Housing Finance Reform and the Shadow Money Supply

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The election of Donald Trump alongside libertarian majorities in the House and Senate is likely to jumpstart housing finance reform efforts, and it appears almost certain that the federal government's role in housing finance will be significantly reduced. A number of legal and economic analyses have looked at the effects that housing finance reform may have on the availability of mortgage funding for American households. However, these commentaries have to date overlooked the implications that such reform presents for the global money supply. This Article shows that (1) housing finance has historically played an important role in money creation; (2) Fannie and Freddie today are a major producer of government-backed "safe assets;" and (3) these safe assets are at the heart of money creation in the shadow banking system today, which is an important part of the overall money supply. Accordingly, this Article argues that housing finance reform as it is currently being contemplated is likely to have negative near-term and long-term implications for financial stability and monetary policy. Policy makers should carefully consider these effects of major changes to the housing finance system on the money supply before committing to any course of action.

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I. INTRODUCTION

In a previous Article,[1] I showed that government guarantees in the U.S. mortgage market have historically promoted financial stability, and argued that this stability was at least in part due to three effects of government guarantees: first, they prevent banking panics; second, they blunt procylicality; and third, they promote the origination of consumer-friendly loans that are less likely to default.

In this Article, I propose another complementary explanation for this phenomenon: housing finance naturally produces liabilities that function as money. Thus, government guarantees of housing finance liabilities create two positive externalities promoting financial stability—they facilitate greater linkages between the Federal Reserve's traditional monetary policy levers and the actual money supply, and they crowd out private forms of money (like the "shadow money" liabilities created by the shadow banking system), which are more prone than publicly backed monetary instruments to procyclicality and instability.

This hypothesis may have a great deal of importance, given the likelihood of major reforms to the housing finance system under the Trump Administration. In September 2008, the government-sponsored enterprises (GSEs)[2] Fannie Mae and Freddie Mac were placed into conservatorship by their primary regulator, the Federal Housing Finance Agency (FHFA), a casualty of the financial crisis that was then brewing.[3] Following their

1. David Min, *How Government Guarantees Promote Housing Finance Stability*, 50 HARV. J. LEGIS. 437 (2013) [hereinafter Min, *Government Guarantees*].

2. The term "government-sponsored enterprise," or "GSE" in shorthand, is statutory in origin. *See* 2 U.S.C. § 622(8) (2006) (discussing "government-sponsored enterprise" provision). The Congressional Budget Office has defined a GSE as "a corporation chartered by the federal government to achieve public purposes that has nongovernmental status, is excluded from the federal budget, and is exempt from most, if not all, laws and regulations applicable to federal agencies, officers, and employees." CONG. BUDGET OFFICE, CONTROLLING THE RISKS OF GOVERNMENT-SPONSORED ENTERPRISES 2 (1991). As I have previously noted, the conservatorships of Fannie and Freddie were carefully structured to avoid giving the federal government an equity stake of 80% or more, in an apparent effort to support the legal argument that the entities were not owned by the government, and that their assets and liabilities therefore did not need to be consolidated onto the federal government's balance sheet. Min, *Government Guarantees*, *supra* note 1, at 441 n. 17 (citing Steven M. Davidoff & David Zaring, *Regulation by Deal: The Government's Response to the Financial Crisis*, 61 ADMIN. L. REV. 463, 489 (2009)). Fannie and Freddie are thus still accurately described as "government-sponsored" enterprises, even though the Federal Housing Finance Agency effectively controls the two companies in its role as conservator.

3. *See* Press Release, U.S. Dep't of the Treasury, Statement by Secretary Henry M. Paulson, Jr. on

conservatorship, a wide array of commentators (including many influential legislators) have been clamoring for some form of "privatization" of the GSEs, wherein the two companies would be wound down, and the federal government would be removed from its longstanding role as the guarantor of last resort of most U.S. housing finance liabilities.[4] President Donald Trump appears to be sympathetic to this view of housing finance, as his presidential transition team was made up of several leading advocates of housing finance privatization.[5]

Such reforms could potentially have a staggering impact on the mortgage markets in the United States, as the two enterprises provide a very large share of all residential mortgage financing. Since the 1990s, and particularly since 2008, Fannie and Freddie have been responsible for financing most American home loans.[6] Thus, any such major structural changes to U.S. housing finance will likely have enormous implications for American homeowners and home buyers, and more broadly, the American economy. Unsurprisingly, legal and policy analysis of housing finance reform has focused almost entirely on the effects this may have on the mortgage markets.

But GSE reform would also have a major effect on global credit markets, a point that has been mostly overlooked to date. To finance their considerable mortgage finance activities, Fannie and Freddie have issued approximately $5.3 trillion in mortgage-backed securities, collateralized mortgage obligations (CMOs), and corporate debt.[7] These liabilities, which are understood to carry an implicit federal guarantee against losses that is nearly as robust as the "full faith and credit" guarantee on U.S. Treasury obligations, are an important component of the supply of so-called "safe assets," making up about one-tenth of the estimated global supply of safe assets, and about one quarter of U.S. safe assets.[8] As I discuss *infra* in Part I, safe assets vary greatly in form and function, but are generally thought to carry *de minimis* credit risk.[9] In the absence of any countervailing measures, housing finance reform is likely to have a short-term contractionary impact, possibly a very severe one, on the supply of safe assets.

Any reduction in safe assets would in turn have important consequences for global money markets today, as safe assets, particularly government-backed safe assets like the liabilities of Fannie and Freddie, have come to play an essential role in the creation of "shadow money." Shadow money has become an important part of the overall money supply, but because it is a private form of money creation and does not carry any formal

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Treasury and Federal Housing Finance Agency Action to Protect Financial Markets and Taxpayers (Sept. 7, 2008) (announcing the placement of the two companies into federal conservatorship and describing this as the "only option" for the Treasury Department and the Federal Housing Finance Agency).

4. *See infra* Part IV.A.

5. This includes Edward Pinto and Alex Pollock of the American Enterprise Institute. *See Trump Administration Transition*, STEPTOE & JOHNSON LLP, https://www.steptoe.com/resources-detail-11703.html (last visited Mar. 19, 2018). Pinto and Pollock have been two of the leading critics of government guarantees in housing finance. *See, e.g.*, Peter J. Wallison et al., *Taking the government out of housing finance: Principles for Reforming the Housing Finance Market*, AM. ENTER. INST. (Mar. 24, 2011), https://www.aei.org/publication/taking-the-government-out-of-housing-finance-principles-for-reforming-the-housing-finance-market/.

6. *See* Min, *Government Guarantees*, *supra* note 1, at 463–64.

7. *See infra* notes 74–77 and accompanying text.

8. *See infra* Part II.A.5.

9. Gelpern and Gerding provide an excellent taxonomy of safe assets. *See generally* Anna Gelpern & Erik F. Gerding, *Inside Safe Assets*, 33 YALE J. REG. 363 (2016).

government guarantees behind it, it relies heavily on the use of collateral to help maintain its monetary attributes.[10] As the International Monetary Fund has described, collateral serves as a "lubricant" or substitute of trust in transactions between financial institutions.[11] Safe assets, which are thought to carry *de minimis* credit risk, are strongly preferred as collateral in shadow money transactions.

To the extent that housing finance reform may significantly reduce the supply of government-backed safe assets, as seems likely, this may have negative ramifications for financial stability and monetary policy. As Prof. Morgan Ricks and others have argued, money creation—including shadow money creation—is inextricably tied to financial stability.[12] In the short run, we can expect to see two major effects of any housing finance reform that significantly reduces the supply of government-backed safe assets. First, there is likely to be a substitution effect as shadow money markets rely more heavily on privately created safe and foreign safe assets. Second, to the extent that there are insufficient substitutes, such a reduction in government-backed safe assets will create contractionary pressures on the shadow money supply, which has become an important part of the overall money supply today. In tandem, these two near-term effects are likely to be quite detrimental for financial stability and macroeconomic growth.

If, as this Article argues, housing finance is intrinsically important for the money supply, then housing finance reform will also have some sizeable long-run effects as well. At the very least, we would expect to see a large increase in the stock of private money, which would greatly raise the likelihood of future financial crises. While there has been much debate over the causes of the 2007–08 financial crisis, there is little dispute that one of the key factors in the striking lack of similar crises or panics in the preceding 70 years was the prevalence of government backing for money liabilities, which effectively prevented bank runs by eliminating concerns that these money obligations would become worthless if they weren't immediately redeemed. Since private money does not carry government guarantees behind it, holders of private (or shadow) money claims must worry about run risk, and thus private money is inherently vulnerable to crises of the sort we just experienced.

Housing finance reform then may result in both severe short-term stresses and large long-term structural deficiences in our financial infrastructure. Policy makers must begin to account for these "supply side concerns" in their deliberations over what to do with Fannie Mae and Freddie Mac. If they do not, we run a high risk of re-creating the same conditions that led to the financial crisis.

This Article proceeds in five parts. Part I describes the historical importance of housing finance liabilities for the U.S. money supply. Part II argues that housing finance may play an important role in the money supply because home mortgages have characteristics that make housing finance uniquely well-suited for producing money

10. As I discuss in greater detail *infra* in Part II.A.3, for a particular obligation to function as money, it must maintain its par value over time. Most forms of money (such as fiat currency or government-insured bank deposits) achieve this through a government guarantee, but private money must find other means of maintaining this value constancy.

11. IMF, GLOBAL FINANCIAL STABILITY REPORT: THE QUEST FOR LASTING STABILITY, 82 (2012) [hereinafter GSFR] https://www.imf.org/~/media/Websites/IMF/imported-flagship-issues/external/pubs/ft/GFSR/2012/01/pdf/_textpdf.ashx.

12. MORGAN RICKS, THE MONEY PROBLEM: RETHINKING FINANCIAL REGULATION 2–5 (2016) [hereinafter RICKS, THE MONEY PROBLEM].

liabilities. Part III describes the directionality of housing finance reform and discusses some of the likely effects of housing finance reform on safe assets and the money supply. Part IV lays out the implications of the arguments made in Parts II and III, and cautions that housing finance reform should proceed carefully in reducing the government's footprint, as this will have significant effects on the money supply, which in turn could have important and negative impacts on financial stability and monetary policy.

II. HOUSING FINANCE AND THE MONEY SUPPLY

Housing finance reform will heavily impact global money markets because housing finance is deeply intertwined with money creation. As I describe in this Part, the obligations issued by Fannie Mae and Freddie Mac play a substantial role in the overall money supply today. These obligations are heavily relied upon as "safe" collateral in a variety of shadow banking transactions that create liabilities that serve the functions of money.

The importance of housing finance to the overall money stock is not a phenomenon that is limited to Fannie and Freddie, but indeed has been the case as long as we have been measuring the money supply. Before Fannie and Freddie, thrifts were the dominant source of housing finance in the United States, and the deposits they used to fund their activities, much like the MBS and debt issued by Fannie and Freddie, were an important part of the money supply. Also, the brief period in which private-label MBS dominated the U.S. mortgage markets supports the argument that housing finance and money are closely related.

A. Fannie, Freddie, and the Shadow Money Supply

In the past decade, a major focus of financial regulators across the world has been "shadow banking," which was widely blamed for having caused the 2007–08 financial crisis. Shadow banking is a term which is generally used to describe financial intermediation that occurs outside the system of banking regulation (including deposit insurance, safety and soundness regulation, and bank resolution) we have in place for depository institutions.[13] Traditional bank intermediation takes place in a single firm—the depository institution, which accepts deposits and uses these to fund its lending activities. Shadow banking intermediation relies on a much more complex process utilizing an array of capital markets actors and market structures, as I have previously described:

> [I]n shadow banking, the originator of a loan sells it off to a bankruptcy-remote securitization conduit (typically either a special-purchase vehicle ("SPV") or a structured investment vehicle ("SIV")), which pools a number of other loans and sells off securities representing the cash flows from the loan pool. The origination and securitization of these loans is financed predominantly through short-term funding coming from the issuance of asset-backed securities ("ABS"), asset-backed commercial paper ("ABCP"), short-term repurchase agreements ("repos"), and similar debt or structured credit instruments. These debt instruments are purchased by money market mutual funds ("MMFs"), bond funds, and other entities, including other securitization conduits that then issue new

13. *See* David Min, *Understanding the Failures of Market Discipline*, 92 WASH. U. L. REV. 1421, 1448–49 (2015) [hereinafter Min, *Understanding the Failures*] (providing an overview of shadow banking).

> debt obligations based on the cash flows from these liabilities. The end effect is functionally the same—long-term loan assets funded by short-term liquid liabilities—but shadow banking utilizes a potpourri of capital market structures to conduct this intermediation.[14]

Shadow banking is significant in size,[15] with some observers estimating that it is larger than traditional (or core) banking.[16] Shadow banking is particularly prevalent in the United States, which has always had a more robust capital markets infrastructure than other countries, and has experienced a significant decline in the role of the traditional banking sector over the past 40 years.[17] One of the primary functions of shadow banking, it has been argued, is to produce new forms of money to meet the demands of global institutional investors.[18] The creation of these "shadow money" instruments relies essentially on the use of collateralization, and this collateral largely consists of so-called "safe assets"—debt instruments that are perceived to have little or no credit or liquidity risk.[19] As a fair amount of recent scholarship has found, the global supply of safe assets appears to be insufficient to meet the overwhelming demand.

As I describe in this Part, Fannie and Freddie liabilities make up an important and sizeable share of the global safe asset supply. Because these liabilities are assumed to enjoy a strong implicit guarantee from the U.S. Treasury (an assumption that was validated by the bailout of the two companies in September 2008), they are understood to be nearly as safe as U.S. Treasury obligations. As a result, they function as a form of "public safe asset" that is especially important for shadow money creation today.

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14. *Id.* at 1450 (citing ANTHONY SAUNDERS & LINDA ALLEN, CREDIT RISK MEASUREMENT IN AND OUT OF THE FINANCIAL CRISIS: NEW APPROACHES TO VALUE AT RISK AND OTHER PARADIGMS 5–11 (3d ed., 2010)); Bryan J. Noeth & Rajdeep Sengupta, *Is Shadow Banking Really Banking?*, REG'L ECONOMIST (Oct. 2011), http://www.stlouisfed.org/publications/re/articles/?id=2165.

15. The exact size of the shadow banking system is a matter of some dispute, in part because there is significant debate over what the exact definition and parameters of shadow banking are. In its most recent Global Shadow Banking Monitoring Report, the Financial Stability Board (FSB), which is made up of the leading central bankers and financial regulators from the G20 countries, described three different ways of measuring the size of shadow banking: a "narrow measure" looking at the economic functions of non-bank financial entities and activities ($36 trillion), a "broad measure" looking at the assets of non-bank financial institutions ($80 trillion), and a broad "MUNFI" measure of non-bank financial institutions as well as insurance companies and pension funds ($137 trillion). FIN. STABILITY BD., GLOBAL SHADOW BANKING MONITORING REPORT 2015 1–13 (2015), http://www.fsb.org/wp-content/uploads/global-shadow-banking-monitoring-report-2015.pdf. Other approaches look at different measures of liabilities (rather than assets). *See, e.g.*, Noeth & Sengupta, *supra* note 14.

16. *See* Morgan Ricks, *Regulating Money Creation After the Crisis*, 1 HARV. BUS. L. REV. 75, 85 (2011) [hereinafter Ricks, *Regulating Money Creation*]; Noeth & Sengupta, *supra* note 14, at 8.

17. *See generally* Saule T. Omarova, *The Quiet Metamorphosis: How Derivatives Changed the "Business of Banking"*, 63 U. MIAMI L. REV. 1041 (2009). *See also* FIN. CRISIS INQUIRY COMM'N, THE FINANCIAL CRISIS INQUIRY REPORT 27–37 (2011) [hereinafter FINANCIAL CRISIS INQUIRY REPORT], https://www.gpo.gov/fdsys/pkg/GPO-FCIC/pdf/GPO-FCIC.pdf.

18. *See, e.g.*, Adi Sunderam, *Money Creation and the Shadow Banking System*, 28 REV. FIN. STUD. 939, 939 (2015); Gary Gorton & George Pennacchi, *Financial Intermediaries and Liquidity Creation*, 45 J. FIN. 49, 50–52 (1990); Douglas W. Diamond & Philip H. Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 91 J. POL. ECON. 401, 405–10 (1983).

19. As Gelpern and Gerding have argued, there is no such thing as a truly safe asset, and there are a number of ways in which legal or regulatory requirements help to facilitate the creation and use of safe assets. *See generally* Gelpern & Gerding, *supra* note 9. As I discuss in Section C of this Part, this Article is primarily concerned with the use of safe assets as collateral to create money-like instruments.

1. Defining Money

Before proceeding, it may be helpful to first briefly discuss what money is. As Friedman & Schwartz, among others, have famously documented, economists have been arguing for several centuries about the best definition of money.[20] Most attempts today to define money use a functional approach,[21] looking at how money is actually used.[22] The most common functional definition of money includes any asset that serves as a medium of exchange, a store of value, and a unit of account.[23] To serve these functions, it is argued that an asset must maintain a high degree of liquidity[24] and be understood to be redeemable at par (in other words, to not suffer fluctuate in value).[25] Some, such as Morgan Ricks , contend that the proper definition of money must also be limited to short-term obligations, so as to limit interest rate and other duration risk.[26]

The Federal Reserve uses two metrics to measure the money supply—a narrower category of money it calls "M1," which consists of currency in public circulation, travelers checks, demand deposits at depository institutions, and certain other checkable deposits; and a broader definition of money it calls "M2," which consists of M1 plus savings deposits (including money market deposit accounts, time deposits, and balances at retail money market mutual fund accounts.[27] But it is also well recognized that the definition of money

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20. MILTON FRIEDMAN & ANNA JACOBSON SCHWARTZ, MONETARY STATISTICS OF THE UNITED STATES: ESTIMATES, SOURCES, METHODS 89–198 (1970) (surveying the historical dialogue over defining money).

21. *What Is the Money Supply? Is It Important?*, BOARD OF GOVERNORS OF THE FED. RES. SYS., http://www.federalreserve.gov/faqs/money_12845.htm (last visited Mar. 19, 2018).

22. *See* Alfred Broaddus, *Aggregating the Monetary Aggregates: Concepts and Issues*, 61 ECON. REV. 3 (1975) (discussing the functional view of money); Ewe-Ghee Lim & Subramanian S. Sriram, *Factors Underlying the Definitions of Broad Money: An Examination of Recent U.S. Monetary Statistics and Practices of Other Countries* 4 (IMF, Working Paper No. 03/62, 2003), https://www.imf.org/external/pubs/ft/wp/2003/wp0362.pdf (describing the international definitions of money aggregates).

23. *See* Irena Asmundson & Ceyda Oner, *What is Money?*, 49 FIN. & DEV. 13 (2012) (describing the functional uses of money). *See also* Zoltan Pozsar, *Shadow Banking: The Money View* 7 (Office of Fin. Res., Working Paper No. 14-04, 2014) [hereinafter Pozar, *Shadow Banking*] (describing the hierarchy of money)

24. *See, e.g.*, Lim & Sriram, *supra* note 22, at 4 (discussing asset liquidity); *See also* IMF, *MONETARY AND FINANCIAL STATISTICS MANUAL* 59 (2000), https://www.imf.org/external/pubs/ft/mfs/manual/pdf/mmfsft.pdf (discussing financial instruments which should be included as part of broad money).

25. *See* Pozsar, *Shadow Banking*, *supra* note 23, at 7 (describing the fluctuations of money values).

26. RICKS, THE MONEY PROBLEM, *supra* note 12, at 29–49. There is also a so-called "empirical approach" to defining money, which is most closely associated with Milton Friedman and Anna Schwartz. The empirical approach asserts that money is an artificial construct, and therefore, we should define money in the manner that best aids us in "organizing our knowledge of economic relationships." FRIEDMAN & JACOBSON SCHWARTZ, *supra* note 20, at 137. Under this empirical approach, the definition of money should include financial assets that most directly affect financial or macroeconomic variables such as national income or prices. *See* Lim & Sriram, *supra* note 22, at 5 (describing which assets should be included in the definition of money).

27. *See Money Stock Measures – H.6,* BOARD OF GOVERNORS OF THE FED. RES. SYS., (Sept. 24, 2015), http://www.federalreserve.gov/releases/h6/20150924/#t1tg1link [hereinafter *Money Stock Measures*]. As Bernanke has described, the Federal Reserve introduced its M1, M2, and M3 monetary aggregates in 1971, but these were narrower in scope than they are today, including only bank deposits (but not thrift deposits, which were counted under the Fed's M3 aggregate). *See* Ben S. Bernanke, Chairman, Fed. Reserve, Monetary Aggregates and Monetary Policy at the Federal Reserve: A Historical Perspective, Speech at the Fourth ECB Central Banking Conference, Frankfurt, Germany (Nov. 10, 2006) (discussing definitions of M1, M2, and M5 currency) (citing Richard G. Anderson & Kenneth A. Kavajecz, *A Historical Perspective on the Federal Reserve's Monetary Aggregates: Definition, Construction and Targeting*, 76 FED. RES. BANK ST. LOUIS REV. 1 (1994)). In 1975, the Federal Reserve introduced M4 and M5, which included large time deposits at banks and thrifts. Over

is not static but can change over time.[28] Thus, the Fed's M1 and M2 aggregates do not necessarily provide a complete or accurate set of contours of the money supply. Perhaps reflecting the malleability of the definition of money, both the M1 and M2 aggregates have undergone extensive revision over time.[29] The key point here is that while the Federal Reserve and others have attempted to define the money supply, there is a broad consensus that these definitions are imperfect, and that the specific components of the money supply are potentially always evolving. There is a growing consensus among those who study money that the existing M1 and M2 metrics are underinclusive, as they fail to include a number of financial instruments that are serving as money substitutes, as I discuss *infra* in this section.

2. Shadow Money Creation

There has been a growing and influential body of research arguing that one of the key functions of shadow banking is to create new forms of short-term, safe, and liquid liabilities that can serve the functions of money.[30] Under this account, the rapid growth of shadow banking is best understood as a response to the needs of institutional cash pools such as asset managers, securities lenders and pension funds, which experienced explosive growth in the 1980s and 1990s, and have grown to rival traditional banks as far as the gross value of assets they hold under their management. For example, in 2003, global institutional investors had a total of $47 trillion under management, as compared to $49 trillion held in traditional banks.[31]

The enormous amount of cash held by institutional investors created a huge demand for short-term, safe, and liquid assets that could function as alternatives to cash.[32] But the

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time, the Fed changed its definitions of these different monetary aggregates, and it eliminated M4 and M5 in 1980. *Id.* The Fed stopped publishing M3 in 2006. *See Discontinuance of M3*, FED. RES. (Mar. 9, 2006), http://www.federalreserve.gov/releases/h6/discm3.htm (highlighting the discontinuance of the M3 currency designation). Today, M1 is roughly equivalent to its old definition, while M2 is roughly equivalent to the old definition of M3. *See* Bernanke, *supra* (comparing the definitions of currency between M1, M2, and M3 designations).

28. For an example of the empirical approach, see generally Bennett T. McCallum & Edward Nelson, *Money and Inflation: Some Critical Issues* (Fed. Reserve Board Fin. & Econ. Discussion Series, Working Paper No. 2010-57, 2010).

29. *See* Bernanke, *supra* note 27.

30. *See, e.g.*, Sunderam, *supra* note 18, at 3 (discussing how shadow banking provides needed "short-term safety and liquidity"); Gary Gorton, *The Development of Opacity in U.S. Banking*, 31 YALE J. REG. 825, 840 (2014) (discussing shadow banking as "genuine banking, and not some aberration"); Jeremy C. Stein, *Monetary Policy as Financial Stability Regulation*, 127 Q. J. ECON. 57, 59–60 (2012) (discussing shadow banking and "achieving financial stability"); Gary B. Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo*, J. FIN. ECON. 425, 425–27 (2010) [hereinafter Gorton & Metrick, *Securitized Banking*] (classifying some shadow banking as "securitized banking"); Gary Gorton & George Pennachi, *Financial Intermediaries and Liquidity Creation*, 45 J. FIN. 49 (1990); *Ricks, Regulating Money Creation*, *supra* note 16, at 76, 79–80.

31. Gary Gorton & Andrew Metrick, *Regulating the Shadow Banking System*, 2010 BROOKINGS PAPERS ON ECON. ACTIVITY 261, 276 (2010), https://www.brookings.edu/bpea-articles/regulating-the-shadow-banking-system-with-comments-and-discussion/ (citing COMM. ON GLOB. FIN. SYS: BANK FOR INT'L SETTLEMENTS,,INSTITUTIONAL INVESTORS, GLOBAL SAVINGS AND ASSET ALLOCATION 1 (Feb. 28, 2007) https://www.bis.org/publ/cgfs27.pdf.

32. Zoltan Pozsar, *Institutional Cash Pools and the Triffin Dilemma of the U.S. Banking System* 3 (IMF, Working Paper No. 11/190, 2011) [hereinafter Pozsar, *Institutional Cash Pools*] (distinguishing between "long-term AAA assets" and "short-term AAA assets").

insured depository system, with its relatively low $100,000 cap on FDIC insurance coverage and increasing consolidation, is designed for retail depositors and thus is not a good fit for the needs of these investment funds. As economist Zoltan Poszar has observed, "there are not enough banks to spread the average institutional cash pool across in insured, $100,000 increments—the pre-crisis deposit insurance limit."[33]

The most obvious candidates to satisfy this demand for cash substitutes are short-term liquid instruments guaranteed by the government, such as short-term Treasury securities. But as Poszar has found, the demand for non-M2 money instruments far outstripped the available supply of short-term, liquid and safe government-backed securities.[34] Thus, the natural "evolutionary response" to this supply-demand imbalance was the creation of new privately created forms of short-term, liquid, and safe assets by the shadow banking system.[35]

To manufacture these money instruments, the private sector essentially invented new types of private financial intermediaries that "served as bridges between pools of long-term assets and the short-term cash balances of institutional cash pools."[36] These intermediaries in turn produced new money-like instruments have been dubbed "money claims" or "money-like claims" to reflect the fact that they serve many of the key functions of money—in particular, they act as a store of value and a unit of account—but do not operate directly as a medium of exchange or payment (although they can be easily exchanged for forms of money that can be used as a medium of exchange).[37] These money claims include shares in money market mutual funds,[38] short-duration repurchase-and-sale agreements (repos), and asset-backed commercial paper.[39] Indeed, as Ricks has pointed out, it is worth noting that institutional investors usually refer to ABCP and repos as "cash" and generally accepted accounting standards designate these instruments as "cash equivalents."[40] ABCP and repos are also treated as cash substitutes by various legal measures—they are categorized as "cash collateral" under bankruptcy laws,[41] and are largely exempted from federal securities law.[42]

Importantly, it appears clear, as a fair amount of empirical and theoretical literature

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33. *Id.* at 8.

34. *Id.* at 9–10 (finding that there was a $1.1 trillion gap between the "supply of short-term government-guaranteed instruments" and the demand for non-M2 money in 2005, a $1.6 trillion gap in 2006, and a $1.6 trillion gap in 2007).

35. *Id.* at 22; Gorton, *supra* note 30, at 10–13; Stein, *supra* note 30, at 59–60, 86; Ricks, *Regulating Money Creation*, *supra* note 16, at 76–80; Gorton & Metrick, *Securitized Banking*, *supra* note 30, at 425–27; Sunderam, *supra* note 18, at 6–7, 13–17, 27–29.

36. Pozsar, *Institutional Cash Pools*, *supra* note 32, at 22.

37. *See* Sunderam, *supra* note 18, at 939–40 (2015) (discussing treatment of short-term shadow bank debt as money-like); Ricks, *Regulating Money Creation*, *supra* note 16, at 89–97.

38. While money market mutual funds (MMFs) provide a relatively safe (if uninsured) alternative to bank deposits, they don't necessarily alleviate the problem of a scarcity of short-term, liquid, safe assets, since MMFs are required to invest in short-term, liquid, safe assets themselves. *See* Bryan J. Noeth & Rajdeep Sengupta, *Is Shadow Banking Really Banking?*, FED. RES. BANK ST. LOUIS REG'L ECON. at 8, 10 (Oct. 2011), https://www.stlouisfed.org/~/media/Files/PDFs/publications/pub_assets/pdf/re2011/2/shadow_banking.pdf.

39. *See generally* Gorton & Metrick, *supra* note 31.

40. Morgan Ricks, *Regulating Money Creation*, *supra* note 16, at 89. *See also* FASB, STATEMENT OF FINANCIAL ACCOUNTING STANDARDS NO. 95: STATEMENT OF CASH FLOWS 6 (1987), http://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1218220128261&acceptedDisclaimer=true.

41. *Id.* at 90 (citing 11 U.S.C. §363(a) (2006)).

42. *Id.* at 90.

has found, that market actors themselve viewed these money claims produced out of the shadow banking system as a substitute for more traditional forms of money.[43] Thus, it appears that the effective money supply today is considerably broader than the M2 definition described above. In addition to currency in public circulation, travelers insured deposits, money market fund shares and insured deposits, the effective money supply today includes a wide array of other short-term, liquid, safe assets that serve as "shadow money." This includes some other government-backed assets, particularly short-term Treasury bills and short-term Agency CMOs, but also a broad array of other money claims issued out of the shadow banking sector without government guarantees.

The supply of privately-backed shadow money claims is quite large, perhaps larger than the amount of money measured under M2. Ricks estimates that the total amount of private money claims outstanding, on a gross basis, is nearly $16 trillion as of year-end 2013, a figure representing 58% of the total money supply.[44] Using a different methodology, Credit Suisse has estimated that the outstanding stock of what it calls "private shadow money" totaled more than $19 trillion at year-end 2011.[45]

As Ricks and Mehrling, among others, have noted, there is a hierarchy of money, with some forms of money being closer to the top of the money hierarchy than others—i.e., their moneyness is more established and tangible.[46]

Moreover, the capital markets create a wide array of financial instruments that may be characterized as shadow money, insofar as they possess some characteristics of money. In this Article, I focus on repurchase agreements ("repos" in industry parlance), for two reasons. First, repos are widely agreed upon as a form of shadow money (unlike, say, securities lending, over which there is significant debate). Second, there are more available data on repos.

3. Shadow Money and the Demand for Collateral

While it may be clear that the shadow banking system creates new forms of money instruments, it is important to understand how these shadow money instruments serve the functions of money. As I discussed previously, the most commonly used functional definition of money is any asset that serves as a medium of exchange, a store of value, and a unit of account. For a particular asset to serve these functions, it must be perceived as safe, liquid, and relatively stable in value.[47] To do this, the value of this instrument must necessarily be insensitive to changes in the perceived risk of the instrument—it must be,

43. *See, e.g.*, Sunderam, *supra* note 18 (showing empirically that investors treated short-term shadow banking debt as a "money-like claim"); RICKS, THE MONEY PROBLEM, *supra* note 12, at 42–46.

44. RICKS, THE MONEY PROBLEM, *supra* note 12, at 34–35.

45. *See* Johnathan Wilmot et al., *Market Focus: When Collateral is King*, CREDIT SUISSE (Mar. 15, 2012), https://doc.research-and-analytics.csfb.com/docView?language=ENG&source=emfromsendlink&format=PDF&document_id=955237241&serialid=1U7Rr6heRpieZmFPGqcN0OvJiPMUtQgvsNOjY5zB%2B6Y%3D [hereinafter *When Collateral is King*].

46. RICKS, THE MONEY PROBLEM, *supra* note 12, at 46–49; Perry Mehrling, The Inherent Hierarchy of Money 1–4 (Jan. 25, 2012) (unpublished paper), http://ieor.columbia.edu/files/seasdepts/industrial-engineering-operations-research/pdf-files/Mehrling_P_FESeminar_Sp12-02.pdf.

47. *See generally* Pozsar, *Shadow Banking*, *supra* note 23.

as Gary Gorton has described, "informationally insensitive."[48] In other words, to function effectively as money, an asset must be stable in value and therefore must be viewed as relatively risk-free and liquid. This point is not merely a theoretical one. As a number of studies have demonstrated, the pricing of money instruments carries a significant premium beyond what standard risk-based pricing models might suggest, indicating that those who purchase and hold monetary assets place value on the monetary attributes of such instruments.[49] In other words, monetary assets have inherent value, above and beyond what the underlying risk-based valuations of these assets might suggest, and this value derives from their monetary characteristics.

For sovereign issuers with stable economies (such as OECD countries), it is quite easy to create money instruments that are perceived as safe, liquid, and risk-insensitive—they simply promise to back these obligations at par with the full faith and credit of the issuing government behind them. Fiat currency, short-term sovereign debt (such as short-term Treasuries), and FDIC-insured bank deposits are all examples of money instruments backed by public guarantees. But for private issuers, creating assets that can serve the function of money is a bit trickier, since the guarantees of private issuers may not be seen as sufficiently robust or safe to ensure the necessary liquidity.

To address this potential adverse selection issue (wherein some money instruments may be seen as riskier than others), private money substitutes are typically overcollateralized. As Holmstrom states this proposition, "[w]hen both parties know that there is enough collateral, more precise private information about the collateral becomes irrelevant and will not impair liquidity."[50] In other words, collateral helps to create the "informational insensitivity" which allows market actors to rely on these instruments as money, without worrying about fluctations in asset value based on new information.

The high reliance on collateral accords with economic theory. Ordinarily, financial intermediation is understood to entail steep information asymmetries, as loans are thought to be idiosyncratic investments with high evaluation and monitoring costs, thus creating a classic principal-agent problem between investors and financial intermediaries (such as banks).[51] When credit risk is tied to the ability and willingness of the borrower to repay, information about the borrower is highly valuable for the lender. But when the loan is collateralized (or better yet, overcollateralized), information about the borrower becomes less relevant. For example, a pawn broker who receives good collateral on a loan does not need to be as concerned about the borrower's credit history, since the collateral itself serves as an enforcement and collection mechanism in the event of default. In this way, collateral

48. Gary Gorton, Slapped in the Face by the Invisible Hand: Banking and the Panic of 2007 3–4, (May 9, 2009) (unpublished paper prepared for the Fed. Res. Bank of Atlanta's 2009 Financial Markets Conference).

49. *See, e.g.*, Gregory R. Duffee, *Idiosyncratic Variation of Treasury Bill Yields*, 51 J. FIN. 527, 529–37, 547–48 (1996); Arvind Krishnamurthy & Annette Vissing-Jorgensen, *The Aggregate Demand for Treasury Debt*, 120 J. POL. ECON. 233, 234–37 (2012); Refet S. Gurkaynak et al., *The U.S. Treasury Yield Curve: 1961 to the Present* 25–28 (Fed. Reserve Bd., Working Paper No. 2006-28); Robin Greenwood & Dimitri Vayanos, *Bond Supply and Excess Bond Returns*, 27 REV. FIN. STUD. 663 (2014) (analyzing how the supply and maturity structure of government debt affect bond yield and expected returns).

50. Bengt Holmstrom, *Understanding the Role of Debt in the Financial System* 5 (Bank for Int'l Settlements, Working Paper No. 479, 2015).

51. *See* Min, *Understanding the Failures*, *supra* note 13, at 1428–29 (citing Ben Bernanke & Mark Gertler, *Banking in General Equilibrium* 1–2 (Nat'l Bureau of Econ. Res., Working Paper No. 1647, 1985)).

helps to ameliorate the problem of information asymmetry in financial intermediation.[52]

As the financial markets have become more complex, they have increasingly come to rely upon collateral. As the economist John Geanakoplos has astutely observed: "[T]he main business of Wall Street is to help people make and keep promises. Over time, as more people have been included in the process, punishment and reputation have been replaced by collateral. This enabled a proliferation of promises, but has led to a scarcity of collateral."[53]

The tremendous growth of privately created shadow money has become a mainstay of capital markets activity, providing short-term financing across a number of different markets. In addition to repo (both bilateral and triparty)[54] and ABCP,[55] collateral is used in securities lending,[56] over-the-counter derivatives[57] and in payments and settlements.[58]

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52. *See* John Geanakoplos, *The Leverage Cycle*, *in* 24 NBER MACROECONOMICS ANNUAL 2009 1, 4–5, 21–25 (2009).

53. John Geanakoplos, *Promises Promises*, *in* THE ECONOMY AS AN EVOLVING COMPLEX SYSTEM II 285, 286 (1997).

54. A repo is structured as a short-term sale of securities, combined with a contractual promise by the seller to repurchase these securities on a specified future date at a prearranged price. Repos effectively serve as a form of short-term collateralized lending. Most repo activity occurs in the triparty repo market, in which repo transactions are facilitated by a third party, which handles clearing and settlement on their own balance sheets. This clearing and settlement role in triparty repo is handled almost exclusively by Bank of New York Mellon and JP Morgan Chase. For a more detailed discussion of repos, *see generally* Adam Copeland et al., *Key Mechanics of the U.S. Tri-Party Repo Market*, FED. RES. BANK N.Y. ECON. POL. REV. (2012), https://www.newyorkfed.org/research/epr/2012/1210cope.html. Some repo activity is done through bilateral repo, in which clearing and settlement are done by the counterparty's custodian bank. *See* VIKTORIA BAKLANOVA ET AL., FED. RESERVE BANK OF NY, REFERENCE GUIDE TO U.S. REPO AND SECURITIES LENDING MARKETS 5–7 (2015) [hereinafter BAKLANOVA ET AL., REFERENCE GUIDE TO U.S. REPO], https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr740.pdf. Bilateral repo transactions are typically made between securities dealers and their clients (typically institutional funds). *See generally* Victoria Baklanova et al., *The U.S. Bilateral Repo Market: Lessons From a New Survey*, OFF. FIN. RES. (Jan. 13, 2016), https://financialresearch.gov/briefs/files/OFRbr-2016-01_US-Bilateral-Repo-Market-Lessons-from-Survey.pdf. Finally, there is the General Collateral Finance (GCF) repo market, which focuses exclusively on repo transactions for Treasuries and Agency securities. *See generally* Michael J. Fleming & Kenneth D. Garbade, *The Repurchase Agreement Refined: GCF Repo*, CURRENT ISSUES IN ECON. FIN. (June 2003).

55. As of July 2007, ABCP conduits held over $1.2 trillion in assets. Viral Acharya & Philipp Schnabl, *Do Global Banks Spread Global Imbalances? The Case of Asset-Backed Commercial Paper During the Financial Crisis of 2007-09* (Nat'l Bureau of Econ. Research, Working Paper No. 16079, 2010), http://www.nber.org/papers/w16079. ABCP is, as its name describes, a type of commercial paper that is backed by assets, i.e., it is (over) collateralized by financial assets. *Id.* at 10.

56. Securities lending is economically very similar to repo, to the point where many observers believe that the two types of activities are fungible. *See, e.g.*, Andre Ruchin, *Can Securities Lending Transactions Substitute for Repurchase Agreement Transactions?*, 128 BANKING L.J. 450, 467 (2011) ("[s]ecurities lending transactions economically and legally substitute for repo transactions"); BAKLANOVA ET AL., REFERENCE GUIDE TO U.S. REPO, *supra* note 54, at 1 ("[t]he economic effect of [securities lending] can be similar to that of a repo . . . ." The main difference between the two is that repos are structured as sales, while securities lending transactions are structured as loans. *See id.* at 1. That being said, both repos and securities lending transactions transfer all rights, titles, and interests in the securities being transferred to the party receiving those securities. Ruchin, *supra*, at 454.

57. As Feder notes, even before the 2007–08 financial crisis, collateral was a key feature in OTC derivatives trading. Norman Menachem Feder, *Market in the Remaking: Over-the-Counter Derivatives in a New Age*, 11 VA. L. & BUS. REV. 309 n.45 (2017).

58. Increasingly, banks and other financial institutions have been required to post collateral intraday against central bank advances, as more and more central banks have implemented real time gross settlement systems. *See* PETER ALLSOP ET AL., THE EVOLUTION OF REAL-TIME GROSS SETTLEMENT 18–22 (2009).

Unfortunately, there is a notable lack of data around the shadow banking system.[59] For example, data on triparty repo only started being aggregated after the financial crisis. That being said, it is quite clear that collateral plays a critical role in the financial markets. A leading International Monetary Fund economist has estimated that the total amount of collateral outstanding in the financial markets, not including collateral pledged in dealer to dealer activities, triparty repo, or ABCP, reached roughly $10 trillion just prior to the crash of Lehman, with that figure currently being closer to $5.8 trillion today.[60] Triparty repo currently accounts for an additional $1.6 trillion in collateral,[61] and ABCP another $270 billion.[62] As the Bureau for International Settlements described back in 2001, "[t]he use of collateral has become one of the most important and widespread risk mitigation techniques in wholesale financial markets."[63] More recently, Credit Suisse chief economist James Sweeney has referred to collateral as the "lifeblood of the modern economy."[64]

4. Safe Assets as Collateral

Of course, not all assets can be used as collateral, and not all collateral is created the same. As the Bank for International Settlements presciently noted back in 2001: "The collateral most commonly used and apparently preferred by market participants are instruments with inherently low credit and liquidity risks . . . With the growth of collateral use so rapid, concern has been expressed that it could outstrip the effective supply of these preferred assets."[65] These types of low credit and low liquidity risk assets have become known as "safe assets" (or sometimes "high quality liquid assets" or "HQLA").[66] While there are a number of different ways in which safe assets are created and used,[67] this Article

59. *See, e.g.*, Tobias Adrian et al., *Repo and Securities Lending* 1, FED. RES. BANK N.Y., at 3 (2011) https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr529.pdf ("[W]e find that existing data sources [on shadow banking activities] are incomplete.").

60. MANMOHAN SINGH, COLLATERAL AND FINANCIAL PLUMBING 7–9 (2014) [hereinafter SINGH, COLLATERAL AND FINANCIAL PLUMBING]. Singh excludes dealer to dealer collateral because the amounts are relatively small (he estimates $50 billion to $100 billion). He excludes collateral pledged in triparty repo and ABCP because this collateral cannot be rehypothecated or repledged, and this reuse of collateral is the focus of his inquiries. Manmohan Singh, *Velocity of Pledged Collateral: Analysis and Implications* 12 (IMF, Working Paper No. 11/256, 2011) [hereinafter Singh, *Velocity of Pledged Collateral*].

61. *Tri-Party/GCF Repo*, FED. RES. BANK N.Y., https://www.newyorkfed.org/data-and-statistics/data-visualization/tri-party-repo/index.html (last visited Mar. 20, 2018).

62. *Asset-backed Commercial Paper Outstanding*, FED. RES. BANK ST. LOUIS, https://research.stlouisfed.org/fred2/series/ABCOMP (last visited Apr. 9, 2018).

63. COMM. ON THE GLOB. FIN. SYS.: BANK FOR INT'L SETTLEMENTS, COLLATERAL IN WHOLESALE FINANCIAL MARKETS: RECENT TRENDS, RISK MANAGEMENT AND MARKET DYNAMICS (Mar. 2001) https://www.bis.org/publ/cgfs17.pdf.

64. *When Collateral is King*, *supra* note 45, at 1–3.

65. COMM. ON GLOB. FIN. SYS., *supra* note 63, at 2.

66. *See, e.g.*, Ingo Fender & Ulf Lewrick, *Mind the Gap? Sources and Implications of Supply-Demand Imbalances in Collateral Asset Markets*, BUREAU FOR INT'L SETTLEMENTS Q. REV. (2013). An alternative definition of "safe asset" is provided by Caballero and Farhi, who state that a "safe asset is one that is expected to preserve its economic value following bad macroeconomic shocks." Ricardo J. Caballero & Emmanuel Farhi, *On the Role of Safe Asset Shortages in Secular Stagnation*, *in* SECULAR STAGNATION: FACTS, CAUSES AND CURES 114 (2014). Of course, it is well recognized that there is no such thing as a perfectly safe (risk-free) asset, something that the financial markets were bluntly reminded of by the financial crisis. *See* GSRF, *supra* note 11, at 83.

67. As I described in the Introduction, Gelpern & Gerding provide an excellent taxonomy of safe assets. *See generally* Gelpern & Gerding, *supra* note 9.

is primarily concerned with the use of so-called "safe assets" as collateral for the creation of money-like instruments. Safe assets consist of both privately produced safe assets (such as AAA-rated asset-backed securities) and government-backed debt issued or guaranteed by a select group of countries perceived as having low risk of non-payment of claims (typically OECD nations).[68] Safe assets are ubiquitous and important enough that they have been described as the "cornerstone"[69] or "anchor"[70] of the global financial system. Echoing the insights of Geanakoplos, the IMF has described safe assets as "a key source of liquid, stable collateral in private and central bank repurchase (repo) agreements and in derivatives markets, acting as the lubricant or substitute of trust in financial transactions."[71]

Safe assets are strongly preferred as collateral in the financial markets, particularly for the short-term and liquid liabilities that are considered to be money substitutes, including most repo transactions.[72] Thus, the enormous demand for non-M2 money has consequently created a corresponding demand for safe assets.

5. Fannie and Freddie Obligations as Collateral

Fannie and Freddie provide a significant share of the total global supply of safe assets. Broadly speaking, Fannie and Freddie issue three types of liabilities, known collectively as "Agency obligations," that fund their activities—corporate debt (known as "Agency debt"); pass-through mortgage-backed securities (known as "Agency MBS"); and collateralized mortgage obligations (known as "Agency CMOs").[73] The amount of Agency obligations issued by Fannie and Freddie is significant. At the end of 2015, the total value of Agency MBS and CMO outstanding[74] was more than $4.5 trillion—$2.823 trillion in Fannie MBS and $1.751 trillion in Freddie MBS.[75] The amount of Agency debt outstanding was also sizeable, accounting for more than $800 billion at the end of 2015, with about $389 billion in Fannie debt and $418 billion in Freddie debt outstanding.[76] As an aggregate amount, Agency obligations totaled about $5.3 trillion. By way of comparison, the Bank for International Settlements (BIS) has estimated that there are somewhere between $48 and $53 trillion safe assets across the entire world, with about $20

68. *But see* SINGH, COLLATERAL AND FINANCIAL PLUMBING, *supra* note 60, at 1–3 (asserting that financial collateral need not be limited to so-called "safe assets," but rather can be comprised of any securities (including equities) that are liquid, mark-to-market, and part of a legal cross-border master agreement).

69. *See* GFSR, *supra* note 66, at 81.

70. Pierre-Olivier Gourinchas & Olivier Jeanne, *Global Safe Assets* 1 (Bank of Int'l Settlements, Working Paper No. 399, 2012), https://www.bis.org/publ/work399.pdf.

71. GSFR, *supra* note 13, at 82.

72. *See* Pozsar, *Institutional Cash Pools*, *supra* note 32, at 3.

73. *See generally* BOND MKT. ASS'N, AN INVESTOR'S GUIDE TO PASS-THROUGH AND COLLATERALIZED MORTGAGE SECURITIES (2002), https://center.stlouisfed.org/courses/start/content/300/documents/an_investors_guide_to_mortgage_securities.pdf.

74. SIFMA, the Securities Industry Trade Group, compiles estimates of Agency obligations outstanding, but combines Agency MBS and Agency CMOs into one category.

75. *US Mortgage-Related Issuance and Outstanding*, SIFMA, https://www.sifma.org/wp-content/uploads/2017/06/sf-us-mortgage-related-sifma.xls (navigate to US Agency MBS Outstanding tab).

76. *US Agency Debt*, SIFMA, https://www.sifma.org/wp-content/uploads/2017/06/sf-us-mortgage-related-sifma.xls (navigate to US Agency Debt – Tenor tab).

to $25 trillion in the United States.[77] In other words, Fannie and Freddie account for about 10% of the world's safe assets and about 20–25% of U.S. safe assets.

Moreover, Fannie and Freddie obligations are understood to be implicitly guaranteed by the United States government against credit losses.[78] This implicit guarantee effectively means that Agency obligations are seen as significantly safer, and thus more desirable as collateral, than other types of safe assets. As such, they compose a significant portion of the collateral used in shadow money creation. As aforementioned in Part I.B, data for many parts of the shadow banking system are unavailable or difficult to obtain, so this Article relies on repos as a proxy for the broader shadow money markets. The data on repos indicates that Fannie and Freddie are a major source of collateral. Since the 2007–08 financial crisis, the New York Fed has been collecting and publishing data on the collateral used in triparty repo transactions and General Collateral Finance (GCF) repo transactions. The most recent data release for triparty repos showed that Agency obligations accounted for $532.7 billion in collateral, almost exactly one-third of the total $1.599 trillion in collateral pledged in this market.[79] The most recent release for GCF repos showed that Fannie and Freddie obligations accounted for roughly $138.3 billion in outstanding overnight collateral, out of a total of $232.1 billion, representing 60% of the overnight collateral pledged in this market.[80]

B. Private-Label Mortgage Securities and the Money Supply

While Fannie and Freddie largely dominated the mortgage markets from the late 1980s up through the present, there was one brief period in which their role as the primary provider of housing finance was disrupted by the extremely sudden and short-lived explosion of private-label securitization of mortgages. Private-label securitization was developed by Wall Street as an alternative to Agency mortgage-backed securitization. Private-label mortgage-backed securities, unlike Agency MBS, are not supported by a government guarantee. Thus, in order to be able to serve the functions of safe assets, private-label MBS must assuage investor concerns about credit risk, something that the Wall Street sponsors of these securities managed to do through the use of tranching

77. *Asset Encumbrance, Financial Reform, and the Demand for Safe Assets* 20–21 (Bank for Int'l Settlements, Working Paper No. 49, 2013), https://www.bis.org/publ/cgfs49.pdf. BIS describes "high-quality assets" and "high-quality liquid assets" rather than "safe assets." *Id.*

78. Due to their status as government-sponsored enterprises, Fannie and Freddie have unique charters which require them to serve a number of specified public purposes (notably, providing affordable housing finance) and submit to a special regulatory regime. At the same time, Fannie and Freddie enjoy several important governmentally granted benefits, including the preemption of many state laws that might otherwise apply to them, exemptions from SEC registration requirements for their securities, and the eligibility of their securities for open-market purchase by the Federal Reserve. For these and other reasons, investors have long assumed that Fannie and Freddie debt and MBS securities are implicitly backed by the federal government, an assumption that leading policy makers and legislators have been careful not to dispel. *See* Min, *Government Guarantees*, *supra* note 1, at 457.

79. *Tri-Party Repo Statistics as of 03/09/2016*, FED. RES. BANK N.Y., https://www.newyorkfed.org/medialibrary/media/banking/pdf/mar16_tpr_stats.pdf?la=en (last visited Mar. 20, 2018). These amounts represent the amount of outstanding collateral pledged as of the seventh business day of each month. *See Explanatory Notes to the Summary Statistics for the U.S. Tri-Party Repo Market*, FED. RES. BANK N.Y., https://www.newyorkfed.org/medialibrary/microsites/tripartyrepo/pdf/explanatory_notes.pdf.

80. *FICC General Collateral Finance (GCF) Repo Data*, FED. RES. BANK N.Y. (Mar. 2016), https://www.newyorkfed.org/medialibrary/media/banking/pdf/ficc_mar2016.pdf?la=en.

structures, overcollateralization, and credit risk mitigants such as bond insurance or credit default swaps.[81]

Private-label securitization enjoyed a relatively brief heyday from about 2003 to 2007, in which it came to dominate U.S. housing finance. Prior to 2003, the market share of private-label MBS hovered between 8 to 12 percent.[82] But beginning in 2003, private-label MBS experienced tremendous and rapid growth, accounting for 38% of all mortgage originations in 2006 and eclipsing Fannie and Freddie as the primary source of U.S. residential mortgage finance.[83] Of course, the collapse of private-label securitization was even more sudden and dramatic than its rise, as the issuance of new private-label MBS dropped to negligible levels by mid-2007, and has remained at very low levels even today, nearly a decade after the financial crisis ended.[84]

One major factor in why private-label securitization grew so rapidly is that it was an important source of collateral for the shadow money markets, including in repo and asset-backed commercial paper transactions.[85] Private-label securitization of residential mortgages accounted for a significant share of the collateral used in repo[86] and asset-backed commercial paper markets.[87] In short, while the reign of private-label securitization of home mortgages was a very brief one, during that short period, it played an important role in the money markets.

C. Thrift Depository Institutions and the Money Supply

The current and recent importance of housing finance securities to the overall money stock is not something idiosyncratic to this particular era, but has long been the case. Since the modern measurements of the money supply were introduced, housing finance has played an important role in producing liabilities integral to the money supply. Prior to the dominance of Fannie and Freddie in housing finance, thrifts —sometimes called savings and loan institutions (or S&Ls)—were the primary source of home mortgage in the United States, accounting for some 70%–80% of housing finance for most of the period from 1945 until 1989.[88] These activities were funded primarily by time deposits, which are broadly understood as being an important part of the money supply. Thrifts played a key role in money creation and monetary policy during this period, as I discuss below.

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81. *See* Min, *Government Guarantees*, *supra* note 1, at 464–66.

82. *Id.* at 465 (citing FIN. CRISIS INQUIRY COMM'N, PRELIMINARY STAFF REPORT: SECURITIZATION AND THE MORTGAGE CRISIS 10–11 (2010) [hereinafter FCIC, SECURITIZATION AND THE MORTGAGE CRISIS], http://fcic-static.law.stanford.edu/cdn_media/fcic-reports/2010-0407-Preliminary_Staff_Report_-_Securitization_and_the_Mortgage_Crisis. Pdf).

83. *Id.*

84. *See id.* at 467.

85. *See* FINANCIAL CRISIS INQUIRY REPORT, *supra* note 17, at 102–26.

86. *See generally* Gorton & Metrick, *Securitized Banking*, *supra* note 30 (theorizing that the repo market's heavy reliance on privately issued residential mortgage-backed securities was a primary driver of the financial crisis). *But see* Arvind Krishnamurthy et al., *Sizing Up Repo*, 69 J. FIN. 2381, 2385 (2014) (finding that repo accounted for only a small share of the financing of private-label MBS).

87. *See* Krishnamurthy et al., *supra* note 86, at 2385 (finding that asset-backed commercial paper accounted for a significant share of the funding for private-label MBS).

88. *See* Min, *Government Guarantees*, *supra* note 1, at 448–50 (describing the role of S&L institutions).

1. Thrift Deposits and the Money Supply

As I described in Part II.A.1, the Federal Reserve's M2 category of money includes savings deposits—which covers money market deposit accounts, time deposits, and balances at retail money market mutual fund accounts.[89] These types of deposits are safe and highly liquid but were not used as mediums of exchange, which is why they are classified as M2 rather than M1.[90] Importantly, these time and savings deposits were historically the types of deposits utilized by thrift institutions.[91]

Between World War II and the 1980s, thrifts were by far the dominant source of housing finance in the United States, holding more than half of all residential mortgage debt.[92] As a result, thrift savings deposits constituted a substantial portion of the overall money supply.

Figure 1: Thrift Deposits vs. Total M2 Money Supply[93]

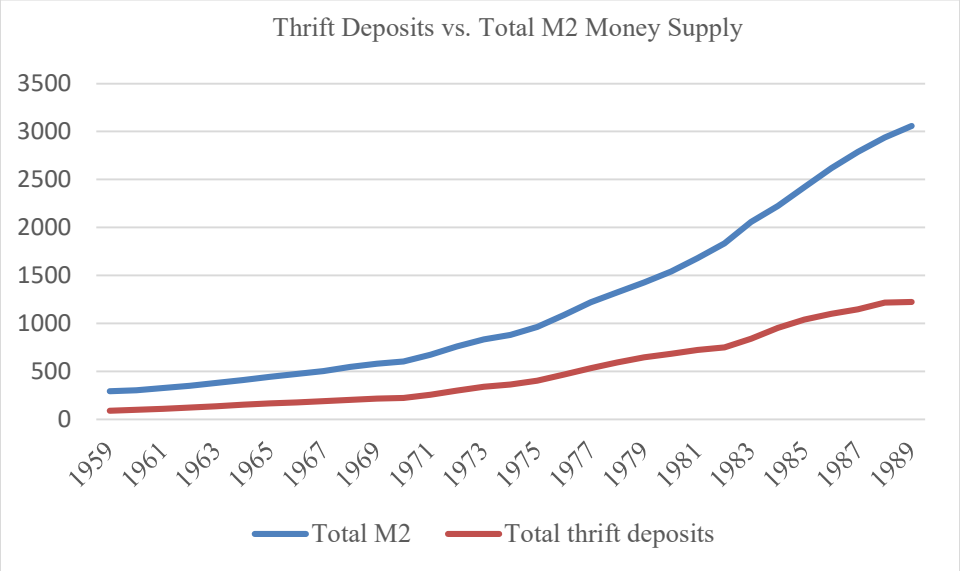
89. *Money Stock Measures*, *supra* note 27.

90. Richard G. Anderson, *Some Tables of Historical U.S. Currency and Monetary Aggregates Data* 5 (Fed. Reserve Bank of St. Louis, Working Paper No. 2003-006A, 2003), https://files.stlouisfed.org/files/htdocs/wp/2003/2003-006.pdf.

91. *See* Jonathan McCarthy & Richard W. Peach, *Monetary Policy Transmission to Residential Investment*, 2002 FED. RES. BANK N.Y. ECON. POL'Y REV. 139, 140 (2002); R. Dan Brumbaugh, Jr. & Andrew S. Carron, *Thrift Industry Crisis: Causes and Solutions*, 2 BROOKINGS PAPERS ON ECON. ACTIVITY 349, 350 (1987) (noting that thrift institutions relied primarily on time and savings deposits).

92. *See* Min, *Government Guarantees*, *supra* note 1, at 449 (citing Richard K. Green & Susan M. Wachter, *The Housing Finance Revolution* 19 (U. Pa. Inst. for Law & Econ. Research, Working Paper No. 09-37, 2007)). Thrifts began to encounter systemic problems with the high inflation of the 1970s, which limited the competitiveness of the rates that thrifts, which were capped by Regulation Q, could offer to depositors. *See id.* at 451–52. These problems became sharply exacerbated by the double-digit interest rate increases of the late 1970s and early 1980s, which negatively affected the balance sheets of thrifts by greatly increasing their cost of funding. *Id*. Congress responded by deregulating the thrift industry, allowing thrifts to invest in a wide array of assets that were unrelated to (or at best loosely related to) housing finance. *Id.* at 452–53. This deregulation, coupled with the regulatory forbearance of thrift regulators in the 1980s, allowed and encouraged excessive risk taking. *Id*. at 452–54. In 1989, the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA), Pub. L. No. 101-73, 103 Stat. 183 (codified as amended in scattered sections of 12 U.S.C.), was enacted, formally acknowledging the insolvency of the Federal Savings and Loan Insurance Corporation (FSLIC), the thrift counterpart to the FDIC. Min, *Government Guarantee*, *supra* note 1, at 453–54. The FDIC absorbed the insurance responsibilities of FSLIC, thus effectively ending the thrift system of the post-War era. *Id*.. While thrifts were still permitted to operate under federal thrift charters issued by the newly created Office of Thrift Supervision, these post-FIRREA thrifts were no longer limited to housing finance, nor were they particularly important in the funding of home mortgages. *Id.* at 454–55.

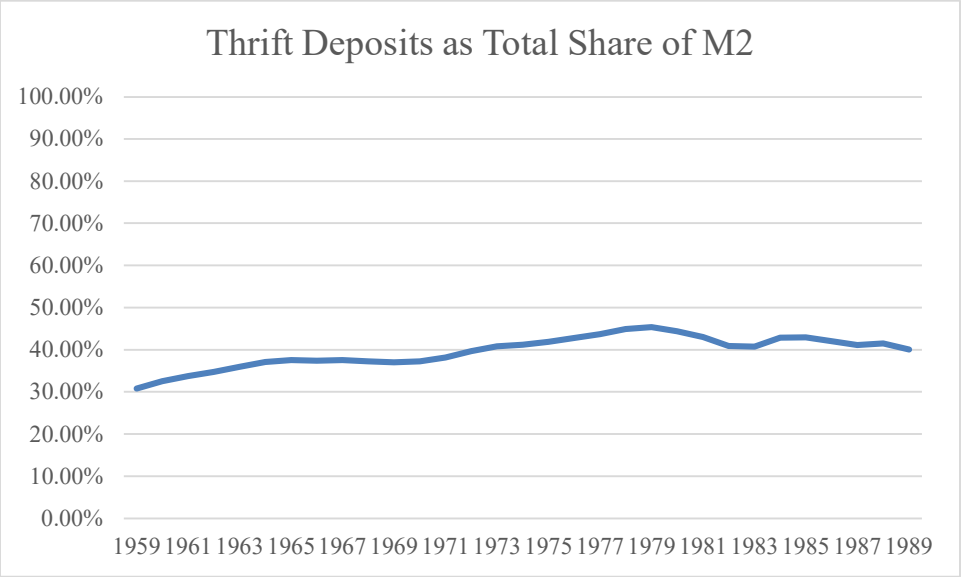
93. *See* Anderson, *supra* note 90, at tbls. 4 & 5 (citing data from the Division of Monetary Affairs, Bd. of Governors of the Federal Reserve System, the Federal Reserve Bd., and the Research Division of the Federal Reserve Bank of St. Louis). For a greater explanation of Anderson's methodology, see *id.* at 27–32. I took the combined totals from the various categories of monetary aggregates for thrift institutions, described in Table 4, and compared that to the total M2 monetary aggregates from Table 5.



As *Figure 2:* Thrift Deposits as Total Share of M2 illustrates, thrifts accounted for a sizeable share of the total M2 money supply between 1959 and 1989. During this period, the thrift share of the money supply ranged from a low of 30.83% in 1959 to a high of 45.39% in 1979, and generally accounted for about a 40% share during most of this period.

Figure 2: Thrift Deposits as Total Share of M2[94]

94. *Id.* at tbls. 4 & 5.



In summary, from World War II until the 1980s, the short-term, liquid, and safe liabilities (time and savings deposits) issued by thrift institutions—the financial intermediaries which were responsible for providing most housing finance in this country over the same period—made up a very large share of the overall money supply.

2. Thrift Institutions and Money Creation

In addition to accounting for a significant share of the money supply, thrift institutions were also key actors in *creating* money during this period, and thus were heavily relied upon as conduits for monetary policy. As described previously in Part I.A., thrifts represented a significant share of all depository institution assets before the 1980s. Between 1960 and 1986, thrift assets represented about one-third of all assets held by U.S. depository institutions.[95] Because of the outsized importance of thrift institutions in taking deposits and making loans, they played a key role as conduits for the Federal Reserve's monetary policy, up until the collapse of the thrift industry in the late 1980s.[96]

III. HOME LOANS AS "NATURAL" COLLATERAL FOR MONEY

Why has housing finance historically been so important for the money supply? In attempting to answer this question, it may be useful to first think about what housing

95. Brumbaugh & Carron, *supra* note 91, at 350 (citing U.S. LEAGUE OF SAVINGS INSTITUTIONS, 87 SAVINGS INSTITUTIONS SOURCEBOOK 46, 48–49 (League, 1987)).

96. *See* Min, *Government Guarantees*, *supra* note 1, at 452–54 nn.73 & 76–77 (providing a more detailed account of the deregulation of the thrift industry, which took place through two laws, and the subsequent implosion of the thrift-centric system of housing finance. The first law was the Depository Institutions Deregulation and Monetary Control Act of 1980, Pub. L. No. 96-221, 94 Stat. 132 (codified as amended in scattered sections of 12 U.S.C.). The second law was the Garn-St. Germain Depository Institutions Act of 1982, Pub. L. No. 97-320, 96 Stat. 1469 (codified as amended in scattered sections of 12 U.S.C.)).

finance actually is. Housing finance is a specific subset of financial intermediation. On the liabilities side, housing finance is essentially the same as other types of financial intermediation.[97] It is on the assets side of the ledger where housing finance is unique from other types of banking. Here, there are several characteristics that may explain why home mortgages have been so closely tied to the money supply. I argue that these characteristics of home mortgages make them uniquely well-suited, as an asset class, for serving as collateral for money liabilities.

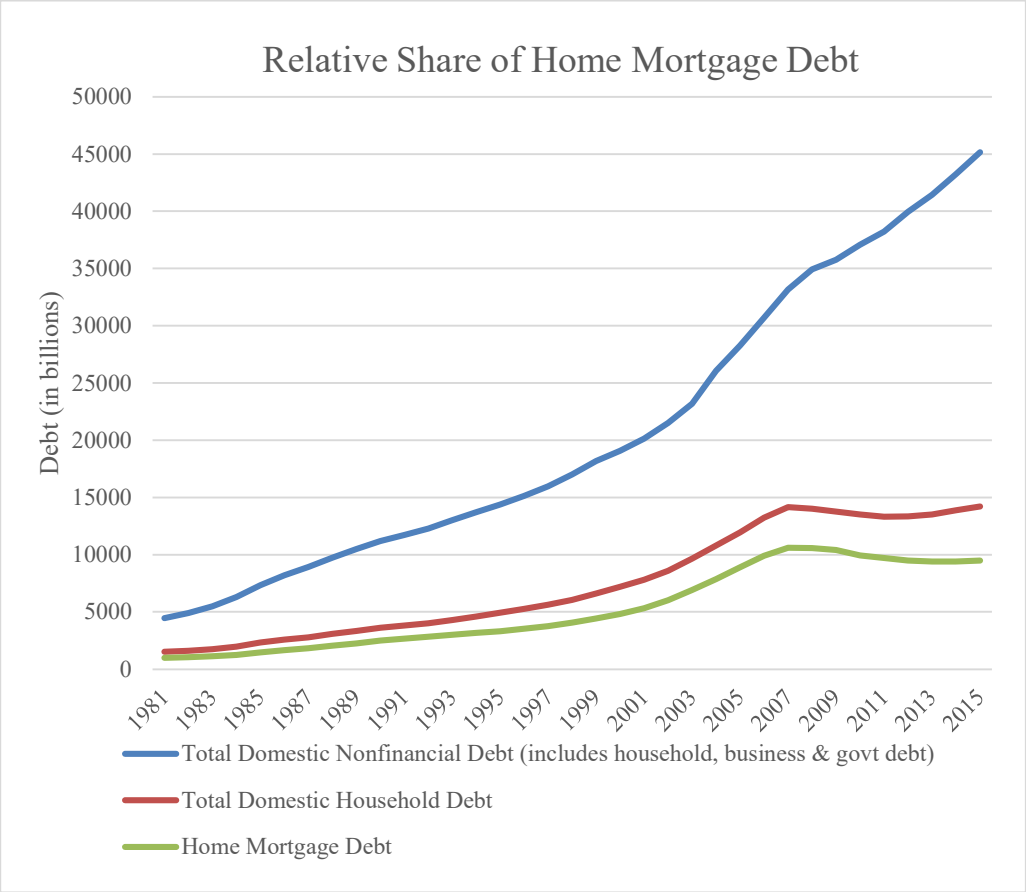
A. Home Loans Are a Sizeable Asset Class

First, any discussion of housing finance must note that residential mortgages comprise an enormous amount of the total outstanding domestic debt. As Figure 3 illustrates, home mortgage debt makes up the vast majority (ranging from 66% to 76%) of total household debt and a significant proportion (ranging from 20% to 32%) of total domestic nonfinancial debt (which includes household debt, business debt, and government debt, but not financial debt) as well.[98] To the extent that financial intermediation is necessary or important for creating liabilities that can serve as money, it makes sense that home mortgages, which are typically the largest single form of credit class in any economy, would be instrumental in money creation.

97. There have been some differences between these liabilities, most notably the time deposits issued by thrifts versus the demand deposits issued by banks. But, these differences are arguably ones of regulatory design rather than economic necessity. Thrifts could have issued demand deposits and otherwise functioned exactly the same. Indeed, this point was illustrated with the passage of the Depository Institutions Deregulation and Monetary Control Act of 1980, which allowed thrifts to offer demand deposits for the first time in the form of Negotiable Order of Withdrawal (NOW) accounts. Pub. L. No. 96-221, 94 Stat. 132 (1980) (codified in scattered sections of 12 U.S.C. and 15 U.S.C. (1988)).

98. BD. OF GOVERNORS OF THE FED. RESERVE SYS., FEDERAL RESERVE STATISTICAL RELEASE-FINANCIAL ACCOUNTS OF THE UNITED STATES 7 (Sep. 16, 2016), https://www.federalreserve.gov/releases/z1/20160916/z1.pdf [hereinafter FINANCIAL ACCOUNTS OF THE UNITED STATES].

Figure 3: Relative Share of Home Mortgage Debt[99]



B. Mortgages Are Good Loans Overcollateralized by Valuable Assets

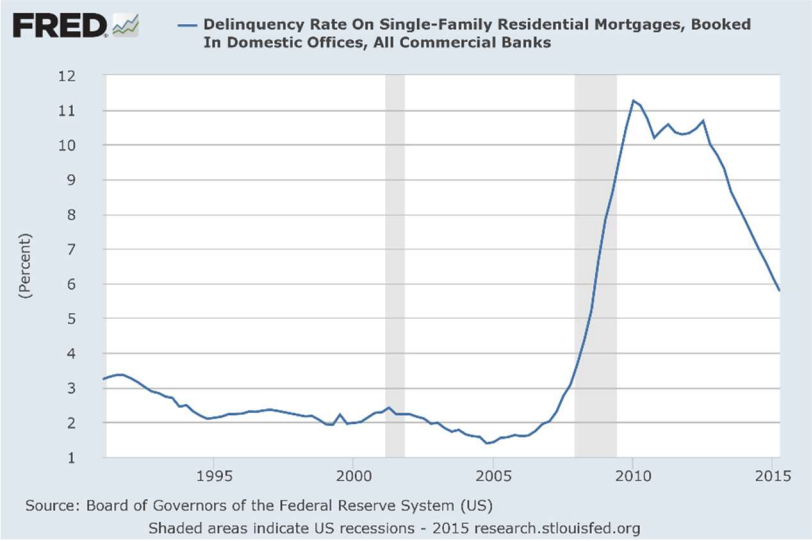
Second, it is worth recognizing that home mortgages have historically been very safe credit products. Most people pay their mortgages because the consequences of not paying their mortgages are fairly steep. In addition to the consequences that arise from defaulting on a loan generally, including a negative impact on one's credit rating, a home mortgage default typically means one loses the place where she lives! Consequently, the default rates on mortgages tend to be extremely low, particularly when one looks at mortgages from a geographically diversified perspective that avoids localized economic distress (such as a major employer going insolvent).

On a national basis, residential mortgages have historically had very low delinquency rates, as Figure 4: Delinquency Rates on SF Home Loans 1991–2015 shows. And while delinquency rates spiked during the mortgage crisis and thereafter, much of the historically

99. *Id.*

high rates of delinquency can be explained by the large number of high-risk mortgages that were originated during this period, or alternatively by the historically anomalous 33% national home price decline that occurred between 2007 and 2009.[100]

Figure 4: Delinquency Rates on SF Home Loans 1991–2015



At the same time, even when home loans do become delinquent, they are still generally good assets because they are structured as secured loans with the collateral being a physical asset—the house—that is, at least at the time of origination, more valuable than the loan.[101] Thus, even in the relatively rare instances when mortgage borrowers default, the lenders can foreclose on a valuable physical asset that is, other than in instances when there are steep home price declines, worth more than they are owed.

Of course, describing home loans as a safe asset class may be seen as naïve, given that we just experienced a mortgage and housing crisis in which mortgage delinquencies hit double digits and caused a massive and historic financial panic, and home prices declined 33% from peak to trough. But it still seems accurate to assert that home mortgages, outside of very rare "black swan" events, are an extremely safe form of credit asset, which may be why the financial system came to rely so heavily on home mortgage debt in the first place.

Given the relative low credit risk of home mortgages, it makes sense that they would be an important asset class for financial intermediation, as holders of monetary liabilities secured by home mortgages would generally be less likely to run based on fears of credit defaults.

100. *See* Min, *Government Guarantees*, *supra* note 1, at 438 (citing Press Release, Standard & Poor's, Some More Seasonal Improvement in Home Prices According to the S&P/Case-Shiller Home Price Indices (July 26, 2011), http://www.housingviews.com/wp-content/uploads/2011/07/CSHomePrice_July-2011-Release.pdf).

101. The home loan is effectively overcollateralized by the amount of the down payment, since the market value of the home, as represented by the purchase price, is greater than the loan value by the amount of the down payment. Thus, the higher the down payment, the greater the overcollateralization.

C. Housing Finance and Monetary Transmission

Third, housing finance is one of the primary mechanisms by which monetary policy is "transmitted" into the real economy. Changes in short-term interest rates—the Fed's longstanding preferred mechanism for effectuating monetary policy—impact the housing market (and through it, the broader economy) in a number of different ways, such as altering mortgage rates and affecting the demand for mortgages, expectations about future home prices, and the housing supply.[102] It is well understood that housing finance is a particularly important channel for monetary policy, because of the importance of housing markets in transmitting monetary policy changes to the real economy.

D. High Costs and Long Duration of Housing

Finally, we should consider the unique characteristics of housing, which is a social necessity, extremely costly to purchase and develop, and has a very long depreciation period. The relative dearth of capital that investors are willing to commit for such a long period (the typical amortization schedule for a mortgage is 25–30 years in most countries) means that financial intermediation is essentially necessary for housing finance. To the extent that financial intermediation depends on monetary instruments for funding, it seems inevitable that housing finance will invariably rely heavily on money-like obligations and, conversely, that the money supply will be highly exposed to residential mortgage debt.

In summary, home mortgages are socially and politically important, they represent an enormous share of credit extended in any economy, they are relatively safe and overcollateralized credit assets, and they are an important conduit for monetary policy.

IV. EFFECTS OF HOUSING FINANCE REFORM

Part I described a shortage in the global supply of safe assets and explained why this was relevant for the global money supply. Because housing finance is so important in

102. *See* Frederic Mishkin, *Housing and the Monetary Transmission Mechanism* 5–6, (FEDS Discussion Series, Working Paper No. 2007–40, 2007), https://www.federalreserve.gov/pubs/feds/2007/200740/200740pap.pdf. It is a matter of some debate as to what drives this "transmission" from monetary policy, which generally targets short-term rates, to housing finance, which typically depends on long-term mortgage rates. As Bernanke and Gertler have noted, it is generally believed that there is a "weak link between monetary policy and long-term real interest rates." Ben S. Bernanke & Mark Gertler, *Inside the Black Box: The Credit Channel of Monetary Policy Transmission* 26–27 (Nat'l Bureau of Econ. Research, Working Paper No. 5146, 1995), http://www.nber.org/papers/w5146. Bernanke & Gertler famously posited that the answer to this dilemma may be the impact of short-term rate changes on financial intermediaries, who expand or contract their lending based on the availability and pricing of their external funding, which is directly affected by Fed short-term monetary policy tools. *Id*. at 18–23. It should also be noted that short-term rate changes more directly impact adjustable-rate mortgage rates, as these mortgages have a relatively short duration before the rate "resets." *See* Marco DiMaggio et al., Monetary Policy Pass-Through: Household Consumption and Voluntary Deleveraging 2–4 (Nov. 2014) (unpublished paper), https://www0.gsb.columbia.edu/mygsb/faculty/research/pubfiles/6391/amir_marco_mpp_nov14.pdf. Also, the recent unconventional monetary policy undertaken by the Federal Reserve, called "large-scale asset purchases" or "quantitative easing," was specifically designed and appears to have been successful in affecting affect long-term rate expectations, as reflected in the mortgage rates for 30-year fixed rate loans. *See generally* Saty Patrabansh et al., *The Effects of Monetary Policy on Mortgage Rates* (Fed. Housing Fin. Agency, Working Paper No. 14–2, 2014), http://www.fhfa.gov/policyprogramsresearch/research/paperdocuments/working_paper_14-2.pdf.

banking, it also plays an important role in how we think about banking stability. As we learned in the recent financial crisis, problems in housing finance can have outsized effects on financial systemic stability. But what has been overlooked to date in the housing finance reform debate are the short-run effects that such reform may have on the supply of outstanding safe assets. Any significant decline in the activities of Fannie and Freddie could have a major impact on the supply of safe assets and an outsized effect on the creation of shadow money.

Part I demonstrated that Fannie and Freddie obligations are an important part of the safe asset supply, and furthermore that they are important for the creation of shadow money. There are over $8 trillion in Agency obligations currently outstanding;[103] as previously mentioned, Fannie and Freddie account for roughly $5.3 trillion of these.[104] Fannie and Freddie Agency obligations are extensively used as collateral in the triparty and GCF repo markets, and they are also heavily relied upon as collateral for other types of shadow banking activities. Part II made the case that housing finance reform may be a natural source of money liabilities. This Part addresses the $64,000 question, or to be more accurate, the $5.3 trillion question, of how housing finance reform—whether that comes through legislative changes or simply through the continued conservatorship of Fannie and Freddie—might impact the money supply and broader financial system, in both the short-term and long-term.

This Part reviews the housing finance reform debate, and points out that the likely possible outcomes at present, including the status quo of FHFA's conservatorship of Fannie Mae and Freddie Mac, are likely to exacerbate the problem of dwindling safe assets. Indeed, certain housing finance reform proposals would provide a severe negative shock to the supply of safe assets. I then lay out what I think are the likely market reactions to an exogenous reduction in the supply of Fannie and Freddie obligations (such as would occur with housing finance reform), and their potential impacts for the broader financial system and macroeconomy. Thus, in the short run, housing finance reform is likely to create a contractionary effect—perhaps a very steep one—on the global money supply. In the long run, the removal of government guarantees from housing finance is likely to mean that more privately backed housing finance liabilities will serve as money.

A. The Housing Finance Reform Debate

Since the 1980s, Fannie and Freddie have been the dominant source of funding for

103. *See* FINANCIAL ACCOUNTS OF THE UNITED STATES, *supra* note 98, at tbl. L.208, 16, 17, 47 (listing agency obligations).

104. *See supra* notes 75–77 and accompanying text (discussing the financial obligations of Fannie and Freddie).

U.S. residential mortgages,[105] with the exception of one brief period from 2003 to 2007.[106] At the end of 2003, Fannie and Freddie were responsible for financing more than $3.6 trillion in mortgages, over 40% of all outstanding residential loans.[107] Agency securitization (including Ginnie Mae securitization of FHA and VA loans) has financed roughly 90% of all new mortgage originations since 2008,[108] with Fannie and Freddie accounting for approximately two-thirds of these.[109]

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105. Until the 1980s, the thrift industry was the dominant source of U.S. residential mortgage financing. But a confluence of events, including high inflation, high interest rates, and sharp deregulation and regulatory forbearance that allowed thrifts to take on outsized amounts of risk, caused a radical decline in the importance of thrift industry in the 1970s and 1980s. *See* Min, *Government Guarantees*, *supra* note 1, at 451–54. In 1971, Agency MBS accounted for about $6.7 billion in mortgage lending, about 2% of all outstanding residential loans. By 1979, Agency MBS accounted for $88.4 billion in mortgage lending, about 10% of all outstanding residential loans. By 1991, Agency MBS accounted for 40% of all outstanding residential loans. *Id*. at 458 (derived from 1985-94 data compiled from *Federal Reserve Statistical Release, Z.1: Financial Accounts of the United States: Historical Data*, BD. GOVERNORS FED. RES. SYS. (Last visited Apr. 28, 2018) https://www.federalreserve.gov/releases/z1/20150611/data.htm.

106. During the period from 2003 to 2006, Fannie and Freddie lost significant market share to so-called "private-label" securitization of mortgages by Wall Street firms. As I previously described, like agency securitization, private-label securitization revolves around purchasing and pooling mortgages from originating lenders and then issuing securities based on the expected cash flow of these mortgages. But while private-label mortgage-backed securities ("private-label MBS") are superficially similar to agency MBS, they have some key differences that are important to note. Perhaps most importantly, private-label MBS were not backed by a government guarantee. Moreover, private-label MBS were typically issued by special purpose, off-balance sheet conduits, which were not subject to capital requirements or any other form of prudential regulation. Additionally, the mortgages in private-label MBS were often originated by non-bank lenders not subject to regulatory supevision. Min, *Government Guarantees*, *supra* note 1, at 464–65. As the staff of the Financial Crisis Inquiry Commission describes, private-label MBS accounted for between 8% to 12% between 1995 and 2003, at which point, it grew tremendously both in terms of absolute volume and the share of total mortgage originations. FCIC, SECURITIZATION AND THE MORTGAGE CRISIS, *supra* note 82, 10–11. By 2005 and 2006, private-label MBS had a market share of nearly 40% of new mortgage originations. *Id*. Over the same period, Agency securitization fell from 57.6% of new mortgage originations in 2003 to 37.4% of new mortgage originations in 2006. *See* FIN. CRISIS INQUIRY COMM'N, GOVERNMENT SPONSORED ENTERPRISES AND THE FINANCIAL CRISIS 15 (2010), http://fcic-static.law.stanford.edu/cdn_media/fcic-reports/2010-0409-GSEs.pdf [hereinafter FCIC, GOVERNMENT SPONSORED ENTERPRISES]. The increase in PLS share coincided almost exactly with home price increases across the United States. *See* Atif Mian & Amir Sufi, *The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis*, 124 Q.J. ECON. 1449, 1453, 1490 (2009) (noting that the home price appreciation patterns in various geographic regions from 2002 to 2005 "coincide[] exactly with the expansion of [private-label] mortgage securitization"). The sudden dominance of private-label securitization was brief in its duration. As the housing markets began to turn sour, private-label MBS began defaulting at unexpectedly high levels, causing major credit losses for investors. As a result, the demand for private-label MBS fell to nearly zero by 2008. *See* FCIC, SECURITIZATION AND THE MORTGAGE CRISIS, *supra* note 82, at 11. ("[T]he non-agency MBS market was nearly nonexistent in 2008."). Since the crisis, private-label securitization of residential mortgages has remained at negligible levels. For example, in 2014 (the most active year for private-label securitization since the crisis), there was only $35.1 billion in private-label securitization of residential mortgages, and only about $10 billion of this was in the form of new mortgage originations, with the remainder of these private-label deals being made of up re-performing or non-performing loans, or resecuritizations of existing deals. *See* Laurie Goodman, *The Rebirth of Securitization*, URBAN INST. 12–13 (Sept. 2015), http://www.urban.org/sites/default/files/alfresco/publication-pdfs/2000375-The-Rebirth-of-Securitization.pdf.

107. Min, *Government Guarantees*, *supra* note 1, at 459.

108. *See* Gerry Flood et al., *The Return of Private Capital*, 4 FANNIE MAE HOUSING INSIGHTS 1, 2 (2014).

109. *See* FED. HOUSE FIN. AGENCY, QUARTERLY PERFORMANCE REPORT OF THE HOUSING GSES, SECOND QUARTER 2015 15, http://www.fhfa.gov/AboutUs/Reports/ReportDocuments/20152Q_QuarterlyPerformance_HousingGSEs.pdf.

That Fannie and Freddie would continue to dominate the housing finance market in 2015 was not something that many would have predicted some seven years ago when the two companies were placed into conservatorship by the companies' primary regulator, the Federal Housing Finance Agency. This conservatorship was expressly authorized by the Housing and Economic Recovery Act of 2008 (HERA),[110] which had been enacted earlier that year in response to the growing mortgage crisis and the consequent concerns about the solvency of Fannie and Freddie.[111]

As Treasury Secretary Henry Paulson made clear in his September 7, 2008 statement announcing the move, the conservatorship of the GSEs was meant to be a temporary measure to support liquidity and confidence in the housing finance system.[112] The conservatorship was designed such that at the end of 2009, various financial supports and guarantees provided by Treasury would expire, and the two companies would henceforth be required to begin winding down their investment portfolios and to pay a significant fee to Treasury.[113] These measures were expressly designed to create a brief and finite "time out" period in which policy makers could decide the future structure of U.S. housing finance.[114]

The sentiment that major reforms of the housing finance system were both necessary and imminent was echoed by many others in the immediate aftermath of the conservatorship, and in the first few years thereafter. But as Secretary Paulson noted in his 2008 statement, the enormity of the changes that would be necessary for a structural redesign of the housing finance system seemed to require congressional legislation.[115] Picking up off of this insight, a number of outside groups and individuals developed comprehensive housing finance reform proposals, meant to provide Congress with a blueprint for wholesale reform of the residential mortgage markets.[116] Several dozen comprehensive housing finance reform proposals have been offered since the onset of the GSE conservatorship.[117] These can generally be divided into three broad categories.

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110. Housing and Economic Recovery Act of 2008, Pub. L. No. 110-289, 122 Stat. 265 (2008).

111. Solvency fears about Fannie and Freddie led to unprecedented investor concerns between the credit risk on Agency securities. Historically, Agency debt traded between 15 to 25 basis points (a basis point is 1/100 of a percentage point) above the rates for U.S. Treasuries of equivalent maturity. But starting in August 2007, that "Agency spread" reached 40 basis points, and by March 2008, the Agency spread was more than 90 basis points. *See* Stephen G. Cecchetti, *Crisis and Responses: The Federal Reserve in the Early Stages of the Crisis*, 23 J. ECON. PERSPECTIVES 51, 59 (2009).

112. Press Release, U.S. Dep't of the Treasury, *supra* note 3.

113. *Id*.

114. *Id*.

115. *Id. See also* Jim Parrott, *Why Long-Term GSE Reform Requires Congress*, URBAN INST. (May 22, 2014), http://www.urban.org/research/publication/why-long-term-gse-reform-requires-congress (advocating for long term reform through Congress).

116. I have previously described many of the most influential housing finance reform proposals offered in the aftermath of the conservatorship of the GSEs, and the political dynamics around these proposals. Min, *Government Guarantees*, *supra* note 1, at 441–44, nn. 20–21. In the interests of disclosure, I note that I was a principal author of the housing finance reform proposal offered by the Mortgage Finance Working Group organized by the Center for American Progress. *See* Mortgage Finance Working Group, *A Responsible Market For Housing Finance: A Progressive Plan to Reform the U.S. Secondary Market for Residential Mortgages*, CTR. FOR AM. PROGRESS (Jan. 2011), https://cdn.americanprogress.org/wp-content/uploads/issues/2011/01/pdf/responsiblemarketforhousingfinance.pdf [hereinafter *Responsible Market*].

117. John Griffith, *The $5 Trillion Question: What to Do With Fannie Mae and Freddie Mac*, CTR. FOR AM. PROGRESS (Feb. 2014), https://cdn.americanprogress.org/wp-content/uploads/2014/02/GriffithHousingTable-revised.pdf (providing a nice review of the different proposals as of early 2014).

The first category, which I call the libertarian approach, includes proposals that envision winding down Fannie and Freddie and replacing them with a purely private set of intermediaries that do not enjoy either explicit or implicit government guarantees behind their liabilities. The conservative think tanks American Enterprise Institute[118] and Cato Institute,[119] and several academics including Dwight Jaffee (UC Berkeley's Haas School of Business)[120] and Viral Acharya and others (NYU's Stern School of Business),[121] are among those who can be described as having offered housing finance reform plans along these lines. The basic outlines of the libertarian approach were incorporated in the "Protecting American Taxpayers and Homeowners Act" (PATH Act) of 2013 (H.R. 2067 —introduced by Rep. Scott Garrett (R-NJ)—which was voted out of the House Financial Services Committee on partisan lines but did not make it to the House floor for a full vote.[122]

The second "explicit guarantee" category includes proposals that anticipate winding down Fannie and Freddie and replacing them with a new set of housing finance intermediaries that issue mortgage-backed securities explicitly guaranteed by a newly created governmental agency modeled after the Federal Deposit Insurance Corporation. Most of the dozens of housing finance reform plans that have been offered to date fall into this category.[123] These proposals differ on some of their particular details,[124] but they all

118. *See generally* Peter J. Wallison, et al., *Taking the Government Out of Housing Finance: Principles for Reforming the Housing Finance Market,* AM. ENTER. INST. (2011), http://www.aei.org/publication/taking-the-government-out-of-housing-finance-principles-for-reforming-the-housing-finance-market-3/ (arguing that government regulation as a risk-limiting mechanism is ineffective).

119. *See generally* David Reiss, *Fannie Mae, Freddie Mac, and the Future of Federal Housing Finance Policy: A Study of Regulatory Privilege*, CATO INST. POL'Y ANALYSIS (2011), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1959497 (employing regulatory theory to construct a reform framework).

120. *See generally*, Dwight M. Jaffee, Reforming the U.S. Mortgage Market Through Private Market Incentives (Jan. 31, 2011) (unpublished manuscript), http://faculty.haas.berkeley.edu/jaffee/Papers/JaffeeMortgageReform.pdf.

121. *See generally* VIRAL ACHARYA ET AL., GUARANTEED TO FAIL: FANNIE MAE, FREDDIE MAC AND THE DEBACLE OF MORTGAGE FINANCE (2011) (exploring how to limit the damage to our economy and avoid taking the same risks in the future).

122. *See* Lauren French et al., *A Threat to Hensarling's Gavel?*, POLITICO (Oct. 22, 2014), http://www.politico.com/story/2014/10/jeb-hensarling-frank-lucas-financial-services-committee-112081 (describing how the PATH Act "never had enough support to make it to the House floor").

123. *See* Griffith, *supra* note 117 (analyzing 21 plans for reform).

124. For example, some of these explicit guarantee proposals call for a private guarantee on the principal and interest paid on mortgage-backed securities, which is then reinsured by the government guarantor. *See, e.g.*, MORTG. BANKERS ASS'N, MBA'S RECOMMENDATIONS FOR THE FUTURE GOVERNMENT ROLE IN THE CORE SECONDARY MORTGAGE MARKET (2009), https://www.scribd.com/document/19357057/70212-RecommendationsfortheFutureGovernmentRoleintheCoreSecondaryMortgageMarket; *Responsible Market*, *supra* note 116. Other explicit guarantee plans call for a single guarantee, to be offered by a governmental entity. *See, e.g.*, Donald Marron & Phillip Swagel, *Whither Fannie and Freddie? A Proposal for Reforming the Housing GSEs*, E21 (2010), http://www.economics21.org/files/pdfs/commentary/05_24_2010_Whither.pdf; NAT'L ASS'N OF HOME BUILDERS, A COMPREHENSIVE FRAMEWORK FOR HOUSING FINANCE SYSTEM REFORM (2012), http://www.workingre.com/wp-content/uploads/2013/09/NAHB-housing-finance-system-reform.pdf. Explicit guarantee proposals have also varied on the role of Fannie and Freddie. Some call for these companies to be wound down and their assets sold off, *see, e.g.*, ELLEN SEIDMAN ET AL., A PRAGMATIC PLAN FOR HOUSING FINANCE REFORM (2013), https://www.economy.com/mark-zandi/documents/2013-06-19-A-Pragmatic-Plan-for-Housing-Finance-Reform.pdf. Others envision Fannie and Freddie being spun out of conservatorship to play a central role in the new system. *See, e.g.*, MORTG. BANKER'S ASS'N, *supra*; Marron & Swagel, *supra*.

feature mortgage-backed securities with an explicit government guarantee as the main source of funding for the housing finance system.

Under the political dynamics of the Obama administration, the explicit guarantee approach gained significant legislative traction, with several different bills being offered that fit into this general category. However, none of these bills came close to being enacted by Congress. On the House side, Rep. Maxine Waters (D-CA), the Ranking Member of the House Financial Services Committee, released a discussion draft of a bill titled the "Housing Opportunities Move the Economy (HOME) Forward Act of 2014," which would replace Fannie and Freddie with a lender-owned cooperative, which would issue government-guaranteed mortgage-backed securities and use these to fund the origination of conforming mortgages.[125] While this bill has yet to be introduced, several of Rep. Waters's Democratic House colleagues, Reps. John Delaney (D-MD), John Carney (D-DE), and Jim Hines (D-CT), did introduce a bill, the "Partnership to Strengthen Homeownership Act of 2015" (H.R. 1491), calling for Ginnie Mae to provide explicit government guarantees on mortgage-backed securities.[126] H.R. 1491 was not taken up by the House Financial Services Committee.

On the Senate side, Senators Bob Corker (R-TN) and Mark Warner (D-VA) introduced the "Housing Finance Reform and Taxpayer Protection Act of 2013" (S. 1217).[127] This bill, which was later re-introduced by Senators Tim Johnson (D-SD) and Mike Crapo (R-ID), the Senate Banking Committee's Chair and Ranking Member, respectively, as the "Housing Finance Reform and Taxpayer Protection Act of 2014," features an explicit government guarantee on qualifying mortgage-backed securities, which would be provided by a new government entity, the Federal Mortgage Insurance Corporation, modeled after the Federal Deposit Insurance Corporation (which provides a comparable guarantee of bank deposits).[128] S. 1217 was passed out of the Senate Banking Committee with bipartisan support on a 13–9 vote, but given that the Democrats controlled the Senate (and thus the Banking Committee) at the time, it is significant that six key Democrats who were seen as representing the liberal wing of the party—Sen. Jack Reed (D-RI), Sen. Charles Schumer (D-NY), Sen. Robert Menendez (D-NJ), Sen. Sherrod Brown (D-OH), Sen. Jeff Merkley (D-OR), and Sen. Elizabeth Elizabeth Warren (D-MA)—all voted against the bill, based on their concerns that it did not sufficiently address affordable housing needs.[129] This lack of Democratic support appears to have doomed S. 1217; like the PATH Act in the House, S. 1217 did not receive a floor vote.[130]

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125. *Housing Opportunities Move the Economy Forward Act of 2014 (HOME)*, http://democrats.financialservices.house.gov/uploadedfiles/media/file/003%20maxine%20waters%20legislation/gse%20bill/waters_046_xml.pdf (unintroduced draft language).

126. H.R. 1491 – Partnership to Strengthen Homeownership Act of 2015, CONGRESS.GOV (Last Visited Apr. 28, 2018) https://www.congress.gov/bill/114th-congress/house-bill/1491.

127. *Housing Finance Reform and Taxpayer Protection Act*, BOB CORKER (Last Visited Apr. 28, 2018) https://www.corker.senate.gov/public/index.cfm/housing-finance-reform

128. *See* LAURIE S. GOODMAN, A REALISTIC ASSESSMENT OF HOUSING FINANCE REFORM 13–14 (2014), http://www.urban.org/sites/default/files/alfresco/publication-pdfs/413205-A-Realistic-Assessment-of-Housing-Finance-Reform.PDF.

129. *See* Jann Swanson, *"Undecided" Democrats Decide "No" on Johnson-Crapo*, MORTGAGE NEWS DAILY (May 9, 2014), http://www.mortgagenewsdaily.com/05092014_housing_finance_reform.asp (describing amendments made to S. 1217 and the events preventing it from reaching a floor vote).

130. *See* Kevin Cirilli, *Liberal Lawmaker: Start Anew on Housing Reform*, THE HILL (Nov. 18, 2014),

The final "status quo" category is not so much a collection of proposals—although a few have been offered—as it is the growing acknowledgement that legislative reform of the housing finance system may continue to be a long ways off, and that the current housing finance infrastructure—and its heavy reliance on the mortgage financing provided by Fannie and Freddie—may therefore be the most viable and realistic option for providing home mortgage funding in the foreseeable future.

Early support for the status quo was offered from various shareholders and other activists who advocated for re-privatizing Fannie Mae and Freddie Mac under a number of different umbrella organizations, including "Restore Fannie Mae,"[131] "Free Fannie Mae,"[132] and "Investors Unite."[133] These investor groups have sought to end FHFA's conservatorship of Fannie and Freddie and allow the companies to re-capitalize, potentially restoring some of the value of their equity shares.[134] They have been heavily supported in their efforts by a number of prominent hedge funds such as Paulson & Co., Perry Capital, and Fairholme Funds, which bought up significant amounts of preferred and common shares in the two companies for pennies on the dollar,[135] and have since spent millions of dollars on lobbying[136] and litigation to try to force the federal government to "free" Fannie and Freddie from conservatorship.[137]

For the first several years following the conservatorship, policy makers largely rejected the notion of a future housing finance system featuring Fannie and Freddie.[138] But as more and more time has gone by without any significant legislative movement on housing finance reform, a small but growing number of influential policy makers have joined the status quo approach. The Urban Institute recently issued a compendium of short summaries of different housing finance reform proposals offered by leading thinkers in the area.[139] Several of these proposals explicitly called for keeping Fannie and Freddie in place.[140]

Obviously, the results of the 2016 election are likely to shift the political dynamic

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http://thehill.com/policy/finance/housing/224562-liberal-lawmaker-start-anew-on-housing-reform (explaining why Johnson-Crapo did not reach a floor vote).

131. RESTORE FANNIE MAE, http://www.restorefanniemae.us/ (last visited Mar. 21, 2018).

132. Free Fannie Mae, FACEBOOK, https://www.facebook.com/FreeFannieMae/ (last visited Mar. 21, 2018).

133. INVESTORS UNITE, http://investorsunite.org/ (last visited Feb. 8, 2018)

134. *See, e.g.*, *Restore Fannie Mae: Restore Fairness*, RESTORE FANNIE MAE (Oct. 18, 2013), http://www.restorefanniemae.us/about-us (describing the purpose of the members of Restore Fannie Mae).

135. *See* Joe Light, *Bets on Fannie and Freddie Get Help From Lobbyists*, WALL ST. J. (May 12, 2016), http://www.wsj.com/articles/bets-on-fannie-and-freddie-get-help-from-lobbyists-1463087581 (describing hedge fund efforts to finance a lobbying campaign for Fannie Mae and Freddie Mac).

136. *See id.*; Matthew Goldstein, *Alliance Battles to Save Fannie and Freddie*, N.Y. TIMES DEALBOOK (Apr. 29, 2014), http://dealbook.nytimes.com/2014/04/29/fairholme-backs-campaign-to-save-fannie-and-freddie/?_r=0; Light (describing efforts to support Fannie Mae and Freddie Mac reform).

137. *See* John Carney, *In a Blow to Fannie and Freddie Shareholders, Court Tosses Out Another Lawsuit*, WALL ST. J. (Aug. 23, 2016), http://blogs.wsj.com/moneybeat/2016/08/23/in-a-blow-to-fannie-and-freddie-shareholders-court-tosses-out-another-lawsuit/ (explaining the loss of a shareholder suit to force Freddie Mac to allow shareholders to inspect its records).

138. MOODY'S ANALYTICS, WHO BEARS THE RISK IN RISK TRANSFERS? (2017), https://www.economy.com/mark-zandi/documents/2017-08-02-who-bears-the-risk.pdf (explaining doubts about Freddie and Fannie's initial longevity).

139. HOUSING FINANCE REFORM INCUBATOR, URBAN INST. 6 (July 2016), https://www.urban.org/research/publication/housing-finance-reform-incubator/view/full_report.

140. *See id.* at 8 (proposing a new reform objective).

sharply. Several prominent advocates of the libertarian approach to housing finance reform have joined the Trump administration in senior policy positions, and the libertarians may have the momentum necessary to enact and implement their preferred approach to housing finance reform.

B. Short-Term Effects of Housing Finance Reform

What is notable about these housing finance reform plans is that they all seek to aggressively reduce the federal government's role in housing finance. The most radical of these plans in this regard, the libertarian approach, would effectively aim to "privatize" all of Fannie and Freddie's current market share. There has been significant debate over the desirability of such a drastic change from the federal government's historically large role in housing finance. But absent from this debate so far has been any consideration of the effects that housing finance reform might have on the money markets. As this Section argues, a steep reduction in the government's role in housing finance, such as contemplated under the libertarian approach, would have a large contractionary effect on the supply of publicly backed safe assets, which in turn is likely to lead to several important consequences.

1. Substitution of Privately Created Safe Assets

One likely outcome of a reduction in the supply of Fannie and Freddie obligations is an increased reliance on (and perhaps increased production of) privately created safe assets. As Gorton, Lewellen and Metrick have illustrated, the ratio of safe assets to all assets has remained relatively constant in the United States, at about 33%, from 1952 to 2010.[141] Gorton et al. also find that government guaranteed safe assets and privately produced safe assets may be substitutes for one another.[142] Generally speaking, government guaranteed assets are preferred as collateral. But when the supply of publicly backed safe assets is insufficient to meet the demand, privately produced safe assets may help to fill the void. A number of subsequent studies have helped to confirm this finding. For example, Krishnamurthy and Vissing-Jorgensen show that the net supply of government debt is strongly negatively correlated with the net supply of privately issued short-term debt.[143] Similarly, Xie and Sunderam show that the issuance of asset-backed securities and ABCP, respectively, are negatively correlated with the amount of outstanding government debt.[144] New production is not the only way in which the supply of privately produced safe assets can be increased. Private actors can adjust the eligibility requirements for collateral,

141. Gary Gorton et al., *The Safe-Asset Share*, 102 AM. ECON. REV. 101, 101 (2012). Gorton et al. define "safe assets" as the sum of U.S. government debt and the "safe" component of private financial debt (essentially, deposits plus other high-grade financial debt); *Id*. at 101–05.

142. *Id*. at 103–04; *See also* Arvind Krishnamurthy & Annette Vissing-Jorgenson, *The Aggregate Demand for Treasury Debt*, 120 J. POL. ECON. 233 (2012) (finding a similar phenomenon with respect to the yields of a number of privately created debt).

143. Arvind Krishnamurthy & Annette Vissing-Jorgensen, Short Term Debt and Financial Crises: What We Can Learn from U.S. Treasury Supply? (Nov. 18, 2012) (unpublished paper), https://pdfs.semanticscholar.org/22fa/69d9279f58ba20b65c551e0b21e22c8178f2.pdf.

144. Lei Xie, Essays on Financial Institutions and Asset Pricing (2013) (unpublished Ph.D. dissertation, Yale University) (On file with ProQuest); Adi Sunderam, *Money Creation and the Shadow Banking System*, 28 REV. FIN. STUDIES 939 (2015).

effectively broadening the supply outward to cover a wider array of "safe" assets.[145]

We have already witnessed one major instance of this phenomenon, in the mid-2000s, as the financial sector ramped up its production of private-label asset-backed securities and mortgage-backed securities in response to the supply-demand imbalance in safe assets. Of course, private-label ABS and MBS turned out to be much riskier than believed, and overproduction of these products has been identified by many as a major cause of the financial crisis.

As a number of prominent scholars have argued, private safe assets are inherently risky and thus a greater reliance on private safe assets as collateral increases financial instability and raises the likelihood of financial crises.[146] As Gourinchas & Jeanne, among others, have pointed out, private safe assets are more likely to lose the quality of "safeness" than public safe assets.[147] Deterioration in the perceived quality of private safe assets was a major driver of the financial crisis.[148] While public safe assets can also lose their perceived safeness, as was recently evidenced by the experience of some Eurozone countries, this only happens when the creditworthiness of the sovereign government guaranteeing these safe assets comes under question, something that happens far more rarely than for private safe assets.[149]

2. Substitution of Foreign Safe Assets

Another potential near-term market reaction to reduced supplies of Fannie and Freddie obligations is an increased reliance on foreign (dollar-denominated) safe assets. Bertaut et al. have found that since the financial crisis (and the reduced demand for private "safe assets" produced by the U.S. financial sector), U.S. demand for safe assets has largely been met by increased reliance on high quality foreign debt instruments, including government bonds, debt issued by financial firms, and debt issued by non-financial firms.[150] These safe assets have primarily come from a handful of OECD countries, including the United Kingdom, Australia, and Canada.[151]

One would expect to see a similar reaction if the existing supply of safe assets was

145. *See* Fender & Lewrick, *supra* note 66, at 72–74.

146. *See* Gourinchas & Jeanne, *supra* note 70, at 36; Krishnamurthy & Vissing-Jorgensen, *supra* note 141, at 4, 24–26 (finding that growth in private short-term debt is correlated with financial crises).

147. *See* Gourinchas & Jeanne, *supra* note 70, at 1–3; *see also* Ben S. Bernanke et al., *International Capital Flows and the Returns to Safe Assets in the United States, 2003-2007*, 13–15 (2011) (Bd. of Governors of the Fed. Reserve Sys., Discussion Paper No. 1014); *Monetary Policy Challenges Ahead*, in Bank for Int'l Settlements, 81st Annual Report (2011).

148. Gourinchas & Jeanne*, supra* note 70, at 1–3.

149. *Id.*, at 34–36. As Gourinchas & Jeanne point out, one important driver of the sovereign debt crisis experienced by some European countries was the proliferation of implicit government guarantees behind bank debt and other securities, which blurred the line between private and public safe assets. *Id*. Others have also blamed the combination of the Eurozone's currency union, which limits the ability of any single country to respond to economic or financial shocks that may disproportionately affect it, combined with the imposition of so-called "austerity packages" that forced struggling countries to reduce their spending levels, which in turn created a "vicious circle" of reduced growth, reduced tax receipts, and further cuts to government spending. *See, e.g.*, Klaus Armingeon & Lucio Baccaro, *Political Economy of the Sovereign Debt Crisis: The Limits of Internal Devaluation*, 41 INDUS. L. J. 254 (2012).

150. Carol Bertaut et al., *The Replacement of Safe Assets: Evidence From the U.S. Bond Portfolio* (Fed. Reserve Bd. Int'l Fin., Discussion Paper No. 1123, 2014).

151. *Id*. at 3–6.

further reduced, as might happen with major housing finance reform that wound down or reduced the footprint of Fannie and Freddie. Assuming that the United Kingdom, Australia, and Canada were able to fill this gap, there are some potentially large problems that might accompany such a substitution. First, as we saw in southern Europe recently, reliance on foreign sovereign debt as safe may be misplaced. Second, to the extent that foreign collateral is used for dollar-denominated shadow money, this may complicate U.S. monetary policy and prudential regulation efforts. Finally, pushing demand out to foreign private safe assets may simply move the locus of crisis to other countries, leaving U.S. financial institutions and markets vulnerable to panics based on credit dislocations outside of our borders. There is some evidence that Canada may be experiencing a housing bubble, and this may be in part due to the mass inflows of credit driven in part by this demand for Canadian safe assets.

3. Greater Rehypothecation

One other likely outcome of housing finance reform would be the increased *rehypothecation* (repledging) of safe assets.[152] Many of the assets that are pledged as collateral are contractually permitted to be re-pledged by the recipient as collateral. Sometimes, the same asset may be pledged and re-pledged multiple times. This *rehypothecation* of collateral effectively expands the supply of safe assets, and has become an important part of money creation today. The rate at which collateral is pledged and re-pledged is sometimes called the "velocity" of collateral.[153]

Most financial market transactions are governed by the "ISDA Master Agreement," a form contract created by the International Swaps and Derivatives Association.[154] For collateralized lending, the ISDA Master Agreement is supplemented by one of several "ISDA Credit Support Annexes," which provide the basic legal terms for the treatment of collateral.[155] Two of these ISDA Credit Support Annexes expressly allow the recipient of pledged collateral to re-pledge that collateral for other transactions.[156] Importantly, rehypothecation has become the norm in the marketplace, as the vast majority of financial institutions that engage in collateralized transactions opt to use one of the credit support annexes that allow the reuse of pledged collateral.[157] Rehypothecation has become an important mechanism for increasing the effective supply of safe assets.[158] As the Committee on the Global Financial System has described, "there is evidence that market

152. There is a technical distinction between "rehypothecation" and a related concept called "reuse," which has to do with who maintains legal ownership of the collateral. *See* COMM. ON THE GLOB. FIN. SYS.:, BANK FOR INT'L SETTLEMENTS, CENTRAL BANK OPERATING FRAMEWORKS AND COLLATERAL MARKETS 15 (2015), http://www.bis.org/publ/cgfs53.pdf [hereinafter *CGFS Collateral Report*]. But for the most part, these two concepts are usually referred to in the aggregate as rehypothecation. *Id*.

153. Singh, *Velocity of Pledged Collateral*, *supra* note 60.

154. Cyril Monnet, *Rehypothecation*, PHILA. FED. RES. BUS. REV. 18, 20 (2011), https://www.phil.frb.org/-/media/research-and-data/publications/business-review/2011/q4/brq411_Rehypothecation.pdf.

155. *Id*.

156. *Id*. at 20−21.

157. *Id*. at 21. ISDA., ISDA MARGIN SURVEY 2013 11 (June 2013), https://www.isda.org/a/HkDDE/isda-margin-survey-2013-final.pdf (finding that 92.7% of all large dealers report rehypothecating collateral). Rehypothecation is particularly prevalent for collateralized transactions involving government securities, with 77.7% of these allowing for rehypothecation. *See* ISDA, ISDA MARGIN SURVEY 2015 (2015) https://www.isda.org/a/0eiDE/margin-survey-2015-final.pdf.

158. *See* Singh, *Velocity of Pledged Collateral*, *supra* note 60, at 3.

participants tend to reuse collateral more frequently in times when collateral scarcity increases, alleviating some of the scarcity effects."[159]

But the phenomenon of increased rehypothecation during periods when safe assets are scarce has not held true in the aftermath of the financial crisis. As Singh and Aitken have described,the velocity of pledged collateral—that is to say, the rate of rehypothecation occurring in collateralized lending markets—has declined significantly since the bankruptcy of Lehman Brothers.[160] One factor in this decline is greater caution by investors, who are increasingly restricting the rehypothecation rights on their pledged collateral as a response to the problems illustrated by Lehman during the financial crisis.[161]

The decline in rehypothecation also appears to be exacerbated by several post-crisis regulatory actions.[162] First, Dodd-Frank effectively prohibits most swap derivative contracts from allowing rehypothecation, because it requires most swaps to be centrally cleared, and the pledged collateral to be held by the clearing counterparty in a segregated account, thus preventing this collateral from being re-pledged.[163] To the extent that Dodd-Frank is expected to move a significant amount of over-the-counter swaps trades to central clearing, this is likely to reduce the velocity of pledged collateral.

Second, Basel III's Liquidity Coverage Ratio (LCR) requires banks to hold a large amount of high quality liquid assets—which may not be rehypothecated—to ensure that they can withstand financial shocks.[164] While it is too early to know how large the LCR's impact on rehypothectation will be, it seems certain to be quite significant. For example, in December 2010, the Basel Committee estimated that, for a significant but not fully inclusive sample of banks that it had analyzed, the LCR would require a €1.73 trillion increase in HQLA (roughly $2.27 trillion USD), as of the end of 2009.[165] In short, the LCR seems likely to limit rehypothecation to a great degree. Thus, rehypothecation is unlikely to do much to ameliorate the collateral shortage that might result due to a decline in Agency

159. *CGFS Collateral Report*, *supra* note 150, at 15.

160. Manmohan Singh & James Aitken, *Deleveraging After Lehman—Evidence from Reduced Hypothecation* 5−7 (IMF, Working Paper No. WP/09/42, 2009).

161. *Id*.

162. Some commentators have argued that the unconventional monetary policy engaged in by the world's leading central banks, especially the large-scale asset purchase (LSAP) programs, have also contributed to the decline in rehypothecation. *See, e.g.*, Andy Kessler, *The Fed Squeezes the Shadow-Banking System*, WALL ST. J. (May 22, 2013), https://www.wsj.com/articles/SB10001424127887323628004578456991962372414 (arguing that the Federal Reserve's large-scale purchases of Treasury securities is "starving the repo market of safe collateral").

163. *See* Monnet, *supra* note 152, at 23−24.

164. *See* BASEL COMM. ON BANKING SUPERVISION: BANK FOR INT'L SETTLEMENTS, BASEL III: THE LIQUIDITY COVERAGE RATIO AND LIQUIDITY RISK MONITORING TOOLS 15−16 (2013), http://www.bis.org/publ/bcbs238.pdf. The rule requires that certain types of banking institutions—financial institutions with $250 billion or more in consolidated assets or $10 billion or more in total on-balance sheet foreign exposure, and depository institutions that are part of bank holding companies with $10 billion or more in total consolidated assets—hold high-quality liquid assets equal to or greater than the amount of 100% of its net cash outflows over a thirty day calendar period. *See* Liquidity Coverage Ratio: Liquidity Risk Measurement Standards, 79 Fed. Reg. 61,440, 61,440 (Oct. 10, 2014) (codified at 12 C.F.R. pt. 249).

165. BASEL COMM. ON BANKING SUPERVISION: BANK FOR INT'L SETTLEMENTS, RESULTS OF THE COMPREHENSIVE QUANTITATIVE IMPACT STUDY 18 (2010), http://www.bis.org/publ/bcbs186.pdf. This report was released in December 2010. As of December 1, 2010, one Euro was worth $1.3115. *See Representative Exchange Rates for Selected Currencies for December 2010*, IMF https://www.imf.org/external/np/fin/data/rms_mth.aspx?SelectDate=2010-12-31&reportType=REP (last visited Mar. 21, 2016). Thus, €1.73 trillion is about $2.27 trillion USD.

obligations.

C. Long-Term Effects of Housing Finance Reform

The preceding analysis also suggests that any significant move towards "privatizing" the housing finance system would, in the long run, accelerate the shift away from publicly issued or guaranteed money (such as fiat currency or insured bank deposits) and towards private forms of money (such as shadow money). After all, if there is a "natural" market need for a certain amount of money, then a policy change that sharply reduced the amount of public money would seem likely to lead to a shift towards more private money. At the same time, to the extent that private money tends to rely on collateral, a dramatic move away from publicly backed housing finance intermediation would also, as described in Section IV.B.1, lead to the replacement of public safe assets with riskier privately created collateral.

V. IMPLICATIONS

As Part III contends, housing finance reform as currently contemplated is likely to reduce the supply of government-backed liabilities used to fund home mortgage loans. In the near-term, this could create further contractionary pressure on safe assets and trigger a consequent shift towards riskier private debt obligations, foreign debt obligations and increased rehypothecation. In the long-term, a more privatized housing finance system would likely lead to a shift away from sovereign or sovereign-backed money and towards private money. This Part argues that these effects are problematic from a policy perspective, and consequently asserts that policy makers should be extremely cautious in reducing the government's footprint in housing finance.

A. Financial Stability Effects

Either a safe asset shortage or an increased shift to private money would increase the likelihood of financial crises. As discussed in Section IV.B.1 *supra*, privately created safe assets tend to serve as a substitute for public safe assets—that is to say, private safe asset production increases as the amount of public safe assets drops.[166] At the same time, there is a growing consensus that privately created safe assets are inherently unstable and a greater reliance on private safe assets results in greater financial instability.[167]

Thus, in the near term, to the extent that housing finance reform would remove Fannie and Freddie liabilities from the global supply of safe assets, these would likely be replaced at least to some extent by private safe assets and thus undermine recent regulatory efforts to improve financial stability. At the same time, as described in Section Part III.B.2, foreign safe assets are likely to fill some of the void, and again, this seems likely to increase the risk of financial instability, given that many of the countries issuing this sovereign debt have smaller or more volatile economic and fiscal situations than the United States.

Housing finance reform is also likely to have significant negative effects on long-term

166. *See supra* notes 139–43 and accompanying text (discussing private safe assets); Gary Gorton & Guillermo Ordoñez, *The Supply and Demand for Safe Assets*, (Nat'l Bureau Econ. of Research, Working Paper No. 18732, 2013) (describing the demand to use safe assets as collateral).

167. *See* Gourinchas & Jeanne, *supra* note 70, at 1 (discussing the potential for instability as safe assets become risky); Gary Gorton & Guillermo Ordonez, *Collateral Crises*, 104 AM. ECON. REV. 343 (2012).

financial stability, since it will exacerbate the trend away from public money and towards private money. Here it may be worth briefly distinguishing between safe assets and money.

Notably, one of the five principal uses of safe assets described by the IMF is as a "reliable store of value" for investors.[168] As discussed in Part I, this "store of value" criterion was also one of key elements used to define money.[169] Indeed, some safe assets also serve the function of money, and money itself is a core safe asset.[170] As Ricks has observed, there can be some fuzziness in the line drawing between safe assets and money.[171] Some safe assets (particularly those with short durations), such as short-term Treasury bills, are themselves considered to be money substitutes.[172] But rather, they are used as collateral to help create money instruments (such as repo).[173] In other words, all money is a form of safe asset, but not all safe assets are a form of money.

Pozsar has developed a helpful hierarchy of modern money instruments.[174] He breaks these out into four categories. Purely public monies (or "public money") are those forms of money that are issued and backed by the government, such as currency, short-term Treasuries, and Federal Reserve reserve accounts.[175] Private-public monies (or "insured money") are those issued by private institutions (such as banks) but backed by the federal government, such as insured bank deposits.[176] Public-private monies are those that are backed by public assets (like Treasury bills or Agency obligations) but not explicitly guaranteed by the federal government, and take the form of government repos (repos backed by government debt and other publicly guaranteed credit assets), among other things.[177] Finally, there are purely private money claims, which are backed by privately created assets and which do not have public guarantees behind them, and include private repos (repos backed by private assets) and asset-backed commercial paper.[178]

One of the driving causes of the financial crisis, according to Poszar and many others, was the large growth of purely private money claims, which are inherently unstable because they have no guarantees against credit losses behind them.[179] Thus, when investors start to lose confidence in the value of the collateral backing private money, there is no backstop to prevent this erosion of confidence from turning into a full-blown panic.

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168. Gourinchas & Jeanne, *supra* note 70, at 1.

169. *See supra* note 23 and accompanying text (defining money).

170. Gelpern & Gerding, *supra* note 9, at 383–85.

171. RICKS, THE MONEY PROBLEM, *supra* note 12, at 46–49

172. In a recent paper, former Federal Reserve Governor Jeremy Stein and several co-authors dubbed these instruments "short-term safe instruments" or STSIs. *See generally* Mark Carlson et al., *The Demand for Short-Term, Safe Assets and Financial Stability: Some Evidence and Implications for Central Bank Policies*, 12 INT'L J. CENT. BANKING 307 (2016).

173. *See* RICKS, THE MONEY PROBLEM, *supra* note 12, at 30–32 (describing the "empirical" approach to money).

174. *See generally* Pozsar, *Shadow Banking*, *supra* note 23 (categorizing modern money instruments).

175. *Id*. at 14.

176. *Id*.

177. *Id*. at 14–16.

178. *Id.* at 16.

179. Pozsar, *supra* note 23, at 16. *See also* Cyril Monnet & Daniel R. Sanches, *Private Money and Banking Regulation* (Fed. Reserve Bank of Phila., Working Paper No. 15-19, 2015) https://www.philadelphiafed.org/-/media/research-and-data/publications/working-papers/2015/wp15-19.pdf; Daniel R. Sanches, *On the Inherent Instability of Private Money*, (Fed. Reserve Bank of Phila., Working Paper No. 15-18, 2015), https://www.philadelphiafed.org/-/media/research-and-data/publications/working-papers/2015/wp15-18.pdf.

B. Monetary Policy Effects

In addition to negatively affecting financial stability, housing finance reform is also likely to be problematic in both the short-term and long-term for monetary policy. In the near term, housing finance reform's contractionary effects on the safe asset supply are likely to create deflationary pressures during a period in which central banks are actively trying to combat deflation.

There is some evidence that public safe assets are already in very short supply. Repos on 10-year "on-the-run"[180] Treasury bills have recently had some high profile failures, where the trades could not be completed due to a lack of Treasury securities.[181] The short supply of these Treasuries has led to the peculiar situation in which traders are paying cash to procure this issue. As of March 2016, the overnight repo rate on 10-year on-the-run Treasuries was negative 2.9%.[182]

While there are a number of possible explanations for why we've seen so many repo fails in recent years (including short sales), the limited supply of publicly backed safe assets has to be considered a major factor. Indeed, a recent paper by economists Gary Gorton and Tyler Muir found that the limited supply of Treasury and Agency securities was indeed a proximate cause of the recent repo fails, and of course this problem would only be exacerbated by a policy-driven shock to the supply of Agency securities.[183] Thus, in the absence of major changes or countervailing measures of how it is currently being conceptualized, housing finance reform is likely to increase deflationary pressures on the money supply.

At the same time, privatizing Fannie and Freddie or otherwise reducing the government's involvement in housing finance is also likely to be problematic in the long-run for monetary policy, since it will shift more of the global money supply away from public money (or public-private or private-public money) and towards purely private money. This in turn would have the potential to further delink the Federal Reserve's monetary policy levers from the actual money supply.

Since the 1970s, the Fed has chosen to address its monetary policy responsibilities by setting the cost of money, rather than trying to control the overall supply of money. It has done so by utilizing its policy tools—primarily open market operations—to set a target rate for overnight lending between banks as to the reserve balances they carry at their regional

180. "On-the-run" refers to the most recently issued Treasury bill of a particular duration. *See generally* JENS H.E. CHRISTENSEN ET AL., DO ALL NEW TREASURIES TRADE AT A PREMIUM? FRBSF ECONOMIC LETTER (2017), https://www.frbsf.org/economic-research/publications/economic-letter/2017/february/do-all-new-treasuries-have-on-the-run-premium/. Conversely, "off-the-run" Treasuries are older vintage bonds that have been issued in prior auctions. *Id.*

181. *See, e.g.*, Izabella Kaminska, *On the Puzzling Increase in UST Settlement Fails*, FIN. TIMES ALPHAVILLE (Jan. 4, 2016), https://ftalphaville.ft.com/2016/01/04/2149052/on-the-puzzling-increase-in-ust-settlement-fails/; Izabella Kaminska, *Something Very Significant is Happening in Repo*, FIN. TIMES ALPHAVILLE (Mar. 22, 2016), https://ftalphaville.ft.com/2016/03/22/2157236/something-very-significant-is-happening-in-repo/.

182. Liz McCormick, *The Treasury Market's Big Short is in 10-Year Notes, Repos Show*, BLOOMBERG (Mar. 6, 2016) https://www.bloomberg.com/news/articles/2016-03-07/the-treasury-market-s-big-short-is-in-10-year-notes-repos-show.

183. Gary Gorton & Tyler Muir, *Mobile Collateral Versus Immobile Collateral* 6–11, (Bank for Int'l Settlements, Working Paper No. 561, 2016).

Federal Reserve Bank.[184] As the Congressional Research Service has described, "[t]he federal funds rate is linked to the interest rates that banks and other financial institutions charge for loans—or the provision of credit. Thus . . . this [short-term] rate influences other, longer-term rates.[185]

To affect the cost of money supply, the Federal Reserve has historically relied on depository institutions and their capacity to create money, through a variety of different tools designed to impact bank money creation. Until the financial crisis, the Fed deployed three different methods to facilitate its monetary policy.[186] The most important of these, known as "open market operations," involves the Fed's purchase—or sale—of securities —usually Treasury securities—from—or to—regulated financial institutions in exchange for Federal Reserve notes.[187] These Reserve notes expand the purchaser's reserve base, thus increasing its ability to make more loans—and thus create more money.[188]

The second monetary policy tool traditionally relied upon by the Fed is the oldest and arguably crudest one, changing the reserve requirements for depository institutions.[189] Banks must keep a specified amount of their deposits in the form of vault cash or deposits with a Federal Reserve Bank.[190] By raising or lowering the reserve requirement, the Fed can increase or decrease the amount of lending—and thus money creation—that banks can do.[191] The use of reserve requirements has largely been phased out of the Fed's monetary policy toolbox, as this mechanism was last utilized in 1992.[192]

Finally, the Fed can change the "discount rate" it charges to commercial banks and other depository institutions on loans they receive from their regional Federal Reserve Bank's "discount window," a lending facility available to these eligible institutions.[193] In recent decades, banks have generally avoided utilizing the discount window, either because of moral suasion from the Fed or because the discount rate was raised to be slightly greater than the Fed Funds rate.[194] Even during the financial crisis, banks were reluctant to rely on discount window credit to address their funding needs. Ben Bernanke, the Fed Chair during the crisis, has stated that this reluctance was due to bank concerns that "their recourse to the discount window, if it became known, might lead market participants to infer weakness—the so-called stigma problem."[195]

The shift from traditional banks, which are directly affected by the Federal Reserve's Fed Funds rate changes, to shadow banks, which are only indirectly affected by these rate

184. *See Open Market Operations*, BD. OF GOVERNORS OF THE FED. RESERVE SYS., http://www.federalreserve.gov/monetarypolicy/openmarket.htm (last visited Mar. 21, 2018) (defining the federal funds rate as "the interest rate at which depository institutions lend reserve balances to other depository institutions overnight").

185. MARC LABONTE, CONG. RESEARCH SERV., RL30354, MONETARY POLICY AND THE FEDERAL RESERVE: CURRENT POLICY AND ISSUES FOR CONGRESS 6 (2015).

186. *Id.* at 3–5.

187. *Id*. at 4.

188. *Id*.

189. *Id*. at 5.

190. *See* LABONTE, *supra* note 183 (explaining the deposits banks must keep).

191. *Id*. at 4–5.

192. *Id*. at 5.

193. *Id*. at 5–6.

194. *Id*. at 5 n. 20.

195. Ben S. Bernanke, Chairman, Fed. Reserve, Speech at the Federal Reserve Bank of Richmond's 2009 Credit Markets Symposium: The Federal Reserve's Balance Sheet (Apr. 3, 2009), http://www.federalreserve.gov/newsevents/speech/bernanke20090403a.htm.

changes, has led to distortions in how monetary policy is actually transmitted into the real economy. Many economists have found that monetary policy transmission has been dampened by the growth of shadow banking.[196] The IMF finds the opposite result—that monetary transmission has been accelerated in countries with large shadow banking systems.[197] But regardless of which view is correct, it appears clear that the shift from traditional banking to shadow banking has disrupted the traditional monetary policy levers used by the Federal Reserve. This disruption would be exacerbated by any policy changes that significantly "privatized" the housing finance system, by moving more of the locus of the money supply to private forms of money, which are less directly responsive to the Fed's existing tools.

C. Caution in the Pace and Structure of Housing Finance Reform

The preceding analysis suggests that policy makers should be careful about proceeding too rapidly or carelessly with plans to reduce the government's role in housing finance. Such reform could have major unintended consequences that work against the interests of financial stability and smooth monetary policy guidance and transmission. At a bare minimum, policy leaders should closely and carefully examine the likely effects that different housing finance reform proposals may have on the global supply of safe assets and the money supply, and adjust these plans to minimize the negative effects that may arise.

VI. CONCLUSION

This Article draws attention to the significant effects that housing finance reform may have on money, and why these supply side effects should be of great importance for policy makers. While many scholars have begun to think about the importance of modern money creation in regulating the financial system, and many other scholars have analyzed the question of how best to amend our housing finance system in the post-Fannie and Freddie era, there has been no overlap between these two groups of scholars. This Article argues that there are important issues raised at the intersection of these areas of scholarship, and suggests that these ought to be more explicitly incorporated into the numerous housing finance reform proposals that are being considered.

196. *See, e.g.*, Thorvald Grung Moe, *Shadow Banking: Policy Challenges for Central Banks* 3 J. FIN. PERSP. (2014) (detailing the effects of shadow banking); Falk Mazelis, The Role of Shadow Banking in the Monetary Transmission Mechanism (Mar. 2016) (unpublished paper) http://www.dynare.org/DynareConference2016/papers/mazelis_shadowbanking_16Mar.pdf (explaining the effects of shadow banking).

197. IMF, FOSTERING STABILITY IN A LOW-GROWTH, LOW-RATE ERA 50–52 (Oct. 2016) https://www.imf.org/external/pubs/ft/gfsr/2016/02/pdf/c2.pdf.