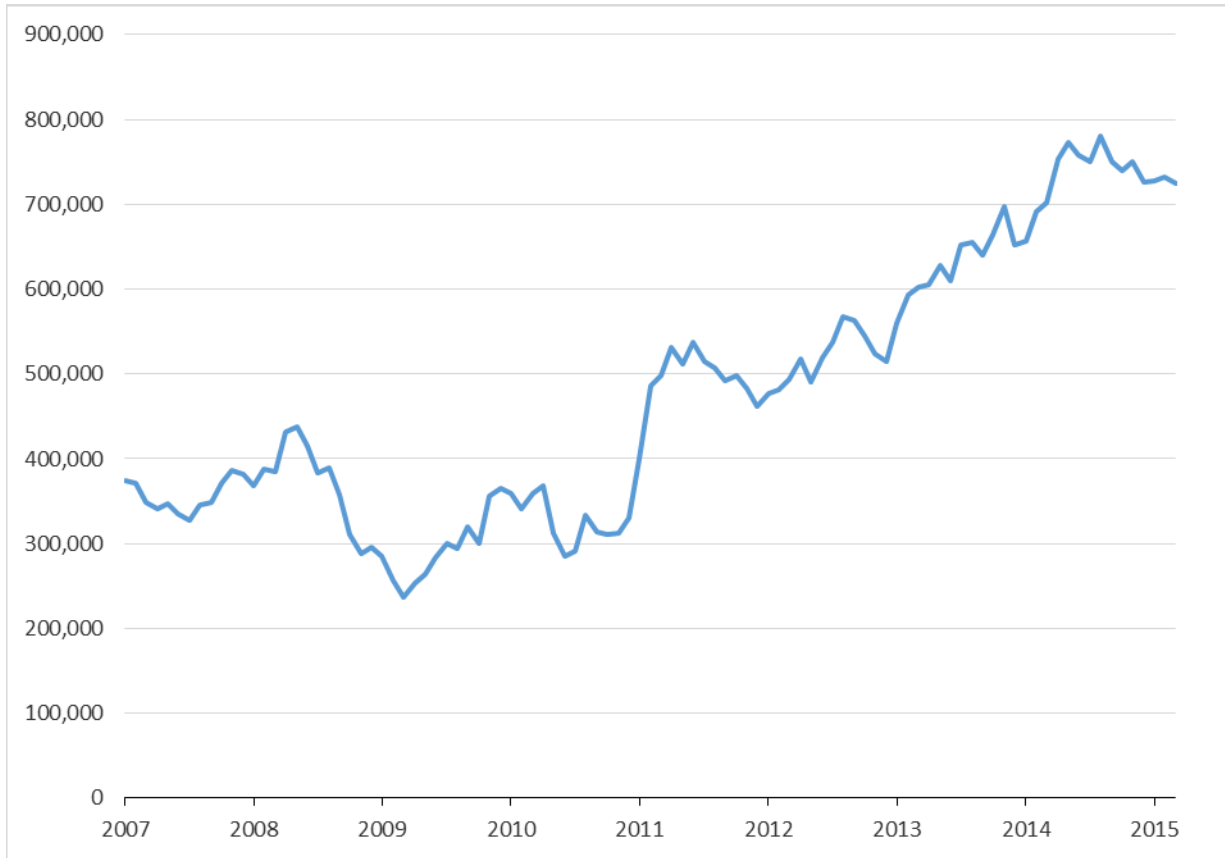
Figure 1: Custody Bank Deposit Flows



(Source: FDIC call reports. Dollars in thousands.)

From the start of the reported data, the three custody banks—Northern Trust, BNY Mellon, and State Street—have seen their custody deposits grow by 51.7%, 24.8%, and 37.5% respectively, for a combined weighted average increase of 34.2%. Some of the deposit-flow volatility and overall increase result from changing market practice, but they also appear to be sparked by regulations that have fundamentally—and often beneficially—altered the behavior of custody-bank customers. For example, to the extent that asset managers are now stress-testing their positions and safeguarding them with added cash, the overall trend of cash and cash-equivalents into custody banks will continue. The following table demonstrates overall holdings of cash and cash-equivalents by investment companies over time:

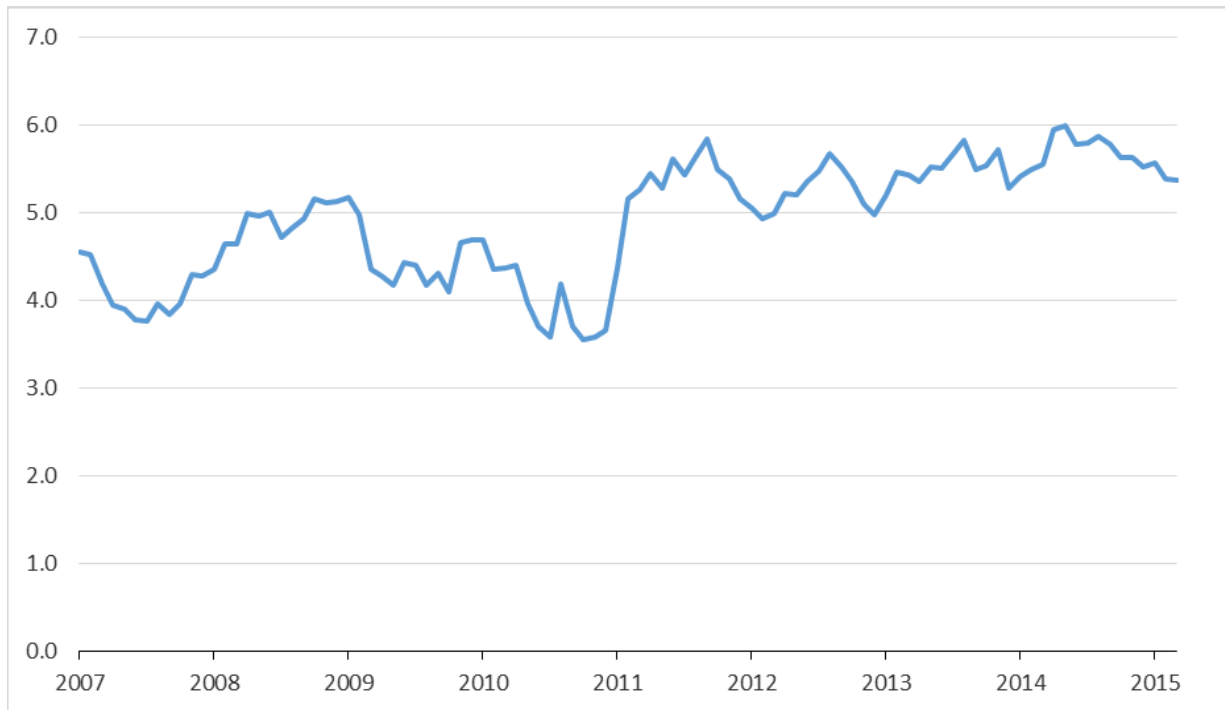
Figure 2: Total Liquid Assets of Mutual Funds



(Source: Investment Company Institute. Dollars in millions. Liquid assets reflects cash, receivables, and short-term securities minus liabilities.)

Furthermore, inflows to custody banks are not simply a function of overall mutual fund growth as mutual funds are now consistently holding higher levels of cash and cash equivalents relative to their total assets than they had prior to the financial crisis:

Figure 3: Liquidity Ratio of Mutual Funds



(Source: Investment Company Institute. The liquidity ratio is liquid assets (cash, receivables, and short-term securities minus liabilities) at mutual funds divided by their total net assets.

C. Regulatory Framework

Despite a substantively-different business model and risk profile, custody banks are generally regulated in the same fashion as all other large U.S. banks. For example, the enhanced supplementary leverage ratio (ESLR)—a capital ratio imposed on U.S. banks deemed global systemically-important banks (G-SIBs)—covers the central-bank placements custody banks hold even though these assets—directly held with the Federal Reserve or other central banks—have no risk of loss of principal.¹²

A calculation of custody-bank leverage ratios shows the significant impact of the ESLR on holdings of central-bank reserves. For purposes of this calculation, we look only at the three U.S. banks that are principally custody banks: State Street, BNY-Mellon, and Northern Trust. As noted above, JPMorgan Chase and Citigroup are also major custody banks, and are thus included in other calculations presented in this paper, but their data are heavily influenced by many other activities, and are therefore not a clear indication of the impact of excess reserves in so small a sample of U.S. custody banks.

¹² Pursuant to the final rule of the Office of the Comptroller of the Currency (OCC), FRB, and FDIC,¹³³ the U.S. ESLR is five percent for bank holding companies and six percent for insured depository subsidiaries. The relevant number pursuant to the final [Basel III global standards](#) is three percent. Some variations in the denominator against which the U.S. ESLR is measured also make it more costly than the global rules.

¹³³ OCC, FRB, and FDIC, *Regulatory Capital Rules: Regulatory Capital, Enhanced Supplementary Leverage Ratio Standards for Certain Bank Holding Companies and Their Subsidiary Insured Depository Institutions*, 79 FR 24528 (May 1, 2014), available at <http://www.gpo.gov/fdsys/pkg/FR-2014-05-01/pdf/2014-09367.pdf>.

Figure 4: Influence of Central Bank Placements on Custody Banks' Leverage Ratios

Institution	Tier 1 capital	Central bank placement	Total assets for the leverage ratio	Leverage Ratio	Leverage without central bank placements
BNY-Mellon	17,693,169	93,211,368	309,371,472	5.72%	8.19%
Northern Trust	7,354,033	14,725,470	106,550,955	6.90%	8.01%
State Street	13,919,961	74,036,647	248,021,789	5.61%	8.00%

(Source: FDIC call reports for 1Q2015. Dollars in thousands. The leverage ratio is calculated as tier 1 divided by total assets for the leverage ratio; the last column removes central bank placements from the assets counted for the leverage ratio denominator.)

For these three banks alone, risk-less, low-return central bank placements resulting from customer custody deposits consume \$182 billion of balance sheet capacity. If central bank placements were excluded from the leverage ratio denominator, then these three custody banks could take in at least \$182 billion in deposit or like-kind inflows. The amount of additional cash-deposit capacity would be higher if JPMorgan and Citigroup were factored in, but as stated above, it is difficult to disentangle their numbers from their non-custody activities. As custody banks represent a store of value during periods of stress, these numbers illustrate that the leverage charge on central bank placements is a significant limiting factor on the ability of custody banks to act as a stabilizing force.¹⁴

Arguably, custody banks could refuse funds and thus minimize their leverage ratio. However, an array of business, regulatory and legal barriers constrains the ability of custody banks to turn away deposits, especially under stress scenarios. Most contractual arrangements with custody-bank customers commit the bank to accepting inflows without constraint. It is possible that customers might be amenable over time to contractual revisions, but this would nonetheless limit their safe-haven options and raise the risk of running afoul of rules applicable to investment funds. Custody-bank deposit constraints would almost surely force customers to find alternative depository-like facilities or assets in other, less-regulated segments of financial markets.

In the event contractual commitments cannot be altered, it is also possible that custody banks might voluntarily restrict cash deposits in advance by turning away new customers and/or cutting off existing ones, but this would again likely prove disruptive. Customer funds will either be placed with other, higher-risk institutions—likely outside the U.S., where leverage ratios often do not exist or are far lower—or simply be used by asset managers and other custody-bank customers for higher-risk purposes; any holding that is not cash placed by a bank with a central bank is by definition riskier. Various recent post-crisis regulatory initiatives outside the banking system—e.g., moves to require asset-management stress testing to prevent systemic liquidity risk—would also be threatened by the inability of custody banks to serve as stores of value, especially under stress conditions.

It is of course possible that custody banks could price to offset the cost of new rules related to their cash deposit-taking operations. Over time, it is also possible that higher returns on other custody-bank holdings—e.g., large positions in sovereign bonds—would offset at least some of these costs. However, the deposit-taking market has so far proved largely inelastic. Normalized interest rates will, over time,

¹⁴ Custody banks may not respond in this exact manner if the leverage weighting of central bank placements were changed, but this number is provided to illustrate the extent to which that leverage charge alone constrains deposit acceptance.

somewhat reduce the cost of cash deposit-taking, but the new leverage requirement is almost as costly for these low-risk holdings as it is for no-risk ones. As a result, the challenge custody banks face in continuing to serve as cash depositories for the global financial system is significantly amplified.

III. Market Drivers

In this section, we evaluate market conditions that contribute to the inflow of cash deposits to custody banks. These market drivers are sometimes exogenous to regulatory drivers and thus may be dampened as conditions change. However, many of these drivers may persist for several years (e.g., abnormally low interest rates, expanding central-bank holdings of high-quality assets), and others appear to be embedded because they are the result of structural market changes. Thus, even if the deposit inflows sparked by some factors abate, the increases shown above in custody-bank deposits are likely to persist or even accelerate. Many investors in the fixed-income market (e.g., insurance companies, pension funds, banks) are price-insensitive—that is, they must hold high-quality assets regardless of yield or price due to regulatory or similar requirements (see below). It thus remains to be seen the extent to which the acute shortages of high-quality assets and related funding vehicles reverses as interest-rate conditions normalize following central-bank tapering. Reduced pricing due to greater supply would not necessarily materialize if price-sensitive investors re-enter the market and counteract central-bank infusions. Cash may thus remain at elevated levels for an extended period of time due to continuing shortages of cash-equivalent assets.

A. Broad Market Forces

Market drivers that lead to higher custody-bank deposits include:

- **Dollar Demand:** The demand for dollar-denominated assets of course affects an array of U.S. obligations (e.g., corporate debt, real estate, mutual funds). However, investors who need readily-liquid assets with no risk of principal loss or price volatility seek cash and, then, need to house it for safekeeping. Many banks accommodate dollar-denominated deposits, but none but a custody bank can do so with the protections of the low-risk balance sheet and operational services described above. Non-U.S. custody banks lack significant capacity as shown above, and housing dollar deposits with them may also create geopolitical risk for the customer.
- **Accommodative Monetary Policy:** Central banks in the U.S., U.K., European Union, and Japan have undertaken accommodative monetary-policy operations that have sharply reduced yield on sovereign bonds, agency obligations, and other low-risk investments. The difference between the likely return on holding cash versus a sovereign or similar obligation is thus very small; indeed, given sometimes-negative sovereign-bond rates, asset-management advisory fees, and inflation adjustments, current market conditions often favor holding cash over these low-risk investment options. In addition, interest-rate risk and other conditions often lead institutional investors to move out of short-term Treasury and similar obligations in favor of cash.
- **Flight to Quality:** During conditions of geopolitical risk or turbulence in bond markets (e.g., the U.S. debt-ceiling crises), investors seek cash. Custody-bank

- deposits have historically spiked during these crises, but continued, elevated levels suggests that the combination of all of these exogenous factors combined with other market drivers will lead to prolonged periods of higher cash deposits that, if not housed with custody banks, may flow to other institutions or into alternative investment vehicles that pose greater investor and even systemic risk.
- High-Frequency Trading (HFT): HFT—also often called algorithmic or algo trading—has rapidly developed as a major market medium for an array of transactions, including those in fixed-income obligations historically used as funding and collateral. While HFT may increase market efficiency, it also houses increasingly large volumes of high-quality liquid assets in the intraday market at firms that provide no market-making or comparable liquidity function for the broader market. Operational and liquidity problems are becoming an increasingly systemic concern, with senior bank supervisors in major markets recently laying out their fears as an urgent policy priority.¹⁵ Under stress, significant funds could seek safe haven at custody banks due in part to the absence of alternative safe-haven fixed-income obligations.

B. Additional Deposit-Inflow Drivers

Historically, an array of financial instruments have been available to safely invest excess funds and provided a readily-marketable, principal-protected source of collateral for market transactions. Due in part to regulatory factors, several key market-risk buffers have been significantly constrained since the 2008 crisis, increasing counterparty need for cash-deposit facilities ideally housed in low-risk custody banks able to support customer transaction-execution needs. Traditional market stores of value for safekeeping or transaction execution are described below, along with current trends:

1. Repurchase Agreements (Repos)

Large banks and other financial institutions have retreated from the repo market in the wake of the financial crisis. Outstanding repo loans—that is, extensions of short-term funds collateralized by high-quality assets like sovereign bonds—have declined by 28% over the past four years, with one analyst predicting a further 20% drop.¹⁶ Prior to the crisis, the value of the primary-dealer repo market was \$4.5 trillion.¹⁷ In 2013, it totaled only \$2.75 trillion, shrinking to \$2.25 trillion at the end of the first quarter of 2015.¹⁸ The Financial Stability Oversight Council (FSOC) report also shows that the tri-party repo market fell from over \$2 trillion to \$1.75 trillion even when reverse repos are included.¹⁹ Another study shows that the tri-party repo market

¹⁵ Senior Supervisors Group (SSG), *Algorithmic Trading Briefing Note* (April 2015), available at <http://www.newyorkfed.org/newsevents/news/banking/2015/SSG-algorithmic-trading-2015.pdf>.

¹⁶ Katy Burne, *Repo Market Sees a Lending Shift as Rules Bite*, Wall Street Journal, April 7, 2015 at <http://www.wsj.com/articles/repo-market-sees-a-lending-shift-as-rules-bite-1428450643>.

¹⁷ Financial Stability Oversight Council (FSOC), *2015 Annual Report*, 54 (May 2015), available at <http://www.treasury.gov/initiatives/fsoc/studies-reports/Documents/2015%20FSOC%20Annual%20Report.pdf>.

¹⁸ *Id.*

¹⁹ *Id.*, See chart 5.2.3 Value of the Repo Market.

has dropped from almost \$2 trillion in 2012 average daily volume to \$1.64 trillion in December of 2014—with this totaling a little more than half of 2008 volume in this market.²⁰

These drops in repos do not necessarily reflect market need for repos—repos are a critical source of liquidity, as well as a tool the Federal Reserve plans to use for an orderly exit from its accommodative policy. The reverse repos mentioned above are offered by the Federal Reserve Board of Governors (FRB) in a facility open to eligible money-market funds (MMFs). This provides added liquidity for some of the largest firms, but they may be reluctant to rely upon the FRB due to the temporary nature of the facility. Smaller MMFs and mutual funds lack this access but remain obligated to safeguard funds to ensure the security of investor interests and thus need alternative repo facilities. In the increasing absence of banks, some repo counterparties are relying on non-banking institutions like real estate investment trusts (REITs) that regulators fear pose significant systemic risk.²¹ Insurance companies have also become significant repo providers, and small broker-dealers have also seen very significant increases (e.g., 63% in two years; this can be attributed to the fact that counterparties are finding it increasingly difficult to leave cash at banks).²²

2. Commercial Debt

Corporate cash holdings hit a new record in May of this year, amounting to \$1.73 trillion.²³ As a result, short-term corporate debt issuance has sharply declined. FSOC has found that, in the U.S., approximately \$2.25 trillion of commercial paper was outstanding before the crisis; this has dropped to \$1 trillion in March, 2015.²⁴ High-quality corporate bonds and commercial paper are another major liquidity source, especially for investment companies.

3. MMFs

Investors seeking safe havens that do not endanger loss of principal have long favored money-market funds. However, prime MMFs—i.e., those catering to institutional investors that do not principally hold sovereign or agency assets—have been required by the Securities and Exchange Commission (SEC) to offer a floating—not fixed—net-asset value (NAV).²⁵ Floating NAVs by definition create risk of loss of principal as the value of the fund is no longer fixed to protect investors against loss. Cash deposits at custody banks have low risk of principal loss, and none is subject to any withdrawal restrictions. The floating-NAV requirement does not take full effect until 2016, but markets appear already to be adjusting to it as asset managers reconfigure their offerings and reduce the number of those with fixed NAVs.

²⁰ Liz McCormick, *No Relief as Shrinking Repo Leaves Bonds Exposed: Credit Markets*, Bloomberg Business, January 13, 2015 at <http://www.bloomberg.com/news/articles/2015-01-14/no-relief-as-shrinking-repo-leaves-bonds-exposed-credit-markets>.

²¹ International Monetary Fund (IMF), *Global Financial Stability Report: Moving from Liquidity- to Growth-Driven Markets* (April 2014), available at <http://www.imf.org/external/pubs/FT/GFSR/2014/01/pdf/text.pdf>.

²² Liz McCormick, *Money-Market Funds Finding New Repo Partners as Dealers Retreat*, Bloomberg Business, June 11, 2015 at <http://www.bloomberg.com/news/articles/2015-06-10/money-market-funds-finding-new-repo-partners-as-dealers-retreat>.

²³ Matthew Heller, *Corporate Cash Hoard Hits a Record \$1.73 Trillion*, CFO, May 7, 2015 at <http://ww2.cfo.com/cash-flow/2015/05/corporate-cash-hoard-hits-record-1-73-trillion/>.

²⁴ FSOC, *2015 Annual Report*, *op. cit.*, see chart 5.2.2 Commercial Paper Outstanding.

²⁵ SEC, *Money Market Fund Reform; Amendments to Form PF*, 79 FR 47736 (August 14, 2014), available at <http://www.gpo.gov/fdsys/pkg/FR-2014-08-14/pdf/2014-17747.pdf>.

4. Scarcity of High Quality Liquid Assets

The global Basel III capital rules²⁶ and the U.S. standards implementing them²⁷ require banks to hold regulatory capital based on unrealized gains or losses in their available-for-sale (AFS) portfolios of assets such as sovereign bonds and agency obligations. Given current, very low interest rates, banks fear significant unrealized losses will accrue to these portfolios as rates rise. Many have thus housed as much of these portfolios as possible in held-to-maturity (HTM) status, which does not force capital adjustment for unrealized loss. Press reports indicate that the share of assets held by the five biggest U.S. banks in HTM rose to 8.4% in 2014—the highest percentage in two decades.²⁸ The same report suggests accelerated demand in 2015, with as much as one-third of agency-issued mortgage-backed securities (MBS) now housed in HTM.

The liquidity rules demanded both by Basel²⁹ and U.S. regulators³⁰ create still more of an incentive for HTM portfolios because banks must hold large books of high-quality liquid assets. The Office of Financial Research (OFR) found that holdings of just Treasury securities increased at banks by \$185 billion (45%) since 2014.³¹ Longer-term bonds offer higher returns than short-term paper, but still pose considerable interest-rate and pricing risk to some extent when housed in HTM books.

C. Asset-Management Industry Incentives for Cash Deposits

Investment companies, and asset managers more generally, have long been significant custody-bank customers due to the transactional and asset-administration services described above combined with custody-bank safe-haven deposit capacity. Several recent factors have exacerbated the demand for cash already created by exogenous market drivers and broader trends that reduce alternatives to cash. These include:

- Stress Testing: Current market conditions—especially growing illiquidity fears due to monetary policy—have led global regulators to press for company-run stress tests at investment companies and asset managers. The SEC did so through

²⁶ BCBS, *Basel III: A global regulatory framework for more resilient banks and banking systems*, (rev. June 2011), available at <http://www.bis.org/publ/bcbs189.pdf>.

²⁷ OCC and FRB, *Regulatory capital Rules: Regulatory Capital, Implementation of Basel III Capital Adequacy, Transition Provisions, Prompt Corrective action, Standardized Approach for Risk-Weighted Assets, Market Discipline and Disclosure Requirements, Advanced Approaches Risk-Based Capital Rule, and Market Risk Capital Rule*, 78 FR 62018 (October 11, 2013), available at <http://www.gpo.gov/fdsys/pkg/FR-2013-10-11/pdf/2013-21653.pdf>.

²⁸ Jody Shenn, *Banks Averting Bond Losses With Accounting Twist: Credit Markets*, Bloomberg Business, February 26, 2014 at <http://www.bloomberg.com/news/articles/2014-02-26/banks-averting-bond-losses-with-accounting-twist-credit-markets>.

²⁹ BCBS, *Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools*, (January, 2013), available at <http://www.bis.org/publ/bcbs238.pdf>.

³⁰ OCC, FRB, and FDIC, *Liquidity Coverage Ratio: Liquidity Risk Measurement Standards*, 79 FR 61440 (October 10, 2014), available at <http://www.gpo.gov/fdsys/pkg/FR-2014-10-10/pdf/2014-22520.pdf>.

³¹ OFR, *The Puzzle of Low U.S. Treasury Yields*, OFR Markets Monitor (April 2015), available at <http://financialresearch.gov/financial-markets-monitor/files/OFR-FMM-2015-04-27-puzzle-of-low-us-treasury-yields.pdf>.

guidance in 2014,³² with SEC Chair White recently suggesting that formal stress-test standards will be advanced later this year.³³ Regulatory pressure and prudent practice are thus combining to encourage major customers to hold larger amounts of cash and, where available, cash-equivalent assets.

- Disclosure Standards: Reflecting its growing concern about investment-company risk, the SEC has also proposed sweeping disclosure requirements for an array of data investment companies would need to make available to both the Commission and investors. Several of these disclosures would require extensive information on the use of non-cash collateral, including the extent to which it is deployed for additional return. While nothing in the proposal would bar rehypothecation or similar activities with non-cash collateral, regulatory and investor pressure could well do so.

D. Additional Financial-Market Drivers

Finally, a wide array of custody-bank customers is affected by changes in market practice and/or regulation that force larger holdings of high-quality liquid assets and, thus, exacerbate market shortages of cash-equivalent or similar assets suitable in lieu of cash deposits. These same phenomena are thus also forcing these market participants to develop alternative, often higher-risk options to traditional sources of liquidity:

- Margin Requirements: Margin requirements ensure a supply of cash or high-quality collateral is retained in the event a counterparty fails to execute its obligations. A major change in policy in the wake of the financial crisis has been a move to clearing and settlement on central counterparties (CCPs) and other execution facilities. These entities often demand higher margin requirements than those once allowed by dealers, which often had other business relationships with a counterparty or similar incentives leading them to reduce margins in over-the-counter trading. The higher the new margin requirements—and pending rules would significantly increase them³⁴—the more need for cash and other high-quality collateral; and
- Risk-Management Considerations: Although many institutional investors are not explicitly bound by the new rules demanding chief risk officers (CROs) and independent risk-management capacity at large U.S. banks,³⁵ well-managed companies have nonetheless made their own risk management considerably more robust. This creates demand for cash and high-quality collateral even when no express counterparty or regulatory requirement governs a firm.

³² SEC, *Risk Management in Changing Fixed Income Market Conditions*, IM Guidance Update (January 2014), available at <https://www.sec.gov/divisions/investment/guidance/im-guidance-2014-1.pdf>.

³³ SEC Chair Mary Jo White, *Statement at Open Market Meeting: Modernizing and Enhancing Investment Company and Investment Adviser Reporting* (May 20, 2015), available at <http://www.sec.gov/news/statement/modernizing-investment-company-and-investment-adviser-reporting.html>.

³⁴ OCC, FRB, FDIC, Farm Credit Administration (FCA), and Federal Housing Finance Agency (FHFA), *Margin and Capital Requirements for Covered Swap Entities*, 79 FR 57348 (September 24, 2015), available at <http://www.gpo.gov/fdsys/pkg/FR-2014-09-24/pdf/2014-22001.pdf>.

³⁵ Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 (Jul. 21, 2010), §165, available at <http://www.gpo.gov/fdsys/pkg/PLAW-111publ203/pdf/PLAW-111publ203.pdf>.

The sum total of all of these market drivers creating shortages of non-cash assets has been described recently as a “starvation diet.”³⁶ One study has estimated the current shortfall to be \$3.3 trillion, although a 2013 study by the Bank for International Settlement’s Committee on the Global Financial System estimated it to be at least \$4 trillion when many of the market drivers and regulatory forces described above were more theoretical than real.³⁷

IV. Regulatory Constraints on Custody-Bank Cash Capacity

In this section, we assess the capacity of custody banks to absorb cash-deposit inflows. Key to this are the regulatory requirements applicable to U.S. custody banks, especially the largest ones designated as G-SIBs and otherwise subject to higher U.S. prudential requirements. Four of the five largest U.S. custody banks (State Street, BNY-Mellon, Citigroup, and JPMorgan Chase) are designated as G-SIBs by both the Financial Stability Board³⁸ and the Federal Reserve.³⁹

A. Capital

As noted, each of these banks now is subject to an enhanced supplementary leverage ratio, which in its denominator treats cash and cash-equivalent assets in the same manner as very high-risk assets. That is, under the ESLR, assets such as reserves held at a central bank or Treasury securities that are given a zero percent weighting for risk-based capital purposes are assigned the same five or six percent requirements (see above) also applicable in the same manner and to the same extent as assets that are so risky that the rules require more risk-based capital than the underlying asset is worth (e.g., a first-loss position in an asset securitization, which bears a 1,250% risk weight).

In addition to naming U.S. G-SIBs, the Federal Reserve’s final capital surcharge on U.S. G-SIBs is considerably more costly than the one required by global regulators.⁴⁰ This is because, as proposed, the surcharge is not only based on a G-SIB’s activities and structure, but also on its holdings of short-term, wholesale funds.

As proposed, excess deposits from custody-bank customers housed for safekeeping are deemed to represent short-term, wholesale funding structures even though these balances are not used to fund risk-assets on the balance sheet. As noted, custody banks generally house excess client deposits in central-bank reserves or in very low-risk obligations like U.S. Treasury securities. Custody banks do not make use of these deposits for proprietary trading, lending, or the other activities that may pose risk when funded by short-term, wholesale liabilities. Further, when a custody bank liquidates excess reserves, no “fire sale” risk is created because the custody bank counterparty is the Federal Reserve.

³⁶ Ewen Cameron Watt, *Investors on ‘safe asset’ starvation diet*, Financial Times, May 20, 2015, at <http://www.ft.com/intl/cms/s/0/a54d8124-f347-11e4-8141-00144feab7de.html>.

³⁷ CGFS, *CGFS Papers No 49: Asset encumbrance, financial reform and the demand for collateral assets*, (May, 2013), available at <http://www.bis.org/publ/cgfs49.pdf>.

³⁸ Financial Stability Board (FSB), *2014 update of list of global systemically important banks (G-SIBs)* (November 6, 2014), available at http://www.financialstabilityboard.org/wp-content/uploads/r_141106b.pdf.

³⁹ FRB, *Risk-Based Capital Rules: Implementation of Risk-based Capital Surcharges for Global Systemically Important Bank Holding Companies*, 12 C.F.R. § 217 (2015), available at <http://www.federalreserve.gov/newsevents/press/bcreg/bcreg20150720a1.pdf>.

⁴⁰ *Id.*

The capital surcharge for excess custody-bank deposits poses not only a structural challenge to the ability of banks to act as stores of value for the financial system under ordinary market conditions, but may also create particularly adverse consequences in markets that, as described above, now increasingly rely on cash and cash-equivalent holdings at custody banks. It could also prove very disruptive during periods of market stress. As noted, custody banks experience spikes in deposit inflows during periods of geopolitical or market stress. For example, State Street saw its deposits rise 36% following the Lehman Brothers crash in 2008. In 2011, during the U.S. debt-ceiling crisis, this same bank saw its deposits rise 18%.⁴¹ Asset-averaging over a quarter for capital-ratio calculation purposes ameliorates some of the adverse impact of short-term spikes on custody-bank compliance. However, as described above, cash-deposit inflows are lasting longer following stress scenarios and show strong signs of an overall longitudinal increase. As a result, the leverage-capital pressure resulting from the ESLR and G-SIB surcharge will likely not be fully offset by quarterly averaging.

B. Possible Waivers

Notably, regulators have to some extent recognized that these requirements could in fact be binding on custody banks during periods of market stress and have suggested that, should threats to financial stability loom, supervisory flexibility might be provided. In the absence of any pre-stress guidance making explicit the flexibility that might be provided, custody banks and their customers must operate on the premise that all applicable rules are binding on custody banks. This is because of:

- **Prudent Risk Management:** Risk-management practices at custody-bank customers dictate advanced planning for any inability to place cash or cash-equivalents at a custody bank under stress. Funds may thus be pre-positioned outside custody banking under both normal and stress scenarios. This might limit market risk, but only if safeguarded liquidity is in fact housed in assets and at institutions with the same low-risk profile as custody banks and like-kind operational capacity under stress.
- **Early Remediation:** The Dodd-Frank Act builds on prior requirements that regulators take “prompt corrective action” (PCA) when banks fall below required capital levels.⁴² These provisions in the Act govern not only the G-SIBs, but also any Bank Holding Company (BHC) with assets over \$50 billion, thus encompassing smaller custody banks in the U.S. The Federal Reserve has not yet finalized the early-remediation rules demanded by Dodd-Frank to ensure stringent and rapid response to emerging prudential challenges at individual BHCs or across the industry.⁴³ However, U.S. banks must and do recognize the significant sanctions that could nonetheless apply to them under PCA in the event they fall below regulatory capital requirements. Indeed, even in the absence of early-remediation intervention, the

⁴¹ Letter from Stefan M. Gavell, Executive Vice President and Head of Regulatory, Industry and Government Affairs, State Street Corporation, to the Legislative and Regulatory Affairs Division, OCC, Robert de V. Frierson, Secretary, FRB, and Robert E. Feldman, Executive Secretary, FDIC (October 21, 2013), available at http://www.federalreserve.gov/SECRS/2013/October/20131030/R-1460/R-1460_102113_111418_579521830781_1.pdf.

⁴² Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 (Jul. 21, 2010), §166, available at <http://www.gpo.gov/fdsys/pkg/PLAW-111publ203/pdf/PLAW-111publ203.pdf>.

⁴³ FRB, *Enhanced Prudential Standards and Early Remediation Requirements for Covered Companies*, 77 FR 594 (January 5, 2012), available at <http://www.gpo.gov/fdsys/pkg/FR-2012-01-05/pdf/2011-33364.pdf>.

Dodd-Frank Act expressly mandates other constraints on any U.S. BHC that ceases to be well-capitalized.⁴⁴ It is unclear if, during a crisis, the Federal Reserve could simply disregard all of these statutory sanctions and allow a custody bank flooded with deposits to escape censure. Even if it did, markets would surely be wary of adverse FRB intervention, possibly sparking greater reliance on non-custody banks and non-bank deposit products, further destabilizing markets already under acute stress.

V. Prospective Market Changes

As described, neither custody banks nor their customers can await normalization of any temporary market drivers (e.g., accommodative monetary policy), assume that structural changes (e.g., HFT) will at some point be reversed as a result of possible policy intervention, or hope for regulatory waivers. As a result, market reconfiguration due to the combination of cash-deposit inflow drivers and regulatory forces are already apparent.

A. Increased Collateral Shortages

As described above, regulatory drivers have significant market impact to which both custody banks and their customers must adapt or face immediate sanction both by regulators and the broader financial market. An array of market and regulatory factors has created scarcities of high-quality liquid assets and cash equivalent investments. Prudent investors—whether or not they are custody-bank customers, or even whether or not they are governed by prudential regulation—thus need alternative holdings that meet prudential goals to the greatest extent possible. This further reduces market liquidity, and may create demand for cash and cash equivalents—possibly sparking a feedback loop in which the less high-quality collateral there is, the more counterparties try to offset the growing risk that their own counterparties are taking greater risks and bulk up their own high-quality assets or cash. This increases shortages, and leads more counterparties again to take risks in hopes of preserving operational capacity and market function. Supply shrinks again and the cycle starts anew even though each counterparty in this chain is doing its best to safeguard its own liquidity.

Banks under all of the rules stipulated above are likely to be the first to break the counterparty-chain reaction because governing capital and liquidity rules force them out of trading, market-making and other market activities. This may safeguard banks, but it exacerbates market reliance on non-traditional collateral and “shadow” institutions to the extent these can support liquidity and market function. Global central banks have posited that “collateral transformation” could solve for some of these shortages, although hedge funds would need to play a far greater market-infrastructure role for this to occur.⁴⁵ However, it will not only take time for collateral-transformation capacity to develop, but any market reconfiguration may (as noted by the central banks) pose significant risk, including transfer of key functions to hedge funds and other non-traditional counterparties.

⁴⁴ Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 (Jul. 21, 2010), §606, available at <http://www.gpo.gov/fdsys/pkg/PLAW-111publ203/pdf/PLAW-111publ203.pdf>.

⁴⁵ Committee on Payments and Market Infrastructures (CPMI), *Developments in collateral management services*, (September 2014), available at <http://www.bis.org/cpmi/publ/d119.pdf>.

B. Fund Outflow

Another potential market consequence of current U.S. policy is the transfer of cash and similar deposits from U.S. custody banks to non-U.S. providers, who have a strong demand for dollar-denominated assets. The largest U.S. custody banks are G-SIBs, and are thus subject not only to the global standards governing these entities, but also to more stringent U.S. ones. These include the ESLR—twice the leverage requirement imposed under the Basel rules on other large banks and G-SIBs—and a higher G-SIB surcharge.

Lost business in the U.S. is not a policy consideration if business transfers to other jurisdictions because firms in those jurisdictions provide better services. In competitively-driven transfers of activities across borders, markets may well become more efficient or innovate more quickly. However, market realignment due to regulatory factors needs careful consideration to ensure that U.S. micro- and macro-prudential interests are not adversely affected as markets reconfigure.

If custody-bank deposits shift outside the U.S., the operational services that generate them would likely also shift overseas. This would not pose legal or reputational risk if transfers are to well-regulated regimes, but a shift to offshore providers could nonetheless prove operationally problematic, especially if significant volumes of trading-and-settlement transactions depart in tandem with the deposits U.S. custody banks will find increasingly difficult to hold. Currency, operational, and other risks would be created if trading-and-settlements shift in concert with the deposits generated from them to non-U.S. banks. Prudential and investor risk would also rise if a foreign bank holding these funds then deployed them for its own activities (lending, trading) instead of safeguarding them as custody banks must do.

VI. Financial-Stability Implications

A. Operational Risk

In the event custody-bank customers are unable to house sufficient funds at custody banks, several operational risks are likely to result:

- Higher overdrafts, which could pose liquidity risk to the customer or custody bank, as well as increasing the potential for failed transactions if overdrafts are not honored;
- Increased “fails” in the fixed-income market. In the absence of cash, asset managers and other custody-bank customers would need to sell assets to honor their counterparty commitments. During periods of market illiquidity (e.g., the October, 2014 “flash crash”), this can be difficult to do, making it all the more important to hold cash; and
- Greater reliance on institutions without the embedded capacity of custody banks to handle complex transactions and resulting risk across jurisdictions, markets, and time zones.

B. Shadow Liabilities

One phenomenon already evident in markets due to the combined pressure of low rates, new rules, and structural change is increased reliance on what some have called “shadow liabilities.”⁴⁶ Shadow liabilities are often defined as floating-rate MMFs, repos, securitizations, and similar instruments. They are not cash or principal-protected assets that are information-insensitive even under acute stress—that is, those that are well-insulated from loss of principal and thus do not require investors to establish sophisticated risk analytics. Flows of funds in and out of information-insensitive liabilities like cash into shadow liabilities can, it has been found, be acutely procyclical because investors flee to safe havens under stress scenarios. Flight-to-quality phenomena—exacerbated by the security benefits of dollar-denominated assets—are the driving forces for these potentially sharp changes in liability strategy and resulting liquidity problems for the broader financial market.

Recognizing this procyclicality, regulators are moving to address this at banks and, to a limited extent, asset managers. Bank reliance on securitization as a funding channel proved very risky in 2008 when investor MBS demand essentially evaporated.⁴⁷ This meant that banks were suddenly left with on-balance sheet assets they could not fund, creating sudden and sharp liquidity squeezes as well as longer-term solvency problems as contagion risk spread across the wider range of asset-backed securities. Repos and other instruments have also been deemed unduly risky, with new liquidity regulation⁴⁸ sharply curtailing reliance on shadow liabilities in favor of core deposits and other funding sources. The SEC has also sought to reduce MMF reliance on shadow liabilities by requiring liquidity standards since 2010⁴⁹ and, now, pressing for stress tests across the asset-management sector.⁵⁰ As a result, the ability of banks to hold information-insensitive liabilities contributes to financial stability not only as a source of liquidity-risk insulation for the bank but also, when cash deposits are received from institutional customers, as a store of liquid reserves for MMFs or similar institutions.

If banks are unable to accept deposits—as is increasingly the case for custody banks critical to institutional investors—significant incentives may be created that force customers that lack safe-haven depositories to house funds in shadow liabilities. The need for safe-haven depositories was clear during the financial crisis. Hedge funds and broker-dealers reduced their holdings of a major shadow liability—securitized assets—by approximately \$800 billion, while banks and the government (principally the FRB) increased their holdings by \$550 billion and \$350 billion respectively.⁵¹ We here acknowledge a new working paper from Federal Reserve staff which suggests that, due to these liability transfers, bank debt

⁴⁶ Alan Moreira and Alexi Savov, *The Macroeconomics of Shadow Banking* (July 2014), available at http://www.newyorkfed.org/research/conference/2014/wholesalefunding/TheMacroeconomicsofShadowBanking_Moreira.pdf.

⁴⁷ Joe Peek and Eric S. Rosengren, *The Role of Banks in the Transmission of Monetary Policy* (September 9, 2013), available at <http://bostonfed.org/economic/ppdp/2013/ppdp1305.pdf>.

⁴⁸ OCC, FRB, and FDIC, *Liquidity Coverage Ratio: Liquidity Risk Measurement Standards*, 79 FR 61440 (October 10, 2014), available at <http://www.gpo.gov/fdsys/pkg/FR-2014-10-10/pdf/2014-22520.pdf>.

⁴⁹ SEC, *Money Market Fund Reform*, 75 FR 10060 (March 4, 2010), available at <https://www.sec.gov/rules/final/2010/ic-29132fr.pdf>.

⁵⁰ SEC Chair Mary Jo White, *Statement at Open Market Meeting: Modernizing and Enhancing Investment Company and Investment Adviser Reporting* (May 20, 2015), available at <http://www.sec.gov/news/statement/modernizing-investment-company-and-investment-adviser-reporting.html>.

⁵¹ Zhiguo He, In Gu Khang, and Arvind Krishnamurthy, *Balance Sheet Adjustments in the 2008 Crisis* (National Bureau of Economic Research 2010), available at <http://www.nber.org/papers/w15919.pdf>.⁵²

⁵² The paper uses 4Q2007 data as the starting point and 1Q2009 data as the ending point.

issuance and leverage increased in response to this absorptive action in the midst of the crisis, but heightened capital pressure may well mitigate the ability of banks to do so going forward.⁵³

C. Price Distortions

Another consequence of high-quality asset shortages may be price distortions between the markets for secured and unsecured financing. Again, an array of regulatory and structural factors comes into play—yield-chasing is among the market factors that are partly independent of regulatory drivers, although monetary policy (e.g., high-quality asset shortages, prolonged periods of low interest rates) can combine with longevity risk at insurance companies or pension funds to stoke this behavior as these companies look for higher-yielding assets to ensure they can meet long-term claims.

Price distortions resulting from demand stoked by high-quality asset shortages can reduce the price of unsecured funding to the point at which borrowers no longer need to post collateral, leading lenders to either take additional risk with uncollateralized extensions of credit, or terminate basic business activities. As demonstrated in a recent paper from the Committee on the Global Financial System,⁵⁴ these pricing disparities are already evident in repo and related markets. This complicates monetary-policy transmission (see below) and also creates significantly more risk in the financial market. Simply put, lenders with collateral or other security are better protected than those without it, as unsecured lenders must depend on the ability or willingness of a borrower to honor its commitments without backstop power to resort to collateral that reduces loss given default.

VII. Macroeconomic Considerations

In the absence of high-quality assets and bank deposit-taking capacity, procyclical shocks are likely far more quickly to evidence themselves in liquidity shortages with significant potential systemic risk. Further, as recent research has suggested, funding flows into shadow liabilities followed by sudden reversed flows into more traditional funding sources may help to explain the lengthy periods between a shock to financial stability and macroeconomic recovery.⁵⁵

Shadow liabilities of course do not arise in a vacuum. They are used to fund an array of assets, including what might be called shadow assets—that is, securitization positions, loans housed now in asset-management vehicles, and an array of other on and off-balance sheet assets once largely found on bank balance sheets. If banks are subject to liquidity stress, they can post high-quality assets, use cash, or access central-bank liquidity facilities. As a result, supplies of credit supporting macroeconomic activity may not be disrupted absent widespread liquidity shortages that can then be addressed via use of traditional Federal Reserve discount-window lending. Non-banks and other financial entities that lack sufficient liquidity or high-quality assets, and instead rely on shadow liabilities, lack assets they can readily monetize, cash on which they can draw, and access to central banks. Large holders of shadow

⁵³ Francesco Ferrante, *A model of endogenous loan quality and the collapse of the shadow banking system* (March 2015), available at <http://www.federalreserve.gov/econresdata/feds/2015/files/2015021pap.pdf>.

⁵⁴ CGFS, *CGFS Papers No 54: Regulatory change and monetary policy*, (May 30, 2015), available at <http://www.bis.org/publ/cgfs54.pdf>.

⁵⁵ Moreira and Savov, *The Macroeconomics of Shadow Banking* (July 2014), available at http://www.newyorkfed.org/research/conference/2014/wholesalefunding/TheMacroeconomicsofShadowBanking_Moreira.pdf.

assets may also be unable to handle large outflows if the assets they hold for investors are illiquid or otherwise complex, and redemption demand outstrips liquid-asset supply. Given the size of institutional investors, shocks to them can be quickly transmitted to the financial system, leading banks to husband their own resources to protect themselves, and precipitating the type of “liquidity freeze” experienced in 2008 with calamitous systemic effect.

New rules may also sharply constrain the ability of banks—especially the very largest ones—to cushion financial stability. As noted above, severe penalties may apply if banks fall below required capital and liquidity ratios, or otherwise breach risk thresholds.

Reflecting all of these developments, central banks are contemplating expanding their lender-of-last-resort (LOLR) role into a “market-maker of last resort” (MMLR) one. In the U.S., various FRB officials have contemplated an MMLR role. For example, President of the Federal Reserve Bank of New York William Dudley has suggested that if regulators cannot constrain liquidity risk at asset managers, then the FRB should take on the market-maker of last resort role.⁵⁶ Mr. Dudley importantly notes that it would take a new law for the FRB to become an MMLR facility and, should this be authorized, a prudential quid-pro-quo should be imposed to prevent moral hazard.

The Bank of England has already announced it is “open for business” as an MMLR, making it clear that emergency liquidity support will not be restricted to banks, as has been the case for centuries.⁵⁷ The Bank of England has far more sweeping prudential powers than the Federal Reserve, thus likely reconciling it to this arrangement. However, even in the absence of these regulatory powers, fears about liquidity crises originating in the non-bank sector have grown to the point at which a senior International Monetary Fund (IMF) official has recommended that MMLRs be established at all central banks in major markets.⁵⁸

While MMLR backstops can reduce systemic risk—especially if regulatory arbitrage and moral hazard are addressed via prudential or resolution protocols—it would nonetheless appear preferable to minimize the need for MMLR facilities by allowing custody banks to play their traditional role as a safety valve for excess cash from institutional investors, and through ample supplies of high-quality liquid assets that can be readily monetized without central-bank or governmental assistance.

VIII. Monetary-Policy Considerations

As the paper from the Federal Reserve Bank of Boston cited above has recognized, financial-stability considerations are now widely understood to be intimately integrated with monetary-policy ones.⁵⁹ Thus, to the extent custody banks cannot play their traditional role, resulting risks could have implications for prospective central-bank actions in the U.S. and other nations.

⁵⁶ Federal Reserve Bank of New York President and CEO William Dudley, *Remarks at the New York Bankers Association 2013 Annual Meeting and Economic Forum: Fixing wholesale funding to build a more stable financial system* (February 1, 2013), available at <http://www.bis.org/review/r130204a.pdf>.

⁵⁷ Mark Carney, *Speech given at the Lord Mayor’s Banquet for Bankers and Merchants of the City of London at the Mansion House, London* (June 10, 2015), available at <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/821.aspx>.

⁵⁸ Huw Jones, *IMF’s Vinals says central banks may have to be “market makers”*, Reuters, June 18, 2015 at <http://www.reuters.com/article/2015/06/18/imf-markets-vinals-idUSL5N0Z43QT20150618>.

⁵⁹ Peek and Rosengren, *Role of Banks*, *op. cit.*

In the wake of the financial crisis, U.S. banks have, as the FRB-Boston paper lays out, held unusually high amounts of excess reserves at the central bank. Flight-to-quality and the other considerations outlined above have led to significant deposit inflows that could not be readily deployed into economically-productive assets. Initially, impediments to doing so came from economic distress that reduced credit demand. This continues in a very slow recovery. The latter of course remains problematic, but growing demand has provided new opportunities for bank intermediation. However, as loan demand recovers, excess reserves have not normalized as one might have expected.

A new challenge to reducing excess-reserve balance is the higher capital and prudential requirements that apply to these assets, especially at the very largest U.S. banks. Excess-reserve balances thus not only remain elevated across the banking system, but also continue to grow at custody banks for the reasons also described above.

The link between high levels of excess reserves and monetary policy is because reserve requirements are the traditional channel through which the FRB's open-market operations transmit monetary policy. If the leverage rules, especially the ESLR, did not apply to very low-risk assets like U.S. Treasuries, banks could be more willing to hold these assets for investment purposes instead of housing large balances in excess reserves. The liquidity rules described above also alter holdings of low-risk, liquid assets and the uses banks may make of them. As the FRB-Boston paper observes, the insensitivity of reserves now has led the Federal Reserve instead to transmit monetary policy through a new, uncertain channel: the national credit market.

New rules have, however, also combined with structural changes to alter the configuration of the credit-market channel, making it an uncertain alternative to the reserve approach. During monetary-policy easing, natural controls against boom-bust cycles once constrained by bank capital requirements can be bypassed by the growing capacity of non-banks to originate and even hold credit products. Recoveries may thus turn all too quickly into booms. Yield-chasing and the other drivers boosting non-bank participation in credit markets could also quickly reverse, leading non-banks to exit credit markets and thus precipitate a bust. Non-banks can do other things with their capital; banks have far fewer options and are thus more stable providers of credit across the boom-bust cycle if pricing and regulatory considerations permit their participation.

The monetary-policy and financial-stability challenges associated with growing non-bank participation are also evident in tightening scenarios because banks can still generate credit through securitization activities, fueling shadow liabilities despite central-bank constraints unless or until non-bank appetite for securitized assets drops. If it drops dramatically—the situation in late 2007—booms quickly morph into busts.

Regulatory drivers may well have made these credit-market trends and, thus, this procyclicality risk, a feature of the post-crisis financial market. Efforts to address this with new “shadow-banking” rules are under way, although with uncertain impact. Over time, the balance between banks and non-banks in the credit-market channel on which the FRB now relies may return. However, until it does, distortions in reserve balances resulting from the large balances of excess reserves cited above force the FRB to rely upon this monetary-policy channel which may or may not normalize as hoped when the FRB begins its exit strategy.

When central banks come better to understand new market mechanics and the role of bank regulations, it may well be possible either to refine traditional monetary-policy transmission channels, or to develop

alternative ones that, to the extent they rely on shadow liabilities, are protected by new rules that limit shadow-liability procyclicality and the resulting need for MMLR backstops. However, no such mechanisms or rules now exist.

As described above, U.S. custody banks are leaving many deposits at the Federal Reserve, resulting in the creation of excess reserves. This is a riskless transaction for the bank and its depositor, but it is now a costly one for the bank due to the ESLR. The traditional alternative to excess reserves—low-risk, low-margin assets—is now more difficult for custody banks because:

- these high-quality, liquid assets are in short supply, as detailed above;
- bond markets are worryingly illiquid; and
- these assets are not only subject to the ESLR, but sometimes also to risk-based charges that raise both capital requirements and the G-SIB surcharge. Obligations issued by the U.S. government-sponsored enterprises carry such a risk-weighted capital requirement, compounding the challenge for custody banks seeking alternative, safe-haven repositories for customer cash deposits.

Artificial flows of funds into sovereign and similar obligations may distort market pricing. As the recent paper from the Committee on Global Financial Stability referenced above has found,⁶⁰ increasing the cost of secured lending (e.g., securities financing) will not only alter price dynamics between secured and unsecured lending, but also blur pricing in ways that create significant noise in the market-pricing mechanics on which monetary policy has long relied. Other research⁶¹ has also found that discontinuities in match-book repos and other secured-transaction pricing may undermine monetary policy.

If custody banks are unable to reject deposit inflows under stress or choose to absorb them, they now are likely to place these funds in excess reserves for the reasons described above. This may be detrimental to the ability of the Federal Reserve to execute monetary policy because its reserve holdings rise still higher and become still more insensitive to open-market operations. If the custody bank is unable to provide this customer safeguard, then funds will either flow into scarce high-quality liquid assets or into shadow assets, making the credit channel still more uncertain.

IX. Fiscal-Policy Considerations

If custody banks are unable to perform their traditional role and absorb cash deposits institutional investors post to handle liquidity risk, the threats to smooth execution of fiscal policy already evident may grow still more worrisome. The IMF's most recent assessment of global financial markets⁶² posited what a senior official called a potential "super-taper tantrum." The Fund attributes this risk to an array of factors—e.g., HFT, reduced market-making, growing fund leverage/complexity, and increased non-

⁶⁰ CGFS, *CGFS Papers No 54: Regulatory change and monetary policy*, 15 (May, 2015), available at <http://www.bis.org/publ/cgfs54.pdf>.

⁶¹ Manmohan Singh, *IMF Working Paper: Collateral and Monetary Policy* (August 2013), available at <http://www.imf.org/external/pubs/ft/wp/2013/wp13186.pdf>.

⁶² IMF, *Global Financial Stability Report: Navigating Monetary Policy Challenges and Managing Risks* (April 2015), available at <http://www.imf.org/external/pubs/ft/gfsr/2015/01/pdf/c1.pdf>.

bank intermediation. As noted, shadow-bank intermediation is in part the result of diminished custody-bank capacity to accept client cash.

The Treasury Department is of course concerned about the impact on fiscal policy of growing fixed-income market illiquidity. It has thus joined with federal regulators to examine recent Treasury-market volatility and identify potential systemic risk.⁶³ The study does not attribute risk directly to regulatory factors, but it does note that standards applicable to banks may play a role in fixed-income market illiquidity and recommends further study of these critical questions. The study makes it very clear that a stable Treasury market is critical not only to global financial markets, but also to the cost of debt issuance to the U.S. taxpayer, noting that:

[S]uperior liquidity is important for a number of reasons: it accrues lower cost of borrowing to Treasury thus benefitting taxpayers, it allows U.S. Treasury securities to act as a reliable interest rate benchmark for a wide range of private market transactions, it provides a reliable means for market participants to transfer interest rate risk on a substantial scale, and it is supportive of the implementation of U.S. monetary policy.⁶⁴

It is noteworthy that the chairman at the Commodity Futures Trading Commission (CFTC) has attributed problems, especially with regard to the transition to clearing houses, in part to the leverage rule and its adverse impact on market liquidity.⁶⁵

Global regulators share this concern, with the Bank of England recently signaling that it is considering change in the U.K. leverage ratio to facilitate clearing and stabilize fiscal policy in that nation.⁶⁶ U.S. regulators have so far expressed reluctance to relax the basic framework of the leverage rules adopted in the final Basel III regulations, but the ESLR is only applicable to U.S. G-SIBs. It could thus be revised without any concern about international assertions of U.S. non-compliance with global standards, especially if the changes pertained only to excess reserves housed at central banks. U.S. regulators considered such an exception for excess reserves in concert with one for other low-risk assets (e.g., Treasury bonds), but decided against doing so on grounds that a perverse incentive for banks to increase debt to fund these assets would result.⁶⁷ This could not occur for excess reserves, however, because low interest rates on them and other constraints would make it extremely unlikely that excess reserves could constitute an asset that custody banks could leverage to fund risky activities.

⁶³ U.S. Treasury Department, FRB, Federal Reserve Bank of New York, SEC, and Commodity Futures Trading Commission (CFTC), *Joint Staff Report: The U.S. Treasury Market on October 15, 2014* (July 13, 2015), available at http://www.treasury.gov/press-center/press-releases/Documents/Joint_Staff_Report_Treasury_10-15-2015.pdf.

⁶⁴ *Id.* at 8.

⁶⁵ Andrew Ackerman, *New Rules on Bank Capital, Swaps Clearing Set to Clash*, Wall Street Journal, February 12, 2015 at <http://www.wsj.com/articles/bank-capital-rule-may-clash-with-effort-on-swaps-safety-1423776442>.

⁶⁶ Huw Jones, *Regulators focus on leverage ratio fallout in derivatives market*, Reuters, June 9, 2015 at <http://www.reuters.com/article/2015/06/09/banks-regulations-derivatives-idUSL5N0YV3RG20150609>.

⁶⁷ OCC, FRB, and FDIC, *Regulatory Capital Rules: Regulatory Capital, Revisions to the Supplementary Leverage Ratio*, 79 FR 57725 (September 26, 2014), available at https://www.fdic.gov/news/board/2014/2014-09-03_notice_dis_c_fr.pdf.

X. Conclusion

An array of market forces, regulatory changes, and geopolitical factors has led many market participants, regulators, and analysts to conclude that financial markets remain vulnerable to significant systemic risk. In its most recent annual report,⁶⁸ FSOC lays this out and notes many of the drivers referenced above as high-risk factors. FSOC does not lay out solutions to any of its risks and most of the studies referenced above also do not do so. This is in part driven by fear that recommending any change to the post-crisis reform framework would be seen as “watering it down,” an accusation that has frequently sparked political firestorms for central banks and regulatory agencies.

However, it is also clear that inaction on regulatory risk drivers may be at least as risky to financial stability, monetary policy, and financial policy as any action large financial institutions might take. Failure to recognize this and make needed regulatory refinements may thus expose financial stability to risk that is perhaps even more systemic since it will arise from sources supervisors have in fact created and even stoked.

This is a truly perverse and unintended consequence of the post-crisis reform framework. Many changes to the framework would indeed water it down, but it does not appear that refining the leverage ratio to exempt riskless assets like excess reserves at central banks could have any such effect. It is, thus, a simple fix with no clear adverse consequences regulators and central banks may wish quickly to consider to ensure that an adequate store of value for the financial system is ready and resilient under stress.

⁶⁸ FSOC, *2015 Annual Report* (May 2015), available at <http://www.treasury.gov/initiatives/fsoc/studies-reports/Documents/2015%20FSOC%20Annual%20Report.pdf>.