Working Paper Series

mREITs and Their Risks

WP 13-19R

Sabrina R. Pellerin
Federal Reserve Bank of Richmond

Steven J. Sabol
Federal Reserve Bank of Richmond

John R. Walter
Federal Reserve Bank of Richmond

This paper can be downloaded without charge from:
http://www.richmondfed.org/publications/

THE FEDERAL RESERVE BANK OF RICHMOND
RICHMOND ■ BALTIMORE ■ CHARLOTTE

mREITs and Their Risks*

Sabrina R. Pellerin, Steven J. Sabol and John R. Walter
Federal Reserve Bank of Richmond

November 2013

Working Paper No. 13-19R

Abstract

This paper examines the history of mREITs and their broader role in the REIT industry. Additionally, it reviews how mREITs operate, how they are regulated, the risks they face, how they manage these risks, and the dangers they pose for the broader financial system.

JEL classifications: G01, G23, G28

Keywords: Real estate investment trusts, REITs, systemic risk, maturity transformation, shadow banks

---

*The authors would like to thank Elizabeth Marshall for valuable contributions to this article. The views expressed in this article are those of the authors and do not necessarily reflect those of the Federal Reserve Bank of Richmond or the Federal Reserve System.

Corresponding authors: Sabrina.Pellerin@rich.frb.org and John.Walter@rich.frb.org

1. INTRODUCTION

Over the last decade, those real estate investment trusts (REITs) that invest predominantly in mortgage-backed securities (MBS) have grown rapidly; so much so, that some observers have expressed concerns that the largest might pose systemic risks for the broader economy. The two largest MBS REITs (or mREITs), which account for 54 percent of all mREIT assets, have been the focus of special attention from policymakers and the press.[1,2,3]

Size is just one reason for recent scrutiny. Observers have also raised concerns along the following three dimensions: 1) mREITs invest in fairly long-term assets but fund themselves with short-term liabilities, implying that they are sensitive to interest rate and liquidity risks; 2) they hold large portfolios of one type of asset, such that if mREITs became troubled and were forced to liquidate holdings, MBS prices might be driven down; 3) and the assets that they hold, predominantly government agency-backed MBS, play an important role in the function of the home mortgage market, implying that if policymakers became concerned that mREITs might fail, these policymakers might feel compelled to intervene to prevent such failures.

Such concerns have led some observers to speculate that the largest mREITs could become the focus of heightened supervisory oversight.[4] Currently, mREITs are not as tightly supervised as other financial entities that are thought to pose systemic risks, such as large commercial or investment banks.

This paper examines the history of mREITs and their broader role in the REIT industry. Additionally, we review how mREITs operate, how they are regulated, the risks they face, how they manage these risks, and the dangers they pose for the broader financial system.

2. HISTORY AND BACKGROUND

What are REITs?

REITs provide investors a means by which they can invest in a diversified pool of real estate or real estate debt – in much the same way that mutual funds allow investors to make diversified investments in securities. REIT payouts and investments must meet certain requirements so that their income is not taxed (REIT distributions are taxable income for their investors). Also, by limiting themselves to real estate investments, REITs avoid a set of limitations that the Investment Company Act of 1940 imposes on similar types of entities, such as mutual funds; these are predominately limitations on the use of debt finance. While REITs have been important players in the real estate market since the late 1800s or earlier, the rules under which they currently operate were set in place by legislation enacted in 1960, so many contemporary observers trace the origin of the industry to that 1960 statute.

---

[1] While some observers define mREITs as those REITs that invest in mortgages or MBS, we use the abbreviation "mREIT" to refer only to REITs that invest in MBS. Additionally, we include in our definition of mREITs only those that finance their assets predominantly with repurchase agreements (or other short-term debt, such as commercial paper). See Table A4 for a list of REITs that fit our definition.
[2] As of Q4 2012, please see table A4 in the appendix for data on other mREITs.
[3] For example, Jeremy C. Stein's speech "Overheating in Credit Markets: Origins, Measurement and Policy Responses" (February 7, 2013), Adrian, Ashcraft, and Cetorelli (2013), and International Monetary Fund, October 2013 Global Financial Stability Report, Chapter1, Box 1.1. http://online.wsj.com/news/articles/SB10001424127887324763404578431033270347040
[4] http://online.wsj.com/news/articles/SB10001424127887324763404578431033270347040

Traditionally, market commentators have divided the REIT industry into two categories, *Equity REITs* and *Mortgage REITs*. The name refers not to the sources of REIT funding, since both equity and mortgage REITs gather funds by selling (equity) shares to investors in addition to issuing debt. Instead, the equity and mortgage distinction refers to the types of investments made by the REITs. Equity REITs purchase or manage rent-generating real estate. In contrast, mortgage REITS make mortgage loans, purchase existing mortgages from lenders or in the secondary market, or purchase MBS. Therefore, mortgage REIT income comes from principal and interest payments on mortgages, either directly to the REIT or funneled through MBS.

The Early Development of REITs: Nineteenth Century to 1956

Real estate investment trusts date to the late 1800s or perhaps earlier.[5] They were initially formed to allow wealthy investors to diversify their real estate holdings while still providing limited liability. Later, REITs opened up to less-wealthy investors with smaller sums to invest.[6]

The earliest examples were formed in Massachusetts (Kiplinger 1962, p. 27). That state forbade corporations from owning real estate except for operational purposes, such as the corporation's office building or factory building, but allowed trusts to hold real estate for investment purposes, presumably explaining REITs' use of the trust structure rather than a corporate structure (Valachi, 1977, p. 450; Kiplinger, 1962, p. 28).[7] These Massachusetts trusts began investing in Boston real estate but then moved on to real estate investments in other major cities around the country (Valachi, 1977, p. 450).

REITs' initial exemption from federal taxes, their loss of the exemption, and later reinstatement, played a fundamental role in the growth of REITs. Indeed, the tax exemption, and the advantage it confers, continues to play an important role today.

When federal income taxes were imposed on businesses early in the twentieth century – initially through the Revenue Act of 1909 and then by later revenue acts following the 1913 ratification of the 16th Amendment to the U.S. Constitution (see Table 1) – trusts were exempted.[8] Various court rulings exempted trusts from taxes

[5] The earliest entity that operated like a REIT – gathering funds by selling shares to investors, providing limited liability and a diversified portfolio of real estate, and distributing proceeds to investors as dividends – seems to have been a Boston corporation formed on February 21, 1820, by a special charter granted by the legislature. Originally this entity was named Museum Hall, but was later renamed Fifty Associates, reflecting ownership by 50 shareholders. ("The Fifty Associates: A Real Estate Syndicate, Boston's Oldest Corporation," *New York Times*, November 6, 1894; *Real Estate Record and Builders' Guide*, F. W. Dodge Corporation, volume 64, October 14, 1899, p. 546). One of the earliest real estate trusts was the Boston Real Estate Trust, formed in the 1880s. By 1899, there were at least 28 real estate investment trusts operating in Boston (*Real Estate Record and Builders' Guide*, F. W. Dodge Corporation, volume 64, October 14, 1899, p. 546)

[6] "The Fifty Associates: A Real Estate Syndicate, Boston's Oldest Corporation," *New York Times*, November 6, 1894.

[7] A business trust is: "An unincorporated business organization created by a legal document, a declaration of trust, and used in place of a corporation or partnership for the transaction of various kinds of business with limited liability… The use of a business trust, also called a Massachusetts trust or a common-law trust, originated years ago to circumvent restrictions imposed upon corporate acquisition and development of real estate while achieving the limited liability aspect of a corporation... A business trust is similar to a traditional trust [created upon the death of an individual, for example] in that its trustees are given legal title to the trust property to administer it for the advantage of its beneficiaries who hold equitable title to it... The property of a business trust is managed and controlled by trustees who have a fiduciary duty to the beneficiaries to act in their best interests... A business trust is considered a corporation for purposes of federal income tax [rules]" (http://legal-dictionary.thefreedictionary.com/Business+Trust).

[8] Congress had attempted to impose a tax on corporations in the Revenue Act of 1894, but this tax was ruled unconstitutional by the Supreme Court in its 1895 Pollock decision. In the Revenue Act of 1909, Congress imposed a different type of corporate tax, and in 1911, the Supreme Court ruled (in Flint v. Stone) that the Revenue Act of 1909's corporate tax was allowable. See Pollock v. Farmers' Loan & Trust Company,

imposed under the Revenue Act of 1909 (Durrett, 1961, p. 142). Between 1913 and 1935, the IRS itself declared that for tax purposes, REITs were not "associations" (associations, as well as corporations and joint stock companies were taxable) and were therefore exempt from taxation (Kilpatrick, 1974, p. 56, in Hall, 1974). During this period IRS regulations ruled that "where trustees hold real estate subject to a lease and collect the rents, doing no business other than distributing the income…" and investors in the trust "have no control except the right of filing a vacancy among the trustees and of consenting to a modification of the terms of the trust, no association exists" (Kilpatrick, 1974, p. 56, in Hall, 1974).

Table 1

Timeline of Legislative or Judicial Actions Important to the Development of the REIT Structure		
Year	1913	16th Amendment to Constitution allows federal income taxes
	1913 - 1935	IRS rulings exempting REITs from taxation
	1935	Supreme Court rules (in Morrissey v. Commissioner) that investment trusts (REITs are such trusts) may be taxed
	1936	Under the Revenue Act of 1936, securities investment trusts received protection from taxation – but REITs did not
	1960	Cigar Excise Tax Extension of 1960 (Public Law 86-779) exempted REITs which met certain rules, from federal income tax

Still, assorted Supreme Court rulings decided between 1919 and 1925 allowed the IRS to impose taxes on various types of trusts, while in the case of other types of trusts allowed no taxes to be assessed (Durrett 1961, p. 142; Valachi, 1977, p. 451-452; *Crocker v. Malley*, 1919; *Hecht v. Malley*, 1924; *Burk-Waggoner Oil Assn. v. Hopkins*, 1925). These varied decisions led to opposing taxation decisions in lower courts and considerable doubt about whether income taxes might be successfully imposed on investment trusts, such as those earning income from securities holdings and on REITs. This uncertainty was resolved in 1935, when the U.S. Supreme Court, in its *Morrissey v. Commissioner of Internal Revenue* decision, ruled that investment trusts could be subjected to corporate income taxation (Valachi, 1977, p. 452; Jones, 1988, p. 447–48).

In 1936, trusts that invested in securities sought legislation to exempt them from federal taxation, and they received such protections in the Revenue Act of 1936.[9] REITs were not granted such protection. As a result, REIT investors were burdened with double taxation, such that the REIT itself paid taxes on its earnings, and then when earnings were distributed to investors, these distributions were taxed as income to the investors.

One observer notes that an important reason REITs did not typically reorganize themselves as investment companies to achieve the protection from double taxation afforded by the Revenue Act was because

157 U.S. 429 (1895); Flint v. Stone Tracy Co., 220 U.S. 107 (1911); and Durrett 1961, p. 142. The 16th Amendment to the Constitution authorized broad taxing powers.

[9] Open-end mutual funds were granted exemption from federal taxation in the Revenue Act of 1936. Closed-end funds received their exemption in the Revenue Act of 1942 (Fink, 2005, p. 17, 19; Morley, 2011, p. 18-26, 60)

doing so would mean that they would need to reduce their use of leverage (Durrett, 1961, p. 144).[10] Were REITs to reorganize as investment companies, they would be required to raise more capital, presumably because of the leverage limitations imposed on investment companies by the Investment Company Act of 1940. The apparent importance of leverage in the typical REIT structure will be discussed in greater detail later.

The REIT industry shrank following the imposition of double taxation (Valachi, 1977, p. 452). Some REITs survived, however, and in the 1950s began lobbying efforts, along with other players in the real estate market, such as the National Association of Home Builders, to restore REIT protection from double taxation (Valachi, 1977, p. 452-53).

REIT Developments Since 1956

REIT tax exemption legislation passed the House and Senate in 1956, but was vetoed by President Eisenhower (Valachi, 1977, p. 453). Eisenhower argued that a REIT exemption was unfair (presumably granting REIT-owned real estate an advantage over corporate-owned real estate), but also that it would lower tax revenues. He argued that, even though securities investment companies – e.g., mutual funds – were protected from taxes, *double taxation* was present for such funds (Durrett, 1961, p 145-46). Specifically, corporations that issue securities held by mutual funds pay income taxes themselves, and then the investors in mutual funds pay taxes on dividends earned on their mutual fund shares. He claimed that, in contrast, real estate itself generated no income taxes, so that protection for REITs would mean that earnings would only be subject to *single-taxation* – taxation at the final investor level.[11]

In 1960, an amendment granting tax exemption to REITs was included in a broad bill addressing a number of tax-related matters – the Cigar Excise Tax Extension of 1960 (Public Law 86-779), which passed the House and the Senate, and was signed into law by President Eisenhower (Valachi, 1977, p. 454). The politics, which led to the 1960 passage of a provision equivalent to one that had failed in 1956, is somewhat murky.[12]

In order to maintain its tax exemption, the 1960 law required REITs to meet the following requirements:[13]

[10] Durrett (1961), p.144, says the following, "Growth of the REIT was stymied because investors would not organize them since this type of venture would require twice the capital needed in organizing a regulated investment company or direct investment in real estate or securities in order to receive a given return."

[11] Presumably, underlying President Eisenhower's argument is the idea that the corporation that undertakes an investment – for example the construction of a building to house a manufacturing operation – funded with a security issue, pays income taxes on the earnings from that investment, while a REIT, which owns a similar manufacturing building, avoids taxation. Therefore the manufacturing firm that operates in a REIT-owned building will be unfairly advantaged compared to a firm that issues debt to buy its building. This argument can be questioned however. The firm that is housed in the building owned by the REIT pays taxes itself on any earnings generated by that manufacturing operation. As a result, the amount it is willing to pay to the REIT in rent will be diminished, removing much or all of the advantage REIT-owned manufacturing may otherwise enjoy. Similarly, it is not clear that the tax payments are lowered by the REIT exemption, because the manufacturer located in the REIT-owned building as well as the manufacturer located in a securities-financed building both pay income taxes on their earnings. Further, the tax deduction that a corporation receives when it borrows to fund a project, can reduce considerably the taxes the corporation would otherwise pay on earnings from that project. Therefore debt issuance tends to protect corporations from taxation (Durrett, 1961, p. 144-46).

[12] Durrett 1961, p. 146 notes that: "Apparently the main reason for the change of attitude by the President lies in the economic condition of the country at that time and the pressing need for private investment capital."

[13] Public Law 86-779, enacted September 14, 1960

Table 2: REITs Requirements to maintain REIT status (from Cigar Excise Tax Extension of 1960)

1.) Distribute at least 90 percent of each year's income to shareholders.
2.) Earn at least 75 percent of its gross income from real estate investments, specifically from a) rents on real property; b) interest earned on obligations secured by mortgages on real property; c) gains from the sale or other disposition of real property or mortgages; d) distributions from other REITs or gains from the sale shares in other REITs; and e) abatements and refunds of taxes on real property.
3.) Earn at least 90 percent of its gross income from: dividends; interest; rents on real property; gains from the sale or other disposition of stock, securities, and real property; and abatements and refunds of taxes on real property;
4.) Less than 30 percent of its gross income is derived from the sale or other disposition of: stock or securities held for less than six months; and real property held for less than four years.
5.) At least 75 percent of the value of its total assets is represented by real estate assets (which include mortgages or interests in mortgages), cash and cash items, and government securities; and not more than 25 percent of the value of its total assets is represented by non-mortgage or non-government securities.
6.) The entity issues transferable shares owned by at least 100 persons.
7.) The entity is managed by one or more trustees.

After passage of the 1960 legislation, the REIT industry began to grow.[14] By 1971 there were 34 "listed" REITs (meaning REITs that are listed on a major securities exchange), and there were 75 by 1980 (NAREIT 2013).

REIT growth during the 1970s and early 1980s was somewhat stymied by troubles suffered due to declining asset values and, for a good number of REITs, mismatches between asset and liability maturities. About half of REITs (measured by dollars of assets), as of 1970, focused their investments in commercial land development (CLD) (Schulkin, p. 225–27, in Hall, 1974). Many of these CLD REITs were funded with commercial paper and other short-term sources of funds, while their assets were longer term (Chan, 2003, p. 18). In the mid-1970s real estate values declined, and rising inflation began to push up interest rates in the late 1970s and early 1980s. With long-term assets and short-term liabilities, rising interest rates caused a number of REITs to experience negative spreads and ultimately fail (Barclays, 2012, p. 22).

Problems in the REIT industry contributed to the already weakened performance of the banking industry in the mid-1970s. As of 1975, "REITs collectively owe[d] the banking industry some $11 billion," and six of the largest New York banks held $3.6 billion in REIT debt, "much of it of doubtful quality."[15] Broadly, the REIT industry struggled in the late 1970s and early 1980s and the number of REITs declined from 75 in 1980 to 59 in 1984 (NAREIT, 2013).

Beginning in 1984 the number of REITs grew fairly steadily for the next decade and peaked at 226 in 1994 (NAREIT 2013). Since 1994, the number of REITs declined fairly slowly until 2008. Since 2008, the number has begun to increase again (NAREIT 2013).

[14] Consistent data on the asset size and number of REITs are difficult to acquire for the years prior to 1970.
[15] "Depression-like period challenges nation's banks", *Miami News*, p. 12A, November 24, 1975.

The Development of mREITs

The first of the still-existing mREITs to be founded was Capstead Mortgage Corporation in 1985. At first Capstead did not invest predominantly in MBS, so it would not have strictly met our definition of an mREIT (REITs that chiefly hold MBS and finance with repo) (Capstead 1989 Annual Report, p. 3). Instead its focus was on purchasing jumbo home mortgages (mortgages that exceeded the size Fannie Mae and Freddie Mac could, at that time, accept) from mortgage brokers and lenders and creating collateralized mortgage obligations (CMOs) from them and selling these CMOs, through Wall Street brokers, to investors (Capstead 1993 Annual Report, p. 9).[16] Early on, repos were a small portion of Capstead's total liabilities (2 percent of total liabilities in 1989).[17] Instead, securities issued under its CMO program amounted to over 95 percent of its liabilities (Capstead 1989 Annual Report, p. 12). By 1993, however, repos were 39 percent of its total liabilities. Capstead increased the MBS proportion of its assets through the 1990s (Capstead 1990 Annual Report, p. 2, 12, 16; Capstead 1993 Annual Report, p. 32; Capstead 1998 Annual Report, p. 5, 15, 16). By the early 2000s Capstead was operating in a manner much more similar to the typical current mREIT. As of 2002, more than half of its assets were agency MBS and 62 percent of its liabilities were repos (Capstead 2002 Annual Report, p. 5, 14).

The second still-existing mREIT to be formed was Dynex Capital, Inc., which was founded in 1987.[18] Initially this company's operations were similar to those of Capstead in Capstead's early years: Dynex purchased nonconforming mortgages (mortgages that are not accepted by Fannie Mae or Freddie Mac because the mortgage is too large or because it does not meet other acceptance requirements) from a set of mortgage companies, accumulated them, and once it had a sufficient group of such mortgages, created and sold CMOs that were collateralized by the nonconforming mortgages (RAC Mortgage 1989 Annual Report, p. 11). During the 1990s Dynex originated mortgage loans itself, as well as purchasing them, and then created securities from such loans (Dynex 2012 Annual Report, p. 1). Still, it was not until early in 2008 that Dynex adopted a typical mREIT business model. In 2008 it began purchasing agency MBS, as well as financing these with significant amounts of repo borrowing (Dynex 2008 Annual Report, p. 1, 23).

In contrast to the varied routes these earliest firms took toward becoming mREITs, the current two largest mREITs, Annaly and Agency, began operations in 1996 and 2008, respectively, following the mREIT business model and have largely followed that model throughout their histories (Annaly 1997 Annual Report, p. 12 - 13; Annaly 2006 Annual Report, p. 2; Annaly 2012 10-K, p. F-3; Agency 2008 Annual Report, p. 1 - 3, 60; Agency 2012 Annual Report, p. 6 - 7).

[16] "A CMO is a financing instrument through which [a company] issues multiclass bonds with different maturities using mortgage loans as collateral. The [issuing company] typically locks in a positive spread between the interest earned on the mortgage loans and the interest and issuance costs of the bonds issued." Capstead 1989 Annual Report, p. 3 - 4.

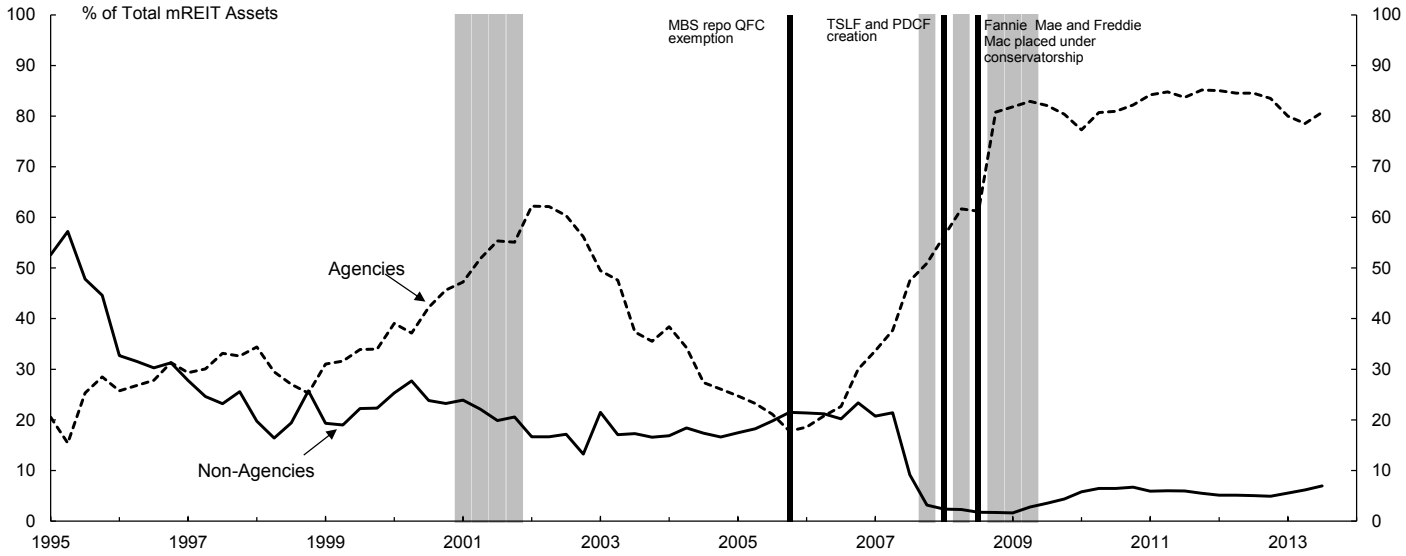
[17] Capstead 1989 Annual Report p. 12 and Capstead 1989 10-K, p.22

[18] Originally named RAC Mortgage Investment Corporation, it was initially a wholly-owned subsidiary of Ryland Mortgage Company (RAC Mortgage Annual Report, p. 18).

Two other currently existing mREITs were formed in the 1990s (see Table A4). At the end of 2000, REITs held $12.0 billion[19] in agency MBS out of a total outstanding amount of $2.5 trillion (SIFMA – "U.S. Agency MBS Outstanding"), or only about 0.48 percent of all outstanding. Therefore, at the beginning of the twenty-first century, REITs – and therefore mREITs -- were fairly minor players in the MBS market. Most of the existing mREITs were formed in the early 2000s or later so that the percentage of outstanding MBS held by mREITs grew significantly starting in the mid-2000s. Even as late as 2008, mREITs held only 1.2 percent of all outstanding agency MBS and agency debt, but by mid-2013, they held approximately 4.2 percent (see Figure 3).[20]

As can be seen in Figure 1, mREITs have varied their mix of agency versus non-agency holdings, over time. Non-agency MBS and other assets have, at times made up a significant portion of mREIT holdings. However, the figure shows that since the financial crisis, Agency MBS has come to dominate mREIT holdings as non-agency MBS issuance declined to just a few billion per year starting in 2008.[21] Agency MBS now makes up the great majority of mREIT assets.

Figure 1: Non-Agency and Agency Holdings for all mREITs



Source: SNL Financial, Richmond Fed.
Note: Quarterly holdings of Non-Agency MBS and Agency MBS as a percentage of total assets of mREITs. Grey shading refers to U.S. Recessions as defined by NBER. Data from mREITs listed in Table A5.

[19] Consistent data on MBS holdings of mREITs seems to be unavailable in 2000, so the figure $12.0 billion figure is for all REITs and comes from Board of Governors 2013 (Financial Accounts of the United States, Table L.210, fourth quarter of 2000). mREITs are a subset of all REITs so their holdings as a percentage of all MBS outstanding will be smaller still.
[20] The reasons for the growth of mREITs are examined in the next section.
[21] www.sifma.org/research/statistics.aspx, "U.S. Mortgage-Related Issuance and Outstanding."

Historical Background on MBS

MBSs have been used in the United States as a means of funding real estate investment, off and on, since the 1870s, but grew to play a huge role in residential mortgage finance by the mid-to-late 1980s (Snowden in Bordo and Sylla 1995, p. 274–95; Board of Governors 2013).[22] During the late 1800s and again in the 1920s, MBS were significant sources of funds for real estate purchase and construction. For example, in the mid-to-late 1920s, bonds backed by mortgages amounted to just less than one-third of total mortgage debt outstanding (White 2009, Figure 14, p. 30). Yet failures of MBS arrangements and widespread losses suffered by investors, led to a dearth of such issues until they were revived by government agencies in the 1960s and 1970s (Snowden in Bordo and Sylla 1995, p. 283).

MBS began the initial stage of their revival with the first MBS issue by a government agency in 1965. The Housing Act of 1964 authorized Fannie Mae to pool home mortgages and guarantee and sell certificates representing flows of payments from these mortgages (U.S. Government Printing Office, 1965, p. 111, 416; Hagerty, 2012, p. 35). Fannie Mae sold $200 million in such MBSs in 1965 and enlarged amounts in the latter 1960s (U.S. Government Printing Office, 1965, p. 111; U.S. Government Printing Office, 1968, p. 526)

The Government National Mortgage Association (Ginnie Mae) became the second agency to issue MBS, when it did so in 1970.[23] Ginnie Mae was created by the Housing and Urban Development Act of 1968 (Public Law 90-448), to encourage the sale of MBS backed by government guaranteed loans (such as loans backed by the U.S. Department of Veterans Affairs and the Federal Housing Administration), by placing its own guarantee on these MBSs.[24] Ginnie Mae is a unit of the Department of Housing and Urban Development, so that its guarantees are obligations of the federal government, and therefore have the full faith and credit of the government behind them.

Federal Home Loan Mortgage Corporation (Freddie Mac) and was created in 1970, similarly to encourage mortgage lending by buying mortgages and creating MBSs that it guaranteed.

Unlike Ginnie Mae, Freddie Mac and Fannie Mae are not units of the federal government, so until 2008, investors in the MBSs they guarantee had a less clear, "implicit," promise of government protection.

Freddie Mac and Fannie Mae were both in danger of defaulting on their MBS guarantees in 2008. To prevent such defaults, the two GSEs were placed in government conservatorship in September 2008 and the U.S. Treasury promised to, on a quarterly basis, provide additional capital to the GSEs whenever their capital became negative (essentially providing an explicit government promise behind MBS issued by these GSEs).[25]

[22] The earliest examples of MBS seem to have been largely backed by farm loans rather than home loans (Snowden in Bordo and Sylla, 1995, p. 275–82). In the 1920s, residential-backed (though perhaps multi-family residential) MBS appeared (Snowden in Bordo and Sylla, 1995, p. 283, 286; White 2009, p. 30, 32).

[23] http://www.ginniemae.gov/consumer_education/Pages/ginnie_maes_role_in_housing_finance.aspx

[24] http://www.ginniemae.gov/inside_gnma/company_overview/Pages/our_history.aspx Note that Ginnie Mae does not create the MBS it guarantees, only placing its guarantee on MBS created by financial institutions it approves (GAO 2011, p. 5).

[25] http://www.fanniemae.com/resources/file/ir/pdf/quarterly-annual-results/2012/10k_2012.pdf, p. 27 and 28.

The Ginnie Mae, Freddie Mac and Fannie Mae guarantees protect MBS investors from losses that ensue when mortgagors default on their mortgage loans. Therefore, MBS investors are protected from credit risk. They are not protected from interest rate or prepayment risks, however.

How mREITs Operate

Because MBS have fairly long maturities, one might imagine that mREITs would tend to fund themselves with equity and long-term debt. Instead, mREITs typically are funded with short-term instruments: largely repurchase agreements (repo – discussed below). Indeed, because short-term debt instruments typically pay a lower rate of interest than long-term instruments, borrowing short and holding long-term assets has tended to earn mREITs a significant spread that accounts for much of their income. While highly profitable at times, mREITs' operating model carries significant risks.

For most of the MBS held by today's mREITs, there is no credit risk – the danger that the issuer of the security (the borrowing firm) will be unable to repay all of the principal or interest promised in the security contract, leading to a loss for the security holder. mREITs, however, are not protected from interest rate or prepayment risk.

Interest rate risk is the danger that market interest rates might rise, causing a decline in the value of the security and a loss to the holder. The longer the maturity of a security, the more its value will decline for a given increase in interest rates. Because MBS tend to be fairly long-term, interest rate risk for them is quite significant.

Prepayment risk exists because most mortgage contracts allow the borrower the option to prepay, meaning pay back the loan prior to maturity of the loan. The prepayment option can produce losses for mREITs when interest rates fall or rise. When interest rates fall, homeowners are more likely to refinance their mortgages, meaning prepay. As a result, MBS holders are paid more quickly than if interest rates remained constant and therefore may suffer losses because their funds are returned to them and must be reinvested at the prevailing lower market yields. When interest rates rise, homeowners are less likely to refinance their mortgages, meaning MBS maturities are extended. Therefore, the value of the MBS declines in response to this rise more than it would for a plain vanilla bond (one without any call or prepayment features).

On average, as of December 31, 2012, mREITs' assets are funded 14 percent by equity and 74 percent by repo.[26] Repo maturities used by mREITs range from less than 30 days to over one year, but on average are about 47 days (as of 2012 Q4 –see Table A4 in Appendix). This compares with a much longer average life of MBS (currently around nine years).[27] Obviously, this mismatch implies that when interest rates increase, mREITs' earnings will decline because their repos re-price more quickly than their MBS. If rates increase enough, the value of their liabilities will exceed the value of their assets, and mREITs will become insolvent, similar to the

[26] Figures are for the 29 firms that fit our mREIT definition and are as of December 31, 2012 – except for Chimera Investment Corporation for which we used September 30, 2012 data, the latest available. All data from SNL Financial.
[27] This figure is the weighted average life (i.e. approximated maturity) of a newly issued (November 1, 2013) Fannie Mae 3 percent coupon MBS using certain prepayment assumptions derived by Bloomberg.

failures of REITs in the 1970s and early 1980s. This interest rate risk, and the amount by which rates must increase to produce insolvency, is discussed later.

A repurchase agreement (repo) is the sale of an asset, by the borrower, with an accompanying promise by the borrower to buy back the same (or like) assets upon maturity, which is often overnight. In fact, they typically are thought of as simply a collateralized loan, with the repurchase assets acting as the collateral. The predominant assets backing repos are securities issued by the U.S. Treasury (35 percent of all tri-party repo collateral),[28] debt securities issued by Fannie Mae or Freddie Mac (6 percent), and MBS issued by Fannie Mae, Freddie Mac, or Ginnie Mae (36 percent). Interest rates on repo borrowing are among the lowest in the funding markets because repos: 1) are typically fairly short-term borrowings, most frequently overnight, usually less than 90 days but occasionally up to several years; 2) because they are backed by highly liquid securities either issued by the U.S. government or by an agency of the government; 3) and repo borrowing receives especially beneficial treatment in bankruptcy.

A review of the financial statements of several of the largest mREITs indicates that most of their repo funding comes from broker-dealers.[29] Broker-dealers also depend on the repo market for financing, and earn a spread between the interest rate paid to them by mREITs and what they must pay to finance these loans.[30] Specifically, brokers receive agency MBS as collateral in bilateral repo transactions with the mREITs and then subsequently use this high-quality collateral to borrow from other financial firms (e.g., money market mutual funds) via the tri-party repo market.[31] It is not clear why broker-dealers are typically able to borrow at lower interest rates in the tri-party market than mREITs, given that they are both providing similar collateral, but data indicate a persistent differential. Annaly had a weighted average repo rate of 63 basis points as of Q4 2012 (see Table A4) whereas the MBS repo rate at the time was around 27 basis points (*Wall Street Journal's* DTCC GCF Repo Index for MBS).[32]

The second reason broker-dealers are willing to provide repo loans to mREITs is that broker-dealers typically face lower "haircuts" on their repo borrowings than do mREITs.[33] A haircut is the difference between the current market value of the collateral and the amount that the creditor will lend, and it is typically stated as a percentage of the value of the collateral. It provides a buffer to protect the lender in the case that the market value of the collateral declines. Because broker-dealers face lower haircuts, they can potentially borrow more for a given amount of MBS collateral than can mREITs, and thus can invest in additional assets from a starting dollar amount of MBS – i.e., they can lever up to a greater extent.

[28] Percentage figures from Federal Reserve Bank of New York's "Tri-Party Repo Statistical Data," as of June 2013 (http://www.newyorkfed.org/banking/tpr_infr_reform_data.html).
[29] For mREITs that disclose details on their repo borrowing in their 10-Qs, broker-dealers appear to be the predominant source of repo financing. See, for instance, the second quarter 2013 10-Qs of the following mREITs: Bimini Capital Management Inc., p. 15; Invesco Mortgage Capital Inc., page 21; CYS Investments, p. 41.
[30] Board of Governors 2013.
[31] A bilateral repo transaction is one in which there are only two parties to the transaction. In contrast, a tri-party repo transaction is one in which the two counterparties use a custodian bank or clearing organization (the third party) to act as an intermediary, and typically the holder of the collateral, to settle the transaction. For more information on the tri-party repo market see Copeland 2012.
[32] Available at: http://www.dtcc.com/products/fi/gcfindex/
[33] For instance, Annaly's average repo collateral haircut in 2012 was 5 percent (December 31, 2012 10-K) while the median repo haircut for cash investors in agency MBS in the tri-party market was only 2 percent (see Federal Reserve Bank of New York 2012).

The haircut faced by an mREIT will limit the extent to which it can lever up, meaning limit how large it can grow, given its equity. For example, if an mREIT starts with $10 million in equity from shareholders, and faces a 5 percent haircut, then the maximum size it can reach without raising more capital is $200 million. Here is how the process for this mREIT would proceed: 1) Starting with the $10 million in equity, the mREIT buys $10 million worth of MBSs; 2) it then uses the $10 million in MBS as collateral for a repo loan of $9.5 million because the lender requires a 5 percent haircut; 3) buys an additional $9.5 million in MBSs and repos it out to receive $9.025 million in a second loan; 4) buys an additional $9.025 million in MBSs. This buying and "repoing out" (meaning borrowing in the repo market) of MBS could go on until the firm has MBS holdings equal to one divided by the haircut (in this case 1/.05) times the original equity ($10 million), or 20 times the original equity (meaning $200 million).

The borrower not only must provide the lender with extra collateral to cover the haircut percentage at the time the loan is initially entered into, but also must ensure that the lender's haircut is maintained throughout the life of the loan. If the value of the posted collateral falls more than a specified amount, the lender will issue a *margin call* requiring the borrower to send the lender additional collateral to reestablish the haircut percentage. Because of the possibility that the value of MBS collateral might fall – for example, when market interest rates increase – mREITs do not lever up to the maximum allowed by the haircut.[34] Instead, they must maintain a portfolio of unencumbered assets – that is, assets not used to back loans – in order to be prepared to respond to any margin calls.[35] As an example, as of the end of 2012, Annaly had unencumbered MBS in its portfolio equal to 16 percent of its repo borrowings (Annaly 2012 Annual Report, p.F-3). If MBS values decline enough that margin calls exceed an mREIT's unencumbered assets, that mREIT will be unable to meet its margin calls, and will default. In such a case, its lenders will keep all posted collateral but will suffer losses themselves to the extent that MBS values decline more than haircuts.

How mREITs are regulated

Currently, mREITs face very limited regulatory oversight. In addition to complying with the rules associated with maintaining REIT tax treatment, the mREITs reviewed in this article are registered with the SEC and publicly traded and therefore must comply with SEC disclosure and reporting requirements and the rules of the exchange on which they trade (NYSE or NASDAQ).[36] However, these rules are consistent across all SEC-registered, publicly traded financial companies.[37]

One feature that makes the mREIT unique among its non-REIT competitors is that its business model relies heavily upon an exception contained in the Investment Company Act of 1940 (the "1940 Act") that excludes, from the definition of investment company (and therefore regulation), certain companies involved in "purchasing

[34] Specifically, mREITs are subject to two types of margin calls: *valuation* and *factor* calls. Valuation calls occur when the value of the collateral falls, whereas factor calls occur when prepayment frequencies (prepayment factors) change, based on prepayment tables published by Fannie Mae and Freddie Mac.
[35] Unencumbered assets can include cash, MBS, and other securities.
[36] Publicly listed companies must satisfy rules related to corporate governance (including having a majority of independent directors), liquidity, earnings, share price, and an internal audit function. For the rule manuals of the NYSE and NASDAQ, see http://nysemanual.nyse.com/lcm/ and http://nasdaq.cchwallstreet.com/, respectively.
[37] As part of the disclosure requirements of the Securities Act of 1933, REITs must register using Form S-11, which is tailored specifically for REITs.

or otherwise acquiring mortgages and other liens on and interest in real estate." [38,39] The rationale behind this exception is to differentiate companies exclusively engaged in the mortgage banking business from issuers in the investment company business and allow the former to benefit from less regulatory oversight since their activities are providing important liquidity into the housing market (SEC, 2011; NAREIT, 2011; SIFMA, 2011). To qualify for this exception, the SEC requires that the exempt company invest at least 55 percent of its assets in mortgages and other liens on and interest in real estate (or "Qualifying Real Estate Assets") and at least 80 percent of its assets in the more broadly defined, real estate-related assets.[40]

Traditional REITs that predominantly hold mortgages clearly fit the mortgage banking exemption contained in the 1940 Act (SEC, 2011, p.55301). However, mREITs, the first of which appeared in 1985 (based on our definition of an mREIT), have relied on SEC staff interpretations of the 1940 Act, which identify "whole pool" agency and non-agency residential mortgage-backed security (RMBS) as being functionally equivalent to mortgage loans, and therefore "qualifying real estate assets."[41,42] Thus, most mREITs hold at least 55 percent of their assets in whole pool agency MBS and treat any "partial pool" agency MBS as satisfying the broader requirements of a real-estate related asset.[43]

In 2011, the SEC released a proposal for comment expressing their concerns that certain types of mortgage pools that exist today, such as mREITs, may not be the type of company they originally intended to exempt from the rules of the 1940 Act (SEC, 2011).[44] Moreover, while traditional REITs engage in activities that are clearly tied to the mortgage banking business, the SEC questions whether the mREIT business model is more similar to that of an investment company and should therefore face the same regulatory oversight as one. For instance, both mREITs and investment companies pool investor assets to purchase securities, provide professional asset management services, publicly offer their securities to retail and institutional investors, and most avoid paying corporate income taxes (SEC, 2011, p.55303).[45] While mREITs generally have a higher

[38] The 1940 Act is the primary law that governs investment companies. Section 3(a)(1) of the Investment Company Act defines an investment company as any issuer that: "A) is or holds itself out as being engaged primarily, or proposes to engage primarily, in the business of investing, reinvesting or trading in 'securities'; B) is engaged or proposes to engage in the business of issuing face-amount certificates of installment type, or has been engaged in such business and has any such certificate outstanding; or C) is engaged or proposes to engage in the business of investing, reinvesting, owning, holding or trading in securities, and owns or proposes to acquire 'investment securities' having a value exceeding 40 percent of the value of its total assets (exclusive of government securities and cash items) on an unconsolidated basis." (1940 Act, p.18).

[39] The exclusion is contained in Section 3(c)(5)(C) of the Investment Company Act of 1940.

[40] These thresholds are based on SEC staff no-action letters and other interpretations (see SEC, 2011, p.55305) and are broadly recognized by mREITs as indicated in their 10-K financial statements (see, e.g., CYS Investments Inc.'s 12/31/12 10-K, p.9, available at: http://www.sec.gov/Archives/edgar/data/1396446/000139644613000004/cys10k2012.htm; and Annaly's 12/31/12 10-K, p.49, available at: http://www.sec.gov/Archives/edgar/data/1043219/000115752313001038/a50573546.htm).

[41] From Annaly's 2012 Annual Report (p.50): "This interpretation was promulgated by the SEC staff in a no-action letter over 30 years ago, was reaffirmed by the SEC in 1992 and has been commonly relied on by mortgage REITs." http://investor.annaly.com/Cache/16693252.PDF?Y=&O=PDF&D=&FID=16693252&T=&OSID=9&IID=

[42] A whole-pool certificate is a security that represents all of the ownership interest in a specific mortgage pool. From CYS Investments 12/31/12 10-K: "We treat Fannie Mae, Freddie Mac and Ginnie Mae whole-pool residential mortgage pass-through securities issued with respect to an underlying pool of mortgage loans in which we hold all of the certificates issued by the pool as qualifying real estate assets."

[43] A partial pool certificate is a security that represents partial ownership interest in a specific mortgage pool.

[44] The SEC's stated goals in the release are to: "1) be consistent with the Congressional intent underlying the exclusion from regulation under the Act provided by Section 3(c)(5)(C); 2) ensure that the exclusion is administered in a manner that is consistent with the purposes and policies underlying the Act, the public interest, and the protection of investors; 3) provide greater clarity, consistency and regulatory certainty in this area; and 4) facilitate capital formation." (p.55301).

[45] Under Subchapter M of the Internal Revenue Code, regulated investment companies and REITs can receive specialized tax treatment (exempt from paying corporate-level federal income taxes on income or capital gains) if they meet certain source-of-income, distribution and asset-diversification requirements. For instance, in order to remain eligible for this tax treatment, the REIT or investment company must

concentration of their assets in real estate, many other investment companies invest in some of the same kinds of assets, albeit to a lesser extent.[46,47] Nonetheless, according to a congressional statement associated with the Investment Company Act Amendments of 1970, mortgage REITs are excluded from the 1940 Act's coverage "because they do not come within the generally understood concept of a conventional investment company investing in stocks and bonds of corporate issuers."[48] Most importantly, the 1940 Act places limits on investment companies' use of leverage, but it also gives the SEC the authority to monitor the companies' activities to ensure that, for instance, they are accurately computing the value of their assets and are not engaging in activities with affiliates that benefit insiders at the cost of investors (SEC, 2011, p.55303).[49] In addition, it also restricts affiliate transactions between the investment company and any affiliate that holds at least 5 percent ownership interest in the company.[50] Identifying ownership stake of all parties to a transaction and severing relationships with REIT affiliates that provide loan servicing may be costly.

These additional restrictions could be very costly for mREITs. However, imposing these additional restrictions may put them on a more level playing field with competitors engaging in many of the same activities but that are subject to much greater regulatory oversight. While our focus has been on investment companies, since REITs (and mREITs) would likely be investment companies if it were not for the composition of their asset portfolio and other requirements to maintain REIT tax treatment, they also compete with other investor groups, which face even greater regulatory oversight, such as banks, investment banks, insurance companies and other lenders. This comparatively light regulatory oversight is likely one of the contributing factors to the growth of this sector.

3. GROWTH of mREITs

While the first mREIT, Capstead Mortgage Corporation, was formed in 1985, the industry did not show much growth until 2002.[51] As can be seen in Figure 2, growth was steady from 2002 until the financial crisis and then in 2009 began rapidly increasing. Since 2006, before the financial crisis, mREITs' total assets have more than doubled to a current size of $380 billion (Q3 2013), of which the two largest, Annaly Capital Management (Annaly) and American Capital Agency Corporation (AGNC), hold the majority. As seen in Figure 2 below, mREIT assets peaked at $449 billion in the third quarter of 2012 and have been declining since.

---

distribute at least 90 percent of their income to investors annually. See: http://www.gpo.gov/fdsys/pkg/USCODE-2010-title26/pdf/USCODE-2010-title26-subtitleA-chap1-subchapM.pdf

[46] According to the National Association of Real Estate Investment Trusts (NAREIT), a national trade association for the REIT industry, mortgage REITs (of which mREITs are a subgroup) are most closely related to closed-end funds that invest in mortgage-related securities. Thus, if the mREIT opts to register as an investment company, it would likely register as a closed-end fund (NAREIT, 2011).

[47] As of March 31, 2011, registered investment companies (excluding MMFs) held $800.8 billion (or 10.5%) and MMFs held $373.4 billion (or 4.9%) of outstanding agency and GSE-backed securities. REITs held $191.1 billion (or 2.5%) (SEC 2011, p.55303, footnote 27 – from flow of funds). "As of June 30, 2011, there were 23 registered open-end investment companies with total assets of $70.6 billion that invested 'at least 65% of their assets in GNMA securities.' In addition, as of that date, there were 34 series of registered open-end investment companies with total assets of $26.6 billion, and 11 registered closed-end investment companies with total assets of $1.8 billion, that invested 'at least 65% of their assets in mortgages/securities issued or guaranteed as to principal and interest by the U.S. government and certain Federal agencies.'" (SEC, 2011, p.55300, footnote 3)

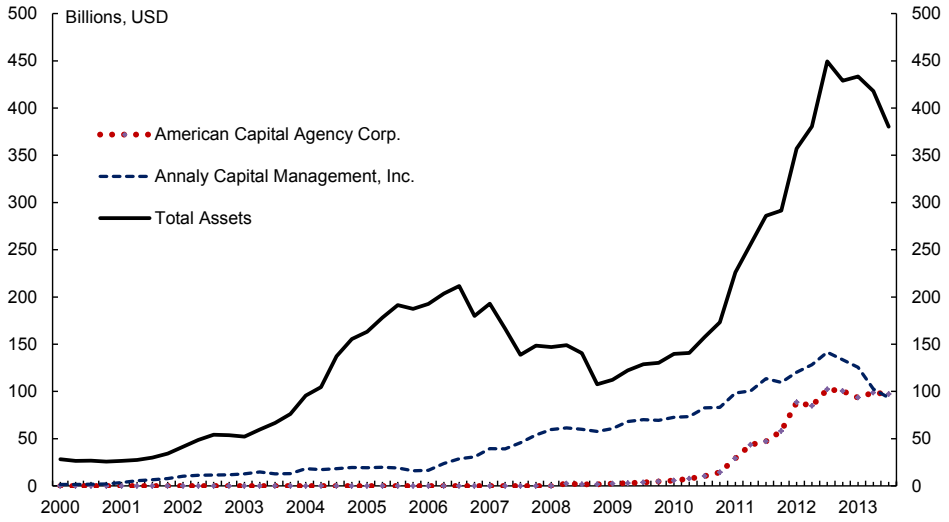
[48] *Investment Company Act Amendments of 1970. House Report 91-1382 (August 7, 1970), at 17.*

[49] From ICI Factbook (2013) in reference to leverage limitations: "these limitations greatly minimize the possibility that a fund's liabilities will exceed the value of its assets." See Section 2(a)(41) of the 1940 Act to see how registered investment companies are required to value their assets.

[50] See Section 17 of the 1940 Act for prohibitions related to registered investment companies engaging in certain transactions with their affiliates.

[51] http://www.capstead.com/about_us.html. This was the first mREIT we could identify.

Figure 2: Total Assets of mREIT Industry, American Capital Agency Corp. and Annaly Capital Management



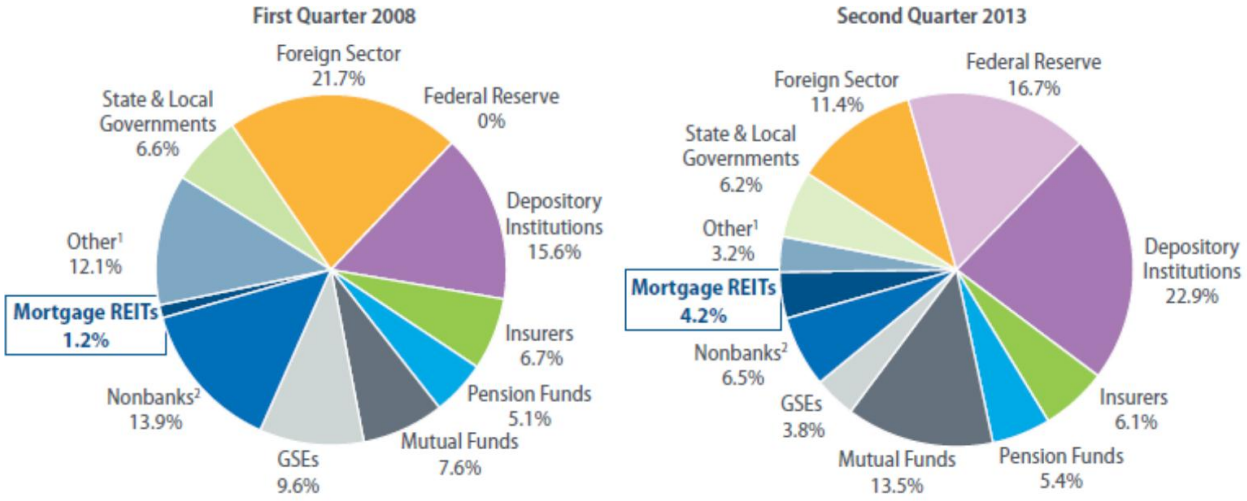
Source: SNL Financial & Richmond Fed.
Note: Quarterly data from mREITs listed in Table A5.

Among the factors that may have contributed to this rapid growth are their favorable tax treatment, relatively light regulatory oversight, advantages associated with the use of repurchase agreements to attain leverage, and federal policies supporting the agency MBS market. These factors made mREITs especially capable of tapping into the sizeable repo market to capitalize on the market's interest in holding government-backed MBS. mREITs arguably increase liquidity in the MBS market through actively trading and by providing a convenient mechanism by which investors can purchase MBS. This may improve the functioning of the real estate market and in turn lower mortgage rates. In 2008, mREITs held $90 billion of agency MBS (1.8 percent), which grew to $325 billion in Q2 2013, constituting 5.6 percent of all outstanding agency MBS (Z.1 Financial Accounts of the United States Table L.210; and SIFMA).

However, despite their growing share of total outstanding Agency MBS over the last several years, they still hold a small proportion compared with other investor groups, such as U.S. depository institutions, mutual funds, and more recently, the Federal Reserve (see charts below). However, mREITs play a very different role because they do not buy and hold MBS as do the largest holders. Instead, they buy MBS and indirectly pass it on to the tri-party repo market (through broker dealers), therefore providing a significant portion (approximately 54 percent as of September 2013) of the agency MBS collateral used in this market.[52] In the following, we focus in on the factors that have likely contributed to the growth of the mREIT and in what ways they have become such a significant player in the MBS market.

[52] SNL Financial and Federal Reserve Bank of New York, "Tri-Party Repo Statistical Data," September 2013, available at: http://www.newyorkfed.org/banking/pdf/sep13_tpr_stats.pdf

Figure 3: Holders of Agency MBS and Agency Debt in 2008 and 2013



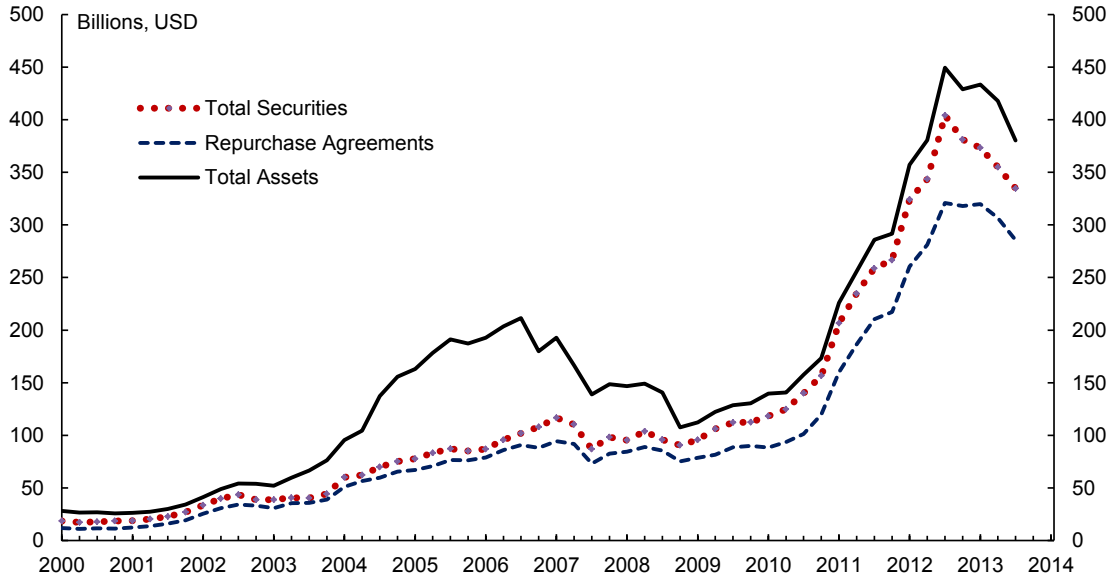
[1] Other includes Nonfinancial Corporations, Households, U.S. Government, and Credit Unions.
[2] Nonbanks include security brokers and dealers, ABS issuers, holding companies, and money market mutual funds.
Note: As of the second quarter of 2013, total agency MBS and agency debt equals $7.6 trillion, according to Z.1 data.
Of this total, $5.8 trillion is agency MBS, according to Securities Industry and Financial Markets Association data..
Source: Z.1 Federal Reserve Board of Governors' Financial Accounts of the United States, Table L.210. Q2 2013 (see footnote 1 to this table for further details on the types of debt included in this chart.)

Justifications for exceptional growth of mREITs

The favorable tax treatment provided to REITs has contributed to their growth by giving REITs an advantage over other financial institutions that do not receive this treatment. However, to maintain this favorable tax treatment, a REIT must meet the seven requirements previously discussed. Given that one of these requirements is that a REIT must pass 90 percent of its taxable income to investors in the form of dividends (rather than retaining earnings), it must fund its growth by acquiring new debt or equity financing.[53] Unlike many of their competitors, mREITs are able to rely more heavily on debt financing because they have no statutory leverage limits as a result of their exemption from the 1940 Act, which will be discussed in greater detail later.[54] In other words, they can continue to borrow to finance a growing number of assets.[55] According to Annaly, the largest mREIT, if they were subject to regulatory oversight that limited their use of leverage, they "would not be able to conduct [their] business as described" and their business would be "materially and adversely affected."[56] Importantly, mREITs rely, almost exclusively, on the use of term repo financing to attain leverage.[57] As seen in the figure below, almost all of the asset growth that has taken place can be attributed to the increase in securities holdings (predominantly agency MBS) financed by repos.

[53] This strategy may be inefficient during unfavorable times when strengthening its balance sheet should be the focus.
[54] Note that repurchase agreements have restrictive covenants that may also put restrictions on leverage.
[55] Although some may specify the amount of leverage that may be used, this amount could easily be increased if approved by the company's board of directors or trustees (SEC, 2011, p.55302, footnote 20).
[56] Annaly Capital Management, December 31, 2012 10-K, p.49.
[57] Term repo lending, by market convention, means repo with a maturity of greater than one day.

Figure 4: Total Assets, Repos and Securities of mREIT Industry

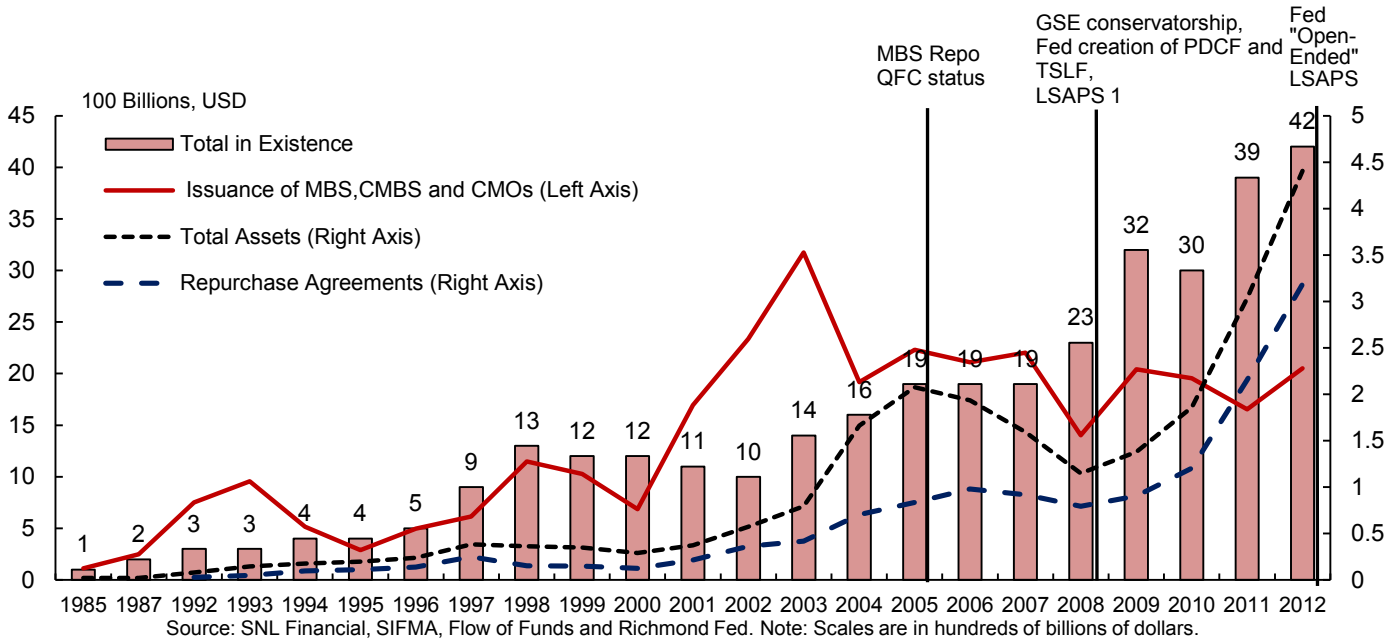


Source: SNL Financial & Richmond Fed
Note: Quarterly data from mREITs listed in Table A5

By investing predominantly in agency MBS, not only do mREITs avoid credit risk, but they are reliant on a sector that has benefited from a large amount of government support. As a result of the recent financial crisis, the Treasury and the Federal Reserve took actions that stabilized the market for mortgage-related securities (see Table A1 for a list of policy actions that have supported MBSs). For instance, in an effort to stimulate the economy, the Federal Reserve has purchased a significant amount of MBSs (holdings total $1.3 trillion as of September 30, 2013).[58] While many sectors were contracting during the financial crisis, existing mREITs continued to grow and new ones were being formed. Of the 42 mortgage REITs (both listed and unlisted) existing today, 19 of them were formed between 2008 and 2012 (see figure 5 below).[59] For instance, a recently formed mREIT (March 28, 2012), Five Oaks Investment Corporation, states in its registration statement that the "current conditions in RMBS markets have created attractive opportunities for investment in non-agency and, particularly, agency RMBS."[60] Moreover, they note that a leveraged agency portfolio is currently very favorable, but uncertainty regarding future actions could quickly change these circumstances, which will be discussed in a later section on risks. Nonetheless, with no credit risk, the agency MBS market has remained liquid and these securities can be relied upon as high-quality collateral in repo transactions with broker dealers. Moreover, the fact that the non-agency MBS market tanked during the crisis is evidence that government support in the agency MBS market was fundamental to the survival (and growth) of the mREITs.[61]

[58] While Fed purchases of MBS could certainly be viewed as making agency MBS more attractive (enhancing the liquidity and therefore the safety), they have also driven up agency MBS prices to some extent, which tends to make agency MBS somewhat less attractive. Data for Federal Reserve MBS holdings from the Board of Governors, Financial Accounts of the United States.
[59] Note that these figures include both listed and non listed mortgage REITs. As of December 31, 2012, 24 of these are publicly traded mREITs (per our definition).
[60] From the Five Oaks Investment Corporation's S-11 (p. 33)
[61] See Figure 12 for an illustration of the dramatic decline in non-agency MBS issuance during the crisis.

Figure 5: mREITs in Existence, Issuance of Securitized Mortgages, Repo, Assets, and Major Federal Policies



Source: SNL Financial, SIFMA, Flow of Funds and Richmond Fed. Note: Scales are in hundreds of billions of dollars.
Assets and repo data based on our sample of listed mREITs, whereas total in existence also includes unlisted.

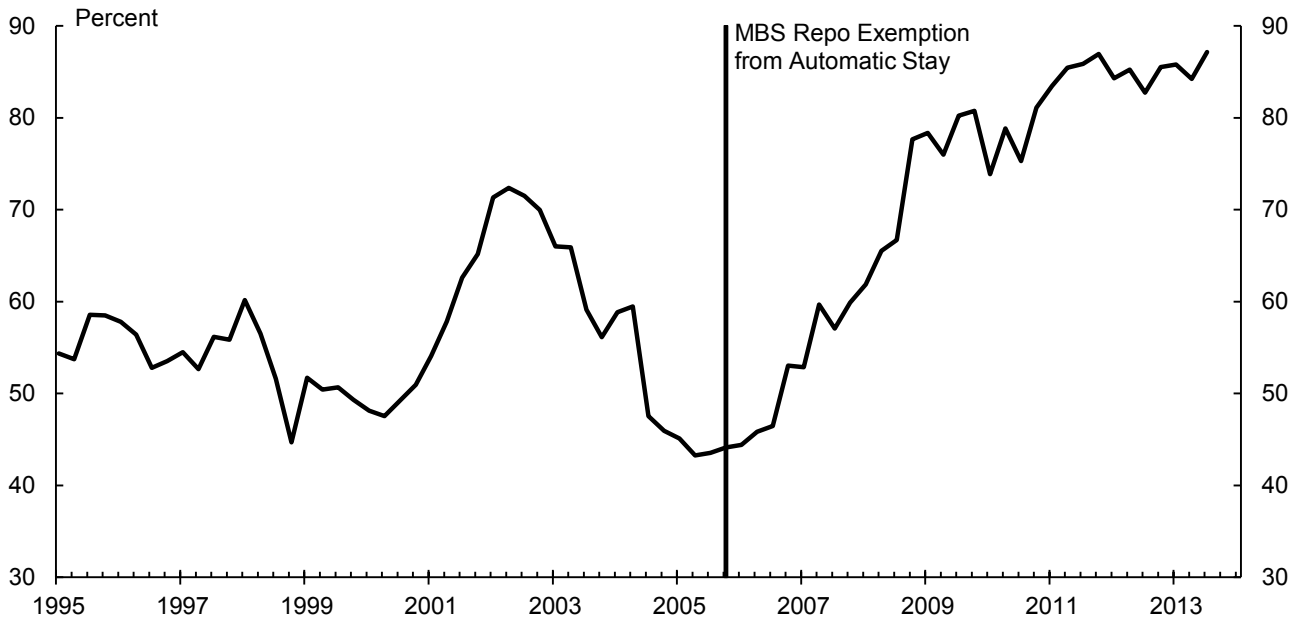
With 87 percent of all mREIT liabilities consisting of repos (as of September 30, 2013), there is good reason to believe that this financing technique may be an important factor contributing to the significant growth of this sector (see Figure 6). The repo market is part of the shadow banking system, which has grown significantly over the last several decades.[62] As can be seen in Figure 5, mREITs' total assets (predominantly MBS) have grown in line with total MBS issuance and these assets have increasingly been funded by the repo market (see also Figure A2). The overall growth in repo usage and MBS issuance over the last two decades can be attributed to the reduced competitive advantage held by banks for deposits (due to certain innovations and regulations) and the rise in "securitization and the use of repo as a money-like instrument" (Gorton and Metrick, 2010). As institutional investors, pension funds, mutual funds, state and municipalities, and nonfinancial firms had a growing demand for nonbank alternatives for deposit-like products, they turned to the repo market, which allowed nonbank financial entities to acquire financing for their activities in return for collateral.[63] The growth in securitization allowed for an increasing amount of collateral to be used for this type of financing.[64]

[62] The shadow banking system can be defined as a system that "comprises a diverse set of institutions and markets that, collectively, carry out traditional banking functions--but do so outside, or in ways only loosely linked to, the traditional system of regulated depository institutions. Examples of important components of the shadow banking system include securitization vehicles, asset-backed commercial paper (ABCP) conduits, money market mutual funds, markets for repurchase agreements (repos), investment banks, and mortgage companies." (Bernanke, 2012)

[63] "In 2003, total world assets of commercial banks amounted to USD 49 trillion, compared to USD 47 trillion of assets under management by institutional investors." (p.1 footnote 2 of BIS 2007). Bank for International Settlements (2007) "Institutional Investors Global Savings and Asset Allocation," report submitted by a Working Group established by the Committee on the Global Financial System, p.1, footnote 2. February 2007. Also see Adrian, Ashcraft, Boesky and Pozsar (2010) for a thorough discussion of shadow banking.

[64] The ratio of private securitization to total bank loans grew from zero in the early 1980s to over 60 percent prior to the financial crisis. Much of this growth is likely attributed to the increased demand for high-quality collateral used in repo transactions (Gorton and Metrick, 2010).

Figure 6: Repurchase Agreements as a Percentage of Total mREIT Liabilities



Source: SNL Financial & Richmond Fed
Note: Quarterly observations of repo liabilities as a percentage of total liabilities for mREITs. Data from mREITs listed in Table A5.

Additionally, mREIT counterparties are likely more willing to finance mREITs due to the limited risks associated with repo financing in the event of an mREIT's failure. Due to certain safe harbor provisions contained in the U.S. Bankruptcy Code (the "code"), the use of repos to finance asset-backed securities, such as agency MBS, gives the lenders in the transaction disproportionately greater rights than typical borrowers in the event of default. For example, in a repo transaction, if the borrower defaults, the lender is not subject to the automatic stay (whereby creditors of a bankrupt firm are prevented, or "stayed," from making any attempts to collect what they are owed) provisions of the code and can take possession and immediately liquidate the assets pledged as collateral under the repurchase agreement. These are called Qualified Financial Contracts (QFCs), which are exempt from the automatic stay under the U.S. Bankruptcy Code and include repurchase agreements, commodity contracts, forward contracts, swap agreements and securities contracts. While special treatment for certain financial contracts has existed since 1978, only in 2005 was the definition of a "qualified financial contract" expanded to include repos backed by MBS (GAO, 2011, p.14). The U.S. Bankruptcy Code of 1978 applied the automatic stay exclusion to only commodities and futures, expanding on this definition in subsequent bankruptcy reform acts.[65] Since mREIT counterparties can provide funding on favorable terms (in terms of fees and haircuts) and have little to no risk of loss as a result of this special treatment, repo financing has been particularly easy for

[65] For the types of contracts currently exempt from the stay, see the following sections of the Bankruptcy Code: 11 U.S.C. § 362(b)(6), (b)(7), (b)(17), 546, 556, 559, 560.

mREITs to attain.[66] Notably, the vast majority of mREIT asset growth took place after the MBS repo exemption and, as seen in the figure below, repos have accounted for an increasing share of mREIT liabilities.

Additionally, by holding predominantly agency MBS, mREIT's assets have limited credit risk and have historically benefited from government assistance, which has likely led to market expectations that this assistance would be provided in the future. Thus, creditors do not need to punish (in the form of higher repo rates or haircuts) their use of leverage to attain growth. Moreover, since mREIT's creditors are providing financing through repos, which receive favorable treatment in bankruptcy, they have less of an incentive to undertake costly monitoring of the risk-taking behavior of these firms. These factors suggest that debt financing (through the use of repos) is cheaper than equity financing for mREITs.

Through leverage, mREITs have been able to grow rapidly while providing investors with high-dividend yields compared to both traditional REITs and investment companies whose business models do not rely on the use of leverage to fund a portfolio of agency MBS. For instance, the average dividend yield for mREITs as of December 31, 2012, was 13 percent, compared with 4 percent for all equity REITs and 9 percent for investment companies.[67] The figure below shows the dividend yield for agency REITs, non-agency/hybrid REITs and the SNL US REIT Equity Index. Even though non-agency securities tend to pay higher interest rates to compensate for credit risk, mREITs are still able to pay higher dividends (SIFMA 2011). One possible factor contributing to higher dividends is the fact that agency MBS are currently treated favorably as compared with non-agency MBS in the repo markets, and thus Agency mREITs are able to attain greater amounts of leverage due to both lower haircuts and average repo rates paid.[68] This ability to lever-up gives the mREIT an advantage over other financial institutions with leverage requirements, which are unable to rely on debt financing to achieve growth.[69] mREITs might benefit from the use of leverage (i.e., find debt financing cheaper) for a couple of reasons. For instance, the low interest rate environment over the last several years has been favorable for mREITs that rely on acquiring long-term assets (MBS) at favorable spreads over their funding costs (repos) and utilize leverage to amplify returns.[70] Figure 8 shows that during a favorable yield curve environment (when the spread between 10 year and three-month treasuries is greatest), asset growth and number of formations have increased.

---

[66] For a discussion of potential inefficiencies that might arise because of exemption of QFCs (e.g., repos) from the stay, see Mark J. Roe, *The Derivatives Market's Payment Priorities as Financial Crisis Accelerator*, 63 STAN. L. REV. 539 (2011) -- http://www.stanfordlawreview.org/sites/default/files/articles/Roe-63-Stan-L-Rev-539.pdf.

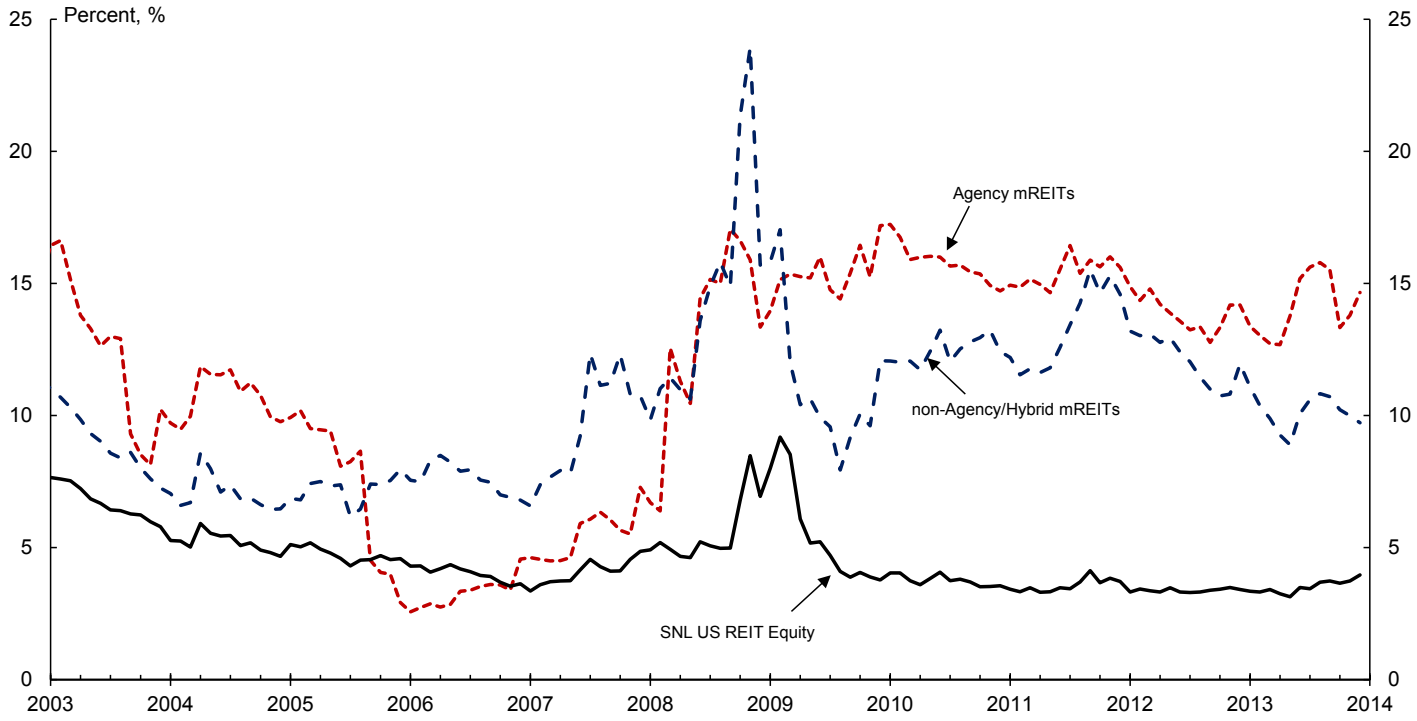
[67] Dividend yield for the 28 FTSE NAREIT mortgage REITs and the 131 FTSE NAREIT equity REITs as of December 31, 2012 (see NAREIT (2012) Exhibit 2, "Investment Performance by Property Sector and Subsector"). Dividend yield for registered investment companies from SNL Financial as of December 31, 2012 and excludes those that report a zero dividend yield.

[68] Indeed, before the crisis the dividend yield as witnessed in Figure 7, was actually higher for non-agency mREITs. This is because MBS were considered relatively safe investments (many held AAA ratings) and haircuts were relatively similar for non-agencies and agency MBS alike.

[69] While some contend that there is no cost benefit to obtaining debt over equity financing (see Modigliani and Miller, 1958), it's clearly stated in the mREITs' financial statements that their business models rely on the use of debt and that limiting their use of leverage would adversely affect their business. According to Annaly's December 31, 2012, 10-K filing: "If we fail to qualify for exemption from registration as an investment company, our ability to use leverage would be substantially reduced, and we would not be able to conduct our business as described. Our business will be materially and adversely affected if we fail to qualify for this exemption."

[70] In the same way that mREITs can multiply their size (given a certain amount of equity) due to leverage, they can also multiply their returns. Building on the previous example used to explain the relationship between haircuts and mREIT size, the following example illustrates how an mREIT can amplify returns using leverage given a set amount of initial equity investment. An mREIT starts with $10 million in equity, it then: 1) buys $10 million worth of MBSs, earning an MBS rate of say, three percent; 2) it uses the $10 million in MBS as collateral for a repo loan of $9.5 million because the lender requires a 5 percent haircut; 3) buys an additional $9.5 million in MBSs and repos it out to receive $9.025 million in a second loan; 4) buys an additional $9.025 million in MBSs, and this process could go on until the firm has MBS holdings equal to one divided by the haircut (in this case 1/.05) times the original equity ($10 million), or 20 times the original equity (meaning $200 million). In the case where the mREIT does not lever up, it earns 3 percent (the MBS rate in this example) times $10 million (initial amount of equity),

Figure 7: Dividend Yield for Agency and non-Agency/Hybrid mREITs and Equity REITs

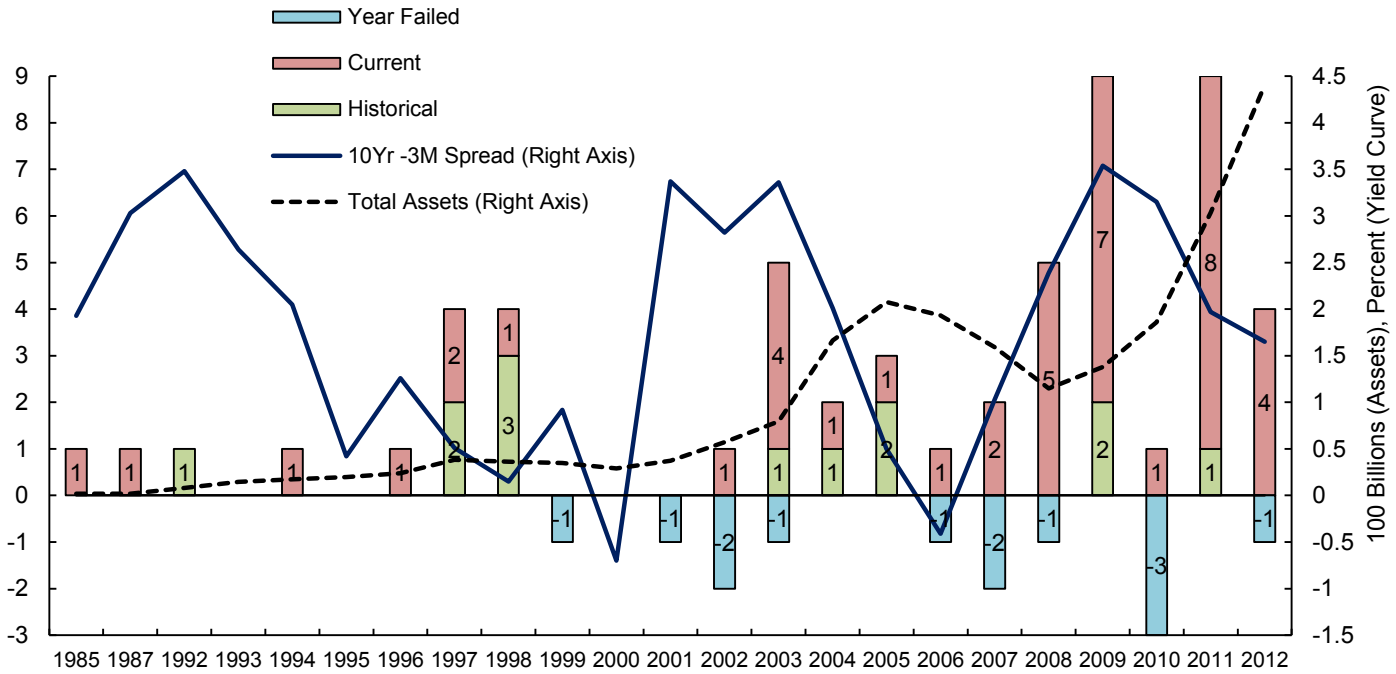


Source: SNL Financial & Richmond Fed.

Note: See Table A3 for a full list of the component companies in the Non-Agency/Hybrid and Agency mREIT indexes. SNL US REIT Equity : Includes all publicly traded (NYSE, NYSE MKT, NASDAQ, OTC) Equity REITs in SNL's coverage universe.

therefore earning **$300,000**. If they use the maximum amount of leverage given a 5 percent haircut (20 times) and pay say, 0.5 percent on the repo loans, they would earn **$5 million**, which is 3 percent (MBS rate) minus 0.5 percent (repo rate) times $200 million (the size of the firm using maximum leverage).

Figure 8: Formation and Failures of mREITs and the Yield Curve



Source: SNL Financial, FRED and Richmond Fed Note: Historical refers to MBS REITs that were founded but are currently no longer in existence. Current refers to MBS REITs that are still in existence. Asset data only for listed mREITs.

However, the interest rate environment shifted some in mid-2012 as long-term interest rates began to rise. In the third quarter of 2012, mREIT assets peaked at $449 billion (see Figure 4) and declined afterward as interest rates steadily increased and investors seemed to expect further increases (judged by Fed Funds Rate predictions derived from futures contracts).[71] The selloff of mREIT assets over this rising rate period could be explained by three things. First, to the extent that investors shifted into mREITs when interest rates were low and falling to "reach for yield," when interest rates started rising these same investors may have started shifting back to less risky investments. Second, mREIT managers themselves may have developed concerns about the adverse effect that rising interest rates would have on their MBS portfolio and therefore reduced leverage to an extent (by 40 basis points to 7.3 over a period of 9 months) by selling assets and repaying debt.[72] Third, their repo counterparties could have become concerned about increased mREIT risks and the risks of holding MBS collateral in a rising rate environment and therefore may have become less willing to rollover MBS-based repo funding or may have increased funding-related costs (e.g. interest rates, haircuts and fees).

Although recently mREIT assets have decreased somewhat, their business model has been generally favorable (provided investors with high dividend yields) in recent years and has contributed to a significant amount of growth in the sector. However, mREITs carry some significant risks. In the following, we will look more

[71] See for example futures-based forecasts available from: http://www.cmegroup.com/trading/interest-rates/fed-funds.html
[72] Leverage here is assets divided by equity (data from SNL Financial). This figure excludes Chimera Investment Corp. since the latest reported data from them is from the third quarter of 2012.

closely at how mREITs operate, how they fit into the larger financial system, and the risks inherent in their business model.

4. mREIT RISKS AND RISK MANAGEMENT

mREITs rely on a specific type of highly leveraged business model – financing a portfolio of mostly long-term agency MBS with short-term repos (and very little equity). This business model leaves them exposed to: 1) risks created by the maturity mismatch between their assets and liabilities; 2) separate risks for certain assets and certain liabilities; and 3) risks that policy shifts that might remove government support for agency MBS or mREITs' ability to use leverage. In addition, some observers are concerned that troubles in the mREIT industry could produce significant weaknesses for the broader financial system. On the liability side, the heavy reliance on repo financing and use of leverage subjects these entities to fragilities. For example, a repeat of the problems that occurred in secured funding markets, similar to those that occurred between 2008 and 2009, would adversely affect this business model. Additionally, the assets of mREITs, by definition, are largely MBS, which have the potential for high price volatility. This volatility can be related to interest rate movements or can be driven by market factors unrelated to shifts in interest rates, as demonstrated during the recent financial crisis. Because mREITs are major players in the MBS market, they could either exacerbate this volatility or experience a separate shock that causes them to de-leverage, meaning sell their assets, at a rapid pace. These sales may have an adverse effect on MBS prices and ultimately the mortgage market.

mREITs take actions to mitigate the risks associated with their asset and liability mix by, broadly speaking, engaging in hedging activities and taking steps to reduce the fragility of their funding structure. Moreover, some of the perceived risks associated with this business model were lessened during the crisis due to government intervention. Some of these risks were illuminated during the financial crisis while others did not play a role. In the following, we will highlight how the risks played out during the crisis and also how mREITs attempt to manage their risk.

Risks to mREITs and How They Manage These Risks

What the financial crisis taught us about mREITs

The financial crisis revealed the fragilities inherent in the mREIT business model. Given that agency MBSs are implicitly backed by the government, one might expect that there would be very little volatility in the agency MBS market. But in fact, interest rate movements indicate significant volatility in perceptions of credit risk on agency MBS. In response to this volatility and other perceived market problems, the government intervened in an unprecedented way to prop up this market, which allowed for mREITs holding predominantly agency MBS to escape the crisis without failures. Beyond risks that showed up in the MBS market, the fact that these assets

were financed by short-term repos led to funding problems for some mREITs and other financial institutions. Regardless of these apparent fragilities, mREITs continue to have similar exposures; therefore, if the financial system were to suffer a significant shock again, and the government does not intervene, failures may take place. Moreover, mREITs have tripled in size since the middle of the financial crisis making the potential for an adverse outcome more likely.[73]

Credit risk for Agency MBS? The financial crisis began with the decline in housing prices, which had a significant impact on the MBS market. The graph below shows the spread between the interest rate paid for repo borrowing using agency MBS collateral and Treasury collateral ($Repo_{MBS} - Repo_{Treas}$) from January 2007 through July 2009. This spread represents the market's perception of the difference in credit-worthiness between MBS and Treasury securities. The spread was relatively low and stable prior to the summer of 2007. This is what one might expect through the financial crisis if agency MBS had no credit risk as people concluded based on the view that the government stood behind agency MBS. However, the volatility in this spread suggests that market participants viewed agency MBS as having credit risk. While it's not clear what generated concerns about the safety of agency MBS, one reason may be that the troubles in the non-agency MBS market were somehow transmitted to the agency MBS market.[74]

During this time period there was widespread turbulence in both the agency and non-agency MBS markets. As can be seen in the figure below, the MBS repo spread remained elevated through the latter portion of 2008. Moreover, the turmoil is evident not only from the high repo rate spread illustrated in the chart below, but also from the spread between the rate on agency MBS and Treasury securities themselves. On March 4, 2008 the spread between Fannie Mae's current coupon 30-year MBS and 10-year Treasuries widened to approximately 200 basis points indicating severe stress in the agency MBS market.[75] Troubles in the MBS market continued and accelerated thereafter as many other firms reported financial difficulties related to the declining value of MBSs.[76]

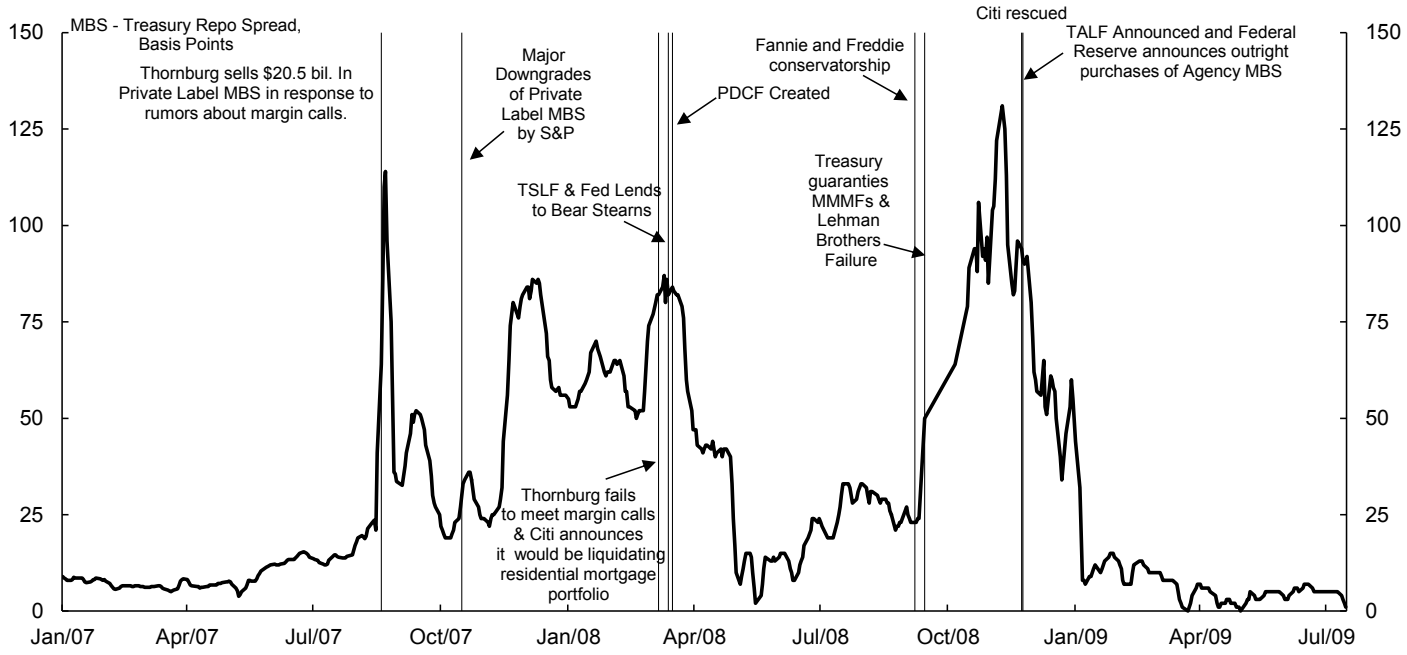
[73] While mREITs have grown significantly, they also are engaging in more risk management activities, especially hedging interest rate risk, and therefore may be less exposed in a future adverse market event.

[74] One possible explanation for the elevated spread is that market participants were uncertain about the government's willingness to provide financial support for Fannie Mae and Freddie Mac, or if any support provided would extend to investors in agency MBS. Still, if this were the explanation for elevated spreads, when the Treasury placed the agencies in conservatorship in September 2008, the spread should have declined considerably. Instead the spread increased.

[75] "Agency Mortgage-Bond Spreads Reach 8-Year High, Hurt Consumers", Jody Shenn, Bloomberg.com, March 4, 2008.

[76] http://www.jec.senate.gov/public/?a=Files.Serve&File_id=4cdd7384-dbf6-40e6-adbc-789f69131903

Figure 9: Spread between Agency MBS term repo rate and Treasury term repo rate



Source: ICAP /Bloomberg & Richmond Fed
Note: Five day centered moving average of spread between sixty day Agency MBS repo and sixty day Treasury repo, in basis points.

Funding fragilities Many financial institutions, including mREITs, that relied on short-term funding, such as repos, to finance long-term assets, such as MBS, experienced significant funding problems. The decline in housing prices raised counterparty concerns about the value of the collateral underlying the repo funding they advanced, thus limiting the ability of the borrower to rollover their financing. Therefore, they were no longer able to fund the assets that they held and in some cases were required to sell them in a down market. For instance, the mREIT Thornburg Mortgage (Thornburg) financed $29 billion of non-agency MBS it owned in Q2 2007 with repurchase agreements and asset-backed commercial paper. Between the second and third quarter of 2007, Thornburg began having trouble rolling over its repos and ultimately had to repay $14.2 billion[77] of its repo borrowings in part by selling assets and such sales led to a $1.1 billion loss. [78,79]

Some common features of repos that make them especially fragile, as demonstrated in the crisis, include margin calls, increased haircuts, and contractual terms that provide for cross-defaults.[80] For example, on

[77] Figure from the difference in repo holdings between Q3 2007 and Q4 2007 from Thornburg's 10-Qs.
[78] "Thornburg Sells $20.5 Billion in Mortgage-Backed Securities," By Lingling Wei and Kevin Kingsbury, WSJ.com, August 20, 2007
[79] From class action complaint: Case 1:07-cv-00815-JB-WDS Document 68 Filed 05/27/2008, UNITED STATES DISTRICT COURT, DISTRICT OF NEW MEXICO,IN RE THORNBURG MORTGAGE, INC Case No. 07-815 JB/WDS, SECURITIES LITIGATION.
[80] Repurchase agreements are often undertaken under terms set out in Master Repurchase Agreements (MRAs). These MRAs often include rules that specify that if the borrower defaults on one repo loan from a particular lender, it is treated as if it has defaulted on all repo loans from that lender (http://www.sifma.org/Services/Standard-Forms-and-Documentation/MRA,-GMRA,-MSLA-and-MSFTAs/MRA_Agreement/, p. 7). These agreements also specify a number of events that fit the agreement's definition of a "default," such as failure to meet margin requirements, to make various required payments, and the insolvency of the borrower. In these cases the lender may choose to declare all

February 28, 2008 Thornburg received a default notice on its repurchase agreements with JP Morgan when they failed to meet margin calls.[81,82] Other major financial firms, like Bear Stearns, were also forced to sell MBS, which likely led to a decline in the prices of MBS and thus margin calls for all repo borrowers using MBS collateral (Bear Stearns's abrupt decline in MBS holdings can be seen in figure A1). The widespread problems in Agency MBS markets and fragilities in repo financing revealed during the crisis suggest that the mREIT business model is quite fragile. Nevertheless, agency mREITs broadly emerged from the crisis largely intact and have grown rapidly ever since, largely because of government actions that propped up the market for agency MBS.

Government intervention in the MBS market In response to the severe strains in the MBS market, the Federal Reserve implemented two unprecedented programs to encourage broker dealers to continue to trade in MBS and other similar securities at a time when market participants had pulled away from these securities. These programs – the Term Securities Lending Facility (TSLF) and the Primary Dealer Credit Facility (PDCF) – supported those, like mREITs, who relied on the repo market to fund their holdings of agency MBS. The $200 billion dollar TSLF program began operating on March 27, 2008 and allowed broker-dealers to exchange their agency MBS for Treasury securities for a term of up to 28 days.[83,84] The program was effectively a swap of collateral that was avoided by the market for stronger collateral, and is viewed as a primary reason for the decline in the spread between Treasury repo and agency MBS repo starting in the spring of 2008 (see figures 9 & A4).[85] This program especially helped the agency mREITs. On the other hand, it did little to help the non-agency mREITs because most non-agency MBS were ineligible for the TSLF program.[86] As seen in the figure below, this program was especially utilized by holders of agency MBS.

---

amounts outstanding as payable. If the borrower is unable to make requested payments, then the lender may keep pledged collateral on all loans covered by one MRA. MRAs may therefore expand a default from one loan to many a number.

[81] "Thornburg Can't Meet Margin Calls, Survival in Doubt (Update5)," David Mildenber, March 7, 2008, bloomberg.com.

[82] Thornburg ultimately declared bankruptcy on April 1, 2009, at which point any remaining repo contracts would have been terminated and may have been immediately liquidated. See: http://www.bloomberg.com/apps/news?pid=newsarchive&sid=acP.oPOVP3VI

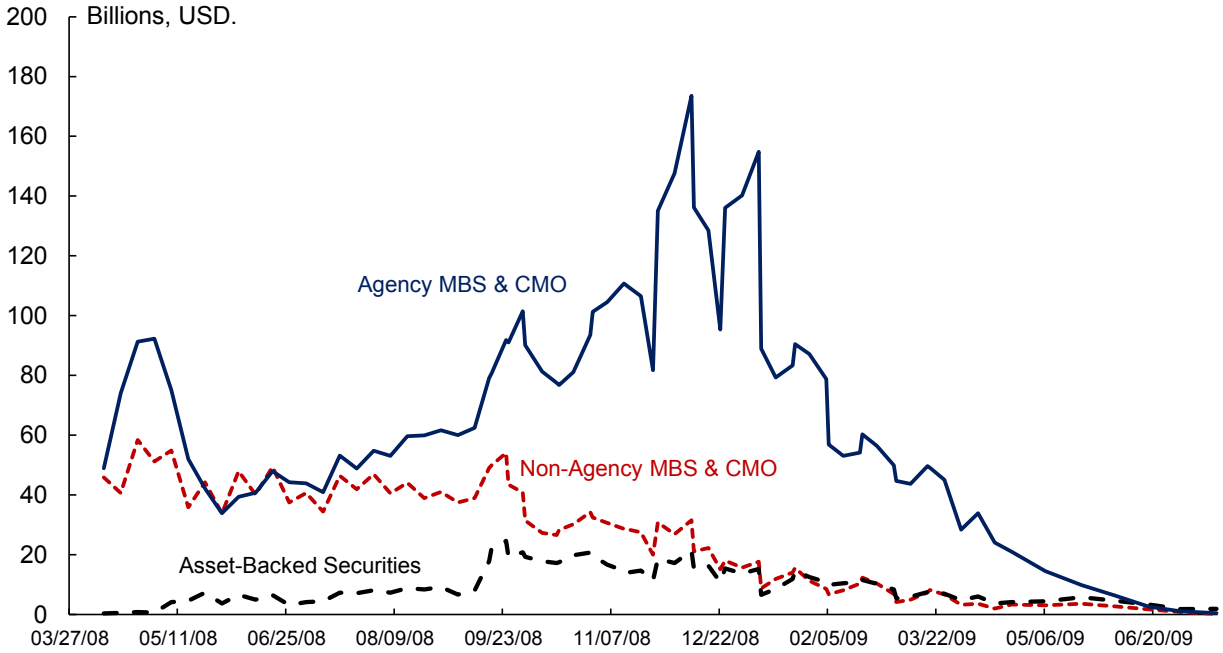
[83] For more on this program please see: "The Term Securities Lending Facility: Origin, Design, and Effects", Michael J. Fleming, Warren B. Hrung, and Frank M. Keane,*Current Issues In Economics and Finance*, Volume 15, Number 2, February 2009 ,www.newyorkfed.org/research/current_issues.

[84] "Schedule 1" collateral is all Open Market Operations eligible collateral. "Schedule 2" collateral is Schedule 1 collateral plus other investment grade securities such as AAA/Aaa-rated non-agency MBS, CMBS, agency CMOs. http://www.federalreserve.gov/monetarypolicy/tslf.htm.

[85] Fleming, Hrung and Keane (2010) Table 2, reports that agency MBS spreads declined 0.54 basis points for every 1 billion in additional Treasury securities lent through the TSLF program.

[86] Internal Federal Reserve sources indicate that by the spring of 2008 the majority of non-agency MBS had been downgraded to below AAA/Aaa, which made such securities ineligible for the TSLF program.

Figure 10: Collateral Pledged to Term Securities Lending Facility

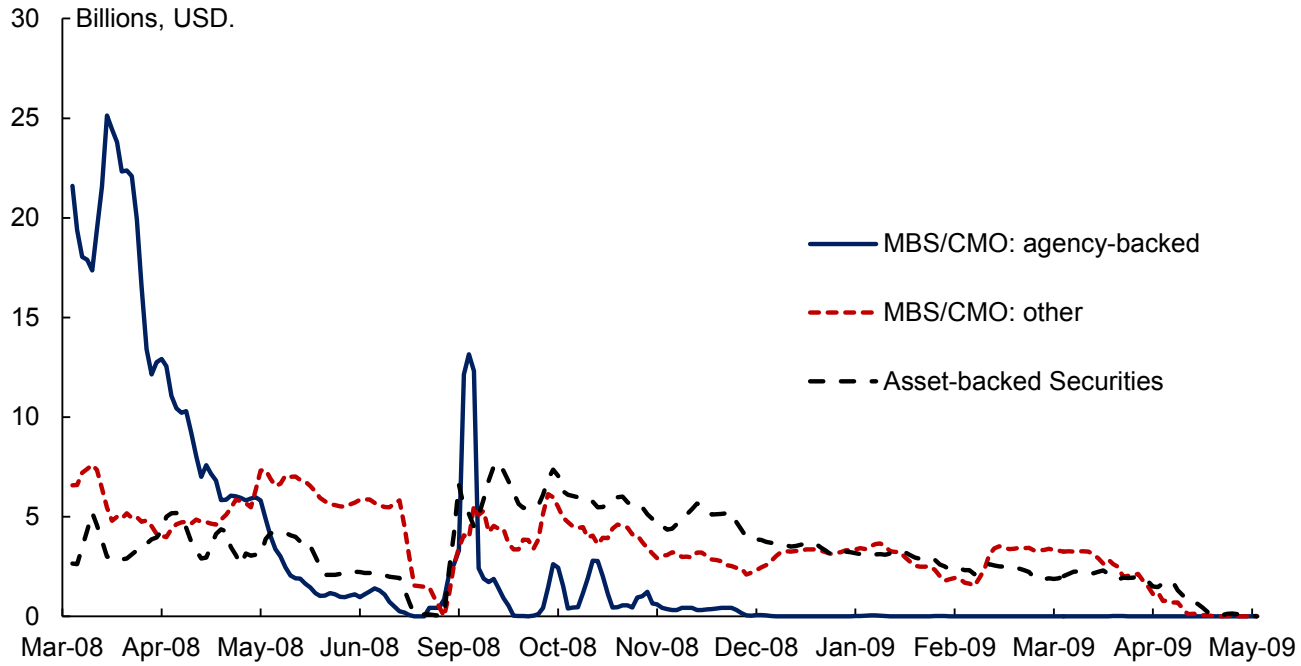


Source: Federal Reserve Board of Governors & Richmond Fed
http://www.federalreserve.gov/newsevents/files/tslf.xls
Note: Three day moving average of collateral pledged to the Term Securities Lending Facility.

The PDCF, which was implemented around the same time, may have also had a positive effect on the agency MBS market. This program allowed the dealers to pledge tri-party eligible collateral in exchange for a cash loan from the Federal Reserve (see figure 11). The TSLF may have been more attractive to dealers because it allowed them to participate in a broad-based auction rather than independently borrowing from the Fed, which may have carried some stigma.[87]

[87] See: http://www.newyorkfed.org/research/current_issues/ci15-2.pdf, p.4

Figure 11: Collateral Pledged to PDCF

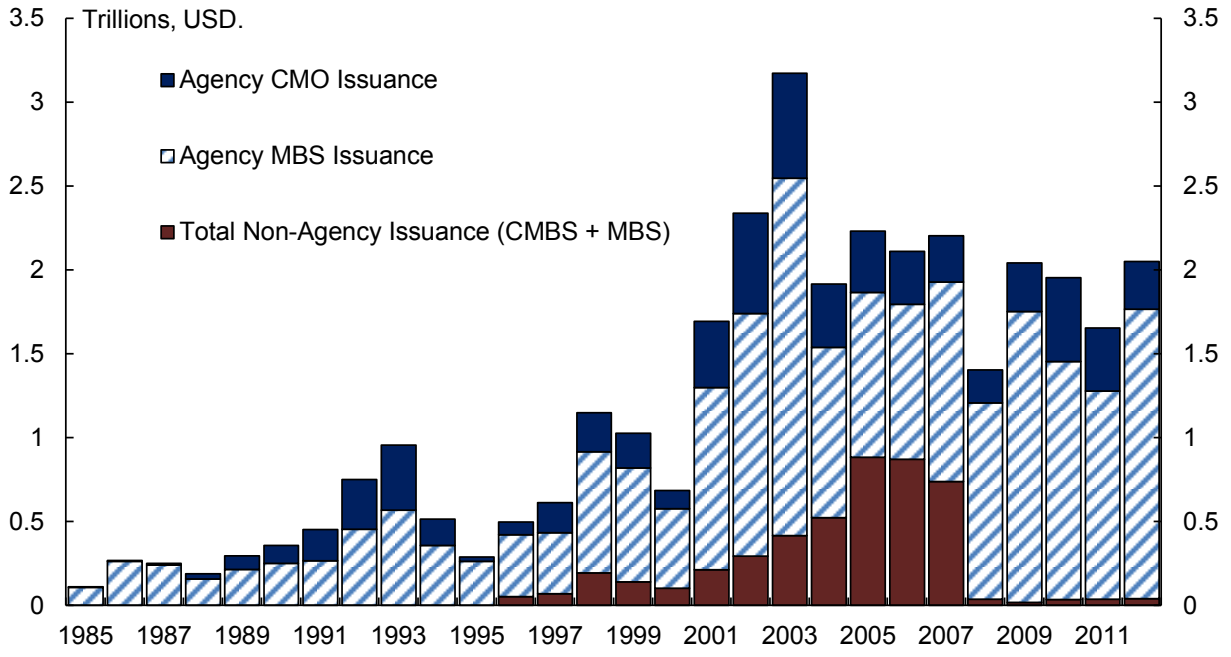


Source: Federal Reserve Board of Governors & Richmond Fed
http://www.federalreserve.gov/newsevents/files/pdcf.xls
Note: Three day moving average of collateral pledged to the Primary Dealer Credit Facility

Both the TSLF and PDCF supported agency MBS and the repo market during the financial crisis. Another program, Large Scale Asset Purchases (the Fed's purchases of up to $500 billion of agency MBS), initiated in November 2008, also propped up the agency MBS market. Additionally, the long-standing implicit government support for Fannie Mae and Freddie Mac, and the conservatorship program that made the support more explicit, allowed agency MBS issuance to continue and even grow, unlike non-agency MBS. Arguably, without the implementation of TSLF, PDCF, outright purchases of agency MBS and support for the GSEs, mREITs would have had a challenging time finding the financing necessary to sustain their business models. While both the agency and non-agency MBS markets suffered turmoil in the crisis, the agency MBS market recovered rapidly and has grown ever since – along with mREITs. Issuances of non-agency MBS declined dramatically during the crisis and has yet to recover (see figure 12).[88]

[88] For data on Agency MBS outstanding amounts and total issuance see: http://www.sifma.org/research/statistics.aspx

Figure 12: MBS, CMBS and CMO Issuance from 1985 to 2012



Source: Fannie Mae, Federal Reserve, Freddie Mac, Ginnie Mae, HUD; FHFA; data compiled by SIFMA

Risks to mREITs (other than those identified from the crisis)

mREITs face a variety of risks because of their business model. Some of these were illuminated by the financial crisis – fragilities in the repo market and perceptions of heightened credit risk for agency MBS – but others that did not appear during this time can also be important risks for mREITs, including interest rate risk, prepayment risk, additional risks associated with repo financing, and regulatory risk.

Interest rate and prepayment risk Because of the maturity mismatch between mREITs' assets and liabilities, interest rate movements can affect their earnings and, indeed, their solvency. If interest rates were to increase rapidly, MBS prices would immediately fall, leading to many of the same problems that arose during the financial crisis as a result of falling asset values. While the mREITs hedge very little against MBS price movements driven by credit risk, and therefore suffered losses during the crisis (which would have been greater had it not been for government support of agency MBS), they do hedge against interest rate risk. Additionally, all mortgage-related investments are subject to prepayment risk, as previously discussed.

Repo fragilities Although some risks associated with the use of repo financing were identified during our financial crisis discussion, there are additional characteristics of repo financing that may contribute to the fragility of mREITs. For example, some observers maintain that the special treatment given to repos in bankruptcy encourages the use of short-term over long-term financing, increasing the fragility of firms (mREITs, for instance) that rely heavily on repo finance. The idea here is that because qualified financial contracts (QFCs) have an advantage in bankruptcy, repo lenders have an inefficiently small incentive to monitor and therefore may provide more credit than would otherwise be appropriate (allowing borrowers to lever up without appropriate fees or

penalties).[89] Additionally, since mREITs' major funding providers – broker-dealers – also rely significantly on repo funding, this argument also applies to them (see Figure A3). As a result, broker-dealers may be particularly fragile, potentially exposing mREITs to a danger of the loss of their funding sources. One further risk, albeit small, sometimes discussed in mREIT's financial reports, is the potential loss of the haircut on a repo if the mREIT's lender defaults.[90]

Government policy risk Currently, agency MBS enjoys an implicit government guarantee, but legislation has been proposed that could ultimately undermine, to some extent, this guarantee. The mREITs that exist today are almost exclusively invested in agency MBS. While at one time some mREITs were large holders of non-agency MBS, these mREITs have disappeared (or failed) as the non-agency MBS market largely dried up (see Figure 12, SIFMA). mREITs have become highly leveraged and have grown rapidly because their primary asset has government backing, limiting credit risk.

If legislation were to pass that undermines this guarantee, mREITs' creditors would certainly respond by demanding some or all of the following to compensate for the expectation of higher credit losses: higher interest rates on repos, higher haircuts, and/or a larger equity cushion. As a result, repo financing would become less attractive, and mREITs would almost certainly shrink. If mREITs' repo funding costs were to increase, then one of two things might happen. First, if the rates earned by mREITs on their MBS assets remained unchanged, their earnings spread would shrink, making them less attractive to investors. Second, if MBS prices increased in line with repo rates, this would likely translate into higher mortgage rates, thus reducing the attractiveness of mortgage borrowing and therefore the supply of MBS – likely leading to a decline in mREITs' holdings. Additionally, creditors might not necessarily charge higher repo rates to mREITs, but could instead demand higher haircuts or higher levels of equity relative to debt. Both of these would limit their ability to lever up to the same extent as they do now, therefore causing them to shrink.

Additionally, mREITs' access to repo funding might be limited because their assets may no longer be considered as acceptable collateral to certain counterparties in the tri-party repo market. mREITs obtain a significant portion of their funding from broker-dealers, and broker-dealers, in turn, are funded to some extent by institutional investors (e.g., money market mutual funds) that face limits requiring them to hold only the safest assets, such as those with government guarantees (i.e., repos collateralized by agency MBS). If legislation removed the government guarantee that agency MBS currently enjoys, broker-dealers may lose some of this funding and therefore may not be able to finance mREITs to the same extent. As a result, mREITs would be forced to reduce their purchases of agency MBS and thus shrink.

Moreover, the ability of mREITs to attain leverage is dependent on whether they maintain their exemption from the Investment Company Act of 1940. If mREITs lose their exemption from the 1940 Act – because the SEC publishes new guidance as to what qualifies as a "qualified real estate asset" or otherwise revises their interpretation of who qualifies for the exemption – they would be required to significantly deleverage. As of December 31, 2012, mREITs had an average leverage multiple of 8 (see Table 3), whereas investment

[89] For a discussion of these views, see: Pellerin and Walter (2012), p. 23-24.
[90] See, for example, Annaly's December 31, 2012, 10-K filing, p.25.
http://www.sec.gov/Archives/edgar/data/1043219/000115752311001180/a6624738.htm

companies are limited to a 1.5 leverage multiple (assets-to-equity).[91] Therefore, in order to reduce leverage to the levels acceptable for an investment company, an mREIT would have to increase its equity or reduce its assets by a significant amount. As an example, Hatteras Financial Corp has a leverage multiple of 8.6. They would have to reduce their assets by 82 percent, holding equity constant; or increase equity by nearly six times its existing levels, holding assets constant; to meet these leverage requirements. Many mREITs heavily rely on this exclusion and note the risks associated with losing this exception in their financial statements. For instance, one mREIT noted that their business would be "materially and adversely affected if we fail to qualify for this exemption," and another stated that it would "substantially change the way we conduct our business."[92,93]

Table 3

Five Largest mREITs	Total Assets 2012Y ($000)	Agency Securities 2012Y ($000)	Repurchase Agreements 2012Y ($000)	Total Equity 2012Y ($000)	Leverage Multiple (assets-to-equity)
Annaly Capital Mgmt Inc.	133,452,295	127,724,851	102,785,697	15,924,444	8.4
American Capital Agency Corp.	100,453,000	85,245,000	74,478,000	10,896,000	9.2
Hatteras Financial Corp.	26,404,118	24,057,589	22,866,429	3,072,864	8.6
CYS Investments	21,057,496	20,842,142	13,981,307	2,402,662	8.8
ARMOUR Residential REIT Inc.	20,878,878	19,096,562	18,366,095	2,307,775	9.0
TOTAL (includes all other mREITs)	**434,218,236**	**360,093,454**	**319,514,935**	**58,763,733**	
AVERAGE (includes all other mREITs)	**14,973,043**	**12,860,481**	**11,017,756**	**2,026,336**	**8.3**

Source: SNL Financial. Note: Data for Chimura Investment Corp. (included in Total and Average) is from 3Q 2012 when they last reported.

However, for the largest mREITs, being subjected to the Investment Company Act is minor compared with the possibility of coming under the Fed's oversight. Because of the potential risks associated with their size and use of short-term financing, the largest mREITs (Annaly and Agency) are under consideration by the Financial Stability Oversight Council (FSOC) to be designated as systemically important financial institutions (SIFIs).[94,95] Among the factors currently under review are firm size, fragility, interconnectedness with other financial institutions and markets, and existing regulatory scrutiny. Designation as a SIFI would subject these companies to enhanced prudential measures, including capital and liquidity requirements, leverage limits, enhanced public disclosures, and risk management requirements. Additionally, SIFIs are required to produce so-

[91] This leverage ratio is calculated based on the 300 percent asset coverage ratio (the amount of assets required to cover their debt), required of investment companies in Section 18 of the Investment Company Act of 1940.
[92] From Annaly Capital Management and Northstar Realty Finance Corp's December 31, 2012, 10-Ks, respectively.
[93] From NorthStar Realty Finance Corp (has subsidiaries that rely on the exception from the 1940 Act) 2012 10-K: "If we are required to register as an investment company under the Investment Company Act, we would become subject to substantial regulation with respect to our capital structure (including our ability to use leverage), management, operations, transactions with affiliated persons (as defined in the Investment Company Act), portfolio composition, including restrictions with respect to diversification and industry concentration and other matters."
[94] As of December 31, 2012, Annaly had assets and outstanding repo financing totaling $133.5 billion and $102.8 billion, respectively; and Agency had $100.5 billion and $74.5 billion, respectively. These levels exceed the FSOC's stage one thresholds for SIFI designation in terms of asset size (greater than $50 billion) and holdings of short-term debt (greater than 10 percent short-term debt to assets ratio). FSOC's stage one thresholds are in place to identify those nonbank companies that are likely to receive a comprehensive review to determine whether the company poses risks to financial stability, which could be mitigated by imposing enhanced prudential standards and oversight by the Federal Reserve. See FSOC's Final Rule, which describes how FSOC intends to make SIFI determinations.
[95] American Capital Agency had listed designation as a SIFI as a risk factor in its Form 10-K for 2011, but the warning appeared to be absent from its 10-K for 2012.

called “living wills,” which must contain a firm’s plans for an orderly resolution in the event of financial distress.[96] While FSOC is currently in the process of making nonbank SIFI designations, which may or may not include designating Annaly and Agency as SIFIs, they will continuously monitor financial firms into the future to identify any perceived risks that may result in a future SIFI designation.

Risk Management

The risks that we have just outlined are all a function of taking advantage of maturity transformation. Banks are the prime example of institutions engaging in maturity transformation. In other words, they finance a portfolio of long-term assets (loans) with short-term liabilities (deposits), taking advantage of depositors’ strong preference for immediate access to their funds (so that these depositors are willing to accept very low interest rates) while still providing borrowers funding for long-term projects.[97] Maturity transformation naturally subjects those firms using it to severe risk of loss when interest rates move unexpectedly. Taking Annaly as an example, given 1) its maturity mismatch as of December 31, 2012; 2) the amount of unencumbered assets it has available to meet margin calls should the value of its assets decline; and 3) assuming no hedging activities; if interest rates were to immediately rise by 440 basis points[98] or more, Annaly would face insolvency. However, Annaly’s and other mREITs’ risk management activities are intended to limit this risk. Whereas banks’ risk-taking and fragility is limited by regulation and the grant of deposit insurance, mREIT activities are largely constrained only by market forces. mREIT risk management activities include spreading out the maturities of their financing (laddering), so all of their liabilities do not come due at once. Beyond laddering they also hedge using simple and complex derivatives-based strategies to address interest rate risk and the risks associated with the prepayment option embedded in MBS.[99] Additionally, mREITs limit their leverage to less than haircuts would otherwise allow as a means of reducing fragility.

The following chart (figure 13) provides an illustration of the magnitude of the asset-liability mismatch of one of the largest mREIT’s (AGNC) and to what extent it hedges. The vertical axis represents the interest rates earned on assets (positive numbers), repo rates (positive numbers), implied cost of financing (TBAs), and net

[96] Given their reliance on the use of repos, which are exempt from the automatic stay provisions of the bankruptcy code, resolution of an mREIT would likely be fairly straightforward in that creditors would immediately take control of the MBS collateral and the mREIT would be left with very few unencumbered assets to be handled in the bankruptcy process.

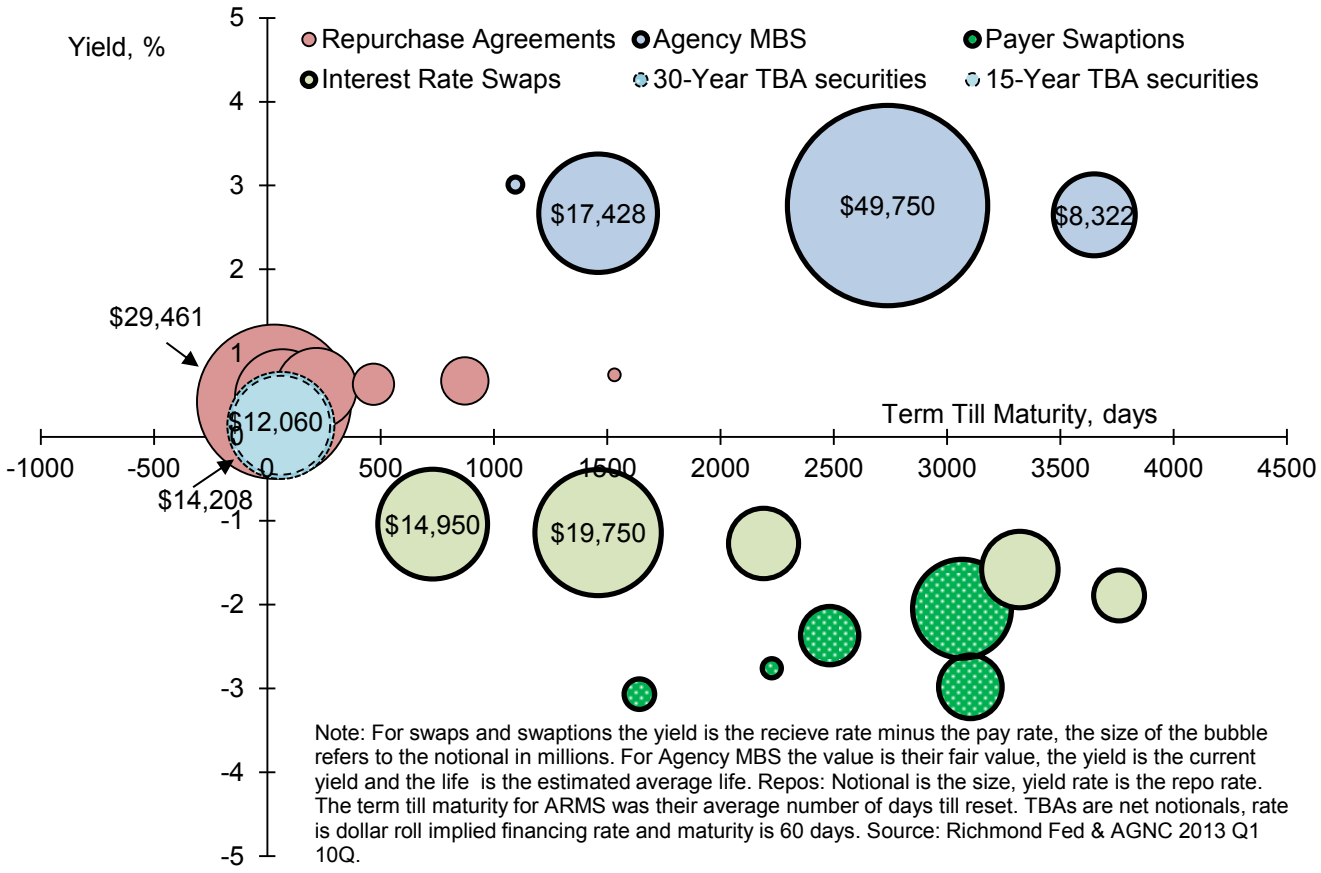
[97] See Diamond and Dybvig (1983) for a discussion of why depositors have a strong preference for investments that allow them immediate access to their funds.

[98] This figure is calculated as follows. According to its December 31, 2012, 10-K (p. F-3), as of the end of 2012, Annaly had $129.9 billion in MBS and other similar securities and $109.2 of these assets were pledged as collateral on its repo (and other) loans. Therefore it had $129.9 – $109.2, or $20.7 billion of MBS and other holdings that are unencumbered. It also had about $2.4 B in cash or other liquid assets, but had about $8.3 billion in payables associated with its investments. So – in total – it had about $14.8 billion to meet margin calls. Calculated, based on the broad figures provided in Annaly’s 2012 10-K, its average MBS maturity appeared to be approximately three years (see page F-16 of Annaly 2012 10-K). We are assuming its other securities have a similar maturity. Using a standard present-value-of-a-bond formula (therefore assuming no prepayments) to determine the effect of a change in interest rates on the value of Annaly’s MBS (i.e., PV = Face value/$(1 + I)^n$), one can determine that market interest rate would need to rise by about 440 basis points to wipe out the extra MBS and cash so that it couldn’t repay its loans.

[99] One might imagine that mREITs would need to address prepayment risk associated with declining interest rates (the chance that falling interest rates will cause mortgage borrowers to refinance, and therefore repay their mortgages, forcing mREITs to need to reinvest these received funds at the new lower interest rate) because MBS contains such risk. However, because mREITs’ have longer term assets than liabilities, such that a decline in interest rates would reduce their funding costs tending to offset any losses produced by prepayments.

swap rates on hedges (fixed pay less floating receive rate).[100] The horizontal axis represents the maturity (in days) of assets, liabilities or derivative contracts. The size of the "bubble" indicates the size of either the notional (with respect to derivatives) or market values of hedges, assets, or liabilities.

Figure 13



Note: For swaps and swaptions the yield is the recieve rate minus the pay rate, the size of the bubble refers to the notional in millions. For Agency MBS the value is their fair value, the yield is the current yield and the life is the estimated average life. Repos: Notional is the size, yield rate is the repo rate. The term till maturity for ARMS was their average number of days till reset. TBAs are net notionals, rate is dollar roll implied financing rate and maturity is 60 days. Source: Richmond Fed & AGNC 2013 Q1 10Q.

From the figure it is clear that the assets AGNC holds have a much greater maturity than their repo liabilities. It also reveals that their hedges are offsetting some of their profits because they are, on net, cash outflows.

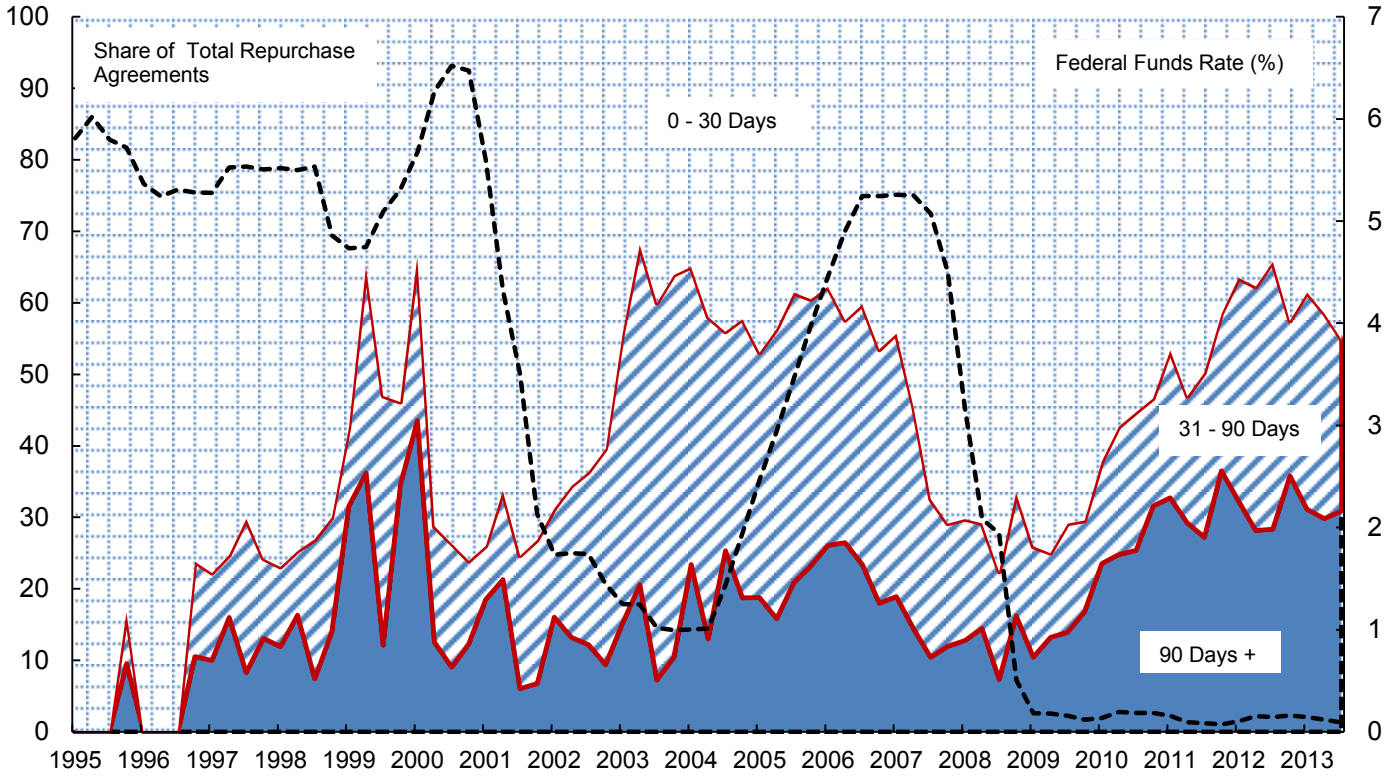
Laddering

Repo financing is typically thought of as being very short-term – having an overnight maturity.[101] If all mREITs' repo financing was overnight, they would be highly exposed to bank-like runs, since all of their liabilities would mature daily. In other words, it is possible that all mREIT creditors could, on a given day, refuse to rollover their repo financing; just like all depositors of a bank could demand their funds on a given day – producing a bank run. To mitigate the possibility of bank-like runs, mREITs typically will arrange their repo funding such that their contracts have various terms to maturity.

[100] Interest payments on repos are expressed as a positive number, rather than a negative number, to allow readers to more easily visualize the net interest margin (spread).

[101] Investopedia defines a repo contract as: "A form of short-term borrowing for dealers in government securities. The dealer sells the government securities to investors, usually on an overnight basis, and buys them back the following day." http://www.investopedia.com/terms/r/repurchaseagreement.asp

Figure 14: mREITs Share of Repo Borrowing by Maturity and Federal Funds Rate



Source: SNL Financial, Haver Analytics, Richmond Fed.

While over the last couple of decades the majority of mREITs' repo contracts have had maturities of less than 30 days, still, a large portion of their repo financing has been for greater than 30 days, particularly in periods when interest rates were expected to rise.[102] As seen in Figure 14, mREITs increased the proportion of repos with maturities greater than 30 days beginning in 2002 and again in 2009, periods during which it seemed clear that interest rates could only increase. In addition to protecting them, to some extent, from interest rate risk, lengthening repo maturities also protects them from rollover risk, which could be higher when interest rates are rising rapidly. For example, creditors may have greater concerns about the health of firms, such as mREITs, which have significant maturity mismatch, when rising interest rates are expected to produce losses. Despite the fact that mREITs enter into repo contracts that are longer than overnight, as seen in Figure 14 the overwhelming majority of their liabilities still have significantly shorter maturities than that of their assets, represented by the blue bubbles. Thus, while laddering can mitigate some of the rollover risk mREITs face, it still leaves them highly exposed to interest rate risk.

[102] The decline in the use of repos with maturities greater than 30 days during the 2007-09 financial crisis could have been, in part, due to broker-dealers' efforts to shorten the maturities of their repo loans.

Fixed-for-floating interest rate swaps

Of all their risk management activities, mREITs rely most heavily on interest rate swaps to manage interest rate risk. In fact, the notional value of their swaps at the end of 2012 totaled $160 billion (37 percent of all mREIT assets) (see Figure A4). Because mREITs' funding costs (determined by repo rates) adjust more quickly than their interest earnings on their MBS portfolio, when interest rates rise, their net income declines. To compensate for the increased funding costs, mREITs enter into fixed-for-floating rate swap contracts that are intended to pay off when interest rates rise. Fixed-for-floating swaps, in this case, will pay the mREIT's swap counterparty a fixed rate while the mREIT receives a floating rate tied to some short-term market interest rate index, such as LIBOR. Since short-term interest rates tend to move together, the income that an mREIT receives on its contract will increase at the same time that their repo costs are increasing. The average swap ratio for all mREITs – total notional value of swaps divided by total repos – was only 50 percent as of December 31, 2012. This means that approximately 50 percent of any rise in mREITs' repo funding costs resulting from an increase in market rates will be offset by the income received on these swap contracts. However, given that the two largest mREITs have recently added, rather aggressively, to the amount of their interest swaps, this figure is larger than it was in recent years and appears to continue to trend upward. Combined, these mREITs increased the notional amount of their swaps by $68 billion from 2010 to the second quarter of 2013, providing evidence that their expectations of future rising rates are increasing (see Figure A5).

Other commonly used hedging activities

Beyond laddering and entering into interest rate swaps, mREITs engage in a number of other activities to hedge interest rate risk, or, in other words, limit the risk associated with the significant maturity mismatch their balance sheet carries. The way in which mREITs determine how significant this mismatch is, is by using a measure called *duration*.[103] Specifically, mREITs control their duration gap (duration of assets minus duration of liabilities) by engaging in hedging activities such as swaptions, options, futures, and short sales.[104]

The table below shows the market values and durations of all of AGNC's assets and liabilities as of Q1 2013 and the resulting net duration gap. A positive duration gap, such as AGNC's, means that a firm will experience losses when interest rates rise. The larger the positive duration gap, the larger the losses. For example, starting with the same duration gap, if there are two firms – one holding all plain vanilla bonds and the other holding all MBS – an increase in interest rates will create more losses for the second firm than the first. This is because the increase in interest rates extends the duration of the MBS firm – due to the embedded prepayment option in mortgages – thereby increasing their duration gap and producing more losses. mREITs identify this special MBS-related risk (often referred to as convexity risk) and hedge for it.[105]

[103] "**Duration** is a measure of the maturity of a fixed-rate security or, equivalently, its sensitivity to movements in interest rates. A duration of four years implies that a 1 percent change in yields is associated with a 4 percent change in price. Note that this market rule-of-thumb estimate of MBS duration is approximate—because future prepayment rates are unknown, the expected duration of an MBS will fluctuate over time because of variation in market conditions and the term structure of interest rates." From: Vickery and Wright. "TBA Trading and Liquidity in the MBS Market." FRBNY Economic Policy Review. May 2013. http://www.newyorkfed.org/research/epr/2013/1212vick.pdf

[104] mREITs may also modify their portfolio holdings as a means of controlling their duration gap.

[105] Some observers argue that there exists a feedback between hedging for convexity and volatility in interest rates. This convexity hedging is seen as one way mREITs potentially pose risks for the broader financial system. See Fernald, Keane and Mosser (1994), Duarte (2008), and Perli and Sack (2003).

Table 4

Assets	Market Value	Duration
Fixed	74.8	4.2
ARM	0.8	1.8
CMO*	0.7	6.7
TBA	27.3	4.4
Cash	3.3	0
Total	106.9	4.1
Liabilities & Hedges	Market Value/ Notional	Duration
Liabilities	-66.3	-0.3
Liabilities (Other)**	-0.9	-7
Swaps	-51.3	-4.5
Preferred	-0.2	-8.4
Swaptions	-22.9	-1.9
Treasury / Futures	-13.6	-6.8
Total		-3.6
Net Duration Gap[+]		0.5

*CMO balance includes interest-only, inverse interest-only and principal-only securities

**Represents other debt in connection with the consolidation of structured transactions under GAAP

Source: American Capital Agency Group, Investor Presentation, June 12,2013, pg. 24

[+]The Net Duration Gap is derived from the weighted duration of assets and liabilities and is not calculated by simply summing the various durations listed here in the table.

Risks mREITs Pose (Systemic Risks)

As previously discussed, a sudden rise in interest rates, a decline in MBS prices caused by other market forces, or any event that causes mREITs to lose a significant portion of their funding, could lead to rapid deleveraging by mREITs and possibly default.[106] Because mREITs are significant holders of MBS, deleveraging or default could have consequences well beyond the mREIT sector.

In the case in which MBS prices decline as a result of rising interest rates or some other market force, mREITs would be hit with margin calls and be forced to sell their unencumbered assets until they exhaust these, and then subsequently would default. Even if the mREIT can meet its margin calls by rapidly selling unencumbered assets, these sales might fetch unusually low prices (fire sale prices) compared with what such

[106] Begalle, Martin, McAndrews and McLaughlin (2013) document that the tri-party repo market is subject to fire sales which are differentiated by pre-default and post-default fire sales.

sales might generate over time. Margin calls could easily force an mREIT to sell its unencumbered assets rapidly, but these are only a small portion of total mREIT MBS holdings (and therefore a very small portion of total outstanding MBS); therefore, it seems unlikely that the rapid sale would have a significant impact on market MBS prices.[107]

On the other hand, if an mREIT defaults and is forced into bankruptcy, its counterparties are able to terminate their repo contracts (due to the bankruptcy QFC exemption), take possession of all of the MBS collateral and perhaps liquidate it.[108] For any of the largest few mREITs, immediate liquidation of all of the defaulting mREIT's collateral may release a sufficient amount of MBS, relative to total MBS outstanding, to impact market prices, at least to an extent. If the MBS market is already in turmoil so that a number of mREITs default, this will exacerbate that turmoil and may lead to broad scale MBS fire sales, having an even greater impact on market prices of MBS. Moreover, if the value of MBS declines to such an extent that mREIT counterparties are not able to meet their own commitments, losses might cascade to their counterparties and their counterparties' counterparties, therefore spilling over to the broader economy.[109] Even if there is no spillover, MBS prices are likely to be driven down (and in turn interest rates on MBS driven up) to some extent by mREIT defaults and the concomitant MBS sales. As a result, mortgage rates are also likely to be driven up, damping housing affordability, thus having an adverse impact on the broader economy.

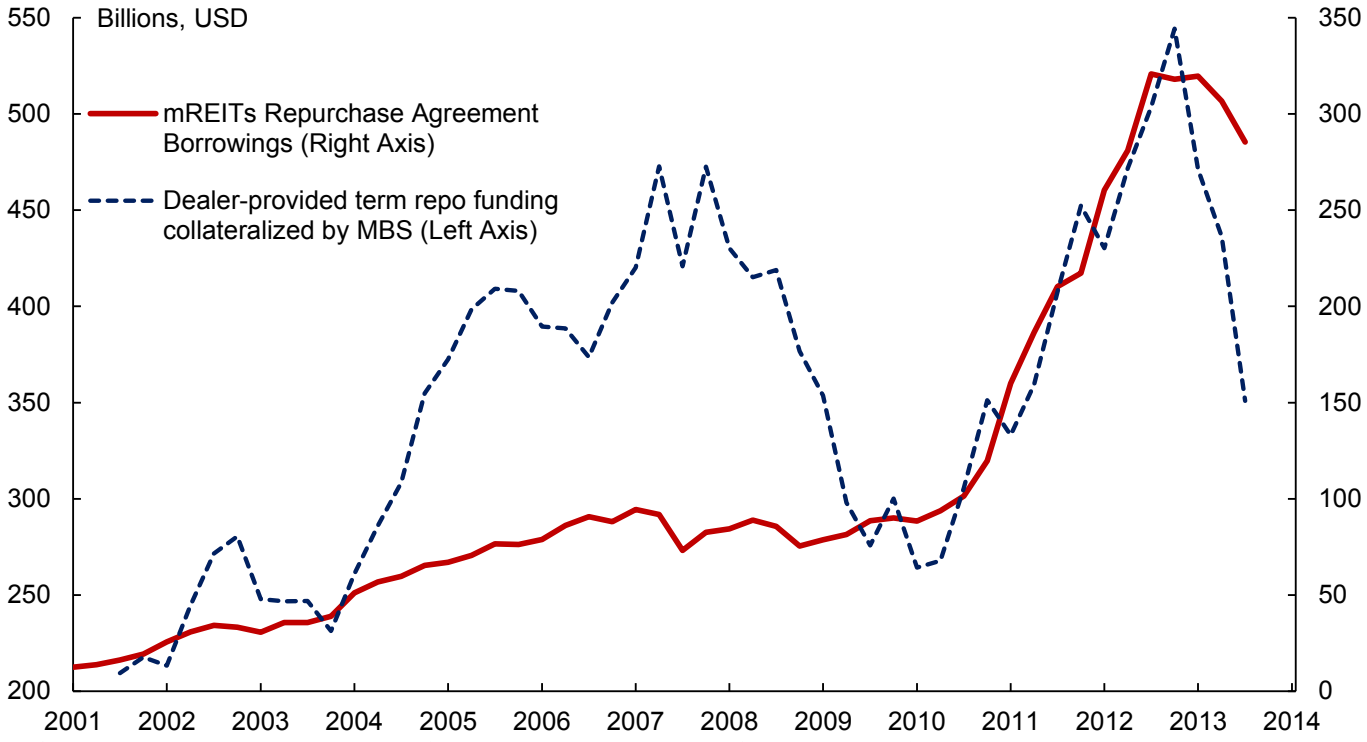
mREITs appear to be important suppliers of MBS collateral to the tri-party repo market through broker-dealers. If a number of mREITs were to default, some of this collateral might be removed from the tri-party market and market efficiency could decline somewhat. As illustrated in Figure 15, over the last several years the amount of the increase in broker-dealer lending (approximately $300 billion between June 2010 and December 2012) is almost exactly equivalent to the amount of the increase in mREIT borrowing, supporting the notion that broker dealers have provided the vast majority of funding used by mREITs. In turn, as can be seen in Figure 16, the amount of agency MBS collateral posted to the tri-party market by broker-dealers – the dotted line – increased by about this same $300 billion between June 2010 and December 2012. The total value of agency MBS collateral in the tri-party repo market – the solid line – appears to mirror movements in the dotted line and both increase by about $300 billion over the same period, So Figures 15 and 16, taken together imply that the agency MBS that mREITs have pledged for most of their recent borrowing, has flowed through to the tri-party market via broker-dealers, and accounts for much of the growth over the last several years in that market. Total agency MBS collateral in the tri-party repo market amounts to $535 billion (34 percent of all tri-party repo collateral – more than any other collateral type) as of September 2013. In the same period, mREITs, through broker dealers, supplied $300 billion, or 54 percent of all agency MBS collateral, to the tri-party repo market.[110] Thus, if mREITs defaulted on a large scale, a significant portion of their MBS collateral would likely become unavailable to the tri-party repo

[107] Annaly total unencumbered assets equaled 16 percent of repo borrowings. From Annaly's 12/31/12 Annual Report, p. F-3.
[108] An mREIT could default on a counterparty without being forced into bankruptcy. Instead, the default could be handled through terms of the repo contract. See: http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/frequently-asked-questions-on-repo/26-what-happens-to-repo-transactions-in-a-default/.
[109] Table A4 in the appendix lists the mREITs that name repo counterparties in their 10-Ks.
[110] The total amount of repos at all mREITs equaled $286 billion as of September 30, 2013. However, to better estimate the true amount of MBS collateral flowing through broker-dealers to the tri-party repo market, we inflate the $286 to account for the additional haircuts posted to broker-dealers in repo transactions. mREIT haircuts on agency MBS-backed repo loans from broker-dealers average 5 percent, thus the amount of agency MBS collateral flowing to the tri-party repo market from mREITs is probably closer to $300 billion ($286 billion*1.05).

market, eliminating a heavily relied upon form of collateral. The collateral could become unavailable for tri-party use if the following two conditions are met: 1) broker-dealers are unwilling to hold MBS collateral outright and therefore sell it to investors; and 2) the investors acquiring the MBS hold it outright rather than using it as collateral in the repo market.[111]

Some investors, those who are not well-suited to perform credit analysis, will lend only if they can receive high-quality collateral in return. If high-quality MBS collateral is withdrawn from tri-party use, these lenders may refrain from making loans that if collateral were available, would be efficient for them to make.[112] Beyond this simple efficiency loss, if MBS collateral were withdrawn from the tri-party market, and certain lenders in that market (such as money market mutual funds) reduced their lending, borrowers who typically borrow in that market might suffer losses, and some might fail.

Figure 15: mREIT Repo Borrowing and Broker-Dealer Lending



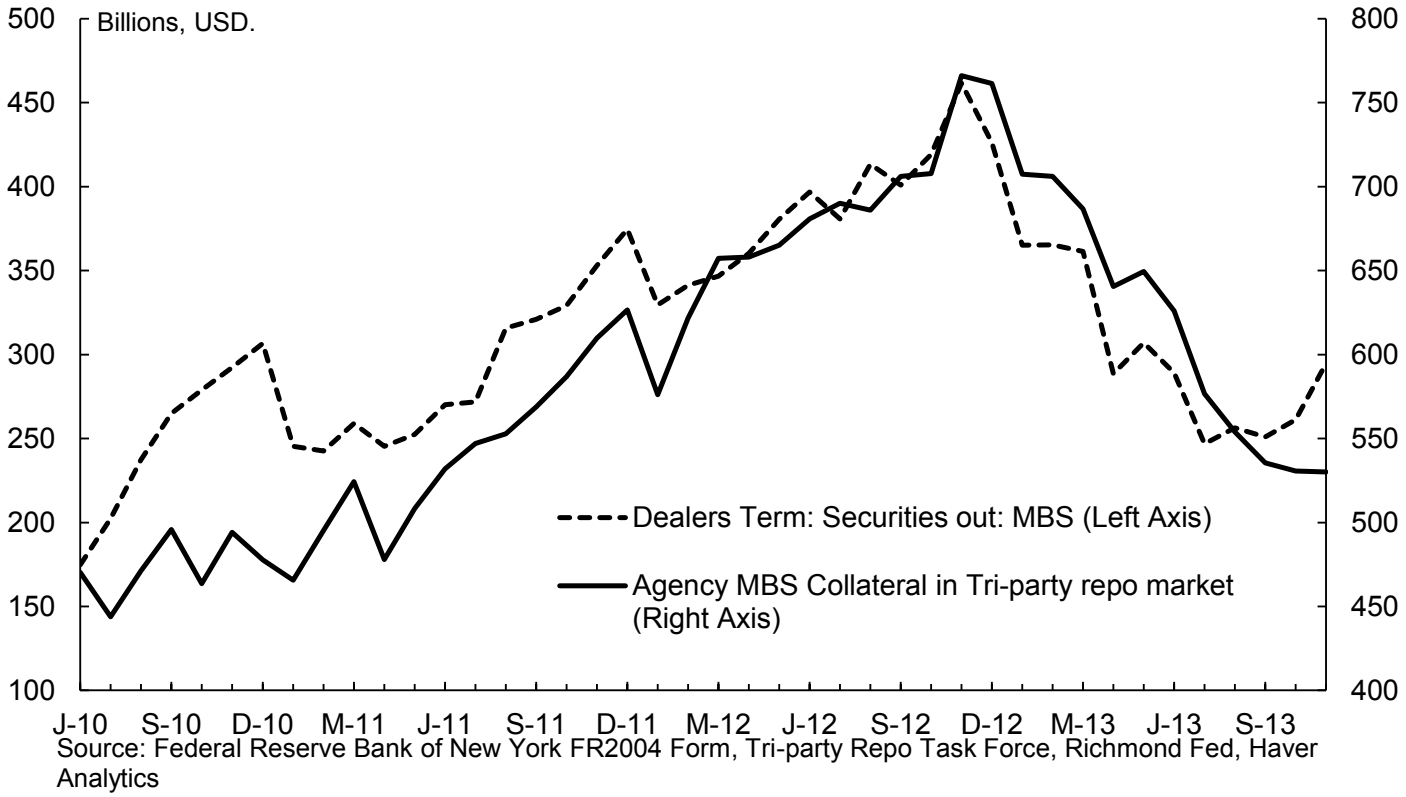
Sources: Federal Reserve Bank of New York FR2004 Form, SNL Financial & Richmond Fed
Note: Quarterly data from mREITs listed in Table A5.

[111] Some observers refer to this as a reduction in "collateral velocity." See "Velocity of Pledged Collateral" Manmohan Singh, IMF Working Paper (2011) for more information on collateral velocity.

[112] There are some observers who believe that the tri-party market is bigger than it otherwise would be due to past government interventions to prop up this market in times of financial distress. Therefore, events such as the failure of mREITs that would shrink the size of the tri-party repo market, may actually not be efficiency reducing.

In fact, there was a significant reduction of agency MBS collateral in the tri-party repo market (see Figure 16) over the same period that long-term interest rates increased (in the nine months prior to the third quarter of 2013). As was previously discussed, mREITs provide a substantial amount of agency MBS collateral to the tri-party repo market and have been shrinking their MBS-based borrowing (as seen in the red line in Figure 15). However, other market participants are reducing their MBS-based repo borrowing even more (as seen in the blue dotted line in Figure 15). Surprisingly, given mREITs' heavy reliance on leverage and significant maturity mismatch, mREITs don't seem to have reacted as strongly to rising interest rates as some other players. However, if interest rates were to rise suddenly, the mREIT structure could lead to a rapid MBS selloff.

Figure 16: Broker-Dealer Agency MBS Financing and Tri-Party Repo



Source: Federal Reserve Bank of New York FR2004 Form, Tri-party Repo Task Force, Richmond Fed, Haver Analytics

5. Conclusion

Policymakers, the press, and other observers have raised concerns about possible systemic risks that may flow from mREITs, especially given the speed with which they have grown over the last five years. mREITs invest heavily in MBS, a long-term asset, and fund these investments largely with term repo, a fairly short-term liability. The recent financial crisis highlighted the risks that might cascade beyond troubled nonbank institutions when those institutions engage in the types of maturity transformation being undertaken by mREITs.

Clearly investors in mREITs have reason to be concerned given that this asset-liability mix leaves mREITs critically exposed to interest rate risk. In fact, recent interest rate increases have caused mREITs to shrink and have produced significant declines in the mREIT stock prices.

Still, the danger to the financial system more broadly is less clear. For one thing, interest rates would need to increase significantly and rapidly to cause widespread mREIT insolvencies. Additionally, mREITs' share of all MBS outstanding, while not insignificant, is only about 6 percent, so that any problems at mREITs would have to be magnified by counterparty actions in order to produce system-wide problems.

References

Adrian, Tobias and Ashcraft, Adam B. and Cetorelli, Nicola, "Shadow Bank Monitoring" (September 1, 2013). FRB of New York Staff Report No. 638. Available at SSRN: http://ssrn.com/abstract=2334918 or http://dx.doi.org/10.2139/ssrn.2334918

Adrian, Tobias, Daniel Covitz, and Nellie Liang. "Financial Stability Monitoring." (No. 601). Federal Reserve Bank of New York, *Staff Working Paper*, (2013).

Bank for International Settlements. 2010 "The Role of Margin Requirements and Haircuts in Procyclicality." CGFS Papers, no. 36, March.

Barclays. 2012. "U.S. REITs. REITs 101: An Introduction." Barclays Capital Inc., Equity Research. July 17. Available at: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCkQFjAA&url=http%3A%2F%2Furbanland.uli.org%2Fwp-content%2Fuploads%2F2013%2F10%2FUSREITs_REITs_101_An_Introduction.pdf&ei=w1d1UqGxG-_esAT4voHoAw&usg=AFQjCNHs2Jv1oqye6y9KALxDDLlWkhJZUg&bvm=bv.55819444,d.cWc&cad=rja.

Bernanke, Ben S. 2012. "Some Reflections on the Crisis and the Policy Response." At the Russell Sage Foundation and The Century Foundation Conference on "Rethinking Finance," New York, New York. April 12, 2012. Available at: http://www.federalreserve.gov/newsevents/speech/bernanke20120413a.htm

Board of Governors of the Federal Reserve System. 2013. Federal Reserve Statistical Release Z.1, Financial Accounts of the United States (formerly named Flow of Funds Accounts). Available at: http://www.federalreserve.gov/releases/z1/.

Bordo, Michael D. and Richard Sylla. 1995. *Anglo-American Financial Systems: Institutions and Markets in the Twentieth Century*. Irwin, New York.

Case 1:07-cv-00815-JB-WDS Document 68 Filed 05/27/2008 Page 1 of 196 UNITED STATES DISTRICT COURT DISTRICT OF NEW MEXICO IN RE THORNBURG MORTGAGE, INC SECURITIES LITIGATION Case No. 07-815 JB/WDS CONSOLIDATED CLASS ACTION COMPLAINT

Chan, Su Han, John Eriickson and Ko Wang. 2003. *Real Estate Investment Trusts : Structure, Performance, and Investment Opportunities: Structure, Performance, and Investment Opportunities*. Oxford University Press.

Claessens, Stijn, Zoltan Pozsar, Lev Ratnovski, and Manmohan Singh. 2012. "Shadow Banking: Economics and Policy." *IMF Staff Discussion Note*. SDN/12/12: n. page. Print. <http://www.imf.org/external/pubs/ft/sdn/2012/sdn1212.pdf>.

Copeland, Adam, Darrell Duffie, Antoine Martin, and Susan McLaughlin. 2012. "Key Mechanics of the US Tri-Party Repo Market." *Economic Policy Review*: 17-28.

Duarte, Jefferson. 2008. "The causal effect of mortgage refinancing on interest rate volatility: Empirical evidence and theoretical implications." *Review of Financial Studies* 21, no. 4: 1689-1731.

Dudley, William C. 2013. ,"Fixing wholesale funding to build a more stable financial system." Remarks at the New York Bankers Association's 2013 Annual Meeting and Economic Forum, New York City, February 1.

Duffie, James Darrell, and David Skeel. 2012. "A dialogue on the costs and benefits of automatic stays for derivatives and repurchase agreements." *U of Penn, Inst for Law & Econ Research Paper* 12-02 (2012).

Durrett, A. Overton. 1961. A. Overton Durrett, "The Real Estate Investment Trust: A New Medium for Investors," *William and Mary Law Review*. Volume 3, Issue 1, Article 8: 140-61. Available at: http://scholarship.law.wm.edu/wmlr/vol3/iss1/8.

Federal Reserve Bank of New York. 2012. "Tri-Party Repo Statistics as of 12/11/2012." Available at: http://www.newyorkfed.org/banking/pdf/dec12_tpr_stats.pdf

Fernald, Julia D, Frank Keane, and Patricia C Mosser. "Mortgage Security Hedging and the Yield Curve."*Federal Reserve Bank of New York Quarterly Review*. Volume 19.Number 2 (Summer-Fall 1994): 92-100. Print. <http://www.newyorkfed.org/research/quarterly_review/1994v19/v19n2article5.pdf>.

Fink, Matthew P. 2005. "The Revenue Act of 1936: The Most Important Event in the History of the Mutual Fund Industry." *Financial History: The Magazine of the Museum of American Finance*. Fall: 16-19. Available at: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCsQFjAA&url=http%3A%2F%2Fwww.moaf.org%2Fpublications-collections%2Ffinancial-history-magazine%2F84%2F_res%2Fid%3DFile1%2FRevenue%2520Act%2520-%2520mag%2520article.pdf&ei=K0J1UtipOYjOsATPvoGYBQ&usg=AFQjCNGb-4IBoA1vuWt1zgUxMreC-9uXMw&bvm=bv.55819444,d.cWc&cad=rja

Fisher, Mark. "Special repo rates: An introduction." *Economic Review-Federal Reserve Bank of Atlanta* 87, no. 2 (2002): 27-44

Fleming, Michael J. and Garbade, Kenneth, The Repurchase Agreement Refined: GCF Repo. Current Issues in Economics and Finance, Vol. 9, No. 6, June 2003. Available at SSRN: http://ssrn.com/abstract=682701

Fleming, Michael J., Warren B. Hrung, and Frank M. Keane. "The Term Securities Lending Facility: Origin, Design, and Effects." *CURRENT ISSUES IN ECONOMICS AND FINANCE* 15.2 (2009).

Fleming, Michael, Warren Hrung, and Frank Keane. "Repo market effects of the term securities lending facility." *FRB of New York Staff Report* 426 (2010).

Fuster, Andreas, Laurie Goodman, David Lucca, Laurel Madar, Linsey Molloy, and Paul Willen . "THE RISING GAP BETWEEN PRIMARY AND SECONDARY MORTGAGE RATES ." *Federal Reserve Bank*. November 28 (2012): n. page. Web. 8 Jun. 2013. <http://www.newyorkfed.org/research/conference/2012/mortgage/primsecsprd_frbny.pdf>.

Geanakoplos, John, "Solving the Present Crisis and Managing the Leverage Cycle" (February 1, 2009). Economic Policy Review, Vol. 16, No. 1, p. 101, August 2010. Available at SSRN: http://ssrn.com/abstract=1678171 or http://dx.doi.org/10.2139/ssrn.1678171.

Government Accountability Office (GAO). 2011. "Bankruptcy: Complex Financial Institutions and International Coordination Pose Challenges." U.S. Government Accountability Office, Report to Congressional Committees, GAO-11-707. July 2011. Available at: http://www.gao.gov/assets/330/321213.pdf (accessed December 18, 2012)

Gorton Gorton, Gary B. and Metrick, Andrew, "Regulating the Shadow Banking System" (October 18, 2010). *Brookings Papers on Economic Activity*, Fall 2010.

Hagerty, James R. 2012. *The Fateful History of Fannie Mae: New Deal Birth to Mortgage Crisis Fall*. The History Press. Charleston, S.C.

Hall, John T. 1974. *REITS: The First Decade, A Collection of Writings*. John T. Hall, Inc. Mequon, Wisconsin.

International Monetary Fund. 2013. "Global Financial Stability Report: Transition Challenges to Stability." World Economic and Financial Furveys. Washington, DC. October. Available at: http://www.imf.org/External/Pubs/FT/GFSR/2013/02/index.htm

Investment Company Act of 1940. Pub. L. No.76-768. 15 U.S.C. Section 80a-1 – 80a-64.

Investment Company Institute (ICI). "2013 Investment Company Fact Book." "Appendix A, How U.S. Registered Investment Companies Operate and the Core Principles Underlying their Regulation." 53rd Edition, 2013.

Jones, Sheldon A., Laura M. Moret and James M. Storey. 1988. "The Massachusetts Business Trust and Registered Investment Companies." *Delaware Journal of Corporate Law*. Volume 13: 421-58.

Juks, Reimo. "Asset encumbrance and its relevance for financial stability."*SVERIGES RIKSBANK ECONOMIC REVIEW* (2012): 3.

Kingsbury, Kevin, and Lingling Wei. "Thornburg Sells $20.5 Billion In Mortgage-Backed Securities." *Wall Street Journal*. N.p., 20 Aug 2007. Web. 10 Jun 2013. <http://online.wsj.com/article/SB118761442268302762.html>.

Kiplinger Magazine. 1962. “Real Estate Investment Trusts.” *Changing Times*. January: 27-30.

Mildenberg , David. "Thornburg Can't Meet Margin Calls, Survival in Doubt (Update5)." *Bloomberg*. N.p., 07 Mar 2008. Web. 10 Jun 2013. <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=abu461kYcx0Y&refer=home>.

Morley, John D. 2011. “Collective Branding and the Origins of Investment Management Regulation: 1936-1942.” University of Virginia School of Law John M. Olin Law and Economics Research Paper Series No. 2011-01. March. Available at SSRN: http://ssrn.com/abstract=1762217 or http://dx.doi.org/10.2139/ssrn.1762217

National Association of Real Estate Investment Trusts (NAREIT). 2011. Comment letter submitted in reference to the SEC’s Release: “Companies Engaged in the Business of Acquiring Mortgages and Mortgage-Related Instruments, Release No. IC-29778; File No. S7-34-11.” November 7, 2011. Available at: http://www.sec.gov/comments/s7-34-11/s73411-159.pdf Accessed September 9, 2013.

National Association of Real Estate Investment Trusts (NAREIT). 2012. “REITs Continue to Outperform Equity Market in 2012.” January 8, 2012. Available at: http://www.reit.com/~/media/PDFs/NAREIT%202012%20REIT%20Market%20Review.ashx. Accessed December 18, 2013.

National Association of Real Estate Investment Trusts (NAREIT). 2013. “Historical REIT Industry Market Capitalization: 1972-2012” Table. Available at: http://www.reit.com/DataAndResearch/US-REIT-Industry-MarketCap.aspx, accessed August 28, 2013.

Nayak, Rodger, and Dhaval Patel. "Annaly externalization to lower costs, pressure competition."*www.snl.com*. N.p., 25 Mar 2013. Web. 10 Jun 2013. <http://www.snl.com/InteractiveX/Article.aspx?id=17252317>.

Perli, Roberto, and Brian Sack. "Does mortgage hedging amplify movements in long-term interest rates?." *The Journal of Fixed Income* 13, no. 3 (2003): 7-17.

Pozsar, Zoltan, Tobias Adrian, Adam B. Ashcraft, and Haley Boesky. "Shadow Banking." *FRB of New York Staff Report* 458 (2010).

Quinn, Lawrence Richter, “A New Operating Structure,” *Mortgage Banking*, June 1998, pp. 82-87.

Roe, Mark J. “The Derivatives Market’s Payment Priorities as Financial Crisis Accelerator,” 63 STAN. L. REV. 539 (2011) -- http://www.stanfordlawreview.org/sites/default/files/articles/Roe-63-Stan-L-Rev-539.pdf.

Securities and Exchange Commission. “Companies Engaged in the Business of Acquiring Mortgages and Mortgage-Related Instruments; Concept release.” Federal Register, Vol. 76, No. 173. (September 7, 2011), pp. 55300- 55308.

Shenn, Jody. "Agency Mortgage-Bond Spreads Reach 8-Year High, Hurt Consumers." *Bloomberg*. N.p., 04 Mar 2008. Web. 10 Jun 2013. <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aixgVeqlkbW4>.

SIFMA. Comment letter submitted in reference to the SEC’s Release: “Companies Engaged in the Business of Acquiring Mortgages and Mortgage-Related Instruments, Release No. IC-29778; File No. S7-34-11.” November 7, 2011. Available at: http://www.sec.gov/comments/s7-34-11/s73411-159.pdf. Accessed October 8, 2013.

Singh, Manmohan. "Velocity of Pledged Collateral IMF Working Paper ." *IMF Working Paper*. WP/11/256 (2011): <http://www.imf.org/external/pubs/ft/wp/2011/wp11256.pdf>.

Stein, Jeremy C. 2013. Remarks on “Overheating in Credit Markets: Origins, Measurement, and Policy Responses” at the "Restoring Household Financial Stability after the Great Recession: Why Household Balance Sheets Matter" research symposium sponsored by the Federal Reserve Bank of St. Louis, St. Louis, Missouri, February 7. Available at http://www.federalreserve.gov/newsevents/speech/stein20130207a.htm

Stulz, René M. "Credit default swaps and the credit crisis." *The Journal of Economic Perspectives* 24.1 (2010): 73-92.

U.S. Government Accountability Office (GAO). 2011. “Ginnie Mae: Risk Management and Cost Modeling Require Continuing Attention.” Washington, DC. Report number 12-49, Nov 14, 2011. Available at: http://gao.gov/products/GAO-12-49.

U.S. Government Printing Office. 1965. “The Budget of the United State Government for the Fiscal Year Ending June 30, 1966.” Washington. Available at: http://fraser.stlouisfed.org/publication/?pid=54.

U.S. Government Printing Office. 1968. “The Budget of the United State Government: Fiscal Year 1969.” Washington. Available at: http://fraser.stlouisfed.org/publication/?pid=54.

Valachi, Donald J. 1977. “REITs: A Historical Perspective.” *The Appraisal Journal*. July: 449-55.

Vandell, Kerry D. "The Mortgage REITs: Dynamos or Duds?." *Wharton Real Estate* (1999).

White, Eugene N. 2009. “Lessons from the Great American Real Estate Boom and Bust of the 1920s.” NBER Working Paper No. 15573. National Bureau of Economic Research. Cambridge, Massachusetts. December 2009. Available at: http://www.nber.org/papers/w15573.

Appendix

Table A1: Policy Interventions

Date	Agency	Policy	Description
Mar-08	Federal Reserve	Primary Dealer Credit Facility (PDCF)	Overnight loans by the Fed against essentially tri-party eligible collateral.
Mar-08	Federal Reserve	Term Securities Lending Facility (TSLF)	The TSLF loaned Treasury securities to primary dealers for one month against eligible collateral. For so-called "Schedule 1" auctions, the eligible collateral comprised Treasury securities, agency securities, and agency mortgage-backed securities. For "Schedule 2" auctions, the eligible collateral included schedule 1 collateral plus highly rated private securities.
Jul-08	FHFA	HERA established FHFA as New regulator for Fannie Mae and Freddie Mac	FHFA becomes the new regulator and overseer of Fannie and Freddie.
Sep-08	FHFA	FHFA appointed as conservator of Fannie Mae and Freddie Mac	Increase the availability of mortgage financing by allowing these institutions to grow their guarantees without limit, while limiting the size of retained mortgage and security portfolios and requiring these portfolios to be reduced over time.
Sep-08	Federal Reserve	Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility	Lending facility that financed the purchases of high-quality asset-backed commercial paper (ABCP) from money market mutual funds by U.S. depository institutions and bank holding companies. The program was intended to assist money funds that hold such paper to meet the demands for redemptions by investors and to foster liquidity in the ABCP market and money markets more generally.
Oct-08	Federal Reserve	Commercial Paper Funding Facility (CPFF)	The CPFF provided a liquidity backstop to U.S. issuers of commercial paper through a specially created limited liability company (LLC), the CPFF LLC. This LLC purchased three-month unsecured and asset-backed commercial paper directly from eligible issuers.
Oct-08	Federal Reserve	Money Market Investor Funding Facility (MMIFF)	Intended to provide liquidity to U.S. money market mutual funds and certain other money market investors, thereby increasing their ability to meet redemption requests and hence their willingness to invest in money market instruments, particularly term money market instruments
Nov-08	Federal Reserve	Term Asset-Backed Securities Loan Facility	Issued loans with terms of up to five years to holders of eligible asset-backed securities (ABS). The TALF was intended to assist the financial markets in accommodating the credit needs of consumers and businesses of all sizes by facilitating the issuance of ABS collateralized by a variety of consumer and business loans; it was also intended to improve the market conditions for ABS more generally.
Nov-08	Federal Reserve	Large Scale Asset Purchases	$500 billion in purchases of Agency MBS
Mar-09	Treasury	Home Affordable Modification Program (HAMP)	Provides homeowners with assistance in avoiding residential mortgage loan foreclosures
Mar-09	Federal Reserve	Large Scale Asset Purchases	Additional $750 billion in purchases of Agency MBS
2008	FHA	Hope for Homeowners Program (H4H)	Allows certain distressed borrowers to refinance their mortgages into FHA-insured loans in order to avoid residential mortgage loan foreclosures
2009	FHFA	Home Affordable Refinance Program (HARP)	Allows borrowers current on their mortgage payments to refinance and reduce their monthly mortgage payments at loan-to-value ratios of up to 125% and without new mortgage insurance
Sep-11	Federal Reserve	Re-investments	Begin Reinvesting Interest and Principal Payments in Agency MBS
Oct-12	FHFA	HARP 2.0	Increase HARP LTV ratio above 125%. Enables borrowers to go to any lender to refinance
Sep-12	Federal Reserve	"Open-ended" LSAPs	Begin open-ended purchases of Agency MBS at a pace of $40 billion per month.

Table A2: Making Home Affordable Program

Making Home Affordable Program	
Principal Reduction Alternative (PRA)	Provides Principal forgiveness on eligible underwater loans that are modified under HAMP
Home Affordable Foreclosure Alternatives (HAFA)	Provides transition alternatives to foreclosure in the form of a short sale or deed-in-lieu of foreclosure.
FHA-HAMP and RD-HAMP modification programs	Provides first lien modifications for distressed borrowers in loans guaranteed through the Federal Housing Administration and Rural Housing Service.
Unemployment Program (UP)	Provides temporary forbearance of mortgage principal to enable unemployed borrowers to look for a new job without fear of foreclosure.
Second Lien Modification Program (2MP)	Provides modifications and extinguishments on second liens when there has been a first lien HAMP modification on the same property.
Source: Treasury.gov/ Richmond Fed	

Figure A1: Bear Stearns Repo Financing and MBS/ABS Holdings

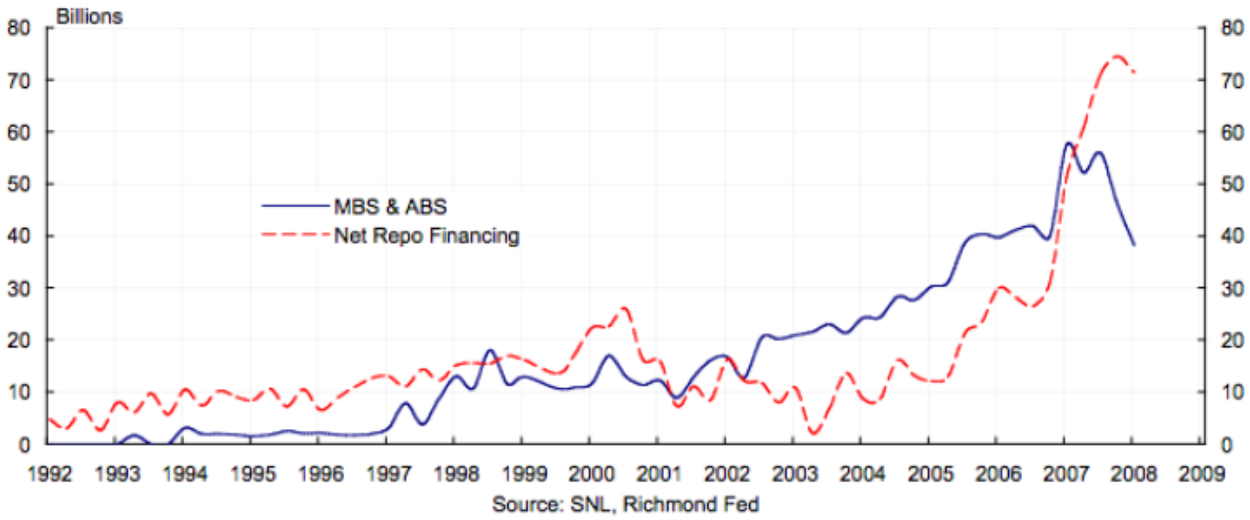
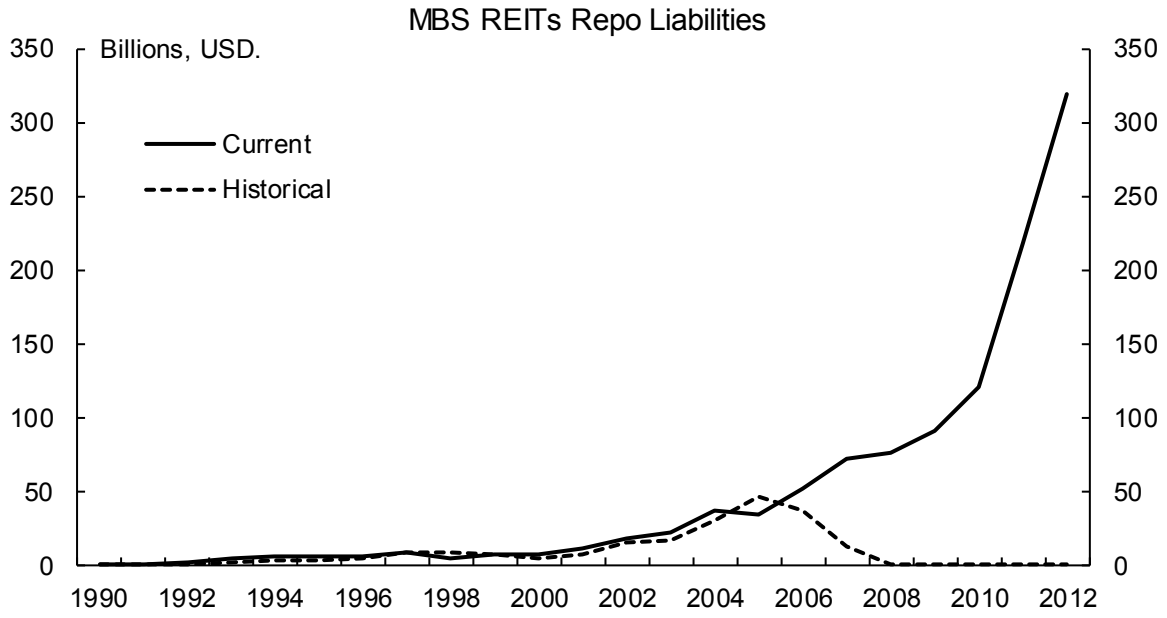
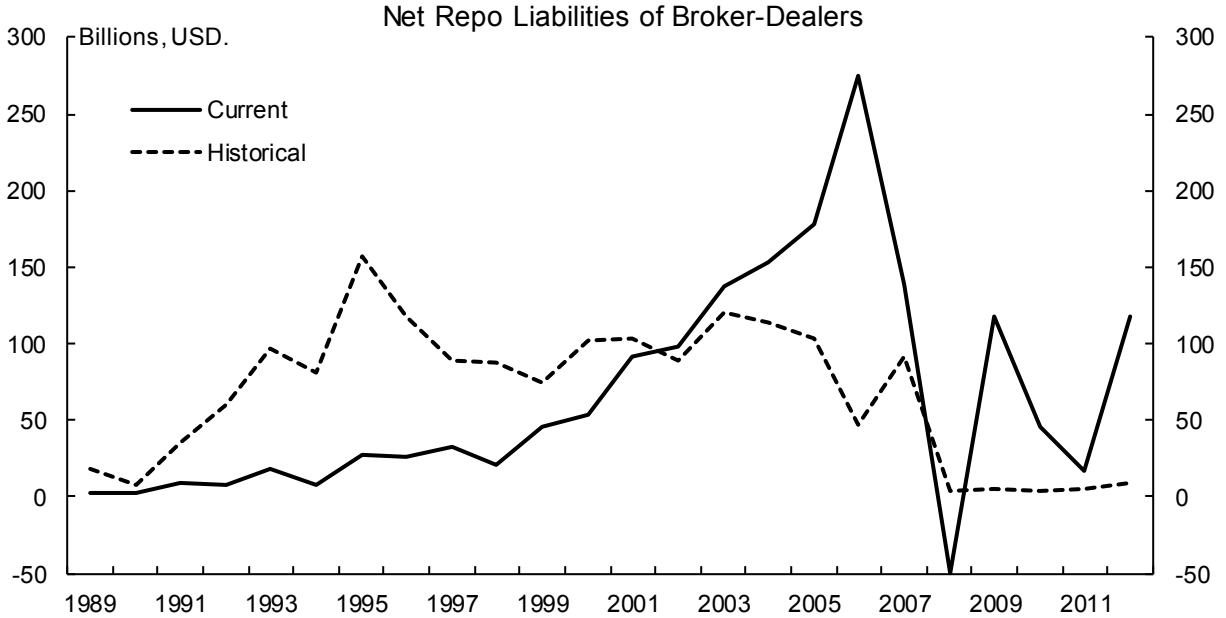


Figure A2:



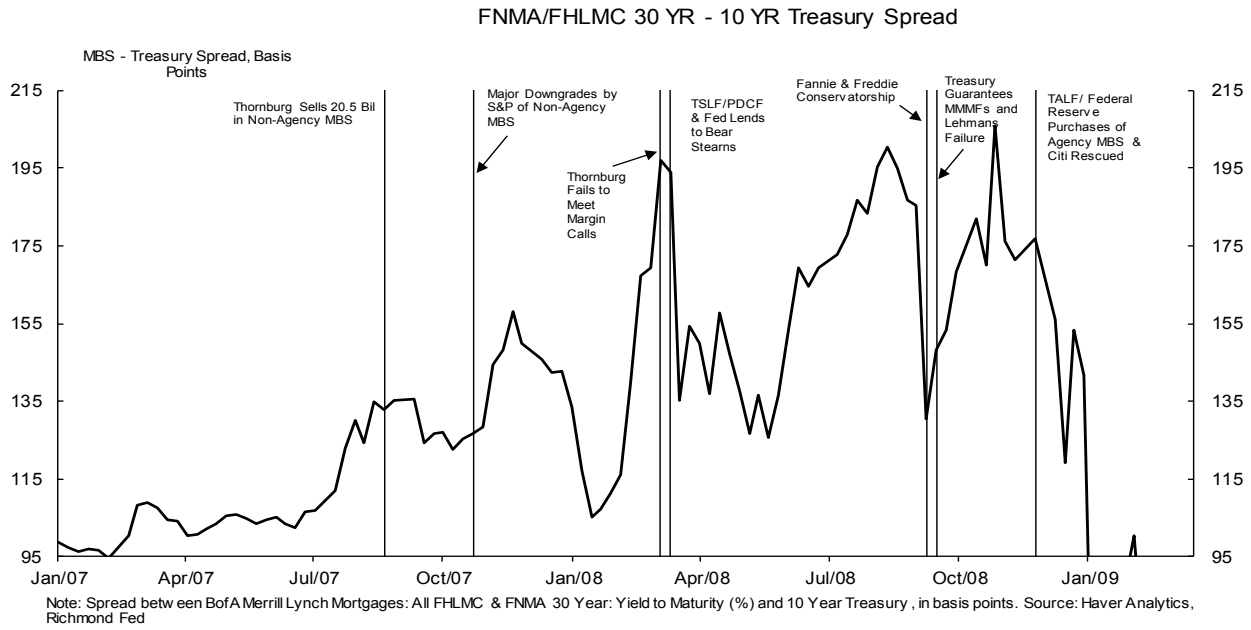
Note: Historical refers to repo liabilities of MBS REITs no longer in existence. Current refers to MBS REITs still operating. Source: SNL Financial, Richmond Fed

Figure A3:



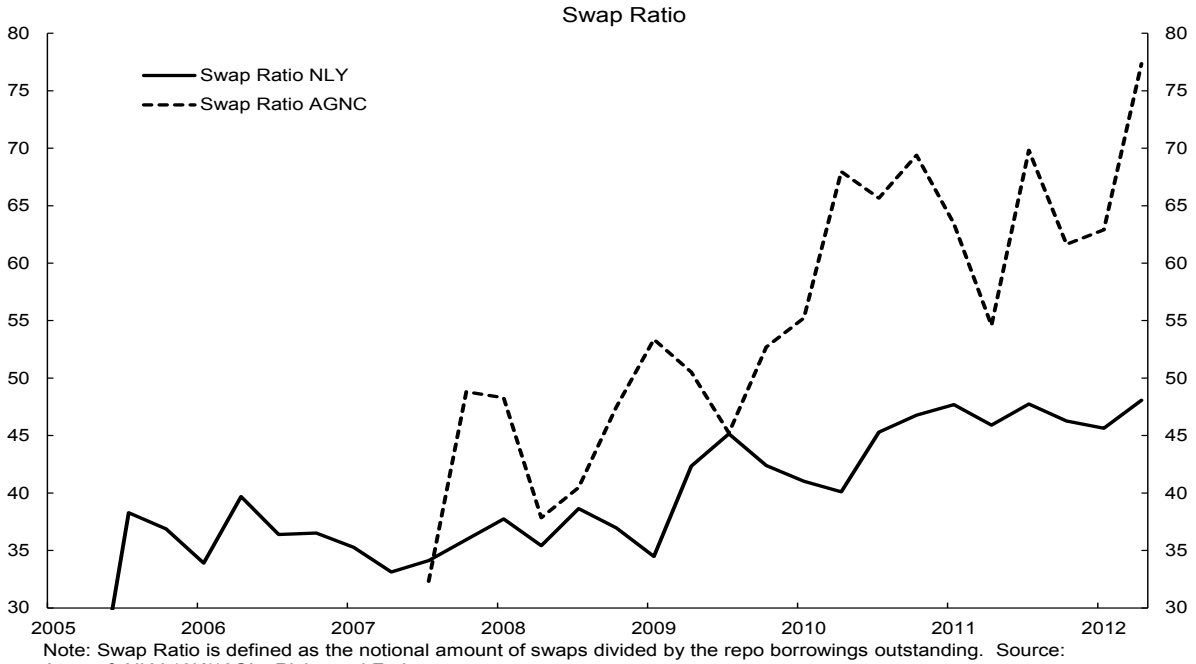
Note: Net repo liabilities is defined as repurchase agreements less reverese repurchase agreements. Historical refers to repo liabilities of Broker-Dealers no longer in existence. Current refers to Broker-Dealers still in operation. Source: SNL Financial, Richmond Fed

Figure A 4



Note: Spread betw een BofA Merrill Lynch Mortgages: All FHLMC & FNMA 30 Year: Yield to Maturity (%) and 10 Year Treasury , in basis points. Source: Haver Analytics, Richmond Fed

Figure A 5



Note: Swap Ratio is defined as the notional amount of swaps divided by the repo borrowings outstanding. Source: Agnce & NLY 10K/10Q's, Richmond Fed

Table A 3

non-Agency/Hybrid mREITs sub-components				Agency mREITs sub-components			
Symbol	Company	Exchange	Weight (%)	Symbol	Company	Exchange	Weight (%)
MITT	AG Mortgage Investment Trust	NYSE	2.193	AGNC	American Capital Agency Corp.	NASDAQ	30.1356
ARI	Apollo Commercial Real Estate	NYSE	2.1207	MTGE	American Capital Mortgage Inv	NASDAQ	3.6671
AMTG	Apollo Residential Mortgage	NYSE	2.0178	NLY	Annaly Capital Mgmt Inc.	NYSE	38.0067
BXMT	Blackstone Mortgage Trust	NYSE	2.6081	ANH	Anworth Mortgage Asset Corp.	NYSE	2.4556
CIM	Chimera Investment Corp.	NYSE	10.9881	ARR	ARMOUR Residential REIT Inc.	NYSE	5.4574
EARN	Ellington Residential Mortgage	NYSE	0.5781	CMO	Capstead Mortgage Corp.	NYSE	3.5523
IVR	Invesco Mortgage Capital Inc.	NYSE	8.7448	CYS	CYS Investments	NYSE	5.4212
JERT	JER Investors Trust Inc.	OTC Pink	0.0008	DX	Dynex Capital Inc.	NYSE	1.7025
MFA	MFA Financial Inc.	NYSE	11.0038	HTS	Hatteras Financial Corp.	NYSE	7.5389
NRZ	New Resdl Invt Corp	NYSE	5.7167	JMI	JAVELIN Mortgage	NYSE	0.6094
NYMT	New York Mortgage Trust Inc.	NASDAQ	1.5234	ORC	Orchid Island Capital Inc.	NYSE MKT	0.1218
NCT	Newcastle Investment Corp.	NYSE	4.8526	WMC	Western Asset Mrtg Cap Corp	NYSE	1.3314
NRF	NorthStar Realty Finance Corp.	NYSE	6.1139				
PMT	PennyMac Mortgage Investment	NYSE	4.4908				
RWT	Redwood Trust Inc.	NYSE	5.2888				
RSO	Resource Capital Corp.	NYSE	2.79				
STWD	Starwood Property Trust Inc.	NYSE	14.6452				
TWO	Two Harbors Investment Corp.	NYSE	13.8335				
ZFC	ZAIS Financial Corp	NYSE	0.49				

**Companies in the Agency mREIT index had an Agency –to-Asset Ratio greater than 80% as of Q4 2012.
non-Agency/Hybrid mREIT index subcomponents had an Agency –to-Asset Ratio less than 80% as of Q4 2012.

Table A4: List of mREITs and Their Relevant Financial Information

Name	Some Facts					Swaps					Repurchase Agreements					Portfolio Composition and Assets		
	External Manager	Date Established	Type	Net Interest Margin (3)	Short-Term Leverage (1)	Swap Ratio (2)	Swaps Notional (Bil. USD)	Weighted Average Pay Rate	Weighted Average Recieve Rate	Weighted Average Years to Maturity	Repurchase Agreements (Bil. USD)	Weighted Avg. Repo Rate	Weighted Avg Days Till Maturity	Weighted Avg. Haircut	Counterparties (list specific counterparties*)	Agency Secs as a % of Total Assets	Total Assets (Bil. USD)	Total Agency Holdings (Bil. USD)
AG Mortgage Investment Trust	1	3/7/2011	Hybrid	2.54	5.3	51.8	2.17	1.172	0.309	4.42	4.19	0.78	36.9	6.90%	30	77.98	4.86	3.79
American Capital Agency Corp.	1	1/7/2008	Agency	1.87	6.8	62.9	46.85	1.46	0.29	4.4	74.48	0.51	118	<5%	32	83.33	100.45	83.71
American Capital Mortgage Investment Corp.		3/15/2011	Hybrid	2.31	6.8	47	2.94	1.33	0.32	5.5	6.25	0.57	50	4.7% Agency, 29.5% Non-Agency	29	82.73	7.7	6.37
Annaly Capital Mgmt Inc.	1	11/25/1996	Agency	1.14	6.5	45.6	46.91	2.21	0.24	4.77	102.79	0.63	191	5%		92.89	133.45	123.96
Anworth Mortgage Asset Corp.	1	10/20/1997	Agency	1.03	7.5	39.4	3.16	1.98	3 month LIBOR	2.8	8.02	0.47	34	4.86%		99.46	9.29	9.24
Apollo Residential Mortgage	1	3/15/2011	Hybrid	2.7	5.1	41.1	1.5	1.2	3 month LIBOR	5.3	3.65	0.61	20	3-7% for Agency MBS, 10-50% for non-Agency MBS	23	73.27	4.49	3.29
ARMOUR Residential REIT Inc.	1	2/5/2008	Hybrid	1.45	8	47.4	8.7	1.2	0.21	5.3	18.37	0.49	34	4.80%	26*	91.48	20.88	19.1
Bimini Capital Mgmt Inc.	1	12/19/2003	Agency	0.87	42.6	0	0				0.15	0.49	14	5.10%	6*	89.47	0.19	0.17
Capstead Mortgage Corp.		9/5/1985	Agency ARM	1.09	8.5	0	0				12.78	0.47		4.50%	23	95.78	14.47	13.86
Chimera Investment Corp.*	1	6/1/2007	Hybrid	4.69	0.9	35.6	0.95	2.08	0.29		2.67	0.45	48	5%		40.52	7.75	3.14
CYS Investments	0	1/3/2006	Agency	1.14	6	53.6	7.49	1.27	3M Libor	2.7	13.98	0.48	19.6	3-6%	23*	95.25	21.06	20.06
Dynex Capital Inc.	0	12/18/1987	Hybrid	2.05	5.8	41	1.46	1.53	3M Libor	3.4	3.56	0.7	67	7.4% Agency, 19.5% non-Agency	19*	81.54	4.28	3.49
Five Oaks Investment Corp.		3/28/2012	Hybrid	5.3	2.5	50	0.04				0.08	0.85	17	10%	4*	58.33	0.12	0.07
Hatteras Financial Corp.	1	11/5/2007	Agency ARM	1.16	7.4	46.8	10.7	1.47		2.6	22.87	0.47	24.8	4.34%	24	90.61	26.4	23.92
Invesco Mortgage Capital Inc.	1	6/5/2008	Hybrid	1.81	6.1	50.9	8	2.13	1M LIBOR		15.72	0.78	17	4.74% Agency, 17.86% non-Agency, 18.91% CMBS	26*	67.69	18.91	12.8
JAVELIN Mortgage Investment Corp.**	1	6/18/2012	Hybrid	0.66	7.7	28.9	0.33	1.5		9.3	1.14	0.62	41	6.40%	18	86.05	1.29	1.11
MFA Financial Inc.	0	4/10/1998	Hybrid	2.7	2.6	28.8	2.52	2.31	0.22	1.4	8.75	0.85	79	4.8% Agency, 30.49% non-Agency, 1.74% Treasuries	26*	53.48	13.52	7.23
New York Mortgage Trust Inc.		6/24/2004	Hybrid	3.38	2.8	40.4	0.36	0.74			0.89	0.54	39	5% Agency RMBS (excluding Agency IOs), 25% Agency IOs, 35% CLOs, total weighted average "haircut" of 6.9%	11*	13.97	7.16	1
Newcastle Investment Corp.	1	10/10/2002	Multiple	4.23	0.9	16.1	0.15	5.04			0.93	0.81	36.5	5% FNMA/FHLMC, 34% non-Agency RMBS, 50% CDO VI	5*	20.76	3.95	0.82
Orchid Island Capital Inc.	1	8/17/2010	Agency	1.66	7.06	0	0				0.1	0.49	15	5.60%	4*	100	0.12	0.12
PennyMac Mortgage Investment		5/18/2009	Multiple	2.21	1.05	0	0				0.16	0.64	69		5*	0	2.56	Don't Hold MBS
Resource Capital Corp.	1	3/8/2005	Multiple	4.85	0.2	127.3	0.14				0.11	2.28	18	3.60%	3*	5.24	2.48	0.13
Starwood Property Trust Inc.		5/26/2009	CMBS & CRE	7.58	0.4	21.9	0.254	1.39	LIBOR		1.16					0	4.32	Negligable amount
Two Harbors Investment Corp.	1	5/21/2009	Hybrid	2.64	3.7	99.6	12.57	0.85	0.426	2.85	12.62	0.72	82	8.40%	21*	69.01	16.81	11.6
Western Asset Mrtg Cap Corp	1	6/3/2009	Agency	3.68	9.2	58.7	2.81	1.2		7.2	4.79	0.48	19	5.71%	14	95.15	5.36	5.1
ZAIS Financial Corp	1	5/24/2011	Hybrid	3.92	1.8	25	0.03	1.51	0.31	5.3	0.12	.49 Agency, 2.15 Non-Agency		3 - 5% Agency, 20 - 40% non-Agency.	3	35	0.2	0.07
Summary Statistics				2.64	6.3	50	160.034	1.68	0.29	4.48	320.34	0.67	47.38	5.4% (Agency), 29%(non-Agency)	17.05	81.97	432.07	354.15

1. Short-term leverage is defined as the amount of repurchase agreement liabilities as a ratio of equity. Leverage ratios below 6 are in blue. 2. Swap Ratios above 50% are in blue with the red text and below 50 is in pink with light blue text. *As of 10/10/2013 Chimera has only submitted a 10-Q for 2012 Q1 and those are the figures reported. **Year end measures are used instead of Q4 2012 if no Q4 2012 estimate is provided. 3. NIM are from the SNL Financial (Financial Highlights) Source: Respective 2012 10K/10Qs, Richmond Fed

Table A5: List of mREITs (Companies that are used for the data in various figures)

1 AG Mortgage Investment Trust, Inc.
2 American Capital Agency Corp.
3 American Capital Mortgage Investment Corp.
4 American Home Mortgage Investment Corp.
5 American Residential Investment Trust, Inc.
6 Annaly Capital Management, Inc.
7 Annaly Commercial Real Estate Group, Inc.
8 Anworth Mortgage Asset Corporation
9 Apex Mortgage Capital, Inc.
10 Apollo Commercial Real Estate Finance, Inc.
11 Apollo Residential Mortgage, Inc.
12 Arbor Realty Trust, Inc.
13 ARMOUR Residential REIT, Inc.
14 Bimini Capital Management, Inc.
15 BRT Realty Trust
16 Capstead Mortgage Corporation
17 Chimera Investment Corporation
18 Clarion Commercial Holdings, Inc.
19 Cobalt Holdings Group LLC
20 CRIIMI MAE Inc.
21 Crystal River Capital, Inc.
22 CYS Investments, Inc.
23 Dynex Capital, Inc.
24 ECC Capital Corporation
25 Ellington Residential Mortgage REIT
26 EOS Preferred Corporation
27 FBR Asset Investment Corporation
28 Five Oaks Investment Corp.
29 Franklin Finance Corporation
30 Hatteras Financial Corp.
31 HomeBanc Corp.
32 Impac Commercial Holdings, Inc.
33 Imperial Credit Commercial Mortgage Investment Cp.
34 IndyMac Mortgage Holdings, Inc.
35 Invesco Mortgage Capital Inc.
36 JAVELIN Mortgage Investment Corp.
37 JER Investors Trust Inc.
38 Laser Mortgage Management, Inc.
39 MFA Financial, Inc.
40 MortgageIT Holdings, Inc.
41 New Century Financial Corporation
42 New Residential Investment Corp.
43 New York Mortgage Trust, Inc.
44 Newcastle Investment Corp.
45 Orchid Island Capital, Inc.
46 PennyMac Mortgage Investment Trust
47 Redwood Trust, Inc.
48 Resource Capital Corp.
49 Saxon Capital, Inc.
50 TMST, Inc.
51 Two Harbors Investment Corp.
52 Webster Preferred Capital Corporation
53 Western Asset Mortgage Capital Corporation
54 Wilshire Real Estate Investment Inc.
55 ZAIS Financial Corp.