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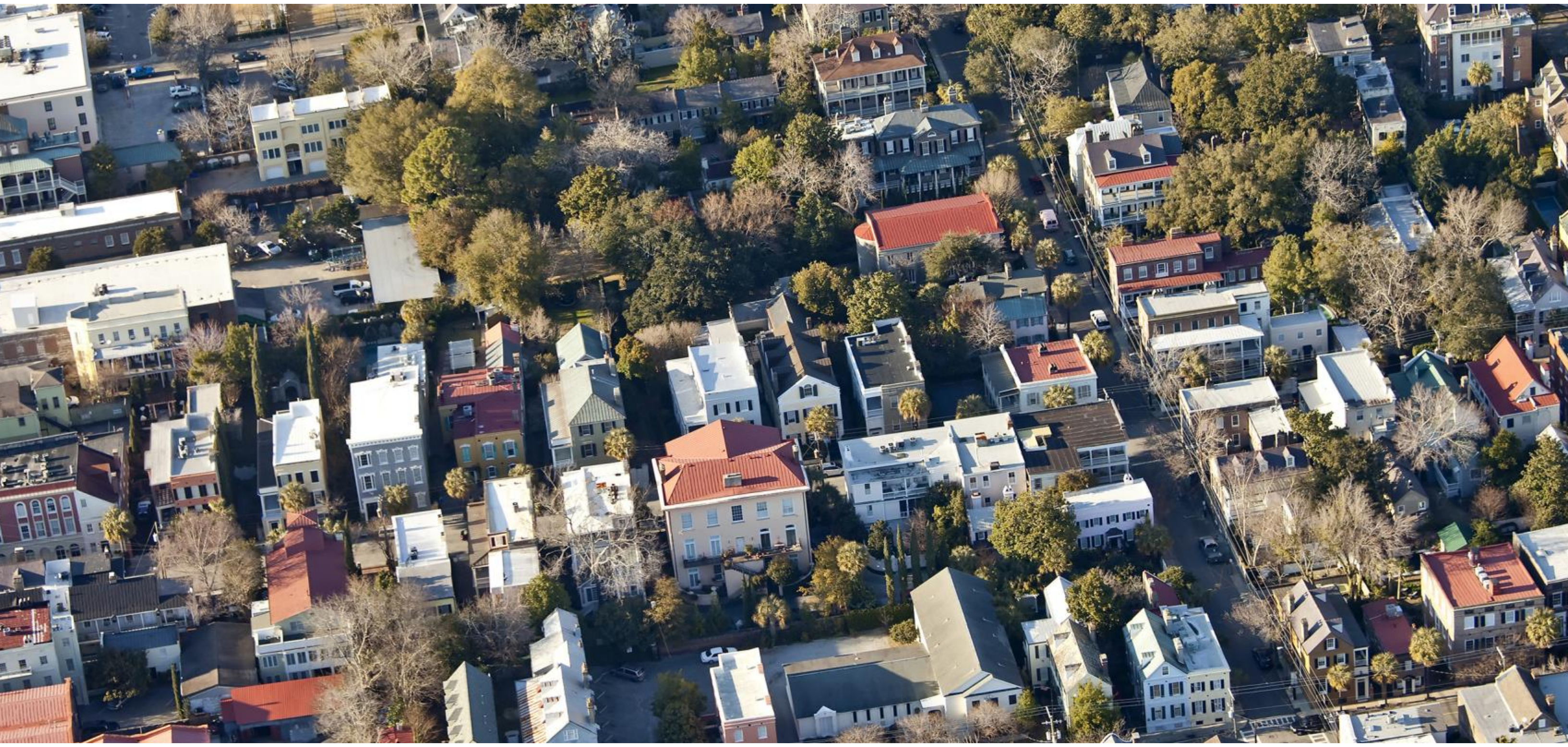

RESEARCH REPORT

Sixty Years of Private Mortgage Insurance in the United States

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August 2017

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Acknowledgments

The Housing Finance Policy Center (HFPC) was launched with generous support at the leadership level from the Citi Foundation and John D. and Catherine T. MacArthur Foundation. Additional support was provided by The Ford Foundation and The Open Society Foundations.

Ongoing support for HFPC is also provided by the Housing Finance Innovation Forum, a group of organizations and individuals that support high-quality independent research that informs evidence-based policy development. Funds raised through the Forum provide flexible resources, allowing HFPC to anticipate and respond to emerging policy issues with timely analysis. This funding supports HFPC's research, outreach and engagement, and general operating activities.

This report was funded by US Mortgage Insurers (USMI), a trade association representing private mortgage insurers doing business in the United States. Although USMI was given an opportunity to review a draft of this publication, the Urban Institute was under no obligation to incorporate any feedback. Additionally, the Urban Institute at all times had full control of the methodology, analysis, insights, and recommendations of this report. We are grateful to USMI and to all our funders, who make it possible for Urban to advance its mission.

The views expressed are those of the authors and should not be attributed to the Urban Institute, its trustees, or its funders. Funders do not determine research findings or the insights and recommendations of Urban experts. Further information on the Urban Institute's funding principles is available at www.urban.org/support.

This report was reviewed with significant comment by John Weicher of the Hudson Institute, an independent research organization. We are grateful to Weicher for his thoughtful contributions to the final product.

Executive Summary

The Modern Private Mortgage Insurance Industry

2017 marks the 60th anniversary of the birth of the modern private mortgage insurance (PMI) industry. Although the industry's roots go back to the pre-Depression era, it has existed in its current form since 1957, when Mortgage Guaranty Insurance Corporation (MGIC), the first PMI firm, was founded. Its creation was motivated by the desire of its founder, Max Karl, to give lenders an alternative to Federal Housing Administration (FHA) lending. Although the FHA had served the mortgage market for more than 20 years, its underwriting restrictions and bureaucratic processes had made obtaining FHA insurance time consuming and inefficient, forcing lenders to look for alternatives.

Mortgage Guaranty Insurance Corporation was so successful that the PMI market soon attracted new entrants and the industry flourished. Private mortgage insurance ballooned from $0.3 billion in 1960 to $63 billion by the late 1970s. Although government-backed mortgage insurance through the FHA and the US Department of Veterans Affairs (VA) was still the largest player, PMI's success introduced competition and ended the government's monopoly. This competitive dynamic between private and government insurance programs exists today and influences borrower decisions while shopping for a mortgage.

The PMI industry has continued growing in recent decades and has made it possible for millions of households to become homeowners. But the industry's growth did not follow a straight trajectory. Periods of sustained growth were often followed by episodes of industry-wide stress and subsequent rebuilding, including during the last housing crisis. Throughout this history, private and government insurance have played complementary roles. Private mortgage insurers have traditionally played a bigger role during periods of mortgage market expansion, while the government has increased its countercyclical role during downturns, ensuring a supply of credit through the cycle.

The formal regulatory oversight of the PMI industry, conducted by the department of insurance in each state, has played an important role in mitigating the effect of downturns on the industry. Additionally, as major counterparties to Fannie Mae and Freddie Mac (the government-sponsored enterprises, or GSEs), private mortgage insurers are subject to intensive supervision and monitoring by these agencies. The standards used by the GSEs, the Private Mortgage Insurer Eligibility Requirements

(PMIERs), are more rigorous than the standards promulgated by state regulators and were strengthened in response to the 2008 housing market downturn.

Because PMI, the FHA, and the VA all insure mortgage credit risk, the products they offer share the basic structure of an insurance contract, although important differences exist. For instance, PMI is a purely private product, and FHA and VA insurance are purely government products. They also differ along such dimensions as the depth of coverage offered (the FHA's 100 percent versus typically 25 percent for PMI and the VA), pricing structure (private mortgage insurers rely on risk-based pricing, but the FHA and VA do not), and the borrower's ability to cancel the insurance (PMI can be canceled, but FHA and VA typically cannot). A typical PMI borrower also looks different from a typical FHA or VA borrower. Private mortgage insurance borrowers tend to have higher credit scores than VA borrowers, and FHA borrowers tend to have the lowest scores of the three. Private mortgage insurance borrowers have the lowest loan-to-value (LTV) ratios among the three, and VA borrowers have the highest LTV ratios because the VA allows up to 100 percent financing. In recent years, PMI borrowers have also exhibited lower debt-to-income (DTI) ratios than FHA and VA borrowers.

Within the conventional space, GSE borrowers with PMI tend to have higher LTV ratios, lower credit scores, and higher DTI ratios than GSE borrowers without PMI. These findings suggest that PMI makes it easier for creditworthy borrowers with limited down payments to access conventional credit. But since the housing bubble burst in 2006, access to credit for all borrowers has declined substantially, even compared with the late 1990s. This is a structural problem that disproportionally affects borrowers at the lower end of the credit spectrum.

Private Mortgage Insurers' Relationship with the GSEs

Private mortgage insurers' role within the mortgage market goes beyond serving borrowers. They are also an important source of credit enhancement for the GSEs. By insuring first-loss credit risk, private mortgage insurers can reduce GSE losses on defaulted mortgages. The value of PMI is evident in that the loss severity to GSEs for high-LTV loans with PMI is lower than the loss severity for low-LTV loans without PMI coverage. This is because PMI coverage does not merely reduce the risk of high-LTV mortgages to the equivalent of a loan with an LTV ratio of 80 percent. The coverage is usually deep enough that high-LTV loans are reduced to the LTV equivalent of 65 to 75 percent, providing greater loss protection than an 80 percent LTV mortgage without PMI coverage. Our analysis shows that for

30-year fixed rate, full documentation, fully amortizing mortgages, the loss severity of loans with PMI is 40 percent lower than that without, despite the higher LTV of mortgages with PMI.

The GSEs depend on private mortgage insurers to cover a substantial portion of their first-loss credit risk. The government-sponsored enterprise charters require they obtain credit enhancement for loans above 80 percent LTV. As monoline industries in the business of taking mortgage credit risk, both the private mortgage insurers and the GSEs were adversely affected by the decline in home values during the recent mortgage crisis. The GSEs were also adversely affected by some private mortgage insurers' inability to pay out valid claims on time. As losses mounted and mortgage market stress worsened, three private mortgage insurers were taken over by state regulators and were restricted from paying out claims to conserve capital. A portion of these claims was eventually paid to the GSEs, but a portion still remains outstanding. Private mortgage insurers also rescinded some policies as improperly issued (returning premiums and refusing claims), straining relations with both the GSEs and many lenders. Given their mutual dependency, the GSEs relaxed the minimum AA credit rating they had historically required of private mortgage insurers to allow troubled insurers continue writing new business. Although such accommodations helped mitigate industry stress, the inability to receive insurance proceeds on time, or in some cases at all, meant the GSEs had to absorb more losses for a longer period than provided for contractually. And because all GSE proceeds are swept to taxpayers, the ultimate cost rests there.

Recognizing the need to raise capital to strengthen balance sheets and provide counterparties greater confidence in its ability to perform, the PMI industry raised substantial capital during and after the crisis. To strengthen future ability-to-pay claims, the newly finalized PMIERs also demanded more capital. As a result, the industry holds more capital today than it did before the crisis. Moreover, to reduce future losses and the risk of future rescissions, the PMI industry has improved internal risk management through better up-front quality control review, reduced reliance on delegated underwriting, use of reinsurance and insurance-linked notes to manage risk, avoidance of nontraditional products, and updated master agreements to more clearly spell out conditions that may result in rescission. Although these actions will not eliminate all counterparty losses or rescissions during future periods of economic stress, they should help mitigate the risk of both. On the other hand, the larger capital buffers, including those required under PMIERs, have led the PMI industry to raise premiums for high-risk borrowers, contributing to the overall tightness of credit, especially at the lower end of the credit spectrum.

The Future of the Private Mortgage Insurance Industry

The PMI industry has navigated the housing downturn and is financially stable. But a path to future growth remains unclear, in part because of continued uncertainty about housing finance reform and the GSEs' future. Most housing finance reform proposals have rightly called for increased private capital—including PMI—in the mortgage market. Most proposals include an explicit role for private mortgage insurers similar to their current role. But the lack of movement on reform and the resulting uncertainty can discourage private entities, including private mortgage insurers, from increasing their commitment to the market.

The future of PMI is also likely to be affected by the increased role of government mortgage insurance in recent years. Although the FHA and VA share of the mortgage insurance market has declined from a peak of 85 percent in 2009, the present level of 65 percent is above the historical norm, in large part because private credit for less creditworthy borrowers, traditionally provided by the private-label securitization market, has remained scarce. In dollar volume, private mortgage insurers provided insurance coverage for about $270 billion in new mortgages in 2016, slightly below the $282 billion covered in 2001, 15 years before. In contrast, the combined volume of mortgages insured by the FHA and VA nearly tripled from $167 billion to $477 billion over the same period.

Broad housing market challenges, such as tight credit, unaffordable house prices, and a shortage of housing supply, are also expected to create headwinds for origination volume. In addition, for most borrowers with less than a 5 percent down payment, an FHA loan has a lower monthly payment than a conventional loan with PMI. In light of this, the PMI industry has outlined a policy agenda that emphasizes reducing the FHA's footprint to historical levels and working with Congress to increase the role of private mortgage insurance post–housing finance reform.

At the same time, several trends and innovations suggest a positive future for the industry. For example, the share of minority households in the United States has grown considerably during the last 20 years, and the trend is expected to continue over the next two decades. Minorities tend to have limited assets and savings and are expected to rely more on high-LTV financing. In addition, the PMI industry has proposed the concept of deeper mortgage insurance as an area for future growth. Under this proposal, insurance coverage percentage for GSE loans would double from the current standard coverage of roughly 25 percent to 50 percent. According to research commissioned by the industry, deeper MI would reduce GSE and taxpayer exposure to credit risk, bring more private capital into the system, and reduce borrowing costs. But the proposal faces hurdles. The GSEs are concerned about further increasing their counterparty exposure to an industry that is already the GSEs' largest source of counterparty risk and is exposed to the same monoline risk of falling house prices.

Long term, private mortgage insurers will also need to confront the challenge of their heavy reliance on GSE business. Although the deeper MI initiative is worth pursuing in the near term, there are two long-term considerations. First, deeper MI would leave private mortgage insurers even more dependent on the GSEs. Second, continued development of GSE credit risk transfer could create new competition for private mortgage insurers within the high-LTV lending space, offsetting potential gains from deeper MI.

Opportunities to diversify away from the private mortgage insurers' GSE-centric business model exist. One strategy is to offer insurance for loans held in lender portfolios, where economically feasible. The portfolio lending market has grown to about one-third of all first-lien originations, a potentially sizable opportunity. But most of this growth has taken place at the top of the credit spectrum. Private mortgage insurance coverage for portfolio loans could give lenders the comfort they need to originate slightly higher–risk loans, easing credit availability. Depository lenders can also receive capital relief for high-LTV mortgages covered by PMI insurance. A related opportunity is to explore PMI coverage for loans held by nonbanks, such as real estate investment trusts, private equity firms, and hedge funds. Nonbanks have increased their lending footprint in recent years, and PMI could encourage them to increase this lending further.

Through six decades, the PMI industry has played an important role in expanding credit access and mitigating lender and GSE risk. Although the industry went through substantial turmoil during the last housing and financial crisis, it has since recovered and restructured and should be more resilient going forward. Demographic changes and other mortgage market developments provide the industry both opportunities and challenges to expand its role to support historically underserved populations and first-time homebuyers using private capital.

Sixty Years of Private Mortgage Insurance

The housing market turmoil that began in 2008 is largely over. The market is more stable than it was nine years ago, house prices have recovered most of their lost ground except in a few geographies, new foreclosure activity has slowed down considerably, and delinquency rates are near long-term historical levels. But today's mortgage market looks different from the one before the crisis. Fannie Mae and Freddie Mac, the government-sponsored enterprises (GSEs), remain in conservatorship, and the government continues to play a large role in the mortgage market. In addition, the mortgage industry and the broader financial system are much more stringently regulated, capital requirements on industry participants are significantly higher, and the costs of originating, servicing, and guaranteeing the credit risk of mortgages are greater than before 2008. Indeed, earning a unit of profit in today's market is more difficult than before the housing crisis. This new reality has forced the entire housing finance industry to readjust and recalibrate, a multiyear effort in search of a new normal.

One subsector of the mortgage market striving for steady state, and the prime focus of this report, is the private mortgage insurance (PMI) industry. The PMI industry provides credit enhancement for mortgages with high loan-to-value (LTV) ratios to benefit lenders and investors. The GSEs are required by charter to obtain credit enhancement for mortgages with LTV ratios above 80 percent. Providing this coverage for GSE-guaranteed mortgages has traditionally accounted for most of the PMI industry's business. Although the industry has insured non-GSE loans, including loans held in lender portfolios and those securitized into private-label securities, these channels have accounted for a small share of the PMI industry's business.[1]

Although the PMI industry's roots go back to the pre-Depression era, it has existed in its current form since 1957. Over six decades, the industry has enabled homeownership for households who may not have enough savings to meet the typical 20 percent minimum down payment requirement for conventional loans. During this time, the industry has also witnessed several ups and downs, including the most recent housing crisis, which tested the industry like no other crisis in recent memory. Although the industry made it through the crisis, a new operating environment, the increased role of Federal Housing Administration (FHA) and US Department of Veterans Affairs (VA) lending, and a more challenging regulatory regime have forced private mortgage insurers to explore additional opportunities for growth.

As the PMI industry contemplates its future, a data-driven independent evaluation of the industry's past achievements and challenges can be instructive. In keeping with this and for the 60th anniversary of the modern PMI industry, US Mortgage Insurers (USMI), a trade association that represents private mortgage insurers, asked the Housing Finance Policy Center at the Urban Institute to prepare an independent analytical report. This report documents the historical performance of the PMI industry through periods of growth and stress, the borrower segments the PMI industry serves, and the record of private mortgage insurers in mitigating losses for the GSEs. Building on this information, the last section of the report discusses the industry's present state, its opportunities and challenges, and ways to navigate the future.

US Mortgage Insurers also asked Urban to prepare a comprehensive data supplement to this report (HFPC 2017). The companion chartbook quantifies and compares the historical characteristics of loans with PMI with loans without PMI along such dimensions as borrower creditworthiness, loan attributes, payment affordability, default rate, and loss severities.

Origin and Evolution of Private Mortgage Insurance

Roots

The origins of the modern PMI industry go back to the title insurance companies that operated in New York in the late 19th century (Rapkin 1967). Relying on statutory ambiguities governing permissible activities, title insurance companies began insuring mortgages. But as mortgage insurance became popular, the state passed enabling legislation in 1904 that allowed title insurance companies to write mortgage insurance.

A second legislative change came seven years later in 1911, when mortgage insurance companies were permitted to invest, purchase, and sell mortgages (or certificates representing interests in a pool of mortgages) to investors, an early form of securitization. The industry flourished over the next two decades against the backdrop of a strong economy, rising stock markets, and booming real estate prices. This strong run, however, was followed by a total collapse of the industry in the early 1930s as house prices dropped almost 50 percent during the Great Depression and defaults and foreclosures skyrocketed (Alger 1934).

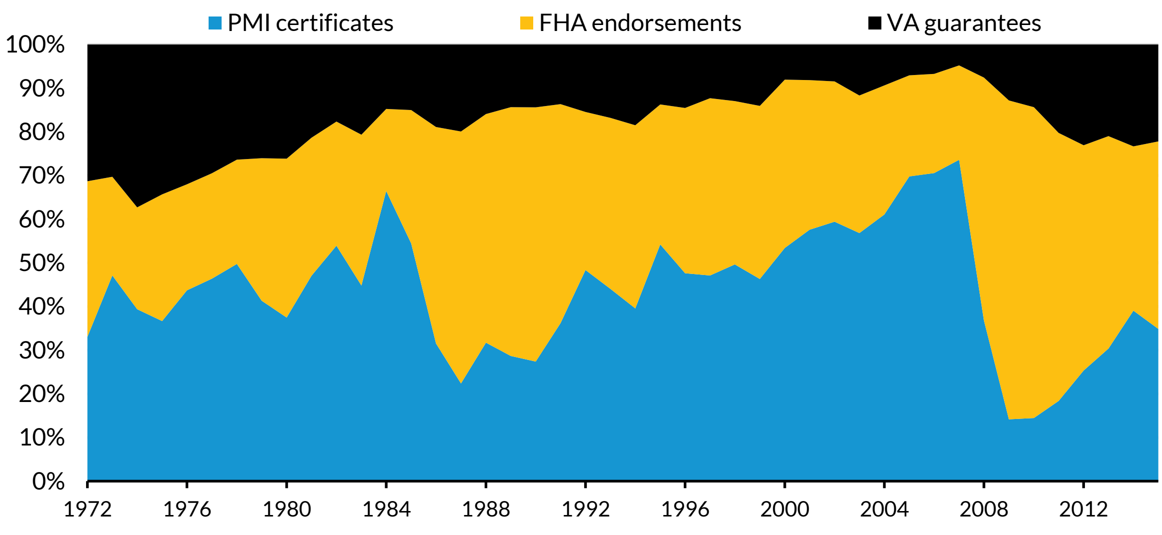
Post–World War II Comeback

The PMI industry remained dormant for the next 25 years until the incorporation of Mortgage Guarantee Insurance Corporation (MGIC) in Wisconsin in 1957 (Herzog 2009). Between the Great Depression and the creation of MGIC, the US government became the sole provider of mortgage insurance, initially through the newly created Federal Housing Administration and later through the Department of Veterans Affairs' mortgage guaranty program for World War II veterans. The founding of MGIC is a significant milestone because it marks the birth of the modern PMI industry.

The creation of MGIC was motivated in part by its founder Max Karl's desire to offer lenders an alternative to the FHA. Rising house prices and growing demand for larger homes after WWII—as well as the FHA's cumbersome processes, loan limits, and restrictions on interest rates—had made obtaining FHA insurance time consuming for lenders and expensive for borrowers.[2] This led lenders to seek alternatives to FHA insurance (FHFA 2009). The success of MGIC—and the demand for non-FHA lending—was so robust that by the early 1970s, all 50 states had passed legislation to allow PMI. The dollar volume of PMI exploded from $0.3 billion in 1960 to $63 billion in 1977 according to the Mortgage Insurance Companies of America Fact Book 1977–78. In comparison, the FHA and VA grew from $56.4 to $141.6 billion over the same period.

FIGURE 1

Mortgage Insurance Market Share Based on Loan Count, 1972–2015



Sources: US Department of Housing and Urban Development, Mortgage Insurance Companies of America, and Mortgage Guarantee Insurance Corporation.
Notes: FHA = Federal Housing Administration; PMI = private mortgage insurance; VA = US Department of Veterans Affairs.

Figure 1 shows the mortgage insurance market share of the FHA, the VA, and private mortgage insurers since 1972. It shows that the PMI industry's growth continued through the 1970s and the mid-1980s as the broader mortgage market remained healthy and delinquencies remained low. Equally important, the rise of the GSEs, which were required by their charters to obtain credit enhancement for loans with LTV ratios above 80 percent, created a steady stream of new business for the industry. This relationship was mutually beneficial because PMI (the only credit enhancement at the time) allowed the GSEs to purchase high-LTV mortgages, which created a new revenue stream for both the GSEs and the PMI industry. The growth of the PMI industry during this period not only ended the government's monopoly in the mortgage insurance market, but enabled PMI to become the dominant provider of mortgage insurance, with over 65 percent market share by 1984. More significantly, the post–Depression era assumption that mortgage insurance had to be the sole domain of the federal government was overcome.

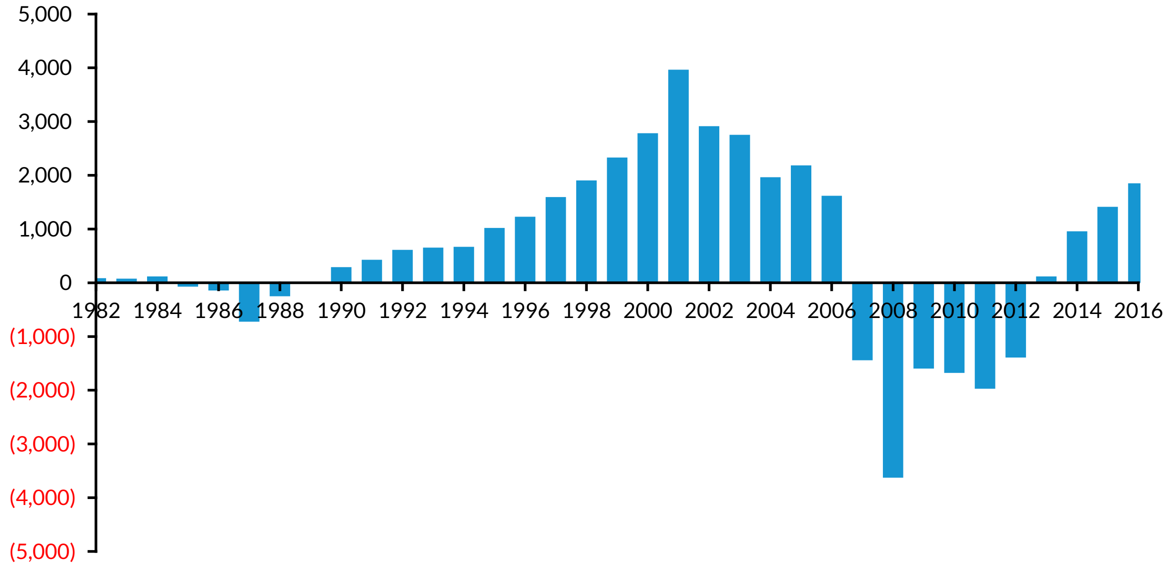
But the growth of the PMI industry was not all based on strong fundamentals. The growth of the 1970s and 1980s occurred in part on a substantial liberalization of mortgage underwriting (Herzog 2009). The rise of high-LTV lending, whose risks were neither well understood nor adequately managed, was one factor. Also contributing to the industry's growth was the rise of riskier nontraditional products, such as interest-only mortgages and adjustable-rate mortgages.[3] By the early 1980s, many private mortgage insurers had amassed substantial exposure to risky mortgages. At the same time, the recession of the early 1980s, slow house price appreciation, and falling house prices in certain areas led to rising delinquencies, creating a perfect storm. The share of loans that were 90 or more days past due doubled from roughly 0.5 percent in 1980 to over 1 percent by 1985.[4] Many private mortgage insurers incurred substantial losses, and some ceased operating. Only half the private mortgage insurers at the beginning of the 1980s were in business by the end of the decade (Canner, Passmore, and Mittal 1994).

The pull-back of the PMI industry meant the US government, through the FHA and VA, was again the dominant insurer of mortgages. The share of single-family mortgages insured by private mortgage insurers declined from 66 percent in 1984 to 22 percent in 1987, while the FHA's countercyclical role exploded. This process—in which the role of private capital expands during strong economic environments with the government expanding its role during stressful times—has been echoed over the past 10 years.

By the late 1980s, the share of mortgages insured by private mortgage insurers had bottomed out, and the industry was soon on an upswing. As economic growth strengthened during the 1990s, so did the mortgage market and the PMI industry. The next 20 years, from 1988 to 2008, were another period of substantial growth for the PMI industry. By the end of 2007, the share of single-family mortgages insured by private mortgage insurers had surged to 74 percent, exceeding the 1984 peak of 66 percent. These gains in market share came when mortgage debt was growing at a healthy pace and delinquencies were low, giving industry's market share and profits a major boost (figure 2). By 2007, the FHA's share of the insurance market had fallen to about 20 percent, with the VA running under 5 percent.

FIGURE 2

PMI Industry Historical Operating Income/(Loss), $ Millions, 1982–2016



Sources: Mortgage Insurance Companies of America and US Mortgage Insurers.

But a large part of the recent housing boom was built on shaky fundamentals driven by the rapid growth of risky products, such as interest-only, negative amortization, or piggyback mortgages; lax underwriting; poor risk management; and inadequate due diligence from nearly all market participants. As the house prices fell and defaults skyrocketed, the PMI industry witnessed substantial losses for several years (figure 2). In addition, private sources of mortgage credit nearly dried up, and the government—through the FHA and VA's countercyclical role —again became the dominant provider of mortgage insurance. The private mortgage insurers' share of the mortgage insurance market bottomed out at 14 percent in 2010, with the FHA and VA making up the remaining 85 percent. As the housing market has improved and house prices have recovered, private mortgage insurers have seen their market share and profits recover gradually.

History of PMI Regulation

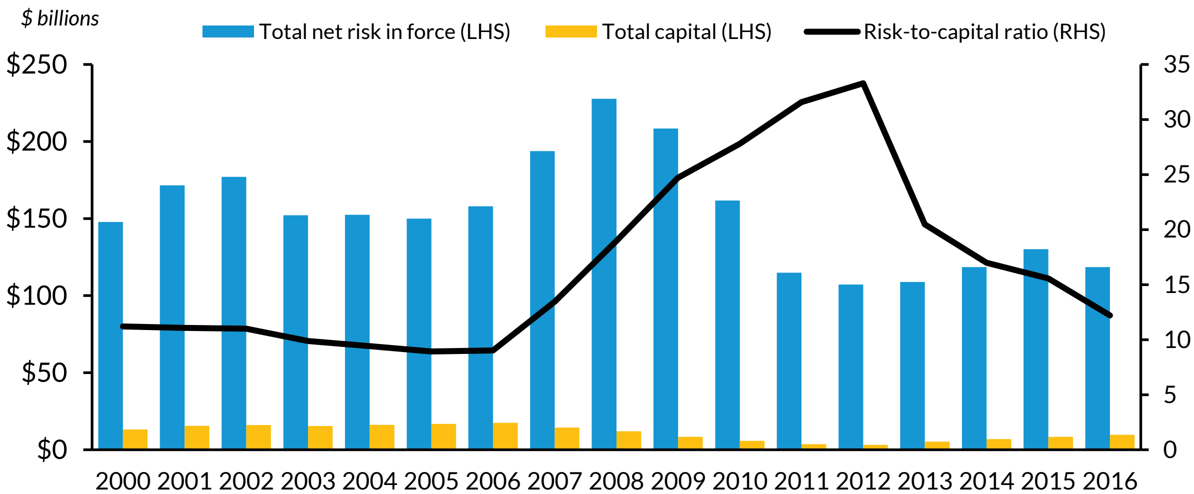
During the pre-Depression era, New York state law required mortgage insurers to set aside a guaranty fund of "not less than two-thirds of the capital stock" (Alger 1934). But because the size of the guaranty fund bore no relation to the dollar volume of guarantees outstanding, the guarantees could grow indefinitely without the need to set aside additional capital. In addition, the reserve fund could be fully invested in mortgages and would lose value precisely when it was most needed. These regulatory flaws were partly responsible for the meteoric rise and the subsequent demise of the PMI industry during the Depression.

After its reemergence in 1957, the industry was regulated more prudently. As insurance companies, private mortgage insurers have always been regulated at the state level by the department of insurance in each state.[5] Private mortgage insurers are also subject to a monoline requirement that limits a firm to insuring only one class of risk—in this case, mortgage credit risk. Under state statutes, private mortgage insurers are required to set aside 50 percent of the annual premiums, for contingency reserves. Private mortgage insurers are also required to set aside reserves for expected losses and premiums they have collected but have not earned yet (unearned premium reserves) (Promontory Financial Group 2011). State law also restricts how private mortgage insurers can invest reserves by limiting the types of investment and the share allocated to specific types of investments to prevent concentration of risk in a single asset class. Until the most recent financial crisis, private mortgage insurers were also required to maintain a risk-to-capital ratio no greater than 25 to 1, or 4 percent capital. This meant the dollar volume of total guarantees outstanding could not exceed 25 times the amount of capital.

Although some of these regulatory standards have been tweaked, the underlying structure of state regulation of private mortgage insurers, including maintaining contingency reserves and capital buffers, has remained largely unchanged. Figure 3 summarizes key financial safety metrics for the PMI industry from 2000 to 2016. Although the industry historically maintained a low risk-to-capital ratio—well below the 25 to 1 required by state regulators—heightened risk taking and shrinking capital buffers during the recent housing crisis pushed the ratio well above the statutory level. In recent years, this ratio has reverted to more reasonable levels as the industry has shored up its capital base (figure 3).

FIGURE 3

Private Mortgage Insurance Industry Financial Safety Metrics, 2000–16



Sources: For 2000–08 data, Federal Housing Finance Agency, "State of the Private Mortgage Insurance Industry: Implications for US Mortgage Markets and the Enterprises" (Washington, DC: Federal Housing Finance Agency, 2009); for 2009–10 data, Mortgage Insurance Companies of America (MICA), "2009–2010 Fact Book & Member Directory" (Washington, DC: MICA, n.d.); for data since 2011, US Mortgage Insurers.

Note: LHS = left-hand side; RHS = right-hand side. Total capital is the sum of policyholders' surplus and contingency reserves.

Private mortgage insurers are the largest counterparties of Fannie Mae and Freddie Mac and are subject to ongoing monitoring and oversight by the GSEs. The GSEs set financial, capital, and operational standards that private mortgage insurers must meet to do business with the GSEs. These standards are often more stringent than state standards. Following the substantial losses experienced by the PMI industry and the GSEs during the last recession, the GSEs enhanced PMI regulation through the Private Mortgage Insurers Eligibility Requirements (PMIERs), finalized in 2015 by the Federal Housing Finance Agency (FHFA) and the GSEs.

The PMIERs set forth requirements for eligibility to do business with the GSEs, operational and underwriting standards, and detailed risk-based financial and capital metrics. The PMIERs also spell out the actions the GSEs can take should any of these standards be violated. Although the PMIERs do not impose a numeric risk-to-capital ratio, they prescribe detailed capital charges, taking into account the riskiness of each insured performing mortgage based on credit score, LTV ratio, origination year, loan type, and maturity, among other factors. Nonperforming loans are subject to higher capital requirements. The net effect of these requirements will be a substantial reduction in the risk-to-capital ratio, resulting in a safer industry going forward. According to Moody's Analytics, PMIERs will ultimately result in an estimated risk-to-capital ratio of around 12 to 1 for a book of business that resembles today's originations (Zandi, Parrott, and deRitis 2014).

The Current Mortgage Insurance Market

In many respects, the current mortgage insurance market is unchanged from prior decades. The key players—the FHA, the VA, and the private mortgage insurers—are the same as before. The roles of these players—the FHA's mission to insure mortgages for low- and moderate-income borrowers and to provide countercyclical support during downturns, private mortgage insurers' first-loss risk protection for conventional mortgages, and the VA's mission to serve veterans—are also the same as before.

But new postcrisis developments have transformed the mortgage market. These developments include a major tightening of capital requirements and regulation, curbs on risk taking, increases in insurance premiums charged by the FHA and private mortgage insurers and higher guarantee fees charged by the GSEs, the ongoing conservatorships of Fannie Mae and Freddie Mac, and the changing face of the PMI industry.

Basic Structure of Mortgage Insurance

The US mortgage insurance market is dominated by the FHA, the VA, and private mortgage insurers. Although these players all insure mortgage credit risk, the structure and mechanism by which the coverage is provided varies substantially.[6] Federal Housing Administration and VA insurance are backed by the full faith and credit of the United States, but PMI is a purely private form of insurance. There are distinctions even within the FHA and VA. While the FHA insures credit risk on 100 percent of the loan amount, VA insurance typically covers only 25 percent of the loan amount. Additionally, the VA allows LTV ratios as high as 100 percent, compared with a maximum of 96.5 percent for FHA loans and typically 97 percent for privately insured mortgages.

Unlike the FHA and VA, PMI coverage is not a static share of the loan amount. The GSEs are required by law to obtain credit enhancement for loans with LTV ratios above 80 percent, and lenders holding loans in portfolio may choose to require PMI on certain loans. The standard coverage increases with LTV ratio and ranges from 12 to 35 percent. This coverage, which is typically paid for by borrowers (also known as borrower-paid mortgage insurance, or BPMI), protects the lender or the GSEs if the loan defaults and the foreclosure proceeds fall short of the outstanding loan balance. Premiums can be paid via monthly installments, through a single up-front payment, or by a combination of the two.

Private mortgage insurers also offer products that provide coverage similar to BPMI, but are paid for by lenders. Under a lender-paid mortgage insurance (LPMI) arrangement, which is not as common as BPMI, lenders pay insurance premiums out of pocket and typically make up for it by charging a slightly higher interest rate. Because the borrower does not pay PMI premiums out of pocket, LPMI can be a useful marketing tool for lenders. Mortgages with LPMI may also have lower monthly payments than mortgages with BPMI because the higher interest rate, which pays for the cost of PMI and remains in effect for the life of the loan, spreads the cost of PMI over a longer period.

Another distinction between government and private mortgage insurance has to do with pricing. The FHA and VA do not vary their mortgage insurance premiums by borrower creditworthiness, but private mortgage insurers do. Private mortgage insurance borrowers with a low credit score pay higher PMI premiums than borrowers with a higher credit score. Private mortgage insurance is also typically cancelable upon request by the borrower once the LTV ratio reaches 80 percent. By law, BPMI coverage automatically cancels once the LTV ratio reaches 78 percent. In contrast, FHA and VA premiums typically are not cancelable.

Current Industry Dynamics

One key aspect of the industry's postcrisis transformation has to do with the firms that make up the PMI industry (table 1). In 2005, before the housing crisis, the industry had eight firms: MGIC, Radian, United Guaranty Corporation, PMI Mortgage Insurance Company, Genworth, Republic MI, Triad Guaranty, and CMG. Three of these firms—PMI, Republic, and Triad—did not survive the crisis and were taken over by state regulators. At the same time, three new players entered the industry—Essent, National, and Arch MI—by acquiring operations of legacy firms or by starting from the ground up. Also, reflecting strategic consolidation, one of the eight private mortgage insurers operating in 2005 has been acquired by another. In January 2017, AIG, the parent company of United Guaranty, sold United Guaranty to Arch MI. The sale allowed AIG to simplify operations and refocus the parent firm while giving Arch more scale and a larger customer base.[7] The result is the PMI industry looks different in 2017 than it did in 2005 (table 1).

TABLE 1

The Changing Face of the Private Mortgage Insurance Industry

	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17
MGIC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Radian	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Genworth	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UGC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Acquired by Arch
CMG	✓	✓	✓	✓	✓	✓	✓	✓	✓	Acquired by Arch			
PMI	✓	✓	✓	✓	✓	✓	✓	[a]					
Republic	✓	✓	✓	✓	✓	✓	✓	Taken into receivership; stopped writing new business					
Triad	✓	✓	✓	✓	Parent filed for bankruptcy; stopped writing new business								
Essent MI						✓	✓	✓	✓	✓	✓	✓	✓
National MI									✓	✓	✓	✓	✓
Arch MI										✓	✓	✓	✓

Sources: Inside Mortgage Finance, US Mortgage Insurers, and the Urban Institute.

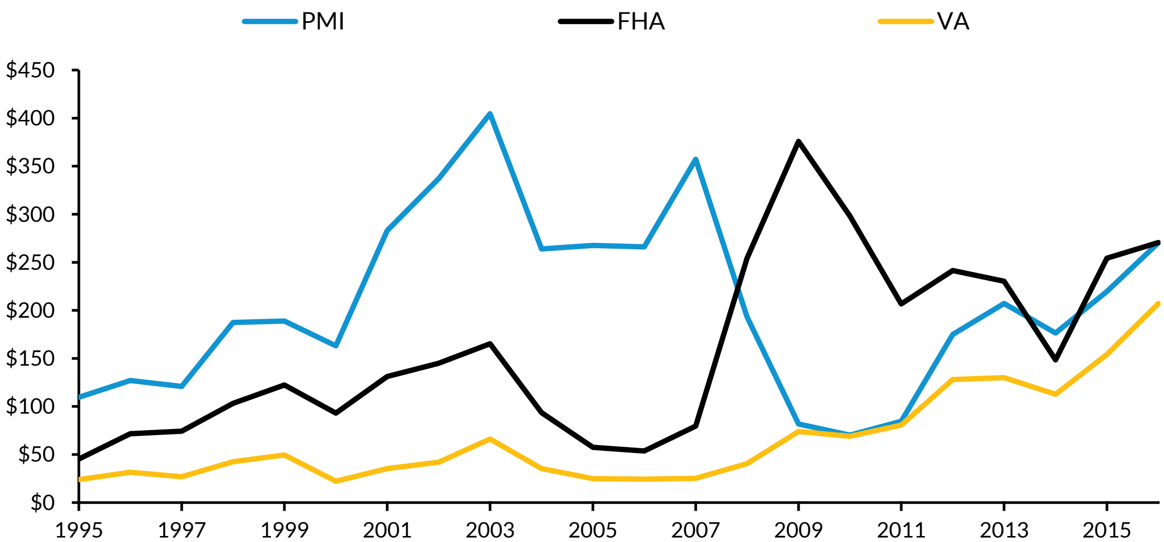
Notes: MGIC = Mortgage Guarantee Insurance Corporation; PMI = Private Mortgage Insurance Company; Triad = Triad Guaranty; UGC = United Guaranty Corporation. Arch acquired CMG and the operating platform of PMI in 2014. Arch also acquired UGC in January 2017. Genworth's parent has agreed to be acquired by China Oceanwide pending regulatory approval.

[a] Parent filed for bankruptcy; stopped writing new business; operations acquired by Arch.

During previous recessions, the FHA played a countercyclical role by expanding mortgage credit availability when private capital pulled back and by stepping back postrecession. But the high intensity of the 2008 recession, a weak subsequent recovery, stubbornly tight credit, and continued dormancy of the private-label securitization market—which has historically served high-risk borrowers—have meant that the FHA's and the VA's higher market shares have persisted. As a result, the PMI industry's traditionally market-leading position (figure 4) has come under pressure. Although the FHA and VA share of the mortgage insurance market has declined from the peak of 85 percent in 2009 to 62 percent, this level is still above the 35 to 45 percent historical average for government insurers.

FIGURE 4

Mortgage Insurance Volume by Channel, 1995–2016, $ Billions



Sources: Inside Mortgage Finance and the Urban Institute.
Notes: FHA = Federal Housing Administration; PMI = private mortgage insurance; VA = US Department of Veterans Affairs.

Borrower economics also favor a continued large role for government-backed lending, largely because, unlike the GSEs and private mortgage insurers, the FHA does not vary its premium based on borrower risk. The effect is illustrated in table 2, which compares the initial monthly payment for an FHA loan with that of a conventional loan with BPMI for an illustrative property with a purchase price of $250,000 and an LTV ratio of 96.5 percent. This comparison takes into account differences between FHA and conventional interest rates; GSE guarantee fees, including the loan-level pricing adjustments; and current PMI and FHA premiums. These loan-level pricing adjustments are up-front fees above the base guarantee fee imposed by the GSEs to cover loans with additional risk factors—those with higher LTV ratios, lower FICO scores, investment properties, manufactured homes, and so on. The last row shows the difference between the monthly payment for an FHA loan and a conventional mortgage with PMI. A positive number indicates that PMI is cheaper than FHA and vice versa. Given that the conventional borrower with an LTV ratio higher than 80 percent faces additional costs both because they need MI and because of the GSE loan-level pricing adjustments, while the FHA does no risk-based pricing, we would expect that loans with greater risk go the FHA. The table shows that for a 96.5 percent LTV loan, the FHA offers better economics for all borrowers with credit scores below 740. Private mortgage insurance becomes more price efficient for a wider range of FICO scores as the down payment increases (Goodman et al. 2017). With a 5 percent down payment, PMI is more economical only for borrowers with FICO scores above 740, whereas with a 10 percent down payment, PMI is more attractive for borrowers with scores above 700.

The FHA, GSEs, and private mortgage insurers raised prices in the wake of the financial crisis. But recent years have witnessed some recalibration of pricing. The FHA reduced its annual premium by 50 basis points in January 2015 after a series of premium increases from 2008 to 2013. The GSEs also modestly recalibrated their pricing in 2015 after increasing base guarantee fees and introducing loan-level pricing adjustments at the peak of the crisis.

TABLE 2

Borrower Monthly Payment Comparison: FHA versus PMI

	FICO Score							
	620–639	640–659	660–679	680–699	700–719	720–739	740–759	760+
FHA MI premiums								
FHA UFMIP	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
FHA MIP	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%
PMI								
GSE LLPA	3.50%	2.75%	2.25%	1.50%	1.50%	1.00%	0.75%	0.75%
PMI annual MIP	2.25%	2.05%	1.90%	1.40%	1.15%	0.95%	0.75%	0.55%
Monthly payment								
FHA	$1,348	$1,348	$1,348	$1,348	$1,348	$1,348	$1,348	$1,348
PMI	$1,722	$1,660	$1,616	$1,494	$1,444	$1,389	$1,342	$1,302
PMI advantage	($374)	($312)	($267)	($145)	($95)	($41)	$7	$47

Sources: Genworth Mortgage Insurance, Ginnie Mae, and the Urban Institute.
Notes: FHA = Federal Housing Administration; GSE = government-sponsored enterprise; LLPA = loan-level price adjustment; MIP = mortgage insurance premium; PMI = private mortgage insurance; UFMIP = up-front mortgage insurance premium. Assumes conventional mortgage rate of 4.13 (including base guarantee fee) and FHA rate of 4.04 percent. Mortgage insurance premiums listed in percentage points. Grey shade indicates FHA monthly payment is more favorable, and yellow shade indicates PMI is more favorable. This calculation does not include special programs, such as Fannie Mae's HomeReady and Freddie Mac's Home Possible, both of which offer more favorable rates. Some of the payment values have been rounded to the nearest dollar.

The private mortgage insurers also altered their pricing in 2016 after increasing prices during the recession. The change—largely in response to higher PMIER capital requirements—lowered prices for high-FICO-score borrowers and increased them for low-FICO-score borrowers.[8] This improved the attractiveness of PMI in relation to FHA for high-FICO-score borrowers, but reduced it for low-FICO-score borrowers. Although this helped private mortgage insurers increase their market share slightly, as more high-credit borrowers obtained conventional mortgages, the FHA's price advantage for low-credit borrowers has limited these gains.

Who Does the Private Mortgage Insurance Market Serve?

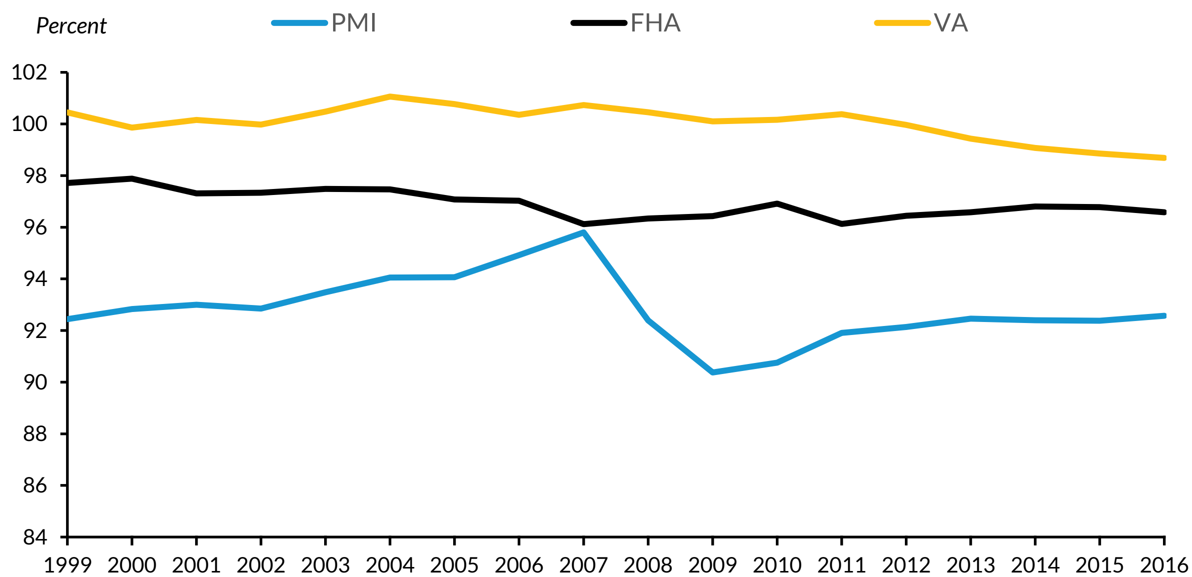
The dominant source of private mortgage insurers' business in recent decades has been GSE-guaranteed loans with LTV ratios above 80 percent—that is, loans to borrowers who do not have sufficient funds for a 20 percent down payment.[9] Loans insured by private mortgage insurers are like the loans insured by the FHA and VA, as all have high LTV ratios. Despite this similarity, typical PMI borrower characteristics are quite different from a typical FHA or VA borrower along key credit dimensions. This distinction is important to understand the segment of borrowers the PMI industry serves.

How Do PMI Borrowers Compare with FHA and VA Borrowers?

The LTV ratio trends for conventional purchase money borrowers with PMI, FHA, and VA borrowers from 1999 to 2016 are shown in figure 5. The Federal Housing Administration, the VA, and private mortgage insurers all serve the high-LTV segment, but the average LTV ratio for a typical FHA borrower is higher than that of a typical conventional borrower with PMI, although the differential has narrowed as PMI LTV ratios have risen. Veterans Affairs borrowers have the highest LTV ratios of the three because VA-backed loans can be made for up to 100 percent LTV plus closing costs. Thus, along the LTV dimension, PMI borrowers are the least risky among the three channels.

FIGURE 5

Average LTV Ratios for Mortgages Insured by PMI, FHA, and VA, by Origination Year

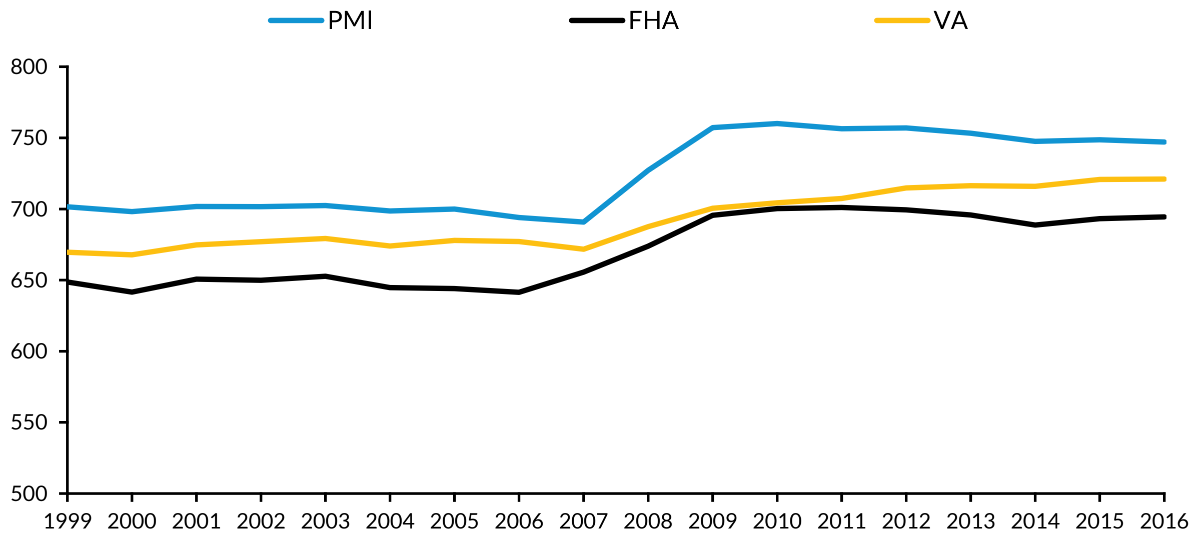


Sources: CoreLogic Servicing and the Urban Institute.
Notes: FHA = Federal Housing Administration; LTV = loan-to-value; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. Based on purchase loans only. Private-label securities loans are excluded. The PMI category includes both government-sponsored enterprise and portfolio loans with PMI.

Similarly, figure 6 compares average credit scores for FHA, PMI, and VA borrowers. During this period, the average credit score for conventional borrowers with PMI was higher than for the average FHA borrower, while the average FICO score for VA borrowers was in between PMI and FHA. This figure also shows that postcrisis tightening of credit has affected all three channels.

FIGURE 6

Average Credit Score Trends for Mortgages Insured by PMI, FHA, and VA, by Origination Year

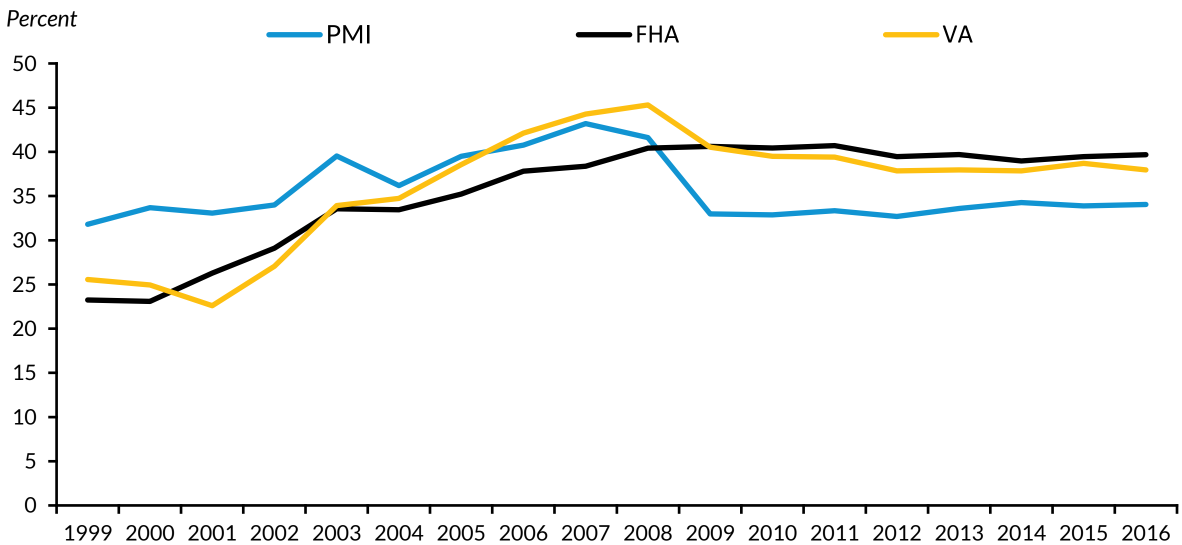


Sources: CoreLogic Servicing and the Urban Institute.
Notes: FHA = Federal Housing Administration; LTV = loan-to-value; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. Based on purchase loans only. Private-label securities loans are excluded. The PMI category includes both government-sponsored enterprise and portfolio loans with PMI.

Figure 7 compares average debt-to-income (DTI) ratios for the three channels. It shows that before 2004, mortgages with PMI had the highest average DTI. But this trend seems to have reversed during the post-bubble years, with FHA DTI currently the highest and the DTI for conventional loans with PMI the lowest. Although DTI ratios increased for all three channels during the housing bubble, postcrisis the FHA's average DTI has not decreased as much as the DTI ratios for mortgages with PMI and VA mortgages.

FIGURE 7

Average DTI Trends for Mortgages Insured by PMI, FHA, and VA, by Origination Year



Sources: CoreLogic Servicing and the Urban Institute.
Notes: DTI = debt-to-income; FHA = Federal Housing Administration; PMI = private mortgage insurance; VA = US Department of Veterans Affairs. Based on purchase loans only. Private-label securities loans are excluded. The PMI category includes both government-sponsored enterprise and portfolio loans with PMI.

Within the broader mortgage insurance market, borrowers served by private mortgage insurers tend to have the highest credit scores and the lowest LTV ratios of the three channels. The DTI trend has been mixed, but current PMI borrowers have the lowest DTI ratios of the group. The DTI ratios of current PMI borrowers are lower than during the early 2000s. Thus, based on these three fundamental indicators of creditworthiness, PMI borrowers have less risky characteristics than FHA and VA borrowers.

How Do GSE Borrowers with PMI Compare with Borrowers without PMI?

Because mortgages backed by the GSEs account for most PMI business, more granular insight into the PMI borrower segment can be obtained by comparing GSE borrowers with PMI with borrowers without PMI. Table 3 summarizes these data from 2013 to 2016. This table compares the average LTV ratio, credit score, first-time homebuyer share, and DTI ratio for GSE-backed purchase origination mortgages with PMI coverage with mortgages without PMI. Unlike the findings from the previous section, which showed that borrowers with PMI tend to be *lower risk* compared with FHA and VA borrowers, this intra-

GSE comparison shows that GSE borrowers with PMI tend to be *slightly more risky* than GSE borrowers without PMI, suggesting PMI is helping these borrowers access conventional mortgage credit.

TABLE 3

Key Characteristics of GSE Purchase Borrowers with and without PMI, by Origination Year

	LTV (%)		FICO		DTI (%)		FTHB Share (%)		Note Rate (%)	
	PMI	No PMI	PMI	No PMI	PMI	No PMI	PMI	No PMI	PMI	No PMI
2013	93.0	73.5	750	760	34.0	32.7	46.4	28.1	4.2	4.0
2014	92.8	73.1	744	757	34.6	33.3	48.5	27.8	4.4	4.3
2015	92.8	72.6	744	758	34.6	33.3	50.3	26.6	4.1	4.0
2016	92.9	72.5	743	757	34.9	33.4	51.9	27.6	3.9	3.8

Sources: eMBS and Urban Institute calculations.
Notes: DTI = debt-to-income ratio; FTHB = first-time homebuyer; LTV = loan-to-value ratio.

The higher risk profile of PMI borrowers reflects the PMI industry's focus and the GSEs' requirement to seek credit enhancement for high-LTV loans. The average LTV ratio for GSE loans with PMI was around 93 percent from 2013 to 2016, while non-PMI loans had a lower average LTV ratio of about 73 percent. The columns to the right make it clear that GSE borrowers with PMI are also more likely to have slightly lower credit scores and slightly higher DTI ratios than GSE borrowers without PMI. The average credit score for GSE borrowers with PMI ranged from 750 in 2013 to 743 in 2016, while the non-PMI borrower credit scores ranged from 760 to 757.

The first-time homebuyer share for GSE loans with PMI—which hovered around 50 percent from 2013 to 2016—is higher than the first-time homebuyer share for GSE loans without PMI, which has averaged about 28 percent. This suggests PMI makes it easier for first-time homebuyers to qualify for conventional mortgages. The first-time homebuyer rate for FHA borrowers tends to be higher (currently 82 percent), and the VA first-time homebuyer rate is comparable with that for GSE mortgages with PMI.

Importance of Private Mortgage Insurance to the GSEs

The GSEs rely on private mortgage insurers to absorb first-loss risk for mortgages with LTV ratios greater than 80 percent. This is a requirement under their charters.[10] The GSEs can also seek PMI coverage for loans with LTV ratios below 80 percent or seek additional coverage for mortgages covered by standard mortgage insurance. Standard coverage does not merely reduce the risk of high-LTV mortgages to the equivalent of an 80 percent LTV loan. It goes further than that.

Standard PMI coverage requirements vary by original LTV ratio. A mortgage with an original LTV ratio between 80 and 85 percent typically requires 12 percent PMI coverage, an 85-to-90 percent LTV loan requires 25 percent coverage, a 90-to-95 percent LTV loan requires 30 percent, and a 97 percent LTV loan requires 35 percent PMI coverage.[11] For a 97 percent LTV loan, private mortgage insurers would insure the first 34 percent of the loan (35 percent of 97 percent). The total loss-absorbing capital standing in front of the GSEs would be 37 percent (34 percent PMI plus the 3 percent borrower down payment). From the GSEs' perspective, the 97 percent LTV loan would be reduced to the equivalent of a loan with 63 percent LTV (100 percent minus 37 percent). Using the same calculation, a 95 percent LTV loan would be reduced to an effective LTV ratio of 66.5 percent, a 90 percent LTV loan to 67.5 percent, and an 85 percent LTV loan to 74.8 percent. The higher the original LTV ratio, the deeper the PMI coverage and the greater the loss protection to the GSEs.

But the ultimate value of PMI to the GSEs depends not only on the depth of coverage provided but also on the private mortgage insurers' ability to absorb losses and pay out claims under the terms of the insurance agreement. How effective were private mortgage insurers in absorbing credit losses during the last crisis? There are two parts to this analysis:

- Comparing the loss severity for GSE-backed loans with PMI with loans without PMI
- The private mortgage insurers' record as a counterparty to the GSEs

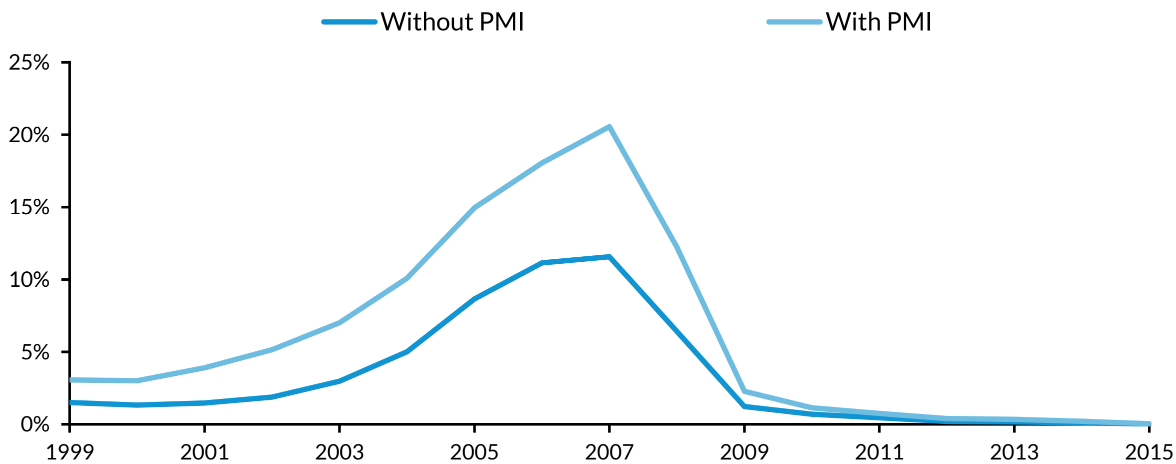
Loan Performance: GSE Loans with and without PMI

LOSS SEVERITY

The eventual loss the GSEs incur on a defaulted loan—net of all expenses and recoveries, including PMI claim payments—expressed as a percentage of the outstanding loan amount is called *loss severity*. Although the probability of default tells us how likely a loan is to default, the loss severity is more consequential because it shows the loss per defaulted loan. Figure 8 compares the default rate (loans that were 180 or more days delinquent) for GSE mortgages with PMI with mortgages without PMI.

FIGURE 8

Historical Default Rates (180 or More Days Delinquent) for GSE-Backed Loans, by Origination Year



Sources: Fannie Mae, Freddie Mac, and the Urban Institute.
Note: GSE = government-sponsored enterprise; PMI = private mortgage insurance. The GSE credit data are limited to 30-year fixed-rate, full documentation, fully amortizing mortgage loans. Adjustable-rate mortgages and Relief Refinance Mortgages are not included. Fannie Mae data include loans originated from the first quarter of 1999 (Q1 1999) to Q4 2015, with performance information on these loans through Q3 2016. Freddie Mac data include loans originated from Q1 1999 to Q3 2015, with performance information on these loans through Q1 2016. Default is defined as six months (180 days) delinquent or disposed of via short sales, third-party sales, deeds-in-lieu of foreclosure, or real estate owned.

The default rate for GSE mortgages with PMI has historically been higher than for those without PMI. This is not surprising, given that loans with PMI have higher LTV ratios and lower credit scores than GSE loans without PMI. The delinquency rate (180 or more days) for recent origination years is practically nonexistent.[12] Even so, the default rate for recent mortgages with PMI, while low, is still higher (roughly twice) the default rate for those without PMI (table 4).

TABLE 4

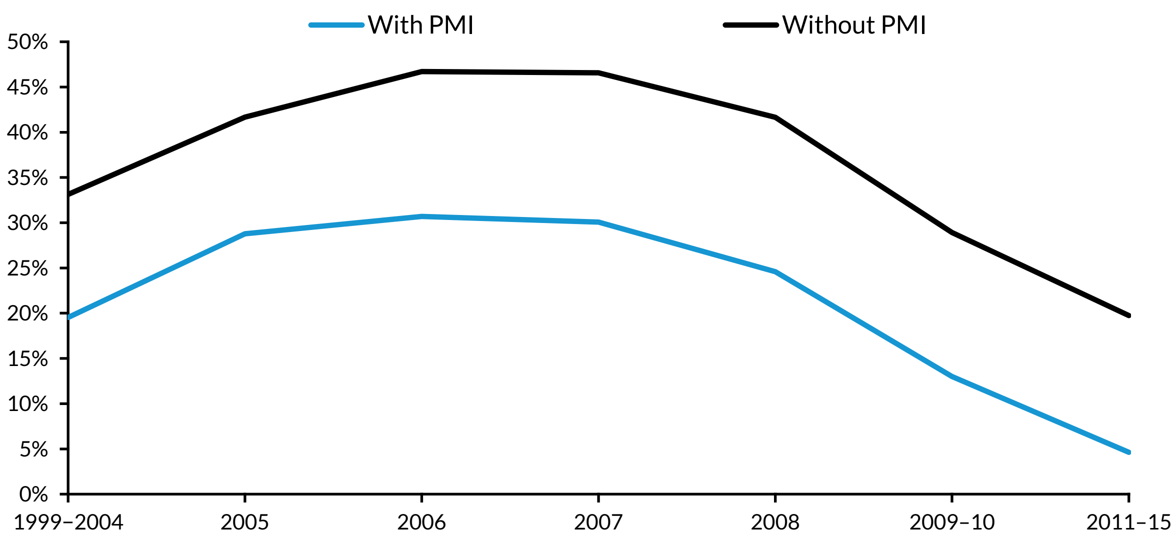
Default Rates (180 or More Days Delinquent) for GSE Loans with and without PMI

Origination year	Default rate for loans with PMI	Default rate for loans without PMI
2010	1.14%	0.70%
2011	0.75%	0.46%
2012	0.39%	0.20%
2013	0.35%	0.16%
2014	0.21%	0.11%
2015	0.04%	0.02%

But higher probability of default does not necessarily translate into higher loss severity, despite the fact that PMI loans have high LTV ratios. Data on GSE loss severity show that GSE loans with PMI consistently have lower loss severities than loans without PMI. Figure 9 shows the loss severity incurred by Fannie Mae and Freddie Mac for loans with and without PMI. The figure shows that lower loss severity for PMI loans is not new. To the contrary, it is a defining characteristic of private mortgage insurance. These data show that PMI loans have exhibited lower loss severity each origination year bucket since at least 1999. In addition, while loss severities climbed for both PMI and non-PMI loans during the last foreclosure crisis, the severity for PMI-insured loans remained below that of uninsured loans.

FIGURE 9

Loss Severity for GSE Loans with and without PMI, by Origination Year Groupings

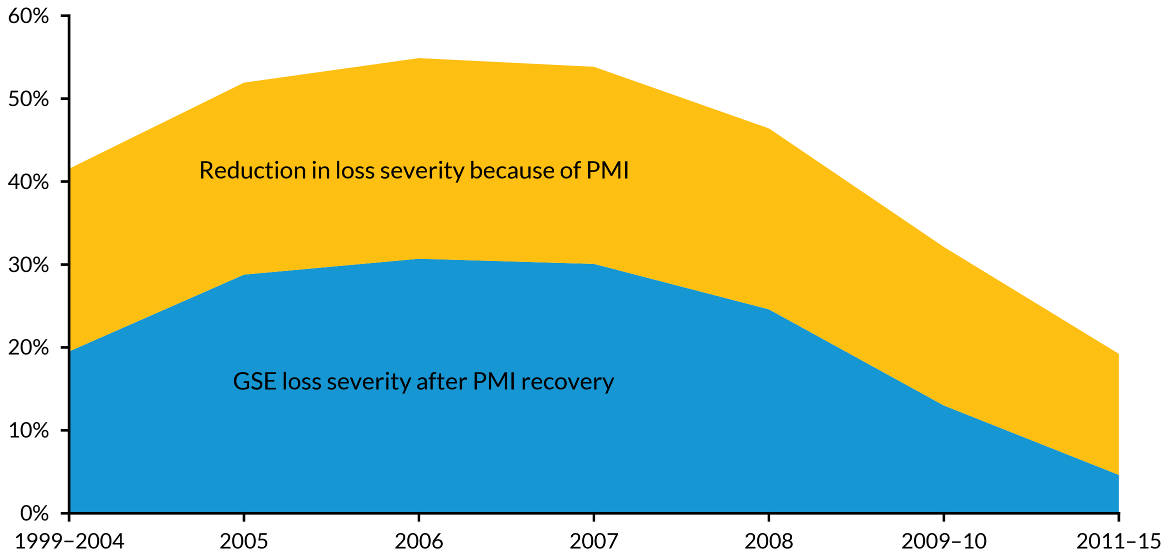


Sources: Fannie Mae, Freddie Mac, and the Urban Institute.
Note: GSE = government-sponsored enterprise; PMI = private mortgage insurance. The GSE credit data are limited to 30-year fixed-rate, full documentation, fully amortizing mortgage loans. Adjustable-rate mortgages and Relief Refinance Mortgages are not included. Fannie Mae data include loans originated from the first quarter of 1999 (Q1 1999) to Q4 2015, with performance information on these loans through Q3 2016. Freddie Mac data include loans originated from Q1 1999 to Q3 2015, with performance information on these loans through Q1 2016.

Although figure 10 is instructive in demonstrating the lower loss severity of PMI-insured loans versus uninsured loans, it does not show how losses are shared between the GSEs and private mortgage insurers for insured loans. Figure 10 shows the loss absorption between the two. The yellow area represents losses absorbed by private mortgage insurers through payment of insurance claims. The blue area represents the actual GSE loss, net of PMI recovery. Absent this recovery, loss severity experienced by the GSEs would be higher. The sum of the two is the hypothetical loss severity the GSEs would have experienced assuming no PMI recovery.

FIGURE 10

GSE Loans with PMI: Reduction in Loss Severity Because of PMI, by Origination Year Groupings



Sources: Fannie Mae, Freddie Mac, and the Urban Institute.
Note: GSE = government-sponsored enterprise; PMI = private mortgage insurance. The GSE credit data are limited to 30-year fixed-rate, full documentation, fully amortizing mortgage loans. Adjustable-rate mortgages and Relief Refinance Mortgages are not included. Fannie Mae data include loans originated from the first quarter of 1999 (Q1 1999) to Q4 2015, with performance information on these loans through Q3 2016. Freddie Mac data include loans originated from Q1 1999 to Q3 2015, with performance information on these loans through Q1 2016.

There are a couple of caveats to this severity analysis. This analysis is based on the single-family loan-level data made available by Fannie Mae and Freddie Mac in support of their credit risk transfer initiatives and includes credit performance only for fixed-rate, full documentation, fully amortizing mortgages. This means that the GSE loss severity and mortgage insurance recovery shares above do not include adjustable-rate mortgages or mortgages with nontraditional features, which are high-risk products that are more likely to default and to have higher loss severities. In addition, the data for this analysis do not include mortgages for which PMI coverage was rescinded.

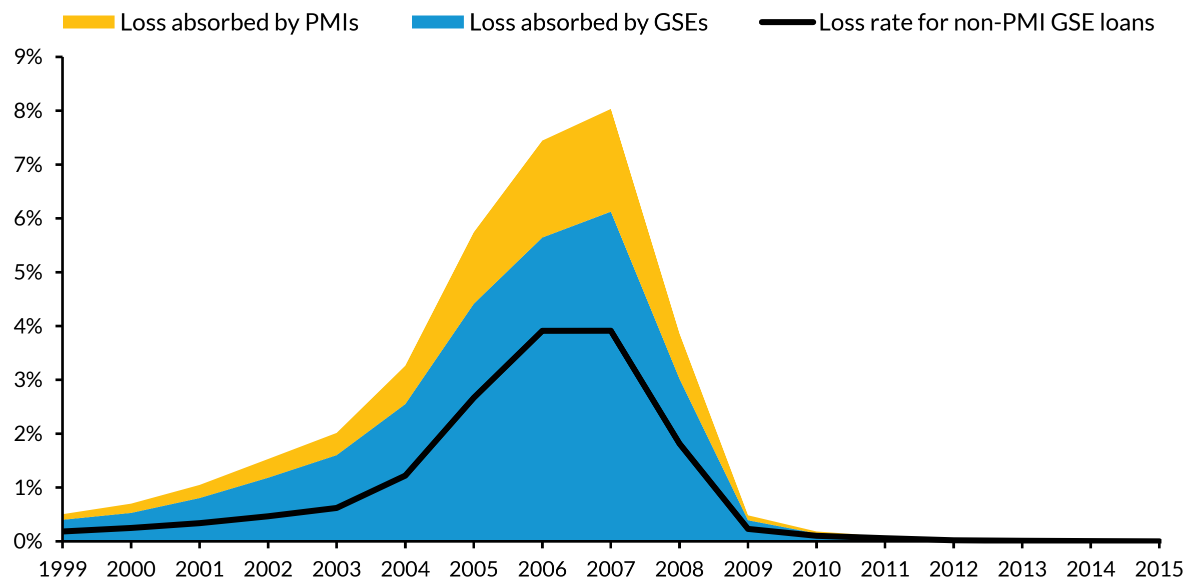
LOSS RATE

Although loss severity is a good measure of loss per defaulted loan, it provides no insight into the losses for a portfolio of loans. The *loss rate* measures the actual dollar losses as a share of the dollar amount of mortgages insured. The loss rate combines the probability of default (as measured by the loans going

180 or more days delinquent) with the probability that if the loans default, they are liquidated, as well as with the loss upon liquidation. Hence, this measure offers a more holistic assessment of overall portfolio risk, and is more consequential in the context of overall firm risk management. Figure 11 shows the historical loss rate for GSE loans with PMI and the loss split between the GSEs and private mortgage insurers (yellow and blue areas). For reference, figure 11 also shows the loss rate for GSE loans without PMI (black line). The combined losses experienced by GSEs and private mortgage insurers for insured loans (sum of the two shaded areas) have historically been higher than the losses for loans without PMI (area below the black line).

FIGURE 11

Losses for GSE Loans, by Origination Year



Sources: Fannie Mae, Freddie Mac, and the Urban Institute.

Note: GSE = government-sponsored enterprise; PMI = private mortgage insurance; PMIs = private mortgage insurers. The GSE credit data are limited to 30-year fixed-rate, full documentation, fully amortizing mortgage loans. Adjustable-rate mortgages and Relief Refinance Mortgages are not included. Fannie Mae data include loans originated from the first quarter of 1999 (Q1 1999) to Q4 2015, with performance information on these loans through Q3 2016. Freddie Mac data include loans originated from Q1 1999 to Q3 2015, with performance information on these loans through Q1 2016.

The allocation of losses between the GSEs and private mortgage insurers makes it clear that PMI reduces losses for GSEs. The yellow region represents the value of PMI recovery, and the blue region represents the net loss to the GSEs after PMI recovery. But even after PMI recovery, the loss rate experienced by the GSEs for loans with PMI is still higher than the loss rate for loans without PMI. Thus, although PMI recovery reduces portfolio-level losses for the GSEs, the reduction is not large enough to overcome the lower LTV ratios of non-PMI GSE loans.

The PMI Industry's Record as a Counterparty to the GSEs

The GSEs' exposure to private mortgage insurers is an important aspect of their counterparty risk management. This is especially important because Fannie Mae, Freddie Mac, and private mortgage insurers are all monoline firms exposed to the same risk of declining house prices. The recent financial crisis, with its 33.4 percent peak-to-trough decline in home prices, severely taxed the entire mortgage market. Leading up to the crisis, rising home prices led to low delinquencies. This in turn created a false sense of comfort and led to a relaxation of credit and documentation standards and the proliferation of nontraditional mortgage products, such as interest-only loans, negative amortization loans, and mortgages with short "teaser" periods of low rates that jumped at reset. High-LTV lending was often accomplished through increased use of "piggyback seconds," second mortgages put into place at the same time as the first mortgage, replacing PMI.

The relaxation of credit standards began in the private-label securities market, but as the GSEs saw their market share loss, they jumped on board by relaxing documentation standards and increasing their use of nontraditional products. And the PMI companies, facing market pressure because of both the GSEs' market share loss to private-label securities and the widespread use of piggyback seconds, insured riskier products while performing little postclosing quality control. In the wake of the crisis, the GSEs and PMI companies have revamped their operations, paying more attention to risk management than ever before.

The Crisis

A major source of tension between private mortgage insurers and the GSEs during the crisis was some insurers' inability to pay out insurance proceeds on time and in full. As credit losses mounted and balance sheet stress for the PMI industry worsened, three firms—PMI Mortgage Insurance Company, Old Republic, and Triad Guaranty—ceased writing new insurance and were restricted from paying out claims so they could conserve capital. Later, a portion of the claims was paid in cash while the remaining were set up as a deferred payment obligation.[13] A portion of these claims still remains outstanding according to the 2016 annual reports of Fannie Mae and Freddie Mac. To reduce financial stress on the industry, the GSEs also waived the minimum AA credit rating they had previously required of the private mortgage insurers. Spreading out claim payments over a longer period (with some portion unlikely to be paid) and other accommodations helped facilitate an orderly resolution of troubled private mortgage insurers and mitigate industry stress. At the same time, the inability to receive full payment on time meant the GSEs had to absorb more losses for a longer period than provided for under the insurance contracts. And with the profit sweep to the US Treasury, the ultimate cost of this falls on the taxpayer.

Another source of tension between private mortgage insurers and the GSEs was the rescission of insurance coverage. Private mortgage insurers can exercise their right to rescind insurance coverage once a claim has been filed and a review of the loan file reveals evidence of fraud or misrepresentation.[14] Before coverage can be rescinded, the insurer investigates facts surrounding the loan's origination, including evidence of fraud or inaccurate information. If the insurer decides to rescind coverage, the insurance policy is canceled and the premiums are refunded. Loans for which coverage was rescinded were covered by the GSEs' representation and warranty policies and were put back to lenders, which mitigated the financial impact for the GSEs, but exacerbated lender losses and created strain between lenders and mortgage insurers.

Mortgage insurers increased rescission rates[15] from 7 percent of claims received historically to as high as 25 percent at the peak of the crisis, according to Moody's Research.[16] Research conducted by Genworth Mortgage Insurance for its portfolio showed a rescission rate of 19 percent from 2007 to 2012.[17] During the run-up to the crisis, mortgage insurers had significantly delegated their underwriting to the GSEs to improve operational efficiencies. Genworth analysis showed that the rescission rate for loans with delegated underwriting was much higher than Genworth-underwritten loans, 23 percent compared with 6 percent.[18] Although limited data are available publicly to conduct a detailed independent study of PMI rescission activity and its causes, the PMI industry has indicated the increase was driven mainly by fraud and misrepresentation, missing documentation, inaccurate appraisals, and noncompliance with PMI guidelines.[19]

The Aftermath: A Stronger Industry

The PMI industry appears to have realized that the increase in the rescission rate during the crisis has created reputational risk, which can deter lenders and GSEs from seeking PMI coverage and lead regulators to account for this risk by discounting the value of PMI coverage for capital relief or other purposes. In recognition of this, the industry has taken four steps:

- **Strengthening capital position.** The industry raised capital in advance of the new capital requirements imposed under PMIERs. Some of these early capital raises were expensive.
- **Instituting a more robust underwriting process.** This includes strengthening in-house underwriting capabilities, performing up-front quality control, reducing reliance on delegated underwriting, and avoiding nontraditional products. Performing such due diligence up front should facilitate early detection and remediation of problematic loans. These operational improvements should also be a useful second set of eyes for the underwriting performed by lenders.
- **Improving risk management.** Private mortgage insurers have placed more emphasis on risk management. They have begun to use reinsurance and insurance-linked notes to manage their risk.[20]
- **Updating master policies**. The new PMI master policy instituted in 2014 spells out in greater detail the conditions, often tied to quantitative thresholds, that must be met before certain errors and omissions can become grounds for rescission.[21] For instance, Material Value Variance, a measure of appraisal error and a term that was not used previously, could become a violation if there was a variance of 15 percent or more between the appraised value of the property and the value stated on the insurance application. Similarly, private mortgage insurers cannot rescind coverage—even if the loan fails to meet underwriting requirements—if the borrower has made the first 36 monthly payments and other conditions are met. In some cases, rescission relief may be available after just 12 months under the new master policies.[22] Although improvements like these will not eliminate the risk of rescission in the future, they will mitigate it.

On the regulatory front, the newly finalized PMIERs spell out detailed risk-based capital requirements that will improve insurers' ability to pay future claims in accordance with the terms of the contract. The flip side of these actions to improve risk management is that they have likely contributed to the tightness of credit, especially for borrowers who need mortgages with low down payments, disproportionately low- and moderate-income borrowers.

The Future of the Private Mortgage Insurance Industry

Private mortgage insurers have played a crucial role over the past six decades enabling first-time homebuyers to gain access to high-LTV conventional financing while reducing losses for the GSEs. At the same time, the industry has gone through several ups and downs. The 2008 housing crisis tested the industry unlike any crisis in the last 60 years, but the industry has regained its balance.

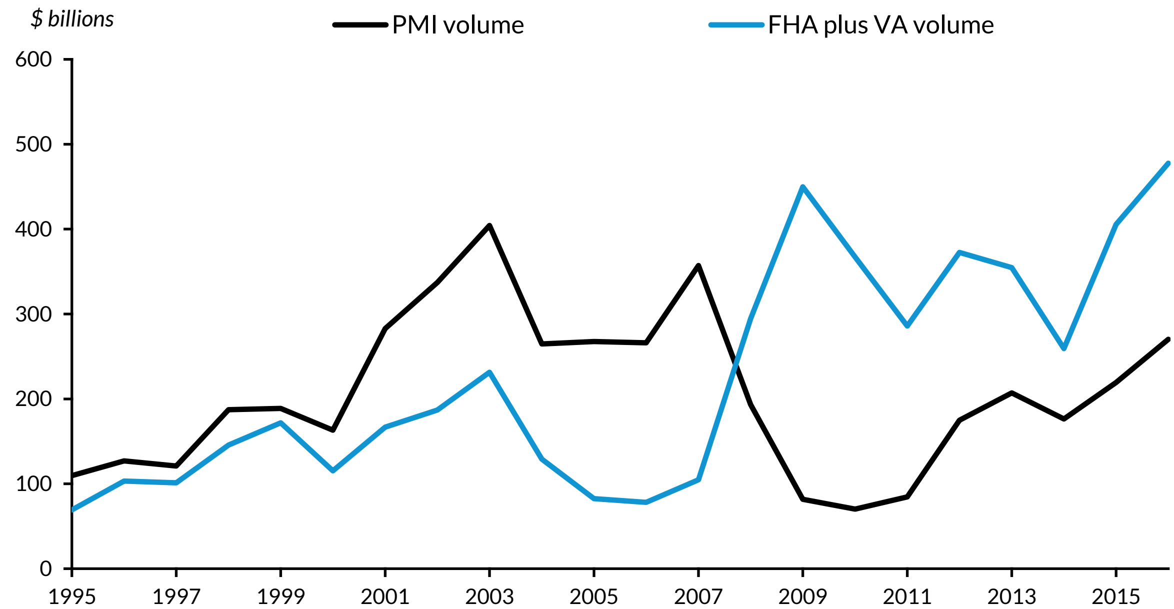
At the same time, the broader housing market has received a complete makeover in the form of an enhanced regulatory environment, more prudent corporate risk management, tighter underwriting standards, and increased focus on reducing taxpayer risk by attracting more private capital. Although these changes have made the mortgage market safer, lenders, with the scars of the crisis still present, are reluctant to originate anything but high-quality mortgages (Goodman 2017).

This dynamic of tight credit, which affects low-FICO-score and high-LTV borrowers disproportionately, poses a broad challenge for the mortgage industry, including for private mortgage insurers. Risk-based capital requirements have led the industry to increase prices for less creditworthy borrowers, adversely affecting access to credit for borrowers private mortgage insurers are intended to serve and have served in the past. Although the price of credit risk protection has risen across the board, low- and moderate-income borrowers have been hit disproportionately by the increased prevalence of risk-based pricing, whether through PMI premium increases or the GSEs' loan-level pricing adjustments. Because of these changes, room for cross-subsidization of high-risk borrowers by low-risk ones that existed previously has shrunk. If high-LTV borrowers continue to face difficulties accessing credit, the PMI industry will bear some of the brunt, financially and reputationally. Additionally, the FHA's current price advantage over private mortgage insurers makes it uneconomical for most high-LTV borrowers who cannot obtain credit to choose private mortgage insurance over the FHA. Lastly, the rise of VA lending and its 100 percent financing makes it a more attractive product relative to PMI for borrowers eligible for VA loans.

The dollar volume of new annual private mortgage insurance stands at roughly the level of the early 2000s (figure 12). In 2016, private mortgage insurers covered roughly $270 billion in unpaid principal balance, slightly below the 2001 level of $282 billion. In contrast, the combined volume of mortgages insured by the FHA and VA has nearly tripled, from $167 billion to $477 billion, over the same period. The volume of loans insured by private mortgage insurers exceeded the combined volume of loans insured by the FHA and VA every year from 1995 to 2007. But the two have traded places since then, with PMI volumes lagging the combined FHA and VA volume.

FIGURE 12

Comparison of Annual Mortgage Insurance Volume: PMI versus FHA and VA, $ billions



Sources: Inside Mortgage Finance and Urban Institute calculations.
Notes: FHA = Federal Housing Administration; PMI = private mortgage insurance; VA = US Department of Veterans Affairs.

Private mortgage insurance volume has recovered since 2011. But as the industry looks to the future, a shortage of housing supply is likely to increase house prices further.[23] Combined with rising rates and tight credit, this will keep many households from being able to afford a home. Higher rates will also choke off refinance activity and create a "lock-in effect," reducing housing turnover. These trends are likely to be negative for purchase originations in the coming years.

Private mortgage insurers could benefit, however, from the decision by many lenders to exit FHA lending because of a range of risks, costs, and uncertainties.[24] Some lenders have announced new high-LTV loan programs with the GSEs as an alternative to FHA lending.[25] The PMI industry is positioned to benefit from this development. The availability of appropriately structured PMI coverage could give lenders who have pulled back from FHA lending a viable alternative, just as the creation of MGIC did 60 years ago.

Changing Demographics

The most powerful growth engine for private mortgage insurers lies in the demographic shifts anticipated to unfold in the next two decades. The future of US homeownership is expected to look different than the past. According to the US Census Bureau, the share of minority households increased from 20 percent in 1990 to 30 percent in 2010. The Urban Institute forecasts the share will reach 38 percent by 2030 (Goodman, Pendall, and Zhu 2015). Minority households tend to have limited assets and savings for a down payment.[26] In addition, high house prices, slow wage growth, and a heavy student loan debt burden for people who do not graduate from college will make it difficult for households to save for a 20 percent down payment, contributing to demand for high-LTV lending. According to USMI, it can take an average household more than two decades to save for a 20 percent down payment at today's housing prices, assuming the US average savings rate.

These trends, along with a steady rise in home prices, will lead many potential homebuyers to seek high-LTV financing for their home purchase, and they will help expand the potential market for PMI. Many of these borrowers will find the FHA and the VA more appealing, but many, especially those with somewhat stronger credit profiles, will find conventional mortgages with PMI more appropriate. This could include high-LTV mortgages backed by the GSEs and those held in lender portfolios. The PMI industry can prepare for this future by introducing products that make PMI more appealing for lenders to offer to their borrowers. This could take the form of better, more targeted outreach toward minority communities or products that meet the needs of borrowers with student loan burdens.

Even in the near term, as mortgage rates rise and refinance volumes dwindle, lenders might be more willing to open the credit box and increase their purchase volumes to offset the decline in refinances, as rate increases are often accompanied by a relaxation of credit standards. Given the large gap between current restrictive credit standards and the reasonable standards of the early 2000s, this would be positive for the PMI industry. The Urban Institute's Housing Credit Availability Index shows the mortgage market is taking less than half the credit risk it took in 2001, a period of reasonable credit standards, and less than one-third the risk it took in 2006–07, when credit was too relaxed.[27] An expansion of credit risk from today's tight standards would be a welcome development for the market and the private mortgage insurers.

Expanding Opportunities

The PMI industry has identified opportunities for its future and has introduced recommendations to work toward a future that is positive for the industry. These include long-term legislative and policy priorities such as urging the FHA to focus more on serving only those low- and moderate-income borrowers who cannot obtain private capital–backed mortgages and working with Congress to increase the role of PMI post–housing finance reform, as well as more near-term strategies (USMI, n.d.).

Deeper MI

To prepare for the immediate future, the industry has proposed the concept of "deeper MI" on the front end of the GSE securitization process, which can work within the confines of the GSEs' risk transfer framework and postreform. Under the deeper MI proposal, the mortgage insurance coverage percentage for GSE loans would nearly double, from the current standard coverage of 25 percent of the loan amount to 50 percent of the loan amount, in exchange for additional premiums. According to research commissioned by the industry, deeper MI offers several benefits: it would reduce the GSEs' and taxpayers' exposure to credit risk, bring more private capital into the mortgage market, and reduce costs for borrowers because the resulting increase in PMI premiums would be less than the corresponding reduction in GSE guarantee fees (which have more than doubled since the housing bust). The difference between the two would be savings for borrowers (Bjurstrom et al. 2015).

To conduct a holistic assessment of deeper MI and credit risk transfer more generally, the FHFA in June 2016 issued a request for input seeking stakeholder feedback on the pros and cons of various risk transfer mechanisms with private mortgage insurers, capital markets, reinsurance companies, and lenders (Division of Housing Mission and Goals 2016). The requirement for the GSEs to engage in increased risk transfer, and more broadly the need for more private capital in the mortgage market, has been a part of several bills and proposals concerning the future of housing finance. In addition, the FHFA's past two scorecards have required the GSEs to evaluate ways to expand risk transfer offerings, including through front-end structures (FHFA 2015, 2016a).

In light of this, the GSEs have done a few front-end transactions with a few private mortgage insurers and more diversified reinsurers,[28] albeit using pool-level insurance rather than the loan-level coverage at the point of origination preferred by the PMI industry (FHFA 2016b). The GSEs are reluctant to alter the structure of the insurance coverage in the way the PMI industry has advocated in part because the GSEs value their ability to pick PMI counterparties to better manage counterparty risk. This partly reflects GSE concerns about increasing exposure to those private mortgage insurers who are less strong financially and thus pose increased counterparty risk.[29] More generally, the GSEs are concerned about sharing even more credit risk with an industry that is already the GSEs' single largest counterparty and is exposed to exactly the same monoline risk of falling house prices, although PMIERs should help mitigate some of it (Division of Housing Mission and Goals 2016; Goodman, Parrott, and Zandi 2015).

More generally, the GSEs are diversifying their credit risk transfer vehicles, as each has its pros and cons. The back-end capital market risk transfer structures (Fannie Mae's Connecticut Avenue Securities and Freddie Mac's Structured Agency Credit Risk Securities, which are the GSEs' preferred and predominant execution) help reduce taxpayer risk, attracts private capital, and has transparent pricing, just like private mortgage insurance. Moreover, the capital markets execution is prefunded. The GSEs receive cash up front and then reduce payout to investors as loan losses mount, eliminating the counterparty risk of having to collect on insurance. But the capital markets structure has one major disadvantage: it is transactional and highly likely to be procyclical. Although such executions can be effective in facilitating broad and low-cost access to credit during good times, they are likely to become expensive—or disappear—during difficult economic times. In contrast, institution-based private capital, such as that provided by private mortgage insurers, lenders, or reinsurers, tends to be less volatile through economic cycles.

The GSEs are working toward diversification in credit risk transfer. In 2014, roughly 91 percent of the GSEs' credit risk transfer was in the form of back-end capital markets transactions (almost all Connecticut Avenue Securities and Structured Agency Credit Risk Securities). In 2016, that was down to 68 percent. Meanwhile, the use of back-end institution-based transactions—primarily reinsurance—has increased from roughly 9 percent to 28 percent, and the use of front-end credit risk transfer has increased from less than 1 percent to 4 percent.[30]

As the GSEs develop their credit risk transfer program, they could experiment with a variation of deeper MI that takes advantage of the increased prevalence of in-house underwriting by private mortgage insurers in recent years. Under this approach, the GSEs would buy deeper coverage from the same mortgage insurer that had initially underwritten the mortgage for standard MI coverage. Theoretically, an insurer is likely to be more comfortable taking on a deeper risk position in a self-underwritten loan than in a loan underwritten by another entity. Economically, this could allow the insurer to charge a lower premium, potentially reducing the GSEs' cost of obtaining deeper MI coverage.

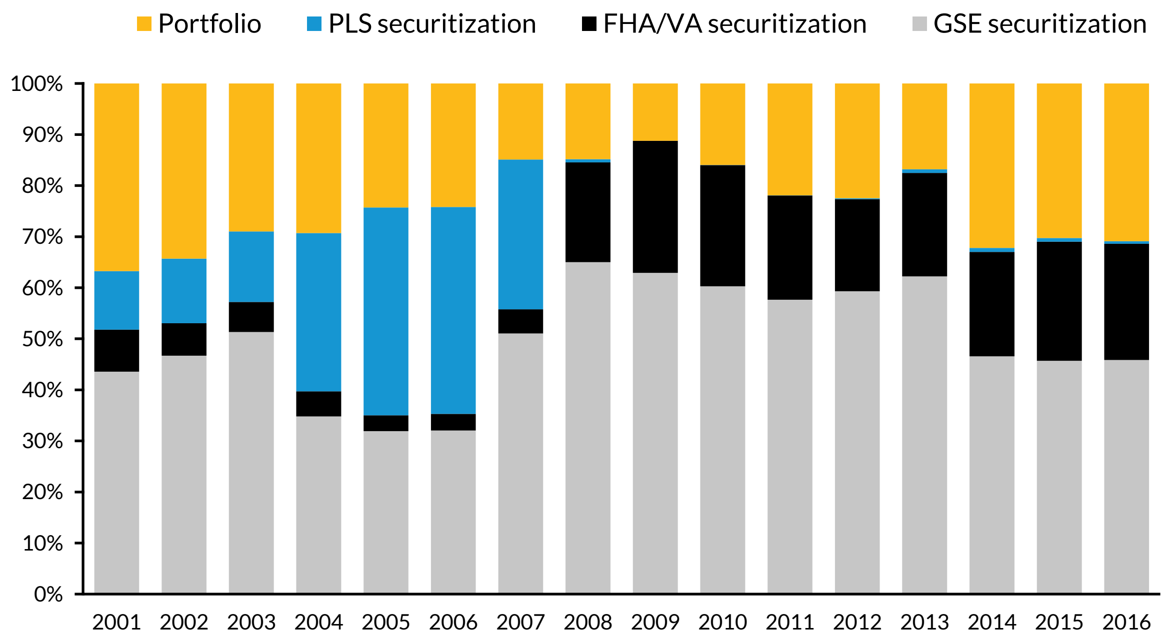
Although the pressure on the GSEs to increase the volume of credit risk transfer may be positive for private mortgage insurers, the continued diversification of the risk transfer program presents the possibility that the niche market private mortgage insurers currently dominate—covering first-loss risk for high-LTV GSE mortgages—will soon be swept into a broader, more competitive market for credit risk transfer. For example, it is conceivable that the GSEs will expand their risk transfer toolkit to provide charter-compliant coverage for high-LTV mortgages without private mortgage insurance. This could happen, for example, if the GSEs expand lender recourse risk transfer at the front end or through entirely new structures. Such a development would be a major departure from the past, when private mortgage insurance represented nearly all the first-loss coverage on mortgages over 80 percent LTV that were insured by the GSEs.

Potential New Opportunities

Given these risks, private mortgage insurers may need to pursue strategies that reduce their reliance on the GSEs. One opportunity is to offer coverage for loans held in lender portfolios. The increases in GSE guarantee fees, coupled with today's pristine originations, have made it lucrative, on a risk-reward basis, for lenders to retain mortgages on their balance sheets. Portfolio lending now accounts for just under a third of all first-lien originations (figure 13). Offering first-loss PMI coverage for portfolio loans, where economically feasible, could benefit both lenders and private mortgage insurers. Such coverage could provide depository lenders relief from regulatory capital, while giving private mortgage insurers an opportunity to increase revenue and diversify away from their current GSE-centric business model. For mortgages backed by one- to four-family residential properties with LTV ratios above 90 percent, PMI can allow depository lenders to reduce the asset's risk weight from 100 percent to 50 percent. Thus, instead of holding 8 percent capital, they would need to hold only 4 percent.

FIGURE 13

First-Lien Origination Share



Sources: Inside Mortgage Finance and the Urban Institute.
Notes: FHA = Federal Housing Administration; GSE = government-sponsored enterprise; PLS = private-label securities; VA = US Department of Veterans Affairs.

Offering PMI coverage for mortgages held in portfolios could also give lenders the comfort they need to increase their commitment to nonpristine lending. In recent years, some of this lending has shifted to nonbank bank entities, such as real estate investment trusts, hedge funds, and private equity firms. As with depositories, the availability of PMI could allow these nondepositories to offload some of their risk, providing incentives for them to increase lending to more nonpristine borrowers. These may include borrowers who are self-employed or borrowers whose income may be irregular but still sufficient for making monthly payments.

Admittedly, providing insurance coverage outside the GSE realm will have its own challenges, the credit ratings of PMI firms being a central one. Financial institutions, lenders, and investors rely heavily on credit ratings to manage their counterparty risk exposure. Five of the seven private mortgage insurers in business today are rated BBB+ or lower, and the other two are rated A. Although this can discourage lenders from seeking PMI coverage in the current environment, PMI firms' credit ratings have improved as the mortgage market has strengthened and company financials have improved.[31] As the industry leaves the housing crisis and the legacy business further behind, its financial strength and credit ratings should continue to improve. Laying the groundwork for future opportunities today will ensure the industry is in a better position to capitalize on them when the right moment arrives.

In the past, the industry has sometimes pursued growth by insuring nontraditional or high-risk products to reach more borrowers or by relying on more delegated underwriting to improve efficiency and reduce costs. But given the most recent loss experience and enhanced focus on risk management, it is highly unlikely that private mortgage insurers will pursue such strategies again. Instead, future growth is likely to come through other channels. Positive factors include a move by some lenders away from the FHA toward GSE lending as well as changing demographics. Additionally, an expansion of credit risk transfer and an expansion of PMI toward more portfolio lending could represent growth opportunities.

GSE Reform

For most of its history, the state of the PMI industry has remained tied to the GSEs. Although this relationship has benefited both in the past, absence of housing finance reform has created uncertainty, not just about the future of the GSEs, but also about the future role of the PMI industry. Bipartisan agreement on housing finance reform is yet to form. But there is broad agreement on one aspect of reform: the need to reduce government footprint and increase the role of private capital. This has been a consistent theme across all mainstream housing finance reform proposals (Bright and DeMarco 2016; MBA 2017; Parrott et al. 2016). Thus, given its long history and experience insuring credit risk of high-LTV mortgages through private capital, the PMI industry is likely to continue to have an important role under most mainstream reform proposals.

Conclusion

Research has shown that saving money for a down payment is one of the largest barriers to homeownership. Access to a healthy set of mortgage products for borrowers with limited down payment funds will remain important. The availability of private mortgage insurance for these high-LTV mortgages has eased these barriers over the past 60 years and enabled homeownership for millions of Americans. Although it has witnessed several ups and down during this period, the PMI industry has always come back.

The period following the Great Recession is no exception. Today's private mortgage insurers are better capitalized and managed than they were before. They raised new capital after the crisis and have strengthened their risk management practices. They are also operating under a far stronger regulatory framework under the new PMIERs. These developments should serve the PMI industry well in the coming decades, as they strive to meet the needs of an increasingly diverse group of high-LTV borrowers.

Notes

1. The analysis presented in this report focuses on PMI coverage for GSE-backed loans and how it compares with the other two predominant providers of mortgage insurance: the Federal Housing Administration and the US Department of Veterans Affairs. Similarly, because of their small footprint, loans insured by the US Department of Agriculture Rural Development are also excluded from this report.
2. Michael Quint, "Max H. Karl, 85, Pioneer in Mortgage Finance," *New York Times*, April 20, 1995, http://www.nytimes.com/1995/04/20/obituaries/max-h-karl-85-pioneer-in-mortgage-insurance.html.
3. Eric N. Berg, "Upheaval at Mortgage Insurers," *New York Times*, March 3, 1988, http://www.nytimes.com/1988/03/03/business/upheaval-at-mortgage-insurers.html?pagewanted=all.
4. Mortgage Bankers Association delinquency survey.
5. Although there is considerable similarity among states regarding PMI regulation, some details vary. See Johnstone (2004).
6. See Promontory Financial Group (2011) for a detailed comparison of FHA and private mortgage insurance.
7. In addition, Genworth Mortgage Insurance is in the process of being acquired by China Oceanwide, an entity with substantial resources, pending regulatory approval.
8. Federal Housing Finance Agency, "Fannie Mae and Freddie Mac Issue Revised Private Mortgage Insurer Eligibility Requirements," news release, April 17, 2015, https://www.fhfa.gov/Media/PublicAffairs/Pages/Fannie-Mae-and-Freddie-Mac-Issue-Revised-Private-Mortgage-Insurer-Eligibility-Requirements-4-17-2015.aspx.
9. Although private mortgage insurers have also offered insurance coverage to lenders for loans held in portfolios and have offered other forms of coverage for GSE loans, such as pool insurance, these offerings have been a small share of their business.
10. The charter requirement for Fannie and Freddie to obtain credit enhancement for high-LTV mortgages was rooted in the perceived risk to taxpayers from such lending and reflected policymakers' desire to mitigate that risk. See Federal National Mortgage Association Charter Act, 12 U.S.C. § 1716 (2010) and Federal Home Loan Mortgage Corporation Act, Pub. L. No. 91-351, 84 Stat. 450 (2010).
11. The GSEs' standard PMI coverage requirements are nearly identical.
12. The default rate for mortgages typically peaks a few years after origination. It is possible that defaults for recent vintages will rise with time. That said, the present default rate for 2010–12 originations—which have already seasoned for five to seven years—is still below normalized historical levels.
13. See "PMI Mortgage Insurance Co. (NAIC No. 27251) PMI Insurance Co. (NAIC No. 10287)," memorandum to state insurance departments, Central Bank of Ireland, Office of the Superintendent of Financial Institutions Canada, and National Association of Insurance Commissioners, August 19, 2011, https://insurance.az.gov/sites/default/files/documents/files/PMI_Order_8.19.11.pdf; and Erik Holm, "Business Curtailed for Old Republic's Mortgage Insurer," *Wall Street Journal*, January 20, 2012, https://www.wsj.com/articles/SB10001424052970204301404577173232900419526.
14. The precise definition of what might constitute fraud or misrepresentation or the specific types of errors that could be grounds for rescission were not always clear previously, creating room for interpretation. The newly updated master agreements have partially mitigated this issue by specifying more precisely, in some cases, the conditions and numeric thresholds that must be satisfied before coverage might be rescinded.
15. Kate Berry, "Mortgage Insurers' Claim Rejections Multiplying Lenders' Pain," *Insurance Networking News*, December 15, 2009.

16. See Monoline Insurers Push Back on Mortgage Claims, Moody's Insurance (Dec. 2009)

17. Genworth, "Regulatory Capital Rules: Standardized Approach for Risk-Weighted Assets; Market Discipline and Disclosure Requirements," memorandum, October 22, 2012, https://www.fdic.gov/regulations/laws/federal/2012-ad-95-96-97/2012-ad-95-96-97_c_864.pdf.

18. Ibid.

19. Ibid.

20. Insurance-linked notes are securities sold to investors. The returns on these securities are linked to an insured loss of the issuer.

21. See Genworth (2014) for a sample PMI master policy.

22. See NMI Holdings, "National MI Offers Rescission Relief after 12 Months on Every Loan," *PR Newswire*, December 10, 2013, http://www.prnewswire.com/news-releases/national-mi-offers-rescission-relief-after-12-months-on-every-loan-235213661.html; and Genworth, "Genworth USMI Provides New Master Policy Resources to Help Customers Understand Improved Coverage Benefits and Plan for Operational Impacts," news release, February 25, 2014, http://investor.genworth.com/investors/news-releases/archive/archive/2014/Genworth-USMI-Provides-New-Master-Policy-Resources-to-Help-Customers-Understand-Improved-Coverage-Benefits-and-Plan-for-Operational-Impacts/default.aspx.

23. Laurie Goodman and Rolf Pendall, "Housing Supply Falls Short of Demand by 430,000 Units," *Urban Wire* (blog), Urban Institute, June 21, 2016, http://www.urban.org/urban-wire/housing-supply-falls-short-demand-430000-units.

24. Joe Light and AnnaMaria Andriotis, "Wells Fargo to Offer Low-Down-Payment Mortgages without FHA Backing," *Wall Street Journal*, May 26, 2016, https://www.wsj.com/articles/wells-fargo-to-offer-low-down-payment-mortgages-without-fha-backing-1464235261?tesla=y.

25. Karan Kaul, "Will Lenders' New Low–Down Payment Mortgage Programs Have a Big Impact," *Urban Wire* (blog), Urban Institute, July 6, 2016, http://www.urban.org/urban-wire/will-lenders-new-low-down-payment-mortgage-programs-have-big-impact.

26. Signe-Mary McKernan, Caroline Ratcliffe, C. Euguene Steuerle, Emma Kalish, and Caleb Quakenbush, "Nine Charts about Wealth Inequality in America," Urban Institute, accessed July 16, 2017, http://apps.urban.org/features/wealth-inequality-charts/.

27. "Housing Credit Availability Index," Urban Institute, Housing Finance Policy Center, last updated July 12, 2017, http://www.urban.org/policy-centers/housing-finance-policy-center/projects/housing-credit-availability-index.

28. See Fannie Mae, "Fannie Mae Announces First Front-End Credit Insurance Risk Transfer Transaction," news release, October 21, 2016, http://www.fanniemae.com/portal/media/financial-news/2016/6464.html;Fannie Mae, "Fannie Mae Announces Second Front-End Credit Insurance Risk Transfer Transaction," news release, February 24, 2017, http://www.fanniemae.com/portal/media/financial-news/2017/credit-insurance-risk-transfer-6524.html; and "Freddie Mac Deep MI CRT," Freddie Mac, accessed July 16, 2017, http://www.freddiemac.com/creditriskofferings/deep_mi_crt.html.

29. Among the seven private mortgage insurers in business today, four are rated BBB-, BBB, or BBB+; one is rated BB+; and two are rated A by Standard and Poor's.

30. Data in this paragraph represent Urban Institute calculations from FHFA single-family credit risk progress reports from June 2016 and December 2016. See "Credit Risk Transfer," Federal Housing Finance Agency, accessed July 21, 2017, https://www.fhfa.gov/PolicyProgramsResearch/Policy/Pages/Credit-Risk-Transfer.aspx.

31. "US Private Mortgage Insurance Outlook: With the Credit Cycle Holding Strong and Financial Strength Stabilizing, Insurers Look to the Future," S&P Global Market Intelligence, January 31, 2017, https://www.globalcreditportal.com/ratingsdirect/renderArticle.do?articleId=1792905&SctArtId=415568&from=CM.

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