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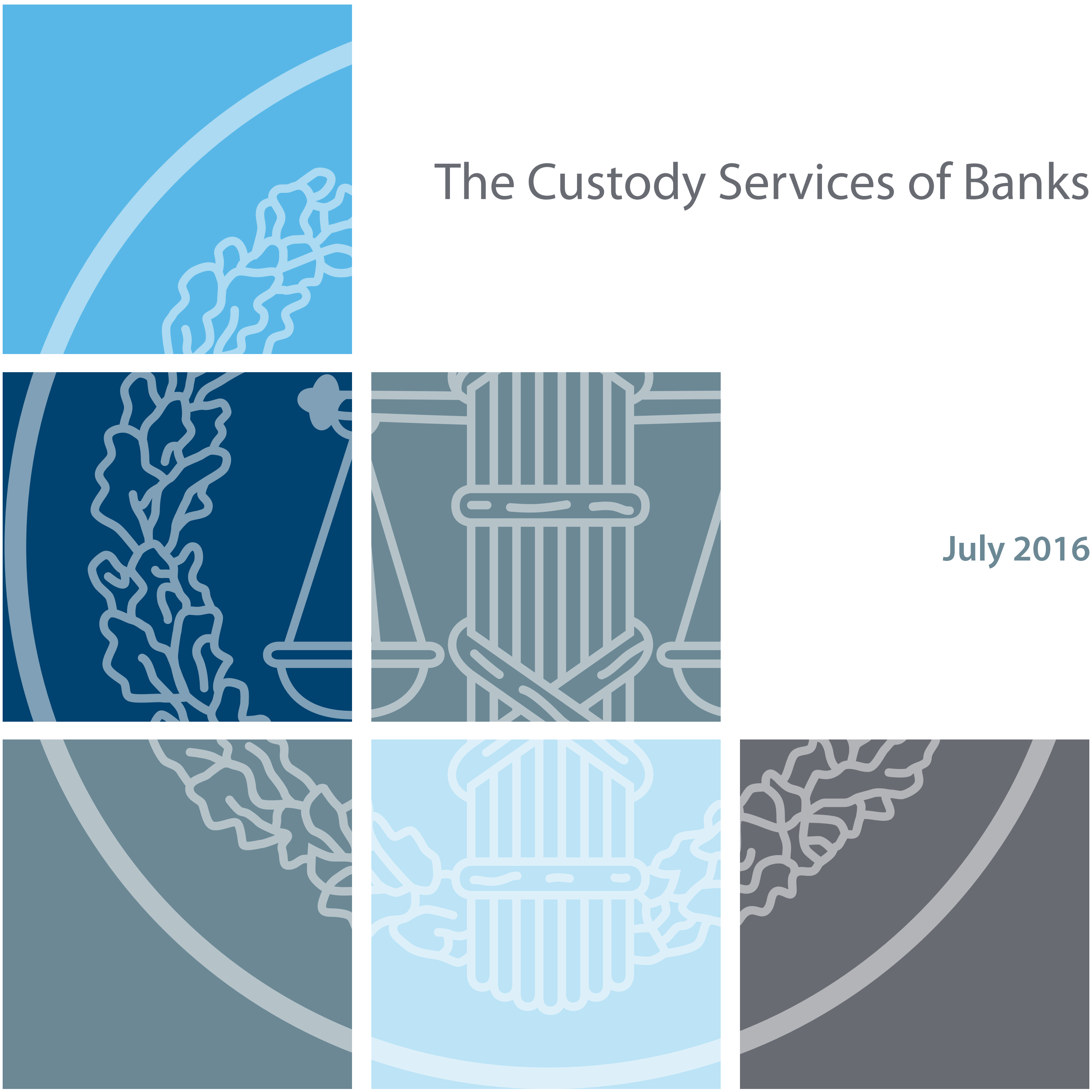

# The Custody Services of Banks

July 2016

# Preface

This white paper seeks to (i) describe the services provided by U.S.-based banking organizations with regard to the provision of custody and related services on a global scale; (ii) distinguish the services provided by custodians from the services provided by other entities in the multi-tiered system for safekeeping, clearing and settling securities; (iii) describe how the balance sheets and risk profiles of custody businesses differ from those of other banking activities; and (iv) clarify certain misconceptions regarding the risks presented by the custody and related services.

As international and national regulatory bodies continue to increase their focus on macroprudential supervision, The Clearing House believes that it is important to ensure that all supervisory policies, tools and regulatory frameworks, including those that apply to custody businesses and the institutions that engage in them, appropriately reflect the particular risks they are intended to address. This paper does not seek to prescribe any particular regulatory framework for custody businesses or the institutions that engage in them, but is rather intended to provide lawmakers, regulators, and the public a comprehensive look at the activities and risks of the custody services provided by banks, with a view to informing future decisions about the manner in which these institutions are regulated.

This paper is one in a continuing series of Clearing House research reports and working papers focused on financial institutions and regulation, and in particular, the role of large banks in the financial system and the costs and benefits of regulating such banks.[1] It was prepared with the assistance of The Clearing House's special counsel, Davis Polk & Wardwell LLP.

# Executive Summary

An investor—whether a retail investor, an employee pension fund, a mutual fund or any other kind of institutional investor—who invests in a financial asset such as an equity or debt security needs someone to hold and safekeep the asset on its behalf; receive on its behalf any dividends or interest payments made by the company that issued the security; alert the investor of any votes or other actions the investor needs to take with respect to the security (such as responding to an offer by the issuer to exchange the security for another security); and, if the investor wishes to sell the security or purchase another security, process the transaction on the investor's behalf. Custodians provide all of these custody services to investors by contracting with the investor either directly or with an agent of the investor, such as an investment manager. In short, a custodian provides custody and related services to investors—broadly characterized as the safekeeping and servicing of an investor's assets—and in this respect plays a critical role in helping investors to build and maintain wealth.

Bank-chartered custodians[2*] provide asset safekeeping and other related custody services to large institutional investors, including asset owners, asset managers, and official institutions, as well as private wealth clients. In the United States, some providers offer custody services on a global scale, as well as asset management, wealth management, and other securities processing services such as brokerage and corporate trust, but do not have a significant commercial banking business.[3†] Other providers offer some or all of these services in addition to a broader traditional commercial or investment banking business.

This paper explains the nature and risks of the custody services provided by U.S. banks and considers the role of the custodian in the financial system, including the extent to which their activities are similar to or different from those of other entities involved in the multi-tiered framework for holding, servicing, and settling transactions in client securities.

## PROVISION OF CUSTODY SERVICES

Custody services involve the holding and servicing of assets on behalf of others. To facilitate the provision of these services, custodians operate securities accounts and cash accounts for their clients. Securities accounts are used to record and safekeep investments in securities made by clients, while cash accounts reflect clients' cash holdings, often in multiple currencies, which are placed on deposit with a bank that provides custody services. Custodian's safekeep and segregate clients' investment assets, or the investment assets of their clients' own clients, and provide a broad range of related financial services. Custodians, in turn, are members of, or have relationships with local institutions that are

* Other market participants, such as broker-dealers, can also provide custodial services, but this paper focuses solely on the services provided by bank-chartered custodians.

† The Bank of New York Mellon ("BNY Mellon"), Northern Trust Corporation ("Northern Trust"), and State Street Corporation ("State Street") are prime examples of such providers, and information about the business of these entities is included in various places in this white paper for illustrative purposes.

members of, central securities depositories ("CSDs") or international central securities depositories ("ICSDs"), which are financial market utilities ("FMUs") that hold securities that are either immobilized or in uncertificated (dematerialized) form, enabling ownership changes to be tracked and recorded through "book-entry settlement" rather than through the transfer of physical certificates. CSDs and ICSDs serve as the official registrar of the issuers of corporate securities by maintaining the lists of the owners of securities on behalf of the issuers, while custodians, through their relationships with CSDs and ICSDs, report and track ownership changes in securities holdings on behalf of their clients. Although some custody services could be provided by non-banks, clients generally prefer to use banking entities that can provide traditional banking services, cash deposit accounts and access to payment systems and that are subject to robust prudential regulation and oversight.

Custodians also offer various administrative services related to clients' assets, including the processing of income and interest payments, corporate action processing, proxy voting, client reporting, depository receipts services, transfer agency services and facilitating client subscriptions and redemptions of fund shares, and fund administration and accounting services. In addition, custodians provide clients with ancillary services related to core custody activities, including agency securities lending and foreign exchange services.[4‡]

‡ This paper focuses on the custody and related services offered by custodians and does not discuss other business lines in which they may engage. For example, this paper will not address analytics, asset management, brokerage, corporate trust, transition management, treasury management, tri-party repo, or wealth management business lines in which custodians may engage.

## THE ROLE OF CUSTODIANS

The provision of custody and other asset services by custodians, facilitates client access to and participation in global financial markets, including interactions with other market participants. In this regard, these services are critical to the functioning of financial markets, and, in fact, the use of these custody services is often required by law or regulation in order to protect investors from potential misappropriation of their assets by funds and other vehicles in which they have invested.[5] The activities of custodians help to link investors to issuers of securities and thereby facilitate the infrastructure investment and physical capital formation necessary for economic growth and the accumulation of retirement and other long-term savings. However, while the services provided by custodians are critical to the functioning of the global financial system, it is important to recognize that these services represent just one tier in the multi-tiered system for safekeeping, clearing and settling securities. As discussed further herein, custodians help facilitate client access to other tiers within the global financial system, such as central counterparties ("CCPs"), CSDs, ICSDs, payment systems, and national central banks (in their role as operators of payment systems or settlement systems), without which clients could not conduct transactions across global financial markets.[6] For example, when a client engages in the purchase or sale of a security, a custodian facilitates the delivery or receipt of the security and the related cash consideration at the direction of the client. As noted above, it is the CSDs and ICSDs that hold the immobilized global certificates representing issuances of securities or whose electronic book entries represent issuances of dematerialized or uncertificated securities, and consequently it is the relevant CSD or ICSD that ultimately settles the transaction on its books. The role of a custodian in settling client securities transactions is typically a post-trade role. After the execution of the trade and notification of the custodian by the client, the custodian will transmit the purchase or sale settlement instructions directly or indirectly (if through a sub-custodian) to the relevant CSD or ICSD, which will effect the settlement and credit or debit the custodian's account (or a sub-custodian's account) the cash or securities, as applicable. Certain custodians operate global custody networks that include local sub-custodians and cash correspondent banks, thereby enabling their clients to efficiently access the global securities markets and payment systems through a single service provider.

Although custodians facilitate transactions involving client assets, they do not make markets in or underwrite the issuance of the assets they service. Trading activities in which custodians engage are ancillary to their core custody function and are specifically focused on assisting clients in the management of their investment assets. In providing custody services, custodians act solely on instructions from their clients and do not exercise any discretion over the use or reuse of client assets under custody, or use them for proprietary purposes. In this regard, the role of a custodian is different from that of an asset manager, which typically has discretion over investments made with, and the use and reuse of, client assets under its management.[7] The term "assets under custody" (or "AUC") is frequently used to refer to the value of client assets held by a custodian, for which the custodian provides safekeeping services and assumes recordkeeping, segregation, reconciliation and monitoring responsibilities. The term "AUC" is intended to distinguish a custodian's pure agency role in holding and servicing those assets from an asset manager's active decision-making role over the assets it manages, referred to as "assets under management" (or "AUM").

Although custodians may have separate commercial or consumer lending relationships with certain custody clients, such lending relationships do not generally extend to the financing of clients' custodied investment positions through loans or long-dated credit facilities. In general, the only lending custodians engage in as principal as part of their custody services business involves the provision of short-term credit (generally intraday or overnight) to facilitate efficient settlement across different payment and settlement systems and time zones, cover overdrafts, facilitate client redemptions, enable the payment of management fees and other expenses, and allow their clients to manage liquidity. This lending is provided in connection with the processing of client securities or payment transactions.

As discussed further below, custodians, like all banks, face credit, market, liquidity, and operational risk. In light of the agency nature of the custody and related activities in which custodians engage, however, the extent to which those risks are presented often differ in scale from those presented by other banking activities.

## COMPETITION IN THE CUSTODY SERVICE INDUSTRY

The market for custody services is highly competitive and includes banks that provide custody services (in addition to other banking services) on a global or regional scale, local custodians, and—with respect to some custody services—ICSDs and CSDs. As of December 31, 2014, there were seventeen banks with assets under custody in excess of $1 trillion. There is a sharp price competition in the global market for custody services, which may reflect the fact that these custodians' clients, including large institutional asset managers and other sophisticated institutional investors, have a high degree of bargaining power as a result of the number of custody service providers in the market and these clients' ability to maintain different custody relationships for different asset classes or investment portfolios.

## FINANCIAL PROFILE OF CUSTODY BUSINESSES

Custody-related revenues are primarily driven by fees collected for services rather than by the use of their balance sheets to take principal risk. In general, these balance sheets are liability-driven, with deposits largely consisting of cash held by their institutional investor clients. Custodians reinvest client cash deposits in broadly diversified and prudently managed portfolios of investment assets; consequently, net interest income is also an important component of revenues. Because they hold large volumes of client-provided liquidity, custodians generally do not rely on significant interbank borrowings or wholesale funding for liquidity purposes.

The cash balances held in custodians' client accounts that are used to support custodial and other operational activities, result from day-to-day transactional activities, such as securities purchases or sales, dividends and interest payments, corporate action events and client subscriptions and redemptions. In addition, custodians hold cash deposit balances maintained by clients to address anticipated and unanticipated funding needs stemming from various operational considerations, such as failed securities transactions, the nonreceipt of payments and timing differences in the movement of cash.[8] As a result, the size of the balance sheet of a custody business is primarily driven by client investment and transactional activity, over which custodians have little direct means of control. While operational deposits are generally stable over time, there may also be short-term "excess" or temporary deposits related to a custody business that flow onto custodians' balance sheets during periods of financial market stress. As clients reassess their view of financial markets and appropriate levels of risk during such times, they may place cash on deposit with custodians, typically after disposing of market assets in favor of cash. This can result in substantial short-term fluctuations in the size of custodians' balance sheets.

The asset side of a bank-chartered custodian's balance sheet is typically invested in a diversified portfolio of high-quality, liquid fixed-income securities, such as government and agency and asset-backed securities. These proprietary securities portfolios are generally held either for investment purposes or to secure extensions of credit related to custodians' securities settlement activities. Client securities are never reflected on a custodian's balance sheet because the institution is not the beneficial owner of its clients' securities and does not bear the credit or market risk relating to those securities. By the same token, because custodians do not own their clients' securities, clients do not have any credit exposure to custodians arising from their safekeeping of the clients' securities.

Custodians do not tend to engage in significant maturity transformation activities (i.e., they typically do not accept demand deposits and use them to fund long-dated loans), and the primary lending activity that custodians conduct as principal involves the provision of short-term credit (generally intraday or overnight in connection with the provision of custody services) to facilitate efficient settlement across different payment and settlement systems and other related operational needs. Thus, the balance sheet associated with a custody business does not inherently present a significant duration or liquidity mismatch. Additionally, the only credit exposure that clients have to custodians related to the provision of custody services is with respect to their cash deposits.[9]

## RISK PROFILE OF CUSTODY BUSINESSES

Assets held in custody by a bank-chartered custodian are not the bank's assets. Consequently, the failure of a custodian would not result in the potential loss of the underlying securities. Although there could be delays while clients move the safekeeping of their investment assets to an alternative provider of custody services (or a bridge entity in the event of insolvency), the beneficial owner's ownership interest in the underlying securities would be unaffected.

Operational risk is particularly relevant to custodians because the provision of custody services is largely dependent on the successful execution of large volumes of operational and administrative tasks and processes that require sophisticated systems to manage. Custodians undoubtedly bear and present operational risks, particularly relating to errors in processing transactions and the loss or corruption of client data. These risks are primarily a function of the quality and capacity of a custodian's operational systems, technology, controls and, of course, employees, but they are not directly a function of the size or composition of a custodian's balance sheet, although, by definition, the larger the volume of custody services provided, the greater the volume of potential losses due to operational risk for which a custodian could be held liable. Furthermore, this risk is not unlike that of any other large data provider, such as a payroll or software administrator.

In their provision of custody services, custodians are exposed to credit risk when they (i) extend intraday and overnight credit to their clients to facilitate the settlement of securities transactions and short-term credit facilities to investment funds, and (ii) agree to indemnify their custody clients that lend securities in securities lending programs through custodians against certain losses. However, the extent to which custodians are exposed to credit risk from such activities is generally limited. Credit risk from extensions of intraday and overnight credit is generally limited because of legal and/or contractual lien, set-off or other rights custodians have to secure repayment of such advances. Further, exposures from both extensions of intraday and overnight credit and securities lending indemnification obligations are very short-term in nature, allowing custodians to curtail their lending activities and rapidly reduce their credit exposure in response to the deteriorating financial condition and creditworthiness of any client or securities lending counterparty.

Custodians are also exposed to market risk related to their portfolios of investment securities, their broader asset-and-liability management practices, and their foreign exchange positions (i.e., FX trades for which custodians' FX desks act as principal). However, securities positions associated with the balance sheet of a custody business consist primarily of highly liquid U.S. government and agency securities, foreign sovereign debt, and asset-backed securities that demonstrate low levels of volatility and market risk. Similarly, the FX business associated with the custody business relates primarily to transactions to support trade settlement and asset servicing and do not typically lead to large proprietary FX trading positions. Further, custodians seek to hedge their FX exposures through the use of FX swaps and futures.

In addition, custodians are exposed to liquidity risk, including from the possible failure to effectively manage intraday liquidity related to mismatches in timing between clearing and settlement activities, and payments to or on behalf of clients. Custodians manage this risk on an intraday basis by actively managing available cash and collateral positions at FMUs and other service providers. Custodians manage this risk overall by maintaining highly liquid assets, including cash, cash equivalents, and U.S. government and agency securities (including mortgage-backed securities). Custodians also have access to markets and funding sources that are limited to banks, such as the federal funds market and the Federal Reserve's discount window.

While the types of risks associated with custody businesses do not differ from those associated with other banking activities, the exposure to each type of risk does differ in scale. Consequently, in assessing the application of macroprudential and other supervisory policies, tools and regulatory frameworks to custody businesses and the institutions that engage in them, The Clearing House believes that international and national regulatory bodies should ensure that such application appropriately reflects the particular risk profile of these businesses and institutions.

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This white paper addresses these issues in more detail, and is structured as follows: Section I of this paper discusses the services provided by custodians and distinguishes the services provided by custodians from the services provided by other entities in the multi-tiered system for safekeeping, clearing and settling securities. Section II of this paper describes how the balance sheet and risk profile associated with a custody business differs from those of other banking activities and seeks to clarify certain misconceptions regarding the risks presented by custody services.

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# Introduction

An investor—whether a retail investor, an employee pension fund, a mutual fund or any other kind of institutional investor—who invests in a financial asset such as an equity or debt security needs someone to hold and safekeep the asset on its behalf, receive on its behalf any dividends or interest payments made by the company that issued the security, alert the investor as to any votes or other actions the investor needs to take with respect to the security (such as responding to an offer by the issuer to exchange the security for another security), and, if the investor wishes to sell the security or purchase another security, process the transaction on the investor's behalf. Custodians provide all of these custody services to investors by contracting with the investor directly or with an agent of the investor, such as an investment manager. In short, a custodian provides custody and related services to investors—broadly characterized as the safekeeping and servicing of an investor's assets—and in this respect plays a critical role in helping investors to build and maintain wealth.

At the most basic level, custody services provided by banks involve holding assets on behalf of others, a function that banks have historically provided to safeguard clients' assets, including the physical securities certificates once commonly issued to investors representing the investors' ownership interest in the issuer. While this function may appear straightforward on its face, as the securities markets have grown exponentially in size and sophistication, and in light of technological innovations that have largely eliminated the need for the issuance of individual paper securities certificates, the custody services provided by banks have become increasingly complex and represent an indispensable part of the multi-tiered financial market system for holding securities and clearing and settling transactions, without which the securities markets could not function.

Bank-chartered custodians[10] provide asset safekeeping and other related custody services to large institutional investors, including asset owners, asset managers, and official institutions, as well as private wealth clients. In the United States, some providers offer custody services on a global scale, as well as asset management, wealth management, and other securities processing services such as brokerage and corporate trust, but do not have a significant commercial banking business.[11§] Other providers offer some or all of these services in addition to a broader traditional commercial or investment banking business.

The Clearing House is publishing this white paper to foster a better understanding of custody activities. Section I of this paper discusses the services provided by custodians and distinguishes the services provided by custodians from the services provided by other entities in the multi-tiered system

§ As previously mentioned, the Bank of New York Mellon ("BNY Mellon"), Northern Trust Corporation ("Northern Trust"), and State Street Corporation ("State Street") are prime examples of these, and information about the business of these entities is included in various places in this white paper for illustrative purposes.

for safekeeping assets and clearing and settling transactions. Section II of this paper describes how the balance sheet and risk profile associated with the custody business differs from those of other banking activities and seeks to clarify certain misconceptions regarding the risks presented by custody services.

# I. Custodians and Their Custody Services

Custodians deliver custody services primarily to institutional investor clients, including U.S. mutual funds and their non-U.S. equivalents, corporate and public retirement plans, sovereign wealth funds, central banks, alternative investment funds, insurance company general and separate accounts, charitable foundations and endowments, and personal and family trusts. Custodians maintain and operate integrated global custody networks that enable them to offer their clients access to the global financial system in up to roughly 100 countries. The value of the assets under custody is not necessarily directly correlated to the size of the balance sheet of the custodian that is attributable to the custody business, except to the extent that those assets consist of cash held as deposits with the custodian. For example, measured by assets under custody ("AUC") as of December 31, 2014, BNY Mellon, Northern Trust, and State Street safe-kept over $52.3 trillion of their clients' assets.[12] The amount of assets as of the same date on their own balance sheets, however, ranges from $110 to $385 billion, which places all three institutions outside of the top 70 largest global banking institutions by asset size.[13]

## A. CUSTODY SERVICES

The starting point for any discussion of the services and activities of custodians is to describe what is meant by the term "custody services." As applied to securities, the term originally referred to the safekeeping by a bank in its vault of the paper certificates representing the individual shares or principal amounts owned by the banks' clients. The settlement of clients' trades in securities was effected by the transfer of the paper certificates from the custodian used by the seller to the custodian used by the buyer. This is no longer the case.

With the development of International Central Securities Depositories ("ICSDs") and Central Securities Depositories ("CSDs"), securities are generally not represented by individual paper certificates anymore, but either by a single global certificate representing the entire issuance or by an electronic book-entry.[14] The result is that a bank providing custody services no longer holds individual paper certificates representing the securities owned by clients. Instead, such a bank holds—and thus "safekeeps"—an electronic book-entry notation in the client's securities account representing the relevant number of shares or principal amount of bonds that the bank holds for its client(s) directly or indirectly through a CSD or an ICSD. As part of this modern safekeeping function, custodians are able to confirm that their holdings at the CSD or ICSD are equivalent to the amount of securities owned by their clients at all times.[15] To settle transactions in securities for its clients, a bank sends instructions directly (or indirectly through a sub-custodian in the relevant market) to the relevant CSD or ICSD, which then effects the settlement on its books.

As discussed in greater detail below, custody services generally can be classified into three main categories:

» Core custody services;

» Ancillary services; and

» Other administrative services.

## 1. Core Custody Services

While custodians today offer a wide breadth of services to their clients, the cornerstone of their custody servicing activities are:

» safekeeping and record-keeping services;

» asset servicing;

» transaction processing and settlement; and

» banking services.

For purposes of this white paper, we refer to these services as the "core custody services" and describe each in greater detail below.

At its most basic level, the provision of core custody services requires the simultaneous operation of two separate but related types of client accounts: one that holds securities and another that holds cash. The securities accounts, which are used for safekeeping client assets, include not only traditional equity and debt securities, but also shares and other ownership interests in mutual funds and other funds, asset-backed securities, alternative investments, and commodities. These investments are held under custody for, and beneficially owned by, the custodian's clients (or its clients' customers). Since clients retain their property rights in the assets credited to securities accounts held with securities intermediaries such as custodians (provided that such assets are properly segregated from custodians' proprietary assets),[16] these investments are not reflected on a custodian's balance sheet. The corresponding cash accounts reflect clients' deposits to manage their investments and may include holdings in multiple currencies. Unlike clients' securities holdings, cash credited to client cash accounts is typically reflected on the balance sheet of a custodian as a deposit liability, just as with any normal bank deposit, because it represents a contractual claim to the payment of the cash balance (plus any accrued interest) from the bank.

### a. Safekeeping and Record-Keeping Services

Custodians are first and foremost responsible for safekeeping the assets in their clients' securities accounts. While the safekeeping of securities has evolved beyond the safeguarding of paper certificates, custodians continue to carry out safekeeping responsibilities, primarily by:

- properly recording the number or principal amount of securities deposited by their clients;
- reconciling the securities holdings of clients with the custodian's accounts with a CSD or an ICSD[17] or with a sub-custodian[18] to confirm that the correct number of securities is held for the client and can be delivered pursuant to the client's instructions; and
- segregating client securities from the custodian's own proprietary assets.

This process will be further explained in Section I.B.2 below.

As part of their safekeeping activities, custodians also provide their clients with reports about their cash and securities holdings and transactional activities, which can be tailored or customized for specific client purposes, including for monitoring the financial performance of securities and other assets.

### b. Asset Servicing

Because securities held by a client with a custodian are, in almost all cases, held by the custodian in a securities account provided by the next entity in the multi-tiered custody chain (CSD, ICSD, or sub-custodian), the client is very often not able to exercise its rights or perform its obligations with respect to the securities without the administrative support of the custodian. As a result, custodians offer asset administration services to their clients, such as income and tax processing, corporate action processing, collateral processing, securities valuation, and reporting services.

- **Income and tax processing services** include collecting income and dividend payments on securities often on a contractual basis on behalf of clients.[19] Custodians also assist their clients in processing withholding tax claims, which arise from payments of interest and dividends on securities, in accordance with applicable tax treaties.
- **Corporate action processing services** include notifying clients of forthcoming corporate actions affecting securities held, such as exchange offers, mergers and acquisitions, rights offerings, and regular and extraordinary meetings of the securities holders at which various matters may be put to a vote of the holders. In this connection, custodians offer proxy voting services, which include delivering proxy notifications and agendas to their clients for their review and action. Clients may then send the custodian voting instructions for onward transmission to the issuer or its agent.
- **Securities valuation services** include the collection and reporting to clients of securities pricing data produced by third-party sources and related administrative ser-

vices in support of the valuation of client securities.

» **Reporting services** include providing clients with reports on their account holdings, recent transactions, and material events, including income collections.

### c. Transaction Processing and Settlement

When a client engages in the purchase or sale of a security (using a broker-dealer and market execution mechanisms), a custodian facilitates the delivery or receipt of the security and the related cash consideration at the direction of the client. As noted above, it is the CSDs and ICSDs that hold the immobilized global certificates representing issuances of securities or whose electronic book entries represent issuances of dematerialized or uncertificated securities, and consequently it is the relevant CSD or ICSD that ultimately settles the transaction on its books. The role of a custodian in settling client securities transactions is typically a post-trade role. After the execution of the trade by the client or its investment manager through its broker-dealer and notification of the custodian by the client or investment manager, the custodian will transmit the purchase or sale settlement instructions directly or indirectly (if through a sub-custodian) to the relevant CSD or ICSD, which will effect the settlement and credit or debit the custodian's account (or a sub-custodian's account) the cash or securities, as applicable. The settlement process is explained in greater detail in Section I.B.2 below.

### d. Banking Services

Banking services provided by custodians relate primarily to the processing of payments and other transactions that result from client investment activities. The acceptance of cash deposits is, of course, in and of itself a banking service. In connection with the provision of custody services, the primary purpose of a client's cash account is to accommodate the investment activity of clients, including the purchase of assets that will be credited to the client's securities account and to receive the proceeds of sales of client assets and cash distributions on client assets held under custody. As noted previously, although in some cases custodians have a business model under which they do not offer certain other services, such as retail, commercial and investment banking services, the custody-related banking activities provided by such banks are the same as those provided by other banks.

Because of timing differences between the processing of securities transactions in a local securities market and a client's location, the high volume of securities trades a client may execute and simple operational errors, it is not always possible for clients to ensure that their cash account with a custodian has sufficient funds to settle all the purchases of securities that the client has instructed the custodian to process. As a result, absent credit concerns with the given client, a custodian will typically advance any shortfall in funds (i.e., effectively an overdraft) necessary to process the purchases for the short time needed for the client to transmit additional funds to the custodian. These cash advances are extensions of credit and, in the vast majority of cases, are outstanding for less than a day (i.e., intraday credit extensions) or less than two days (i.e., overnight credit extensions). They are provided on a short-term basis and typically secured by a security interest in the equivalent value of assets held in the client's securities account. This banking service is thus closely linked to a custodian's provision of safekeeping and securities settlement services.

A custodian typically also provides cash management services, such as end-of-day balance reporting and sweep arrangements and short-term investment products, which allow for client cash balances to be reinvested in securities, including interests in money market funds or other investment vehicles. In this regard, the securities in which the client's cash is invested become part of the securities held in custody for clients for as long as the cash is reinvested.

## 2. Ancillary Services

In addition to their core custody services, custodians also offer other financial services that are ancillary to the custody function, including agency securities lending and foreign exchange services. Although a wide range of providers offer these ancillary services, the business model of custodians positions them well to offer such services to their custody clients.

### a. Agency Securities Lending Services

Custodians' clients hold large pools of liquid debt and equity securities in their securities account. In response to client demand for a way to enhance the yield on their investment assets, custodians have developed agency services that enable clients to lend these securities to other market participants. These securities lending programs have become a valuable source of additional yield for institutional investors.

To facilitate securities lending transactions, a custodian first matches clients interested in lending securities with prospective borrowers approved by the lending client. The custodian then enters into industry-standard or bespoke securities lending agreements, typically as agent for the lending client. Insurance companies and pension funds are among the major lenders of securities, while broker-dealers, hedge funds, and other financial institutions are frequently securities borrowers. Securities lending transactions are secured transactions, with the borrowers fully collateralizing their obligation to return the borrowed securities with other securities or cash. The role of the custodian is to effect the loan of securities against the collateral and to monitor the value of the lent securities against the value of the collateral received and verify that additional collateral is posted (in the event of a shortfall in the value of the collateral) by the borrower or excess collateral is released (in the event of an excess in the value of the collateral) by the lender over the life of the transaction. At the direction of its securities lending client, a custodian will also typically act as agent in reinvesting the cash collateral posted by a securities borrower.

Because securities lending clients rely on agents, such as custodians, to perform due diligence and manage credit risk in relation to the securities borrowers that the lender approves, a custodian typically agrees to indemnify the lender by replacing lent securities in the case of a borrower default. The principal credit risk that a custodian takes in operating an agency securities lending program is in providing such an indemnity. Although important to the overall structure of the market, the risk presented by a client indemnification is quite limited, with custodians having rarely experienced more than de minimis securities lending–related losses due to borrower default.

### b. Foreign Exchange Services

Custodians' clients typically invest in securities from many countries and, therefore, require custodians to provide services related to both their securities and cash accounts on an international basis. Where necessary, custodians have cash correspondent relationships with banks in the country of the investment and thus can process transactions and make and receive payments in the various local currencies. Custodians are thus able to support clients in holding cash deposits and settling securities transactions in multiple currencies. As a natural outgrowth of their access to the local currencies of the securities markets they serve, and in response to client demand, custodians offer their clients a variety of foreign exchange products and services, including execution of FX spot and forward transactions and currency options. Custodians may also act as market makers in certain currencies, providing further liquidity in those currencies.

By providing these foreign exchange services, custodians allow their clients to engage seamlessly in securities transactions in a variety of currencies. To the extent that clients regularly anticipate having to convert currencies, the foreign exchange products offered by custodians provide them with convenient and attractive ways to lock in particular exchange rates for a period of time and hedge their risks against exchange rate volatility.

## 3. Other Administrative Services

Custodians have expanded beyond the provision of core custody and ancillary services to offer a relatively standard set of custody-related administrative services. These administrative services are a logical outgrowth of, and complementary to, custodians' operation of their clients' securities and cash accounts, allowing custodians to capitalize on their knowledge of clients' investment businesses and their own operational expertise and capacity in asset administration and transaction processing. Custodians are able to provide these services on a cost-effective basis, especially compared to the cost for clients to develop and maintain their own internal capabilities, in part because custodians are able to achieve economies of scale.

Administrative services offered by custodians to clients typically include fund accounting and administration services, transfer agency services, and outsourcing services. These services are provided to a variety of investment funds, including mutual funds, pension funds, private equity and hedge funds, and other collective investment vehicles.

### a. Fund Accounting and Administrative Services

Fund accounting and administration services include the generation and calculation of a fund's net asset value ("NAV"). This involves reporting the value of assets held in a client account, as well as fund expenses, and then communicating the NAV to the fund manager, transfer agent, any exchange on which the fund is traded, and other recipients. Fund administration services also include tax and compliance reporting[20] and the preparation and dissemination of financial and other reports to fund investors.

### b. Transfer Agency Services

Transfer agency services generally consist of acting as the registrar of a fund, processing and recording subscriptions to and redemptions of fund shares by investors, interacting with the fund's custodian (which will often be the custodian itself) to make related payments to and from the fund's cash account, and acting as a reporting agent to a fund's shareholders, distribution agents and regulatory authorities.

### c. Collateral processing services

Custodians also provide services to support collateralized transactions (such as repurchase and reverse repurchase transactions, securities lending and borrowing, and collateralized derivatives transactions) in which clients may engage bilaterally as principals. Such services include verifying the amount of the relevant credit exposure, calculating initial and variation margin requirements and executing margin calls.

### d. Outsourcing Services

Outsourcing services generally consist of the performance by custodians of activities under a long-term contract that have historically been conducted by a fund's or other custody client's own middle or back office functions. These activities include transaction management, cash management, record-keeping and accounting, data management, reconciliation and performance measurement and analysis.

## B. THE ROLE OF CUSTODIANS IN THE FINANCIAL SYSTEM

In order to better understand the significance of the custody services provided by a custodian, it is important to understand the multi-tiered chain of intermediation that connects investors to the financial market utilities ("FMUs")[21] that ultimately clear and settle the investors' payments and securities transactions. The primary role of a custodian in providing custody services is to act as an intermediary between, on the one hand, the client that either invests in securities and other investment assets on a proprietary basis (i.e., the beneficial owners of the securities), or manages or holds securities and other investment assets on behalf of the beneficial owners, and, on the other hand, the FMUs that provide the necessary financial market infrastructure to clear and settle transactions in, and act as the ultimate holders of, the investment assets.[22¶] In its role as such an intermediary, a custodian may access FMUs through its own direct membership or indirectly, through the memberships and services of other

¶ Of course, many U.S. custodians have an investment management business that provides investment advisory and investment management services, but in each case that is a separate and distinct line of business from its custody business. As noted above, this white paper focuses exclusively on custody businesses.

intermediaries such as local custodians, which we refer to in this paper as "sub-custodians."

The decisions to purchase or sell investment securities or other assets, or whether and how to exercise voting or other rights with respect to the securities (such as whether to exercise options or rights to convert securities into other securities), are made by custodians' clients. In providing custody services, the custodian acts on and follows its client's instructions and does not make any investment decisions or exercise any investment discretion on its client's behalf.

## 1. Custodians' Clients

In order to operate across such a large number of foreign markets in which clients invest their assets, custodians may establish contractual relationships with local sub-custodian banks, rather than establish a physical presence in each market. Whether achieved through organizational expansion or by establishing a network of local sub-custodians, the geographical reach of large U.S. custodians uniquely positions them to serve investors with large and diversified international portfolios.

Custody clients consist primarily of institutional investors, high-net-worth individuals, and individual or family trusts. Institutional investor clients include U.S. mutual funds and foreign public funds, corporate and public retirement plans, asset management companies, U.S. registered investment advisers and foreign investment advisors, private equity funds, alternative investment funds, hedge funds, insurance companies, corporations, endowments and foundations, sovereign wealth funds, other banks, and national central banks.

Institutional investors use the services of custodians for many reasons. First, because of the breadth of services custodians offer, clients are able to work with one service provider that can meet all of their custody needs. This saves clients the cost and burden of in-house staffing and resource development, and provides the benefits of a centralized, highly integrated service delivery model. As the financial markets have globalized and as trading instruments have grown increasingly complex, custodians have expanded their offerings to meet the diverse needs of their large investor client base. Because custodians operate globally, providing their services in more than 100 countries, they are able to benefit from significant economies of scale and provide their services to clients at favorable prices. Finally, many clients prefer to use a custodian rather than a non-bank custodian or FMU because custodians provide clients with traditional secure banking services, cash deposit accounts, and access to payment systems and are subject to a robust prudential framework and oversight (including compliance with the Basel III regulatory capital requirements).

Certain institutional investors are required by law or regulation to rely upon custodians to satisfy customer protection requirements, such as those mandating the segregation of client assets or transparency of investment performance. The 1940 Act, for example, explicitly requires a U.S. mutual fund to "place and maintain its securities and similar investments" with a qualifying custodial institution.[23] Because mutual fund custody arrangements are often very complex and must satisfy strict regulatory requirements, many U.S. mutual funds elect to use a single custodian to maintain centralized operations. Similarly, European Union rules also require the use of custody services for certain funds, mandating, for example, that the assets of each UCITS or AIF be held with a single depositary.[24]

The breadth of services provided by custodians also allows their clients to customize their contracts to receive the services suited to their particular needs. For example, managers of large global funds typically require a full suite of custody-related activities—especially fund administration services—and may even outsource their middle-office or back-office functions to custodians. Clients with a more limited geographic footprint and lower transaction volumes may only employ custodians for selected services or markets. Other clients, such as large, sophisticated asset managers and insurance companies, may use the services of different custodians, and indeed different global and local custodians based in other countries, often to service specific asset classes or needs. Certain categories of clients, such as government agencies, national central banks, corporations, endowments, and foundations may have more specific needs for custody services in selected countries or asset classes, or may use custodians primarily to access various payment systems.

The specialized nature of the custody services that custodians provide, in addition to the time and costs involved in establishing new custody relationships and moving the assets from one custodian to another (a process known as "onboarding"), tend to result in stable and long-lasting relationships between custodians and their clients. For example, in order for a client to transfer assets to another custody provider, it must enter into a custody contract with the new provider, establish its profile on new custody and accounting systems, migrate accounting and other financial data, initiate a parallel period of shadow accounting and reporting, and open new accounts in each market where it transacts. This resource-intensive process can take at least six to twelve months to complete and requires significant investments in technology, operating platforms and staff. While there is considerable time and expense involved in switching custody providers, the presence of numerous competitors in the market for custody services provides clients with sufficient incentives to regularly evaluate existing custody relationships in comparison to the alternatives present in the market, thus incentivizing custodians to maintain competitive pricing structures. *See* Section I.C for a detailed discussion of the competitive dynamics of the custody services industry.

### 2. The Interaction between Custodians and FMUs

Through the intermediation of custodians, clients can access the payment, settlement and other services provided by FMUs, including central counterparties ("CCPs"),[25] CSDs, ICSDs, national central banks, payment systems[26] and settlement systems,[27] without which clients could not conduct transactions across global financial markets. Thus, the custody services provided by custodians facilitate the efficient functioning of a modern, diversified financial system. As discussed previously, custodians, act as one tier in the multi-tiered system of intermediaries that connect investors to the FMUs that ultimately clear and settle the investors' payments and securities transactions. Other intermediaries include asset managers and investment advisers, which, as discussed above, constitute custodians' institutional client base, and local custodians acting as sub-custodians for custodians.

### a. CSDs and ICSDs

As noted above, to eliminate logistical burdens and reduce operational risk associated with issuing, transmitting, exchanging and safekeeping physical securities certificates, CSDs have been established in most markets globally to hold the physical securities certificates, which, particularly for debt securities, may be in the form of a single global note representing the entire principal amount of the debt.[28] While these FMUs were originally intended simply to immobilize certificated securities, due to technological advances, certain securities have been fully dematerialized (or "uncertificated") and exist at CSDs only in electronic form.[29] CSDs maintain the list of the owners of securities (the "official register of shares" or debt), as applicable, on behalf of issuers and are generally the holder of record of the securities held in the CSD. CSDs also recognize a change in ownership among account holders following the purchase or sale of a security through providing the service of a settlement system.[30]

CSDs operate on a membership model and allow access only to those institutions that meet specified requirements, including, for example, being subject to prudential regulation, meeting financial soundness requirements, or maintaining and updating technological systems to ensure compatibility with CSD systems.[31] CSD members typically consist of custodians, broker-dealers, CCPs and other CSDs, national central banks and, for some limited purposes, corporations. CSD members hold their respective interests in securities in the form of book-entry credits to their securities accounts at the CSD.

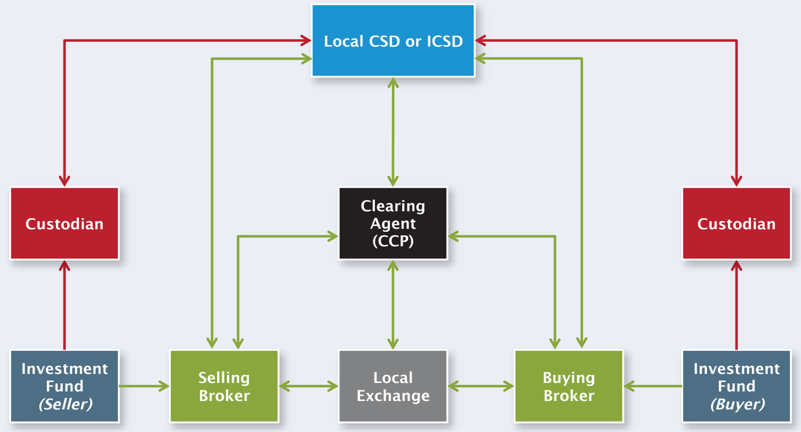
While CSDs typically only process securities from their home-country market, some have expanded their activities by processing securities from other markets.[32] This is especially true in parts of the world with smaller, more fragmented capital markets. In order to offer custody services for foreign securities, a CSD must "link" with a foreign CSD. This can be arranged through the appointment of a sub-custodian that is a direct member of the foreign CSD or, more typically, by a CSD opening an account in its own name with a foreign CSD.[33]

While CSDs operate within national borders and generally offer membership only to domestic firms, ICSDs provide the same services across national borders and offer membership to entities—generally the same types of institutions that qualify for memberships in CSDs—without regard to their home country. In addition, while CSDs typically focus on book-entry settlement activities and often avoid activities that involve extensions of credit, existing ICSDs[34] have vertically integrated to offer both settlement and associated banking and custody services, including extensions of credit, collateral management services and the operation of securities lending and borrowing programs. While CSDs are the official holders of record of securities issued and traded in their domestic markets, ICSDs are the ultimate and official holders of record only for certain securities issued as so-called "Eurobonds," namely, debt securities issued by issuers of different nationalities in different currencies (typically U.S. dollars or euros) to the international debt market.

The development of CSDs and ICSDs and the corresponding immobilization or dematerialization of securities has transformed custodians' safekeeping responsibilities from the safeguarding of physical securities certificates in their vaults, to the reconciliation of book-entry securities positions credited to the relevant securities accounts. Specifically, a custodian must confirm that its book-entry credits at a CSD or ICSD are equivalent to the book-entry credits held by its clients in their securities accounts on the books of the custodian. In doing so, a custodian thus facilitates the delivery of securities owned by its clients at a client's request.

Because a CSD or ICSD holds the certificates representing the entire issuance of securities or, in the case of dematerialized or uncertificated securities, the electronic record that evidences the entire issuance of securities, in most cases the settlement of a transaction in securities would be effected by a custodian on behalf of its clients by communicating with the relevant CSD or ICSD.[35] Typically, the settlement of securities transactions involves

**FIGURE 1. SETTLEMENT THROUGH CSDS AND ICSDS[36]**



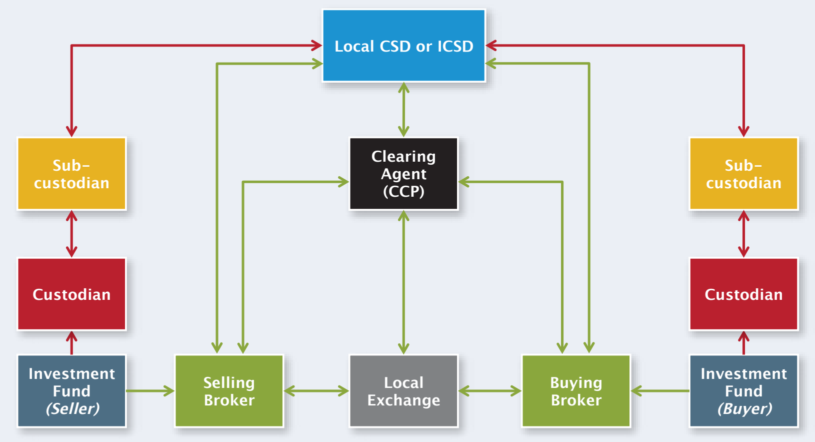

the movement of securities and cash from a custodian's account with a CSD or ICSD to another custodian's or broker's account with that CSD or ICSD. This will be explained in greater detail below.

While institutional investors could undertake this reconciliation and settlement activity on their own by becoming a member of a CSD, they may not meet the strict requirements—or may not want to invest resources to fulfill the strict requirements—to become a CSD member. Thus, many institutional investors gain access to CSDs and ICSDs worldwide through the use of a custodian that operates on a global scale (a "global custodian").

### b. Sub-Custodians

As noted above, leading custodians operate in more than 100 securities markets worldwide. In certain well-established markets, U.S. custodians are direct members of the local CSD through a physical presence in the market, either in the form of a branch of their U.S. bank or another subsidiary bank, or in the form of a locally incorporated subsidiary. These direct memberships are generally known as "self-custody" arrangements. In numerous other markets, however, custodians do not have a physical presence and prefer to access a CSD through the appointment of a sub-custodian.

**FIGURE 2. SETTLEMENT THROUGH SUB-CUSTODIANS**




These sub-custodians are generally local custodians, multi-market custodians sometimes known as "multi-direct" custodians, or other global custodians. The sub-custodian is a direct member of the relevant CSD and will generally hold securities accounts with the CSD and a cash account with the local central bank or an alternative cash provider (such as the CSD). Instructions to process securities transactions and exercise voting rights and other rights with respect to corporate actions are processed by the sub-custodian on the custodian's behalf, and the sub-custodian then reports the results and receives any distributions on the securities (such as interest payments and dividends) in the cash or securities accounts it holds. Sub-custodians may therefore be one of the tiers involved in the provision of custody services, including safekeeping and asset administration services, by custodians to their clients.[37]

### c. The Settlement of a Securities Transaction by a Custodian

While transactional arrangements vary, a single purchase or sale of a security typically involves several tiers of the financial market system for holding, clearing and settling securities. For example, an investor seeking to sell securities held in its portfolio may contact a broker to sell the securities on its behalf. The broker will then typically enter into a trade with another broker acting on behalf of the buyer of the securities. The trade may be executed on a trading venue, such as a securities exchange, or over the counter. After the trade is executed, the transaction must still be settled (i.e., the seller's securities must be transferred to the buyer and the buyer must pay the seller for the securities).

As shown in Figure 3, assume for purposes of this example that the securities in question are common equity of a UK issuer listed on the London Stock Exchange, that the seller is a non-UK institutional investor, and that the buyer is a UK investment fund. The seller holds the UK equities in a securities account with a custodian's U.S. bank and uses a UK broker to execute the transaction. The buyer uses a UK broker and has a securities account with a UK custodian.

In this case, upon completion of the trade, the seller's UK broker will instruct the custodian to settle the transaction. The custodian uses its U.S. bank's London branch or subsidiary to hold the seller's broker's UK equities in its securities account with the UK CSD, Euroclear UK & Ireland, which operates the CREST settlement system. As a result, the custodian's U.S. bank will instruct its London branch or subsidiary to settle the sale of the UK equities to the UK investment fund. The custodian's London branch or subsidiary will then instruct CREST to debit the UK equities from its CREST securities account and arrange for its cash account to be credited with the amount of cash that the buyer, through its broker, has agreed to pay the seller for the UK equities.

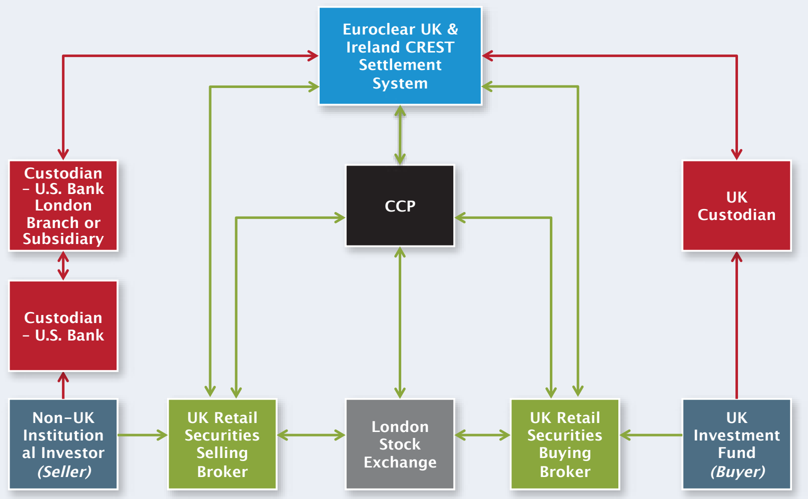
In the meantime, the buyer's UK broker

has executed the trade and the buyer has instructed its UK custodian to debit its cash account with the amount of cash it has agreed to pay for the securities. The UK custodian has instructed CREST to debit from its cash account the amount of cash the buyer has agreed to pay for the securities and to credit the number of UK equities it has agreed to buy from the seller.

CREST will receive both sets of instructions, match and validate them, and then will settle the transaction on its books on a delivery versus payment ("DvP") basis, meaning that it will simultaneously credit the securities to the UK custodian's securities account and credit the cash to the custodian's London branch or subsidiary's cash account. The custodian's London branch or subsidiary will credit the cash to its U.S. bank's cash account, and the custodian's U.S. bank will credit the cash to the seller's broker's cash account. The seller's broker will then credit the cash to the seller's cash account (which may be held by the broker with another U.S. bank).

If the trade is cleared through a CCP, there would be an additional step to the above transaction, in that the seller's U.S. broker would enter into the trade with the buyer's UK broker, but each broker's custodian would clear the trade through a CCP, which may net the trade with other trades in the same securities and produce a net trade in a smaller amount and with a different counterparty than the original trade between the seller's and buyer's brokers. However, the process by which each counterparty's custodian would settle the netted trade in CREST is the same as described above.

**FIGURE 3. SETTLEMENT PROCESS EXAMPLE**




## C. COMPETITION IN THE CUSTODY SERVICE INDUSTRY

The market for custody services is highly competitive and includes custodians, other banks that provide custody services (in addition to other banking services) on a global or regional scale, local custodians, and—with respect to some custody services—ICSDs and CSDs. As seen in Figure 4, as of December 31, 2014, there were twenty banks that, in their financial reports, reported holding at least $500 billion of AUC; of these, seventeen banks reported holding at least $1 trillion of AUC. Thus, there is a significant degree of substitutability in the market among current custodians—that is, the ability of one custodian to substitute in part or wholly for another custodian in providing custody services, without taking into consideration the possibility of new banks entering the market through acquisitions of part or all of the custody business of an existing custodian.

This data understates the degree of competition and substitutability in the global market for custody services. As explained in Section I.B.2 above, banks are not the only entities that provide custody services; thus, defining the market for custody services solely by reference to the AUC held by banks—and without including in the calculation the AUC held by the ICSDs or other non-bank

## FIGURE 4. TOP CUSTODIANS BY AUC AS OF DECEMBER 31, 2014

| RANK | FIRM | AUC[38] (IN US$TN) | HQ |
|---|---|---|---|
| 1 | BNY Mellon | 24.6 | United States |
| 2 | State Street | 21.7 | United States |
| 3 | J.P. Morgan | 21.1 | United States |
| 4 | Citigroup | 12.5 | United States |
| 5 | BNP Paribas | 9.0 | France |
| 6 | HSBC | 6.4 | United Kingdom |
| 7 | Northern Trust | 6.0 | United States |
| 8 | Mitsubishi UFJ | 4.9 | Japan |
| 9 | Société Générale | 4.7 | France |
| 10 | Brown Brothers Harriman | 4.0 | United States |
| 11 | UBS | 3.4 | Switzerland |
| 12 | RBC Investor & Treasury Services | 3.3 | Canada |
| 13 | SIX Securities Services | 3.2 | Switzerland |
| 14 | CACEIS | 2.9 | France |
| 15 | Sumitomo Mitsui Banking Co. | 1.6 | Japan |
| 16 | U.S. Bancorp | 1.1 | United States |
| 17 | Santander | 1.1 | Spain |
| 18 | SEB Group | 0.9 | Sweden |
| 19 | Nordea | 0.8 | Sweden |
| 20 | National Australia Bank | 0.5 | Australia |
| TOTAL | | 133.7 | |

custody providers—understates the degree of competition and substitutability in the custody market. However, because there are many entities that could hold the same assets and count them in their AUC—including CSDs and ICSDs, custodians, and sub-custodians—it is difficult to determine an accurate market size in terms of total AUC without the inevitable problem of double-counting certain assets. For example, in those instances in which a local custodian holds assets on behalf of a global custodian, both the local custodian and the global custodian would count those assets as AUC. Because more than one custodian may account for the same assets when disclosing AUC, the AUC figures reflected above for the top 20 banks that provide custody services, although correct for each individual bank, may collectively overstate the AUC.

While the primary role of CSDs and ICSDs is to act as market utilities whose function is the maintenance of the ultimate book of record of ownership of the securities they hold on behalf of issuers (operating as a "single utility" provider in many markets), some CSDs, as well as the ICSDs, have the ability to hold securities that have been issued in other CSDs either directly with that CSD or through a subcustodian, and thus have the ability to act as an alternative to custodians for some categories of securities, and for some types of entities (largely banks and broker-dealers). CSDs and ICSDs are typically regulated and supervised based on their core functions as market utilities, but some applicable regulation, such as the European Union's Central Securities Depositories Regulation, does allow CSDs and ICSDs to provide so-called "ancillary" services that include services relating to securities issued in other CSDs, while at the same time setting out specific rules for the provision of such services.

These different types of custody service providers not only work to provide custody services to custody service providers at higher tiers in the chain of holding AUC, but also compete with those custody service providers and one another and provide clients with alternatives (to a greater or lesser degree) for the provision of custody services. In their own markets, local custodians compete not only with other US custodians, other global custodians and local custodians, but also with the ICSDs and the relevant CSD with respect to entities that meet the eligibility requirements to be members of ICSDs and CSDs.

There is sharp price competition in the global market for custody services. Measured by the amount of custody servicing fees per $1,000 of AUC for four banks that provide a significant volume of custody services, one source recently estimated that fees have decreased from approximately 3.5 cents ten years ago to 2.5 cents in 2014.[39] This may reflect the fact that these custodians' clients, which include large institutional asset managers and other sophisticated institutional investors, have a high degree of bargaining power as a result of the number of custody service providers in the market and these clients' ability to maintain different custody relationships for different asset classes or investment portfolios. Although, as noted in Section I.B.1 above, institutional clients tend to have stable and long-lasting relationships with custodians, the presence of numerous competitors in the market for custody services provides clients with sufficient incentives to regularly evaluate existing custody relationships in comparison with the alternatives present in the market, thus incentivizing custodians to maintain competitive pricing structures.

Finally, although the provision of custody services requires significant investment in IT infrastructure and systems and operational processes, the servicing of large amounts of AUC does not require the maintenance of correspondingly large balance sheets. This is evidenced by the fact that BNY Mellon, Northern Trust, and State Street, which rank first, second and seventh, respectively, in AUC in Figure 4 above, ranked ninth (BNY Mellon), thirteenth (State Street) and twenty-ninth (Northern Trust) among U.S. holding companies in terms of total consolidated assets as of December 31, 2014,[40] and none of them is among the 70 largest banks worldwide.[41] Balance sheet size is not, therefore, a direct measure of a bank's ability to provide custody services, and it is not necessary for a provider wishing to enter the custody services market to have a balance sheet comparable in size to the largest global banks.

# II. Financial and Risk Profile of Custodians

As explained above, a custody business occupies a unique niche in the financial sector. Additionally, as noted above, some, custodians do not generally engage in commercial or consumer lending except as part of their broader service offerings to institutional and wealth management clients. The balance sheets associated with a custody business is different from that associated with other banking businesses that require the maturity transformation activities of taking short-term deposits to fund long-term assets such as commercial and industrial loans, commercial real estate loans, and residential mortgage loans.[42] To the extent that custodians engage in lending activities as part of providing custody services, they are typically limited to the routine provision of short-term credit on an intraday or overnight basis to facilitate the settlement of securities transactions and other operational matters.

The activities of custodians in providing custody services are also different from those of broker-dealers or prime brokers. First, custodians do not, in connection with providing custody services, make markets in or underwrite the issuance of the assets that they service. Second, custodians typically do not finance clients' investment positions through loans or other similar credit facilities. Finally, to the extent that custodians engage in trading activities, it is ancillary to the provision of their core custody services. When custodians facilitate the purchase and sale of securities in connection with the provision of custody services, they act as agents solely on instructions from their clients and do not make investment decisions or exercise any investment discretion over client assets, or use them for proprietary purposes.

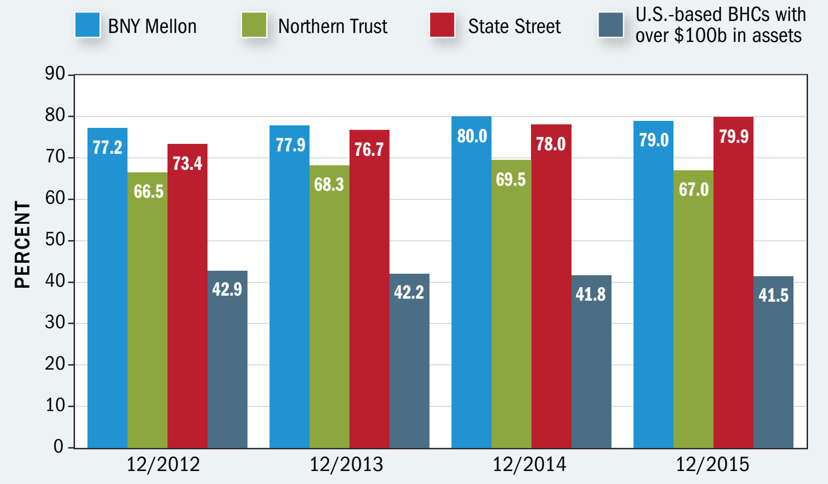
Nor do custodians engage in the same types of activities as certain FMUs, such as CCPs or payment systems. In providing custody services, custodians do not typically become principals to their clients' trades through novation and netting, unlike CCPs, but instead act as agents on behalf of their clients. The only principal trading activity in which custodians typically engage is FX trading, and even that is client-driven activity: the volume of FX trading is a consequence of the volume of client instructions to purchase and sell securities denominated in currencies different from those in which the clients' cash balances are denominated. As noted previously, custodians provide access to FMUs on behalf of their clients and operate in a highly competitive market.

This section of the white paper explains how custodians' financial performance and financial condition is reflective of their business model. In addition, it addresses the risks borne by custodians in providing custody services and the risks to which their clients are exposed when holding assets with custodians.

## A. FINANCIAL PROFILE OF CUSTODIANS

Custodians are chartered as banks and accept insured and uninsured deposits in the same

FIGURE 5: PERCENTAGE OF REVENUE FROM FEES (2012-2015)[45]




way as commercial banks do, but the balance sheets associated with their custody services means that both their income statements and balance sheets differ from those of typical commercial banks.[43]

## 1. Income Statement

For many commercial banks, revenue is derived primarily from their maturity transformation activities, i.e., taking short-term deposits and using them to fund long-term loans such as commercial and industrial loans, residential mortgage loans, and commercial real estate loans. The single revenue item in a bank's income statement that most reflects this lending activity is net interest income or net interest revenue, which is the difference between interest income (consisting of the amount of interest earned on the principal amount of the loan) and interest expense (consisting of the amount of interest paid by the bank to the source of its funding for the loans, e.g., the amount of interest paid to the bank's depositors). According to a report published by Autonomous, on an asset-weighted average basis, net interest income accounted for just under 60% of U.S. banks' revenues in 2014, with the percentage ranging from over 75% for smaller regional banks (with total assets between $1 billion and $50 billion) and approximately 60% for large regional banks (with total assets between $50 billion and $500 billion) to approximately 50% for large banks (with total assets above $500 billion).[44]

In comparison, for a custody business (including the ancillary services discussed above), fee revenues, rather than net interest revenues, compose a majority of total consolidated revenues. Figure 5, sets this out for illustrative purposes with respect to BNY Mellon, Northern Trust, and State Street.

In the four-year period from 2012 through 2015, the percentage of total revenues accounted for by revenues from custody services ranged from 64.1% to 69.2% for BNY Mellon, 51.4% to 53.8% for Northern Trust, and 87.7% to 88.4% for State Street.[46] The majority of the revenues from custody services consist of fees rather than net interest income, although, as described below, custodians do earn net interest income, which contributes to their overall profitability.[47]

Individual custodians typically categorize their fee-based revenues from custody services in slightly different ways, but they generally represent asset servicing fees, fund administration fees, securities brokerage fees, payment fees, securities lending fees and fees from providing analytical investment performance data and other similar services to clients.[48] These fees are primarily calculated as a function of, as applicable, the market values of assets under custody or administration, the volume of transactions, and market interest rates.[49] The revenue calculations can vary depending on the contract between the custodian and its client, particularly if its services are bundled under the terms of the contract. The advantage of fee-based revenue, especially in a low interest rate environment, is that, unlike net interest income, it is not dependent on the level of or spread between interest rates. Rather, it is more dependent on the market values and transaction volumes of the assets being serviced, both of which are more strongly correlated to client investment activities and general market conditions.

Custodians also earn revenue in the form of net interest income. In connection with the provision of custody services, net interest income primarily arises from the interest earned on the reinvestment of clients' cash deposits in proprietary investment securities (which generally consist of highly liquid government and agency securities and asset-backed securities) and interbank deposits, as well as interest charged on extensions of credit in connection with purchases of securities and other similar operational matters on behalf of clients. These extensions of credit are generally very short-term, primarily on an overnight basis. While the percentage of custodians' revenues represented by net interest income is significantly lower than that of most commercial banks, net interest income is important to the overall profitability of custodians.[50]

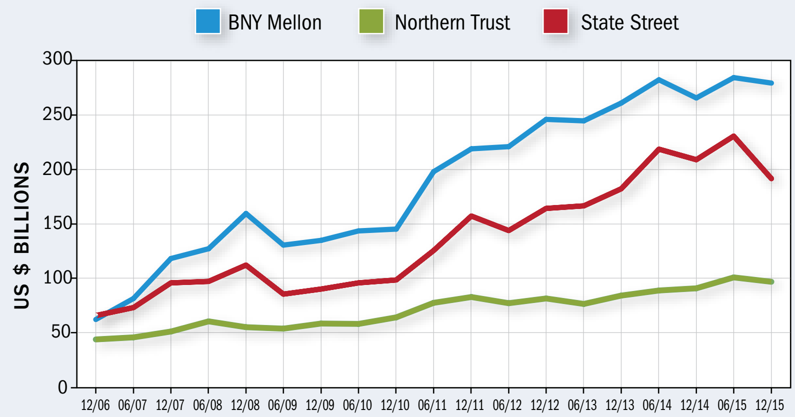
Fee-based revenues from custody services have historically been steady and predictable, even during periods of economic downturn. Custodians' fee-based revenue structure creates a predictable flow of income that has historically been quite stable throughout economic cycles.[51] In short, custodians' reliance on custody services for the majority of their total consolidated revenues, of which the largest component in turn consists of fee-based revenues, has produced a relatively stable profit margin that contributes to their ability to maintain strong capital ratios and thus increases their resiliency in the event of financial market uncertainty.

## 2. Balance Sheet

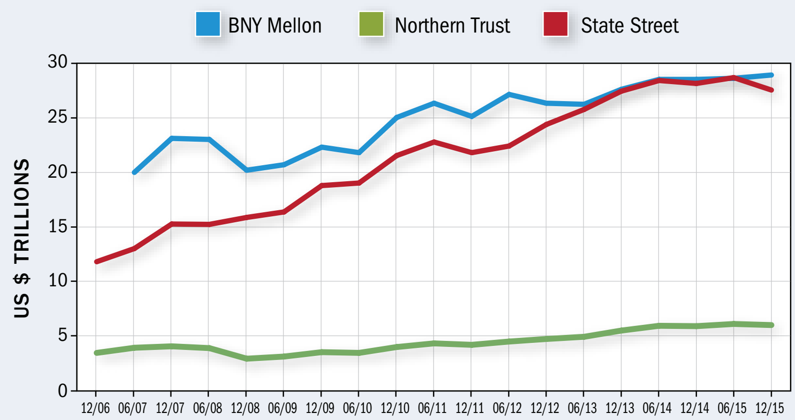
As explained above, the market for custody services is generally defined by AUC (or a combination of AUC and AUA where reported together). To the extent that AUC or AUA consist of securities or other non-cash assets, they are not recognized on the balance sheet of custodians. This is because, provided that the securities are properly segregated from the custodian's own assets and those of any sub-custodian, ICSD or CSD with which the securities are sub-deposited, they are not the property of the custodian. They remain the property of the beneficial owners of the securities and therefore are recognized on the balance sheets of the beneficial owners. The beneficial owners may be the custodian's clients or clients of the custodian's clients. Because client securities are not reflected on the balance sheet of custodians, custodians do not take any principal risk in the form of credit risk (i.e., the risk of the issuer of a debt security not paying principal and interest and thus defaulting on the debt) or market risk (i.e., the risk of a decline in the market price of securities compared to the price paid for them) on client securities.[52]

Although AUC and AUA are not reflected on the balance sheets of custodians, the amounts of AUC and AUA nevertheless indirectly

## FIGURE 6: GROWTH OF TOTAL DEPOSITS AT SELECTED CUSTODIANS FROM DECEMBER 2006 – DECEMBER 2015




## FIGURE 7: GROWTH OF AUC/AUA AT SELECTED CUSTODIANS FROM DECEMBER 2006 – DECEMBER 2015




contribute to the size of their balance sheets because, for example, AUC and AUA result in cash deposits necessary to purchase securities, as well as dividends and interest payments. BNY Mellon, Northern Trust, and State Street experienced significant growth in AUC and AUA from June 30, 2007, prior to the onset of the global financial crisis, through the end of 2014.[53] In the same period, the deposit liabilities of these institutions, representing client cash deposits, increased by even greater rates.[54] The ratio of deposits to AUC/AUA, however, typically remains very low, as indicated in Figures 6 and 7. To the extent that deposits have grown faster than AUC/AUA, this indicates that custodians have generally experienced a "flight to quality" since the global financial crisis, described further below.

The balance sheets of custodians are liability-driven rather than asset-driven. Client cash deposits are the primary building block of balance sheets associated with a custody business. These cash deposits consist of (i) client-deposited cash balances, which are used primarily to purchase securities, (ii) proceeds from the sale of securities, and (iii) cash distributions of dividends and interest from client securities. Like any cash deposit with a banking institution, the cash held at a custodian becomes the property of that bank and can be used by the bank for its own purposes. The depositing client has a contractual claim to the return of the cash: either on demand or, in the case of time deposits, upon expiration of a contractual term to the deposit. As a result, the deposits are reflected as liabilities on the balance sheet of the custodian, and the asset side of the balance sheet reflects the assets in which the custodian has invested the funds, whether investment securities or receivables from the placement of the cash with another bank (including a central bank such as the Federal Reserve).

Client deposits represent the lion's share of the total liabilities of a custody business. For example, at the end of each year from 2012 through 2015, the percentage of total consolidated liabilities represented by deposits ranged from 76.5% to 78.8% for BNY Mellon, 89.4% to 95.4% for Northern Trust, and 81.4% to 85.5% for State Street.[55]

Client deposits held with custodians in their role as custody service providers fall into two main categories: operational deposits and other deposits. Operational deposits generally constitute deposits that support custodial and other operational activities and result from day-to-day transactional activities, such as securities purchases or sales, dividends and interest payments, corporate action events and client subscriptions and redemptions. In addition, custodians hold cash deposit balances maintained by clients to address anticipated and unanticipated funding needs stemming from various operational considerations, such as failed securities transactions, the nonreceipt of payments and timing differences in the movement of cash.[56] Since operational deposits are necessary for clients to obtain custody services, they are less likely to be withdrawn, as the lack of sufficient funds in a client's cash account could limit the ability of the custodian to provide the required level of service or effect transactions on the client's behalf. As such, deposits resulting from the provision of custody services represent a stable source of funding.[57] This is recognized in the Basel III liquidity standards, where operational deposits are assigned a lower run-off factor due to the need for clients to place "deposits with a bank in order to facilitate their access to and ability to use payment and settlement systems and otherwise make payments."[58] The stability of these deposits is also attributed to the general stability of the custody relationship between a custodian and its clients. Contracts governing custody relationships typically have termination provisions requiring advance notice periods of up to one year, making it unlikely that clients would withdraw these operational deposits in a short period of time, much less without any warning. In short, although custodians may not have a broad retail deposit base, their operational deposit base provides a stable and predictable source of funding.

In addition to operational deposits, clients often place additional amounts, sometimes referred to as "excess deposits," with custodians, especially in times of financial market stress. Figures 6 and 7 above, for example, show a general increase in the amounts of deposits placed with custodians from the end of June 2007 to the end of December 2008, notwithstanding that the amounts of AUC and AUA generally decreased over the same time period. This trend is evidence of the fact that clients tend to view custodians as "safe havens" in times of severe market stress.[59] This also explains why, particularly in such stressed conditions, custodians may see increased volatility in their balance sheets—with such a high percentage of their liabilities consisting of client deposits, their balance sheets may grow significantly in stressed conditions as a result of their clients' desire to hold higher amounts of cash deposits instead of other assets. Any such client-driven growth may, as a result, put pressure on custodians' Tier 1 leverage ratio or Basel III Supplementary Leverage Ratio, neither of which is a risk-weighted measure and both of which therefore treat as an asset of equal value $100 million of U.S. Treasuries and a $100 million equity exposure to a highly leveraged hedge fund.

Apart from client cash deposits, custodians generally have few other liabilities on their balance sheets. While these institutions may, at times, borrow funds from other banks or wholesale funders, the liquidity provided by clients through their cash accounts largely obviates the need to borrow from outside lenders for liquidity.

The assets associated with a custody business consists primarily of two main asset categories: cash on deposit with other institutions, including the Federal Reserve and other central banks; and investment securities, which typically consist of high-credit-quality, highly liquid securities such as U.S. government and agency securities, foreign sovereign debt securities, and asset-backed securities.[60] These types of securities generally have very low risk weights for purposes of the Basel III risk-based capital rules[61] and qualify as High Quality Liquid Assets ("HQLAs"), which are assets that satisfy the liquidity requirements of the U.S. Basel III LCR. These investment securities are also used by custodians as collateral to secure intraday and overnight borrowings from sub-custodians, ICSDs, central banks and other entities in connection with the purchase of securities on behalf of their clients. At the end of each year from 2012 through 2015, the percentage of total consolidated assets of custodians represented by cash, deposits with central and other banks, and investment securities ranged from 62.9% to 66.7% for BNY Mellon, 62.8% to 64.3% for Northern Trust, and 72.0% to 78.4% for State Street.[62]

As noted above in Section I.A.1.d of this white paper, custodians also make intraday, overnight and other short-term loans in connection with providing custody services. These short-term loans are primarily attributable to overnight overdrafts to fund purchases of securities, as well as draw-downs on lines of credit to regulated collective investment undertakings such as U.S. mutual funds, EU UCITS and other similar retail investment funds to accommodate the funds' day-to-day operational needs, such as unanticipated movements of cash, client redemption activities, payment of management fees and other expenses.[63] These credit facilities are generally short-term (30-60 days), and the provision of credit is typically subject to the fund's ability to meet asset quality and minimum diversification requirements.

This limited lending activity is reflected in the relatively low percentage of net loans and leases[64] recognized on the balance sheets of custodians. For example, at the end of each year from 2012 through 2015, the percentage of total consolidated assets represented by net loans and leases ranged from 12.9% to 16.1% for BNY Mellon, 28.4% to 30.4% for Northern Trust, and 5.5% to 7.7% for State Street.[65]

Lastly, because custodians do not engage in material volumes of market-making or dealing activities, they have very few trading assets on their balance sheets. At the end of each year from 2012 through 2015, trading assets as a percentage of total assets represented from 1.9% to 3.2% for BNY Mellon, 0.3% for State Street, and an insignificant fraction (less than 0.1%) for Northern Trust.[66]

## B. RISK PROFILE OF CUSTODIANS

The unique financial profile of a custody business is reflective of its unique risk profile. Custodians do not face different or unique categories of risk compared to other types of banks and financial institutions—like all banking organizations, they face credit risk, market risk, liquidity risk, and operational risk. However, because of the unique nature of the custody business, the extent to which custodians face each of these risks varies significantly from the risk banks face for other types of business.

## 1. Risks Faced by Custodians

The risks faced, managed and mitigated by custodians can be classified into four main categories:

- operational risk (including legal, fiduciary, and IT risk);
- credit risk;
- market risk; and
- liquidity risk.

### a. Operational Risk

As with all banking institutions, custodians face operational risk, which is the risk of loss resulting from inadequate internal processes, human error, systems failure or external events, or failure to comply with applicable laws or regulations.[67] These types of errors and failures are often evidence of a gap between applicable written internal policies and procedures, regulations or contractual agreements and the actual execution of those written guidelines. The U.S. Basel III rules classify operational risk loss events into seven categories: (1) internal fraud, (2) external fraud, (3) employment practices and workplace safety, (4) clients, products and business practices, (5) damage to physical assets, (6) business disruption and system failures, and (7) execution, delivery and process management.[68]

While every banking organization faces some or all of these categories of operational risk, these risks are particularly relevant to custodians because the provision of custody services is largely dependent on the successful execution of large volumes of operational and administrative tasks and processes that require sophisticated systems to manage. The following are examples of custody or related services provided by custodians that create operational risk:

1. **Corporate Action Processing Services.** One of the most significant sources of operational risk arises from the processing of corporate actions relating to securities held under custody, such as exercising voting rights on mergers or other extraordinary corporate transactions, tendering securities in tender offers or exchange offers, exercising conversion rights (e.g., to convert debt into equity), or exercising warrants or options to acquire securities. In processing such corporate actions, custodians are exposed to the risk of errors such as missing deadlines to exercise rights, crediting or debiting cash or securities to incorrect clients or accounts and committing errors in executing client instructions (e.g., electing to receive the wrong securities in a merger or exchange offer). Because corporate actions are often tied to specific record dates for securities holdings and specific deadlines by which the companies whose securities are implicated must take certain actions, a failure to process a corporate action properly can result in the loss of all or part of the value of a client's investment in the particular securities and a legal claim for damages

by the client against the custodian. A custodian may also have to buy securities to make a client whole and bear any difference between the cost of purchasing the securities and the value of any securities incorrectly acquired or which the custodian incorrectly failed to sell, exchange or convert.

2. **Settlement.** A second source of operational risk for custodians arises from their purchases and sales of securities for the account of their clients. Settlement instructions can be incorrectly entered or processed, with the result that incorrect numbers or amounts of securities or cash may be credited or debited to client accounts. Further, because an error in a settlement instruction entered by a custodian may prevent it from being matched with a settlement instruction entered by the counterparty or its agent, the transaction may fail to be processed altogether. This in turn can lead to the failure of other transactions that depended for their completion on the completion of the failed transaction. In the case of transactions that are supposed to settle on a DvP basis, these errors can lead to failed settlements. They will not lead to the loss of the value of the investment, since the clients will still have their cash or securities, but could require the custodian to buy securities or recompense clients for the cost of funds for the period in which funds were not received and thus were not available to the client. In the case of the transactions that are supposed to settle on a non-DvP basis, such that one party performs while the other does not, these errors can lead to a loss of the principal amount of the cash or securities and a claim against the custodian for that amount.

3. **Fund Administration and Related Services.** Fund administration services are also a source of operational risk. If a custodian erroneously calculates or records the value of securities and other assets held by an investment fund or the fund's expenses, it may incorrectly calculate a fund's NAV, with the result that the fund's shares will be incorrectly priced and valued. Client holdings, subscriptions and redemptions of fund shares can all be adversely affected by erroneous prices and can lead to client claims for resulting losses.

4. **Agency Securities Lending.** A custodian that provides agency securities lending services is exposed to the risk of erroneously monitoring or determining the value of the collateral provided by the borrower to the lender or incorrectly processing the substitution of collateral or the return of the borrowed securities. Any of these errors can lead to claims for losses by the lenders or borrowers of securities.

5. **Legal and Compliance Risk.** Custodians also face operational risk in the form of legal and compliance risk. While there are many definitions of legal risk, it is often defined as the risk of loss that an institution faces if a contract has unenforceable covenants or if the law changes or is not applied as initially understood. This can lead to a loss equal to the value of the contractual right the custodian is seeking

to enforce (e.g., the amount of a fee for a service). Compliance risk is the risk of loss that an institution faces from the failure of an individual or group within the institution to comply with applicable laws or regulations, such as anti-money laundering, U.S. economic sanctions, antitrust or antifraud requirements. This can lead to losses in the form of legal expenses, civil money penalties and the costs of remediating any weaknesses in compliance controls, policies and procedures that led to the violation of laws or regulations.

6. **Fiduciary Risk.** The services provided by custodians also implicate a broad array of confidentiality and fiduciary requirements. Fiduciary risk is the risk of loss resulting from an organization's failure to properly exercise discretion when acting on behalf of its clients, or to properly monitor and oversee a third party's exercise of such discretion. This can result in substantial financial liability, reputational damage, decreased client demand for products and services, and potentially costly changes to business practices in order to prevent recurrence.

The examples listed above, although specifically relevant to custodians, are not different in kind from the examples of operational risks faced by banks and other financial institutions for other lines of business. For example, banking organizations engaged in securities brokerage, prime brokerage and asset management activities, as well as ICSDs and some CSDs, can similarly be exposed to the risk of incorrectly processing corporate actions related to securities or erroneously settling securities transactions. And all banking organizations and financial institutions are exposed to legal and compliance risk, as well as technology risk, including cybersecurity risk. What distinguishes leading custodians' exposure to these types of operational risk is the scale and volume of their custody operations—the extent and potential consequences of operational risk are obviously greater for a bank that holds over $20 trillion in assets under custody than for a bank that holds $200 billion in assets under custody.

Custodians seek to mitigate their operational risk through a variety of measures. First and foremost, they invest heavily in and continuously update their operational processing systems and IT infrastructure, employing automated and straight-through transaction processing wherever possible to minimize the need for manual processing and intervention. These investments and updates both improve the ability of custodians to accurately service growing volumes of assets under custody and to accurately process related cash payments and securities transactions and also allow them to meet evolving operational standards and requirements for connecting with ICSDs, CSDs and other FMUs. In addition, custodians invest heavily in enhancing their risk management and compliance controls, policies and procedures. Apart from these active efforts to mitigate the risk of the occurrence of operational risk loss events, custodians also seek to mitigate the financial consequences of possible loss events through insurance and, ultimately, holding capital against operational risk in accordance with the applicable U.S. Basel III capital requirements.

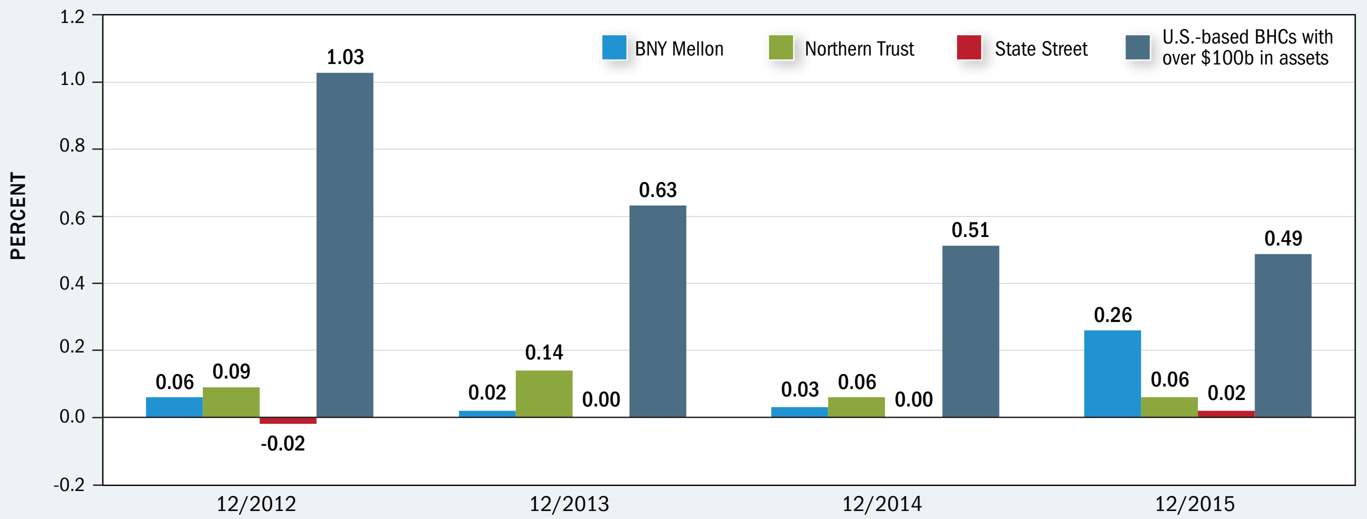
### b. Credit Risk

A custody business, like a banking business, is exposed to credit risk, which is the risk that a borrower or other counterparty will not be able to pay its obligations on time and in full. As discussed in Sections I.A.1.d and II.A.2 above, custodians extend intraday and overnight credit to their clients to facilitate the settlement of securities transactions and short-term credit facilities to investment funds. In addition, custodians take on counterparty credit risk by indemnifying their custody clients that lend securities in securities lending programs through custodians against certain losses. Finally, custodians take on a degree of counterparty credit risk when—in order to facilitate client investments in emerging market securities—they engage in FX transactions in emerging market currencies that are not settled through the CLS payment system. While this risk is mitigated by the practice of posting collateral, market volatility in certain emerging market currencies can result in residual unsecured credit exposure.

Overall, however, the extent to which a custody business is exposed to credit risk is generally limited because they do not engage in significant maturity transformation activities (i.e., they typically do not accept demand deposits and use them to fund long-dated loans, such as commercial and industrial loans, commercial real estate loans and residential mortgage loans). Because their credit exposures related to the custody business are very short-term in nature, custodians retain the ability to curtail their lending activities and rapidly reduce their credit exposure in response to any client's deteriorating financial condition and creditworthiness. These credit exposures are also generally incurred in connection with DvP (for securities) or payment versus payment (for foreign exchange) transactions, in which the custodian's client would not pay the amount of cash without receiving the number or principal amount of securities it was purchasing or pay the amount of one currency without receiving the corresponding amount of the other currency. In other words, the transactions are generally transactions in which there is no risk of loss of principal for the custodian's client if the counterparty to the trade does not perform its obligation to complete the transaction. Custodians may, however, be exposed to credit risk if they advance cash in anticipation of settlement or receipt of income or tax payments, rather than waiting to verify actual settlement. Some of these settlement-related credit exposures are fully secured by the client granting a security interest in all cash and securities credited to the client's accounts with the custodian, thus giving custodians the ability to set-off the exposure amount against cash or foreclose on and liquidate assets to ensure repayment of the credit extension.[69]

The relatively low level of credit risk faced by custodians with respect to their custody business is evidenced both by the lower level of credit losses and the lower level of their allowance for loan and lease losses relative to the U.S banking industry more broadly. The data shown in Figure 8 for BNY Mellon, Northern Trust, and State Street is illustrative: at the end of each year from 2012 through 2015, charge-offs of loans as a percentage of their total loan and lease portfolios represented from 0.02% to 0.26% for BNY Mellon, 0.06% to 0.14% for Northern Trust, and -0.02% to 0.02%

## FIGURE 8: CREDIT LOSSES: CHARGE-OFF RATE (2012-2015)



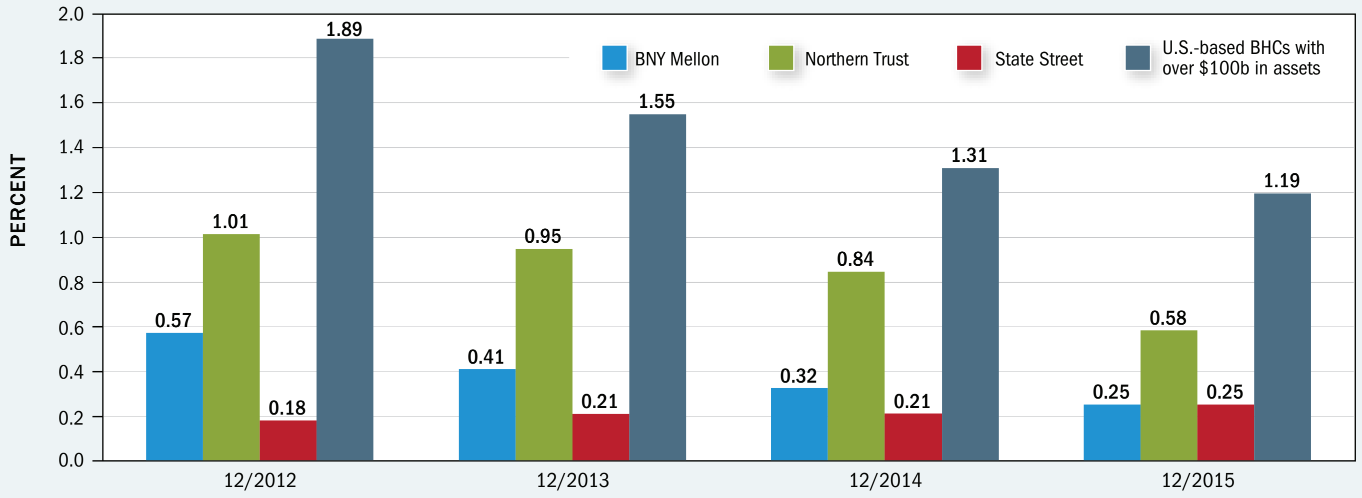

for State Street.[70] Over the same time period, annual charge-offs of loans as a percentage of their total loan and lease portfolios represented on average 0.49% to 1.03% for all U.S.-based BHCs with over $100b in assets, and 0.41% to 1.22% for commercial banks generally as reported by the Federal Reserve Board.[71]

Loans made by custodians in connection with their custody business also have a lower allowance for loan and lease losses as a percentage of their total loans and leases than Commercial Banks on average. For example, as seen in Figure 9, at the end of each year from 2012 through 2015, the allowance for loan and lease losses as a percentage of total loans and leases ranged from 0.25% to 0.57% for BNY Mellon, 0.58% to 1.01% for Northern Trust, and 0.18% to 0.25% for State Street.[72] For all U.S.-based BHCs with over $100b in assets, the allowance for loan and lease losses as a percentage of total loans and leases ranged from 0.18% to 3.88% at the end of 2012, from 0.21% to 2.95% at the end of 2013, and from 0.21% to 2.48% at the end of 2014, and 0.25% to 2.07% at the end of 2015.[73] In short, consistent with their lower level of credit exposures and the short-term, settlement-related nature of the majority of these credit exposures related to their custody business, banks have suffered lower credit losses, and have lower reserves against expected credit losses, associated with their custody businesses, than U.S.-based BHCs with over $100b in assets have overall.

While the overall credit risk faced by custodians is relatively low, custodians' counterparty credit exposures can be concentrated. Because of their business model, custodians typically face other financial institutions[74] (including sub-custodians and cash correspondent banks) and collective investment funds (including mutual funds, UCITS, sovereign issuers, and hedge funds). If these counterparties fail or are perceived to be failing, the exposures held by custodians could present a significant risk to custodians and their clients. Custodians mitigate these risks by collateralizing such transactions with high quality liquid assets, which effectively shifts the credit risk from the financial institution counterparty to the issuer of the collateral.

Further, as with all other banking organizations that are exposed to credit risk, custodians seek to mitigate their credit risk through a robust credit risk management framework, including the use of counterparty credit exposure limits, performing legal reviews of the enforceability of their collateral agreements and security interests, and ensuring that they have control

## FIGURE 9: ALLOWANCE FOR LOAN AND LEASE LOSSES (2012-2015)[75]




over the collateral provided by their clients (which generally consists of cash and securities already held by the client with the custodian).

In addition, custodians also hold significant levels of capital against their counterparty credit risk exposures both for internal risk management purposes and in compliance with U.S. Basel III capital rules. For example, notwithstanding their generally lower level of credit risk and credit losses (including through the financial crisis) compared to the average U.S.-based BHCs with over $100b in assets, BNY Mellon, Northern Trust and State Street have reported Tier 1 risk-based capital ratios comparable to those of this group of banks. At December 31, 2015, for example, the Tier 1 risk-based capital ratios were 12.29% for BNY Mellon, 11.4% for Northern Trust, and 15.3% for State Street; U.S.-based BHCs with over $100b in assets reported Tier 1 risk-based capital ratios ranging from 10.8% to 17.37% at the same date.[76]

### c. Market Risk

Custodians are also exposed to market risk, which is the risk of loss on a position in securities, foreign currencies, commodities or other assets resulting from changes in market factors such as prices or interest rates. However, the extent of the market risk faced by custodians is limited. They do not incur any market risk on assets they hold under custody or administration because, as explained in Section II.A.2 above, AUC and AUA are not the property of custodians and are not reflected on their balance sheets. The securities and other assets that comprise AUC and AUA may well be subject to market risk because their values will fluctuate based on changes in market prices, interest rates and other market factors, but any such market risk is borne by the beneficial owners of the assets, not by custodians. In addition, as explained in Section II.A.2 above, unlike banks with substantial securities market-making and dealing activities, custodians have immaterial percentages of their balance sheets associated with their custody business comprising trading assets and trading liabilities as to which they incur market risk.

The market risk to which a custody business is primarily exposed relates to its portfolios of investment securities, its broader asset-and-liability management practices, and its foreign exchange positions (i.e., FX trades for which custodians act as principal). Changes in market prices, interest rates or other market factors can affect the value of investment securities, and changes in foreign exchange rates can affect the value of FX positions. In this respect, custodians are no different from other banks that have securities investment portfolios and foreign exchange exposures. However, because a custody business generally uses investment securities as sources of liquidity, including through pledging them as collateral to FMUs, ICSDs and CSDs to secure intraday and overnight extensions of credit related to purchases of securities on behalf of custody clients, the securities consist primarily of highly liquid U.S. government and agency securities, foreign sovereign debt, and asset-backed securities. Most of these securities evidence low levels of volatility and market risk and thus meet the criteria to qualify as High Quality Liquid Assets for purposes of the U.S. Basel III LCR requirements. Similarly, custodians tend to act as FX dealers in connection with foreign currencies that have historically experienced relatively stable exchange rates and in any event seek to hedge their FX exposures through the use of FX swaps and futures.

#### d. Liquidity Risk

Custodians are also exposed to liquidity risk, which is the risk of loss from an actual or perceived inability to meet cash and collateral obligations. This includes the risk that a custodian may fail to effectively manage intraday liquidity related to mismatches in timing between clearing and settlement activities, and payments to or on behalf of clients. To manage this risk on an intraday basis, custodians must actively manage available cash and collateral positions at FMUs and other service providers. To manage liquidity overall, custodians maintain highly liquid assets, including cash, cash equivalents, U.S. government and agency securities (including mortgage-backed securities), select non-U.S. government and supranational securities, and certain other high-quality securities that remain relatively liquid in times of stress. Custodians also have access to markets and funding sources that are limited to banks, such as the federal funds market and the Federal Reserve's discount window.

### 2. Risks Faced by the Clients of Custodians

Just as custodians are exposed to risks arising from providing custody services to their clients, their clients are exposed to risks from using the custody services. The main risks that clients may face can be classified as follows:

» The risk of loss or delay arising from the custodian's operational errors; and

» Credit risk.

#### a. Risk of Loss or Delay Resulting from a Custodian's Operational Errors

As explained in Section I.A.1.a, the provision of custody, custody-related and ancillary services is subject to operational risks resulting from—among other things—inadequate internal processes, human error, and system failure. If a custodian commits an operational error, such as failing to process a corporate action or settle a securities transaction for a client, the client is at risk of losing all or a portion of the value of its investment or expected profit from the investment or transaction. The client will likely claim the amount of the loss from the custodian for breach of contract or negligence and, provided that the claim is justified, will ordinarily obtain compensation from the custodian. Ultimately, the risk to the client is that it may not be able to recover the full extent of its losses (for example, because the custody contract limits liability to direct damages and excludes liability for consequential damages such as lost profits) or may face a delay in obtaining compensation.

These risks are the same risks a client of any bank faces in obtaining other types of services from a bank. For example, if a bank fails to disburse a loan or to credit a fund transfer to a client's account, a client may be unable to pay the full extent of its obligations coming due on that day. These are also risks that a client would face in using any third party to provide custody services, or indeed if it performed its own back-office services. In short, they are risks that are inherent in using any service provider in connection with holding investment assets and effecting transactions in those assets.

Clients are also exposed to the operational risk of a custodian's failure to properly segregate client securities from the bank's own securities portfolio—the same risk faced by any client of any financial institution that holds securities or other non-cash assets on the client's behalf (such as securities brokers holding client securities). However, this risk can be mitigated by verifying the use of separate client accounts on the books of the custodian and client omnibus accounts on the books of sub-custodians, ICSDs, CSDs and other FMUs, as well as verifying the existence of adequate controls and processes through SSAE 16 reports and similar audit reports made available by custodians, as well as information relating to compliance with such asset protection requirements as Rule 17f-5 under the 1940 Act relating to the custody of assets on behalf of registered investment companies.

### b. Credit Risk Resulting from Exposure to a Custodian

As with a client of any bank, clients of custodians face the risk of loss of any uncollateralized cash deposits in an amount above the limit of the Federal Deposit Insurance Corporation's deposit insurance, which is $250,000 for each account holder. This is because cash held on deposit with a bank represents a contractual claim for the return of the cash amount from the bank rather than the retention of a property interest in an asset that belongs to the client. In the event of a custodian's insolvency, the client would have a claim against the Federal Deposit Insurance Corporation as receiver of the bank for the amount of the deposit and, under the Federal Deposit Insurance Act, would benefit from the priority that depositors have over other unsecured creditors of the bank. A client can mitigate this credit risk in the case of a custodian by maintaining only enough cash in its cash account on any one day that is necessary to process normal course transactional activities. Cash holdings of custody clients represent, however, a very small percentage of custody assets.

Clients of a custodian that lends securities through the bank's agency securities lending program also have a credit exposure to the bank to the extent that the bank has agreed to indemnify the lender in the event that the borrower fails to provide sufficient collateral to fully secure its obligation to return the borrowed securities. The indemnity generally covers any shortfall between the required amount of collateral necessary to cover the full amount of the value of the borrowed securities and the actual value of the collateral provided by the borrower. The credit risk to which the custodian's lender client is exposed in this case is no different than the credit risk faced by any entity relying on a bank's guarantee of a third party's obligations.

As explained in Sections I.A.1 and II.A.2 above, a custodian generally has a security interest in cash and securities credited to a client's account to secure its intraday or overnight extensions of credit to the client in connection with settling its purchases of securities. The client faces a risk of loss of cash or securities if the custodian exercises its rights and enforces its security interest by exercising its set-off rights against the client's cash or foreclosing on and liquidating securities collateral, but this risk only materializes if a client fails to repay the extensions of credit made by the bank. In other words, the client itself can mitigate this risk by ensuring that it meets and performs its obligations to the custodian. This risk is no different than the risk that any borrower faces on any secured loan extended by a bank.

# Conclusion

Custody services occupy a unique space and play a critical role in the global financial market with respect to safekeeping and servicing investor assets and, through provision of these services, helping investors build and maintain wealth. The custody services provided by custodians facilitate client access to and participation in the global financial ecosystem, which includes asset managers, broker-dealers, and FMUs. In providing such services, custodians help to connect investors and enable capital to be deployed efficiently, thereby helping to support overall economic growth and the accumulation of retirement and other long-term savings.

As discussed in detail in this white paper, to the extent custodians are engaged in offering custody services, their financial and risk profiles are distinguishable from those associated with other services offered by banks. While custodians experience to some degree the same risks as any other banking institution, these businesses tend to have different credit, market and interest rate risk profiles from that of other banking businesses. In light of these significant differences, The Clearing House believes that a custody business should not automatically be subject to the same regulatory and supervisory framework as other banking businesses, but rather that the regulatory and supervisory policies applicable to a custody business should be tailored to address the specific risks inherent and unique to custody businesses. The Clearing House has frequently emphasized that a "one-size-fits-all" approach to regulation, and to macroprudential regulation in particular, is inappropriate and would inherently fail to account for the wide variety of business models and practices that exist among individual institutions. As international and national regulatory bodies continue to increase their focus on macroprudential supervision, The Clearing House believes that it is important to ensure that all supervisory policies, tools and regulatory frameworks, including those that apply to custody businesses and the institutions that engage in them, appropriately reflect the particular risks they are intended to address. ■

# Endnotes

1 *See, e.g.,* "Scaled To Serve: The Role Of Commercial Banks In The U.S. Economy" and a study entitled "Understanding the Economics of Large Banks," The Clearing House's Working Paper Series on the Value of Large Banks, and the fourth quarter issue of The Clearing House's Banking Perspective journal, which was devoted to the topic: "The Value of Banks to Society."

2 Other market participants, such as broker-dealers, can also provide custodial services, but this paper focuses solely on the services provided by bank-chartered custodians.

3 The Bank of New York Mellon ("BNY Mellon"), Northern Trust Corporation ("Northern Trust"), and State Street Corporation ("State Street") are prime examples of such providers, and information about the business of these entities is included in various places in this white paper for illustrative purposes.

4 This paper focuses on the custody and related services offered by custodians and does not discuss other business lines in which they may engage. For example, this paper will not address analytics, asset management, brokerage, corporate trust, transition management, treasury management, tri-party repo, or wealth management business lines in which custodians may engage.

5 For example, the Investment Company Act of 1940 ("1940 Act") requires U.S. mutual funds to ensure the proper segregation of fund assets, a service often fulfilled by custodians. European Union rules regarding the Undertakings for Collective Investments in Transferable Securities ("UCITS") and Alternative Investment Funds ("AIFs") also require the use of custody services, mandating that the assets of each UCITS or AIF be held at a single depositary or custodian.

6 The Depository Trust Company is an example of a settlement service provider in the United States.

7 Of course, a custodian may have its own investment management business that provides investment advisory and investment management services, but in each case that is a separate and distinct line of business from its custody business. As noted above, this white paper focuses exclusively on custody businesses.

8 These two categories of deposits are often termed "operational deposits," and in many cases are given favorable treatment for capital and regulatory purposes over other types of institutional deposits.

9 In addition to lending in connection with their provision of custody services, custodians may extend credit in connection with their non-custody activities, including, for example, wealth management activities.

10 Other market participants, such as broker-dealers, can also provide custodial services; this paper, however, focuses on the services provided by bank-chartered custodians.

11 As previously mentioned, the Bank of New York Mellon ("BNY Mellon"), Northern Trust Corporation ("Northern Trust"), and State Street Corporation ("State Street") are prime examples of these, and information about the business of these entities is included in various places in this white paper for illustrative purposes.

12 AUC is the value of client assets held by a custodian, for which the custodian provides safekeeping services, and for which the custodian assumes recordkeeping, segregation, reconciliation and monitoring responsibilities. As of December 31, 2014, BNY Mellon's AUC was $24.6 trillion, Northern Trust's AUC was $6.0 trillion, and State Street's AUC was $21.7 trillion. *See* National Information Center, 2014 FR Y-15 Snapshot Excel (Aug. 3, 2015).

13 SNL, Largest 100 Banks in the World (July 1, 2014). BNY Mellon ranks 72nd and State Street ranks 96th on the list of largest banks worldwide by total assets. Northern Trust does not place in the top 100 banks by total assets. The trading assets and liabilities of these three institutions are relatively insignificant, ranging from $3.0 to $19.7 billion, (*See* SNL Reports, December 31, 2014 Trading Assets and Liabilities for BNY Mellon, State Street, and Northern Trust (accessed Sept. 28, 2015) reflecting the fact that custodians do not engage in any meaningful volume of trading, market-making or underwriting activities as principals in connection with their custody business.

14 Diana Chan, et al., The Securities Custody Industry, European Central Bank: Occasional Paper Series Number 68, 5 (2007). The former is generally referred to as a security "immobilized" in a CSD or ICSD; the latter is generally referred to as a "dematerialized" or "uncertificated" security on the books of a CSD. In some cases, an issuance is represented by two global certificates: one representing a domestic offering tranche and one representing an international offering tranche.

15 *Id.* at 10.

16 *See, e.g.,* U.C.C. § 8-503(a) (1994).

17 In the case of a direct account relationship with the CSD or ICSD.

18 In the case of an indirect account relationship with a CSD or ICSD.

19 In many major markets, the custodian credits these payments to its clients on the scheduled payment date even prior to actual receipt of the funds from the issuer, in which case the custodian is effectively advancing the funds to its clients, with the advances generally secured by a security interest in a client's assets held in the securities account. By advancing the funds, the custodian helps the client facilitate the efficient management of investment assets, including by enabling transactions to settle despite timing differences arising from issuers in one time zone making payments to holders in a different time zone.

20 Compliance reporting consists of monitoring compliance with investment guidelines and other similar mandates.

21 The term "financial market utility" is defined by Section 803 of the Dodd-Frank Wall Street Reform and Consumer Protection Act to mean "any person that manages or operates a multilateral system for the purpose of transferring, clearing, or settling payments, securities, or other financial transactions among financial institutions or between financial institutions and the person." 12 U.S.C. § 5462(6)(A) (2015). These entities are referred to as Financial Market Infrastructures, or "FMIs," by the Bank of International Settlements.

22 Of course, many U.S. custodians have an investment management business that provides investment advisory and investment management services, but in each case that is a separate and distinct line of business from its custody business. As noted above, this white paper focuses exclusively on custody businesses.

23 *See* 15 U.S.C. § 80a-17(f) (2012); *see also* 17 C.F.R. § 270.17f-4 (2015). Although U.S. mutual funds are permitted to self-custody their assets, due to the regulatory requirements associated with self-custody it is rare for them to do so.

24 *See* European Commission, Directive 2014/91/EU of the European Parliament and of the Council Amending Directive 2009/65/EC on the Coordination of Laws, Regulations, Administrative Provisions Relating to Undertakings for Collective Investment in Transferable Securities (UCITS) as Regards Depositary Function, Remuneration Policies and Sanctions, Art. 22(1) (July 23, 2014); Directive 2011/61/EU of the European Parliament and of the Council on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No. 1095/2010, Art. 21(1) (June 8, 2011).

25 The Options Clearing Corporation, the National Securities Clearing Corporation and the Fixed Income Clearing Corporation are examples of CCPs in the United States.

26 FED ACH and the Clearing House Interbank Payment System are examples of payment systems in the United States.

27 Continuous Linked Settlement ("CLS") is an example of a settlement service provider in the United States.

28 DTCC (United States) and Euroclear UK & Ireland are examples of CSDs.

29 Chan, *supra* n.14 at 3. Many issuances of U.S. Treasury securities, for example, exist solely in uncertificated form and the official register or record of each such issuance is the Federal Reserve's Fedwire settlement system.

30 *Id.* at 8.

31 *Id.* at 10.

32 *Id.* at 14. CSDs are particularly likely to offer such services for foreign securities that are also listed on the CSD's home-country exchange, but may also accept such securities if the national central bank in their home country accepts them as collateral against extensions of credit in their payment system or in connection with the central bank's monetary operations.

33 *Id.* at 16.

34 Euroclear Bank SA/NV and Clearstream Banking S.A. in the European Union are examples of ICSDs.

35 It is possible, of course, for two clients of a custodian to hold the same securities with the same custodian and for those securities to be held in the same omnibus client securities account (and in the same sub-account, if relevant) held by the custodian with the CSD or ICSD. In this case, the custodian could simply settle the securities transaction on its books, debiting and crediting the cash and securities in its clients' respective cash and securities accounts, without the involvement of the CSD or ICSD (because the custodian's cash and securities positions in its cash and securities accounts with the CSD or ICSD would remain unchanged). Such activity is both incidental (as it depends on the occurrence of a specific set of circumstances), and relatively rare (as most brokers active on a particular trading venue use a direct account at the relevant CSD).

36 The diagrams that appear in this paper are modified versions of the diagram found in The Payment System: Payments Securities, and Derivatives, and the Role of the Eurosystem 89 (Tom Kokkola ed., European Central Bank, 2010).

37 Some banks also act as clearing banks for certain types of transactions, such as tri-party repo transactions. The role of clearing banks is analogous to the role of custodians or sub-custodians in settling securities transactions, except that in acting as clearing banks they generally settle the securities transaction on their own books without a corresponding transfer of securities on the books of a CSD or ICSD. Because this paper is focused on custodians' provision of custody services, BNY Mellon's role as one of two U.S. tri-party repo clearing banks is not discussed.

Custodians facilitate tri-party repo transactions by providing clients access to tri-party repo services offered by the custodian or other clearing banks. In a tri-party repo transaction, the repo buyer (i.e., the lender of the cash) and repo seller (i.e., the seller of the cash) enter into a bilateral repo transaction using their cash and securities accounts with a custodian. Custodians facilitate such transactions by entering into such transactions as agent for the repo buyer and repo seller.

38 There is no consistent reporting of AUC. In some cases, the figures in this chart may include Assets Under Administration ("AUA"), which includes assets that the custodian may or may not hold in custody, but for which it provides asset administration services, such as fund accounting, regulatory and shareholder reporting, performance and analytics, and back or middle office outsourcing. In addition, in some cases the AUC figures published in this chart were not reported as of December 31, 2014, but are instead reported as of a date period within nine months of December 31, 2014. Figures that were not initially reported in US$ were converted using Internal Revenue Serv., Treasury Reporting Rates of Exchange ("IRS Table") issued at the date nearest to the date of the AUC figure. *See* National Information Center, *supra* n.12; BNP Paribas Securities Services, About Us: Key Figures (accessed May 21, 2015); HSBC, Annual Report and Accounts 2014 (Feb. 23, 2015); Northern Trust, 2014 Annual Report, (Form 10-K) (Feb. 26, 2015); Institutional Investor, The 2014 World's Largest Custodians: The Leaders (accessed June 4, 2015); Société Générale, Press Release: 2014 Activity and Results (Feb. 12, 2015); Brown Brothers Harriman, Press Release: Brown Brothers Harriman Private Banking to Open a New Office

in Nashville (May 5, 2015); UBS, UBS Group – Basel III Pillar 3 Disclosure for Global Systemically Important Banks (G-SIBs) Indicators as of 31 December 2014 (accessed Oct. 5, 2015); RBC Investor & Treasury Services, Press Release: RBC Investor and Treasury Services Selected as Custodian by Legg Mason (Mar. 31, 2015); Six Securities Services, Annual Report 2014 (Apr. 29, 2015); CACIES, About Us: Key Figures (accessed May 21, 2015); Sumitomo Mitsui Trust Group, About Sumitomo Mitsui Trust Group (accessed Oct. 5, 2015); Santander, Press Release: Santander Signs Alliance with Group Led by Warburg Pincus to Create Leader in the Custody Business (June 19, 2014); SEB Group, 2014 Annual Report (Mar. 4, 2015); Nordea, GSIB: Systematic Importance Indicators (accessed May 21, 2015); Brendan Swift, NAB Still the Big Player in Custody But Others Catching Up, Fin. Review (Apr. 16, 2015).

39 Mike Mayo, Rob Rutschow, Chris Spahr, Tom Hennessy, & Mark Holland, World's Worst Oligopoly: Time for Trust Banks to Adjust, CLSA Special Report, 6 (Jan. 2015).

40 FFIEC National Information Center, Holding Companies with Assets Greater than $10 Billion (accessed May 8, 2015).

41 *See* SNL, *supra* n.13.

42 In the case of custodians, such as BNY Mellon, Northern Trust, and State Street, that do not engage in significant maturity transformation activities, their overall balance sheet will be different from those of other custodians that do engage in broad commercial banking businesses.

43 As noted in footnote 42, in those cases where a custodian elects not to engage in general commercial banking, its income statements and balance sheets overall would be expected to differ from those of typical commercial banks.

44 Autonomous Research US LP, US Banks 4 (Mar. 19, 2015). *See also* SNL Financial, Bank of New York Mellon Corp.: Non-Interest Income / Operating Revenues, Period: 12/15 Q (Mar. 7, 2016) (ratio of non-interest income to operating revenues in the fourth quarter of 2015 was 79.50% for BNY Mellon, 74.98% for Northern Trust, and 80.54% for State Street, while the average for similarly sized "peer" U.S. commercial banks ranged from 35.87% to 55.21%).

45 As used in this paper, "U.S.-based BHCs with over $100b in assets" refers only to BHCs that have a U.S.-based parent company, not BHCs that are part of Foreign Banking Organizations under 12 C.F.R. § 211.21(o). In all instances, BNY Mellon, Northern Trust, and State Street are included in the banking organizations categorized as "U.S.-based BHCs with over $100b in assets." BNY Mellon, 2015 Annual Report (Form 10-K) (Feb. 26, 2016); BNY Mellon, 2014 Annual Report (Form 10-K) (Feb. 27, 2015); Northern Trust, 2015 Annual Report (Form 10-K) (Feb. 29, 2016); Northern Trust, 2014 Annual Report, *supra* n. 38; State Street, 2015 Annual Report (Form 10-K) (Feb. 19, 2016); State Street, 2014 Annual Report (Form 10-K) (Feb. 20, 2015) (together, "2014-2015 Annual Reports for BNY Mellon, Northern Trust, and State Street"); Ally Financial Inc., 2015 Annual Report (Form 10-K) (Feb. 24, 2016); Ally Financial Inc., 2014 Annual Report (Form 10-K) (Feb. 27, 2015); American Express Co., 2015 Annual Report (Form 10-K) (Feb. 19, 2016); American Express Co., 2014 Annual Report (Form 10-K) (Feb. 24, 2015); Bank of America, 2015 Annual Report (Form 10-K) (Feb. 24, 2016); Bank of America, 2014 Annual Report (Form 10-K) (Feb. 25, 2015); BB&T Corp., 2015 Annual Report (Form 10-K) (Feb. 25, 2016); BB&T Corp., 2014 Annual Report (Form 10-K) (Feb. 25, 2015); Capital One Financial Corp., 2015 Annual Report (Form 10-K) (Feb. 25, 2016); Capital One Financial Corp., 2014 Annual Report (Form 10-K) (Feb. 24, 2015); Citigroup Inc., 2015 Annual Report (From 10-K) (Feb. 26, 2016); Citigroup Inc., 2014 Annual Report (From 10-K) (Feb. 25, 2015); Citizens Financial Group, Inc., 2015 Annual Report (Form 10-K) (Mar. 26, 2016); Fifth Third Bank Bancorp, 2015 Annual Report (Form 10-K) (Feb. 25, 2016); Fifth Third Bank Bancorp, 2014 Annual Report (Form 10-K) (Feb. 25, 2015); Goldman Sachs Group, Inc., 2015 Annual Report (Form 10-K) (Feb. 22, 2016); Goldman Sachs Group, Inc., 2014 Annual Report (Form 10-K) (Feb. 25, 2015); JPMorgan Chase & Co., 2015 Annual Report (Form 10-K) (Feb. 23, 2016); JPMorgan Chase & Co., 2014 Annual Report (Form 10-K) (Feb. 24, 2015); Morgan Stanley, 2015 Annual Report (Form 10-K) (Mar. 23, 2016); Morgan Stanley, 2014 Annual Report (Form 10-K) (Mar. 2, 2015); PNC Financial Services Group, Inc., 2015 Annual Report (Form 10-K) (Feb. 29, 2016); PNC Financial Services Group, Inc., 2014 Annual Report (Form 10-K) (Mar. 2, 2015); Regions Financial Corp., 2015 Annual Report (Form 10-K) (Feb. 16, 2015); Regions Financial Corp., 2014 Annual Report (Form 10-K) (Feb. 19, 2015); SunTrust Banks, Inc., 2015 Annual Report (Form 10-K) (Feb. 23, 2016); SunTrust Banks, Inc., 2014 Annual Report (Form 10-K) (Feb. 24, 2015); U.S. Bancorp, 2015 Annual Report (Form 10-K) (Feb. 25, 2016); U.S. Bancorp, 2014 Annual Report (Form 10-K) (Mar. 2, 2015); Wells Fargo & Co., 2015 Annual Report (Form 10-K) (Feb. 24, 2016); Wells Fargo & Co., 2014 Annual Report (Form 10-K) (Feb. 25, 2015); (together, including 2014-2015 Annual Reports for BNY Mellon, Northern Trust and State Street "2014-2015 Annual Reports of U.S.-based BHCs with assets over $100b"). *See also* Autonomous *supra* n.44 at Chart 55 (demonstrating that revenue from fees has typically comprised between 40-50% of money center banks' total revenues over the last five years).

46 *See* 2014-2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, *supra* n. 45. For purposes of this calculation, revenues from BNY Mellon's Investment Services business, Northern Trust's Corporate and Institutional Services business, and State Street's Investment Servicing business were used as a proxy for custody services revenues.

47 In the case of BNY Mellon, Northern Trust, and State Street the percentage of total consolidated revenues (i.e., not just from custody services, but from all services provided by custodians, such as investment management and/or private wealth management), fee-based revenues in 2012-2015 represented from 77.2% to 80.0% for BNY Mellon, 66.5% to 69.5% for Northern Trust, and 73.4% to 79.9% for State Street. *See* 2014-2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, *supra* n. 45.

48 *See* 2014-2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, *supra* n. 45.

49 *Id. See* Autonomous Research *supra* n. 44.

50 *See* Autonomous Research *supra* n. 44. In the four-year period from 2012 through 2015, net interest income as a percentage

of revenues from custody services ranged from 23.3% to 24.9% for BNY Mellon, 12.9% to 16.4% for Northern Trust, and 22.8% to 28.9% for State Street. *See* 2014-2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, *supra* n. 45. As a percentage of total consolidated revenues (i.e., not just from custody services), net interest income in 2012-2015 decreased from 20.3% to 19.9% for BNY Mellon, 25.4% to 22.8% for Northern Trust, and 26.4% to 20.2% for State Street. *Id.* For the same four-year period, the average percentage of total consolidated revenues represented by net interest income for the U.S.-based BHCs with over $100b in assets ranged from 43.2% to 45.7%. *See* 2014-2015 Annual Reports of U.S.-based BHCs with over $100b in assets, *supra* n.45.

51 For each of the four years ended December 31, 2015, pre-tax operating margin from custody services were reported as ranging from 26% to 30% for BNY Mellon, 20.2% to 27.6% for Northern Trust, and 23% to 28% for State Street. *See* 2014-2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, *supra* n. 45. For the same four-year period, net income as a percentage of total consolidated revenues (i.e., not just from custody services) ranged from 14.5% to 21.2% for BNY Mellon, 17.6% to 20.7% for Northern Trust, and 19.1 to 21.3% for State Street. *Id*.

52 As explained in more detail below, the only exception to this arises if a custodian takes a security interest in client securities to collateralize an extension of credit to its client to purchase securities and forecloses on the securities to enforce its security interest or else to enforce a lien over the securities for unpaid custody fees.

53 For example, BNY Mellon increased its AUC/AUA by 44.5% from approximately $20 trillion to $28.9 trillion; Northern Trust increased its AUC/AUA by 52.2% from approximately $4.0 trillion to $6.1 trillion; and State Street increased its AUC/AUA by 111.0% from approximately $13 trillion to $27.5 trillion. *See* 2014-2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, *supra* n.45; BNY Mellon, Quarterly Report for the Quarter Ended June 30, 2015 (Form 10-Q) (Aug. 7, 2015); BNY Mellon, Quarterly Report for the Quarter Ended June 30, 2014 (Form 10-Q) (Aug. 11, 2014); BNY Mellon, 2012 Annual Report (Form 10-K) (Feb. 28, 2013); BNY Mellon, Quarterly Report for the Quarter Ended June 30, 2012 (Form 10-Q) (Aug. 8, 2012); BNY Mellon, 2010 Annual Report (Form 10-K) (Feb. 28, 2011); BNY Mellon, Quarterly Report for the Quarter Ended June 30, 2010 (Form 10-Q) (Aug. 6, 2010); BNY Mellon, 2008 Annual Report (Form 10-K) (Feb. 27, 2009); BNY Mellon, Quarterly Report for the Quarter Ended June 30, 2008 (Form 10-Q) (Aug. 8, 2008); BNY Mellon, 2007 Annual Report (Form 10-K) (Feb. 28, 2008); Northern Trust, Quarterly Report for the Quarter Ended June 30, 2015 (Form 10-Q) (July 29, 2015); Northern Trust, Quarterly Report for the Quarter Ended June 30, 2014 (Form 10-Q) (July 28, 2014); Northern Trust, 2012 Annual Report (Form 10-K) (Feb. 26, 2013); Northern Trust, Quarterly Report for the Quarter Ended June 30, 2012 (Form 10-Q) (July 27, 2012); Northern Trust, 2010 Annual Report (Form 10-K) (Feb. 25, 2011); Northern Trust, Quarterly Report for the Quarter Ended June 30, 2010 (Form 10-Q) (July 30, 2010); Northern Trust, 2008 Annual Report (Form 10-K) (Feb. 27, 2009); Northern Trust, Quarterly Report for the Quarter Ended June 30, 2008 (Form 10-Q) (July 31, 2007); Northern Trust, 2007 Annual Report (Form 10-K) (Feb. 28, 2008); State Street, Quarterly Report for the Quarter Ended June 30, 2015 (Form 10-Q) (July 29, 2015); State Street, Quarterly Report for the Quarter Ended June 30, 2014 (Form 10-Q) (Aug. 6, 2014); State Street, 2012 Annual Report (Form 10-K) (Feb. 22, 2013); State Street, Quarterly Report for the Quarter Ended June 30, 2011 (Form 10-Q) (Aug. 5, 2011); State Street, 2010 Annual Report (Form 10-K) (Feb. 28, 2011); State Street, Quarterly Report for the Quarter Ended June 30, 2009 (Form 10-Q) (Aug. 10, 2009); State Street, 2008 Annual Report (Form 10-K) (Feb. 27, 2009); State Street, Quarterly Report for the Quarter Ended June 30, 2007 (Form 10-Q) (Aug. 3, 2007); State Street, 2007 Annual Report (Form 10-K) (Feb. 15, 2008).

54 Deposit liabilities increased from approximately $81.4 billion to $279.6 billion (an increase of 243.7%) for BNY Mellon; from approximately $45.9 billion to $96.9 billion (an increase of 111.2%) for Northern Trust; and from approximately $73 billion to $191.6 billion (an increase of 162.4%) for State Street. *Id*.

55 *See* 2014-2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, *supra* n. 45; BNY Mellon, 2012 Annual Report, *supra* n. 53; Northern Trust, 2012 Annual Report, *supra* n. 53; State Street, 2012 Annual Report, *supra* n. 53 (together, "2012, 2014, and 2015 Annual Reports of BNY Mellon, Northern Trust, and State Street").

56 For example, the final rule implementing the Basel III Liquidity Coverage Ratio ("LCR") in the United States defines "operational deposit" in relevant part as "unsecured wholesale funding or a collateralized deposit that is necessary for the [bank] to provide operational services as an independent third-party intermediary, agent, or administrator to the wholesale customer or counterparty providing the unsecured wholesale funding or collateralized deposit." *See* 12 C.F.R. § 249.3 (2015).

57 For this reason, operational deposits benefit from a lower assumed run-off rate in calculating the net cash outflow denominator of the LCR than deposits from wholesale customers that are not operational deposits. *See* 12 C.F.R. §§ 249.32(h)(3) and (4) (2015) (5% and 25% outflow rates for operational deposits, depending on whether the entire deposit amounts are covered by deposit insurance).

58 Basel Committee on Banking Supervision, Basel III: The Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools ¶ 93 (Jan. 2013).

59 Custodians are likely viewed as "safe havens" because, as explained above, they do not engage in high volumes of trading activities or typical maturity transformation activities and also have historically reported relatively high risk-based capital ratios.

60 As noted elsewhere in this white paper, overdrafts and other short term extensions of credit to facilitate transactions by custody clientele are common assets relating to a custody business but are not material in size relative to the business as a whole.

61 For example, U.S. Treasuries and most foreign sovereign debt securities have a zero risk weighting under the U.S. Basel III rule's standardized approach for counterparty credit risk, meaning that banks are not required to hold any capital against such securities reflected on their balance sheets.

62 *See* 2012, 2014, and 2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, *supra* n. 55.

63 Collective investment vehicles are generally subject to limits on borrowing or otherwise constrained in borrowing because of leverage and asset coverage ratios.

64 Net loans and leases are the amount of loans and leases net of the amount of the related allowance for loan and lease losses.

65 Northern Trust's percentage of assets represented by loans and leases is relatively high in comparison to BNY Mellon and State Street's because the figure includes loans made as part of its significant Wealth Management operations.

66 *See* 2012, 2014, and 2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, *supra* n.55.

67 *See, e.g.,* 12 C.F.R. § 217.101(b) (2015) (Federal Reserve's final rule implementing Basel III advanced approaches; definition of "Operational risk"). Under the U.S. Basel III rules, only advanced approaches banking organizations are required to hold capital against operational risk. BNY Mellon, Northern Trust, and State Street use the advanced approaches capital framework.

68 *See* 12 C.F.R. § 217.101(b) (2015) (Federal Reserve's final rule implementing Basel III advanced approaches; definition of "Operational loss event"). The Basel Committee on Banking Supervision issued its Standardized Measurement Approach for operational risk – consultative document on March 4, 2016, available at: http://www.bis.org/bcbs/publ/d355.htm.

69 In addition, in many cases, custodians retain the right to reverse provisional credits in case of counterparty default.

70 *See* 2012, 2014, and 2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, *supra* n.55.

71 *See* 2014-2015 Annual Reports of U.S.-based BHCs with assets over $100b, *supra* note 45; Ally Financial Inc., 2012 Annual Report (Form 10-K) (Mar. 1, 2013); American Express Co., 2012 Annual Report (Form 10-K) (Feb. 22, 2013); Bank of America, 2012 Annual Report (Form 10-K) (Feb. 28, 2013); BB&T Corp., 2012 Annual Report (Form 10-K) (Mar. 1, 2013); BNY Mellon, 2012 Annual Report, *supra* n. 53; Capital One Financial Corp., 2012 Annual Report (Form 10-K) (Feb. 28, 2013); Citigroup Inc., 2012 Annual Report (From 10-K) (Mar. 1, 2013); Citizens Financial Group, Inc., 2012 Annual Report (Form 10-K) (Mar. 7, 2013); Fifth Third Bank Bancorp, 2012 Annual Report (Form 10-K) (Feb. 22, 2013); Goldman Sachs Group, Inc., 2013 Annual Report (Form 10-K) (Feb. 28, 2014); JPMorgan Chase & Co., 2012 Annual Report (Form 10-K) (Feb. 28, 2013); Morgan Stanley, 2013 Annual Report (Form 10-K) (Feb. 25, 2014); Northern Trust, 2012 Annual Report, *supra* n. 53; PNC Financial Services Group, Inc., 2012 Annual Report (Form 10-K) (Mar. 1, 2013); Regions Financial Corp., 2012 Annual Report (Form 10-K) (Feb. 21, 2013); State Street, 2012 Annual Report, *supra* n. 53; SunTrust Banks, Inc., 2012 Annual Report (Form 10-K) (Feb. 27, 2013); U.S. Bancorp, 2012 Annual Report (Form 10-K) (Mar 22, 2013); Wells Fargo & Co., 2012 Annual Report (Form 10-K) (Feb. 27, 2013); (together, "2012-2015 Annual Reports of U.S.-based BHCs with assets over $100b"). *See also* Federal Reserve Board Statistical Release, Charge-Off and Delinquency Rates on Loans and Leases at Commercial Banks (accessed Mar. 7, 2016). The figures presented here are an average of reported quarterly figures and assume that the amount of charge-offs is relatively equal throughout the year.

72 *See* 2012, 2014, and 2015 Annual Reports of BNY Mellon, Northern Trust, and State Street, respectively, *supra* n.55. Northern Trust's allowance for loan and lease losses, which is higher than that of BNY Mellon and State Street, reflects not only the allowance made for its custody services, but also for its significant Wealth Management operations.

73 *See* 2012-2015 Annual Reports of U.S.-based BHCs with assets over $100b, *supra* n.71.

74 These financial institutions are often subject to extensive prudential regulation, including stress testing.

75 *See* 2012-2015 Annual Reports of U.S.-based BHCs with assets over $100b, *supra* n.71.

76 SNL Financial Data, Tier 1 Risk-Based Capital Ratios for the U.S.-based BHCs with over $100b in assets (Mar. 7, 2015).