

Cyclical Stabilization and the Structure of Mortgage Finance

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Thank you for providing me with the opportunity to speak at the Urban Institute so soon after its successful launch of its exciting new Housing Finance Policy Center. The Center has put together a top-quality group of experts internally and on their advisory boards, and its initial publications promise that the Center will play a significant role in education and research directly relevant to housing finance policy. I particularly like its new chart book, *Housing Finance at a Glance*, which pulls together many aspects of this very complicated field in a way that makes the area more accessible to outsiders, especially new researchers.

In his speech on housing on August 6, President Obama emphasized the importance of building a housing finance system that will provide secure homeownership for responsible middle class families. To this end, the President laid out four principles for reform of the GSEs, Fannie Mae and Freddie Mac, and for building a new housing finance system that will strengthen middle class families and promote financial stability. These four principals are:

1. Private capital must be at the center of a reformed housing finance system.
2. Fannie Mae and Freddie Mac should be wound down through a responsible transition, taxpayers should never again be on the hook for bad loans and bailouts, and private capital should bear the substantial majority of mortgage-based losses.
3. The system must ensure widespread access to safe and responsible mortgages like the 30-year fixed rate mortgage in good and bad economic times.

4. The system must support affordable access to home ownership for creditworthy first-time buyers and access to affordable rental housing for middle class families and those aspiring to be.

I am a macroeconomist, so today I will discuss housing finance reform from a macroeconomic perspective. Specifically, I will elaborate on one aspect of the President's principles, the need for the mortgage finance system to provide liquidity at reasonable rates during good and bad economic times. I will refer to this property as cyclical resilience.

The basic idea of cyclical resilience is straightforward: even if the economy is in a downturn, and even if there are disruptions to financial markets, the housing finance system should still provide reasonably-priced mortgages to creditworthy borrowers. Otherwise, financial market shocks, such as sharp drops in prices of classes of assets, could result in reduced liquidity and could stall the real side of the economy through curtailed housing market activity¹. Stalling out the housing sector would in turn produce or exacerbate a broader economic downturn.

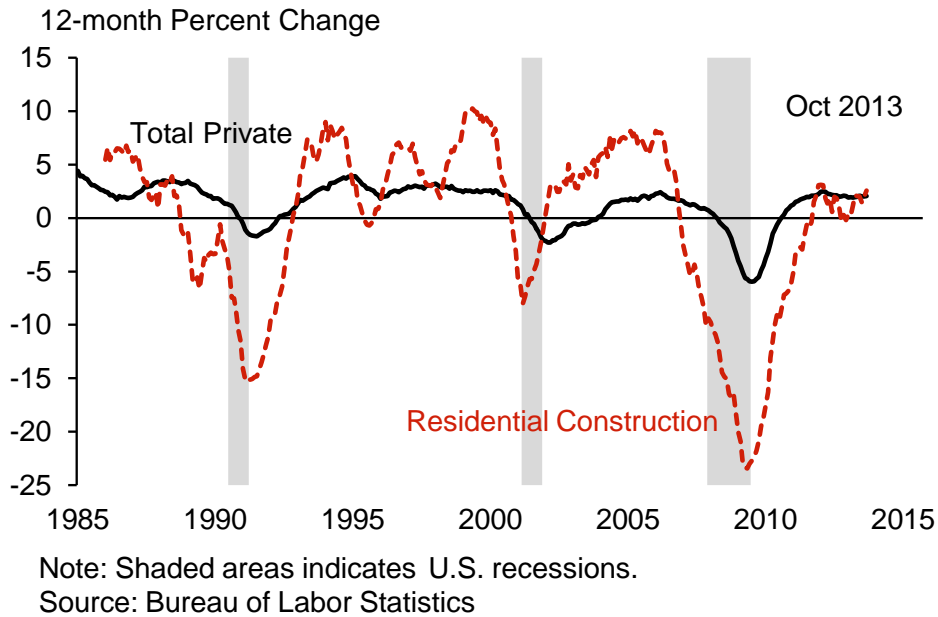
Moreover, housing sector contractions can particularly hit low- to middle-income communities, which are disproportionately dependent on the housing sector for employment and on home equity for savings. A cyclically resilient housing finance system provides a buffer between financial market disruptions and real economic activity.

The cyclical volatility of the housing sector is a longstanding feature of U.S. business cycles, not just the Great Recession. As you can see in Figure 1, employment in residential construction is far more volatile than overall private-sector employment, with 12-month growth rates fluctuating between +10% and -15% between 1985 and 2005. Measures of production, such as private residential fixed investment in the National Income Accounts, show similarly large cyclical volatility relative to overall economic activity. One reason for the volatility of the housing sector is that homes are durable assets. Because the existing stock of durable goods provides a service flow, consumption of the services derived from durable goods continues even without new purchases. Thus, unlike food, buying a car or a home can be postponed in bad economic times.

¹ See Stein (1996), Kiyotaki and Moore (1997), and Ortalo-Magne and Rady (2006).

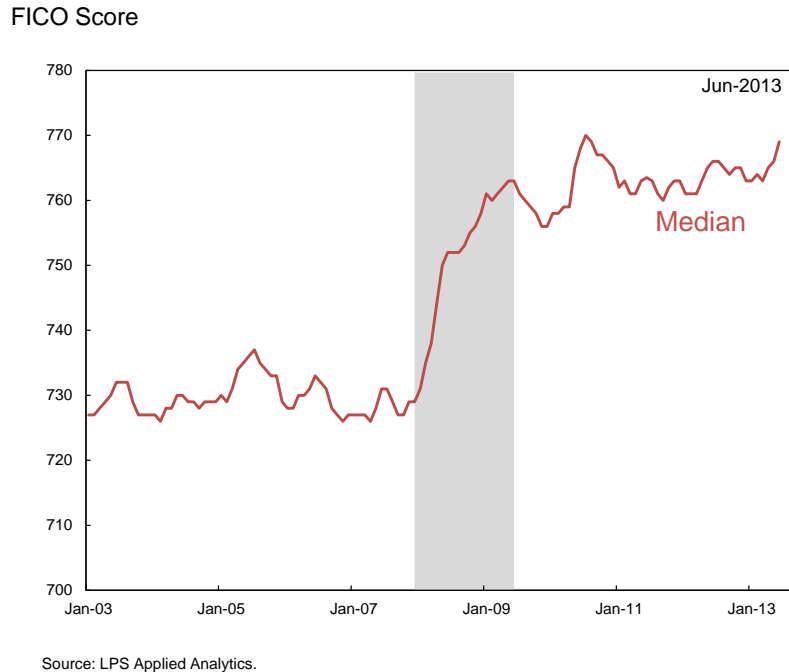
As a result, the production of new durable goods, including housing, is more cyclically volatile than the production of nondurable goods and services.

Figure 1. Employment: Total Private and Residential Construction, 12-month percent change, 1985-2013



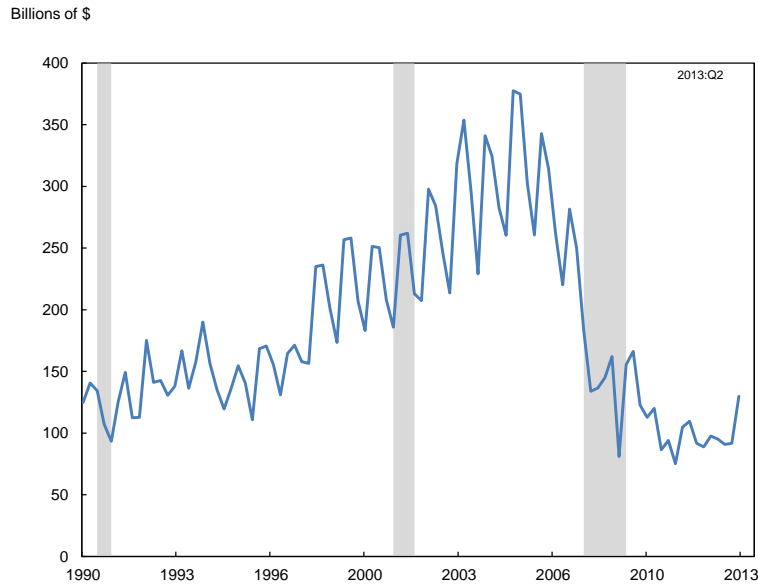
This said, even in downturns there are creditworthy potential homebuyers, and the natural cyclical volatility of housing can be, and has been, exacerbated by financial market failures that reduce liquidity in the mortgage market. This reduced liquidity was particularly evident during and after the financial crisis. With the demise of private-label securitization and tightened underwriting standards, even creditworthy borrowers had difficulty getting a mortgage. As seen in Figure 2, the median FICO score among newly originated prime mortgages climbed from 730

Figure 2. FICO Scores for New Prime Mortgages



in 2007 to around 760 in 2009 and remains elevated today. As Federal Reserve Chairman Bernanke put it, roughly the bottom third of applicants who might have qualified for a mortgage several years ago could not qualify even years into the recovery. Consistent with tighter credit availability, Figure 3 shows that the real dollar volume of mortgage originations fell tremendously during the recession and, despite a recent pickup, since then has hovered around a level last seen in the 1990s. A central feature of cyclical resilience is limiting housing market volatility induced by financial shocks and illiquidity in the mortgage market.

Figure 3. Real Dollar Volume of Mortgage Originations

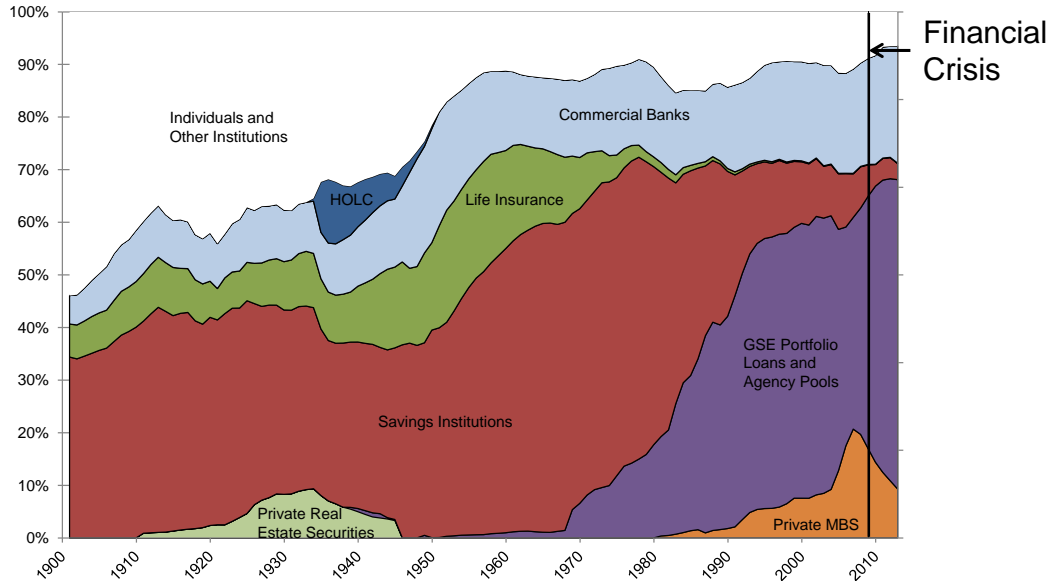


Source. Mortgage Bankers Association.
Note. Amounts reported in 2000 dollars.

Different institutional structures of housing finance have different degrees of cyclical resilience. It is useful to keep in mind that the U.S. housing finance system has, in fact, had many different institutional structures over its long history. As Figure 4 shows, the institutions providing residential mortgage credit evolved throughout the 20th and 21st centuries. In 1900, private individuals, whose share is shown in white in the chart, were an important source of mortgage credit, but over time, their role diminished as other institutions took their place. Some of these changes arose due to financial innovations, such as the development of mortgage insurance and an early form of private securitization in the 1910s. Other changes occurred in the aftermath of financial crises. The period from 1965 through 1990 saw particularly large changes in the sources of finance, notably the increase of mortgage-backed securities, or MBS, and the declining share of mortgage debt held by savings institutions associated in part with the Savings & Loan crisis of the late 1980s. Government interventions have also contributed to this evolution, such as through the Homeowners' Loan Corporation in 1933, which bought and

refinanced distressed loans during the Great Depression, the Federal Savings and Loan Insurance Corporation, which insured deposits for S&Ls, and the creation of the GSEs².

Figure 4. One to Four-Family Mortgage Debt Outstanding



Source: As seen in Snowden (2010), 1945-2013: Federal Reserve Financial Accounts of the United States; 1900-1944: Grebler (1956).

During the crisis and recovery, the Federal government played a meaningful countercyclical role in providing liquidity when private sector liquidity dried up. For example, FHA-, VA-, and USDA-insured mortgages increased from 2 percent of mortgage originations in 2006 to 26 percent in 2013, facilitating the purchase of over 6 million homes between 2007 and 2013. Without this support, housing demand would have been substantially weaker and the housing market recovery we are seeing today would likely have been postponed. In addition, the Home Affordable Modification Program (HAMP) has helped over 1.2 million borrowers through permanent loan modifications. Combined with more than 2 million FHA homeowner

² Snowden (1995, 2010) reviews aspects of the history of U.S. mortgage finance.

interventions and the 3.8 million helped through private lender programs largely modeled after the HAMP template, more than 7 million homeowners have been helped in one way or another³.

Economic theory also supports the case for a government role in a cyclically resilient housing finance system. A starting point for economists is to stress the many things that the private sector does well. The virtues of private sector competition apply to housing finance, including service delivery, innovation, price discovery, private-sector means for diversifying risk, and developing financial products that draw on worldwide sources of funding for U.S. mortgages. A reformed housing finance system should therefore put the risk and rewards of mortgage lending in the hands of private actors. But financial markets are not perfect, and the government has a role in reducing the impact of financial market failures on real economic activity, especially when those failures are exacerbated in a cyclical downturn.

During a cyclical downturn, asset pricing theory tells us that a temporary decline in consumption will lead to an increase in the stochastic discount factor and thus a cyclical risk premium on rates (Cochrane (2011)). I will refer to this cyclically varying rate emerging from consumption-based asset pricing without liquidity constraints as the efficient rate. But during times of financial and cyclical stress, asset market imperfections can lead to pricing that places large risk premia on top of this efficient rate or can even lead to a drying up of liquidity. For example, in the financial crisis, information asymmetries surfaced as counterparty risk in short-term funding markets, something that in normal times is a remote concern. Additionally, if a negative common shock hits a class of asset holders, they can be forced to sell that asset simultaneously at “fire sale” prices⁴. And information processing and cash-flow lags, such as those discussed by Duffie (2010) in his Presidential Address to the American Finance Association, can lead to additional persistent divergence of asset prices from fundamentals. Because the shocks at issue here are common macro shocks, these risks are not diversifiable.

³ For detailed discussions of government actions during the financial crisis, see FCIC (2011), Dynan and Gayer (2011), Gorton and Metrick (2012), and Hancock and Passmore (2010).

⁴ See Shleifer and Vishny (1992), and more recently by Kashyap, Rajan, and Stein (2008), Diamond and Rajan (2009), Stein (2010).

Financial market failures, such as those associated with information asymmetries, fire sales, and information processing limitations, lead financial markets to place an additional premium on risk above and beyond the efficient rate. In severe circumstances, these failures in effect can lead to an inability to price risk, so that liquidity dries up. This additional risk premium and reduction of liquidity means that creditworthy borrowers cannot get a mortgage at the efficient rate during a cyclical downturn. Moreover, because this reduction in liquidity acts like credit rationing, it weakens the link between overall interest rates and mortgage rates, compromising the ability of countercyclical monetary policy to act through the housing market. These market failures call both for a housing finance system that is cyclically resilient in its design, and for a countercyclical government role in that housing finance system.

Even in normal times, the government can still play a useful, albeit much more limited, role. For example, one important government role in normal times is to facilitate the so-called TBA market, a futures market on which Vickery and Wright (2013) estimate more than 90% of Agency MBS trades occur. The TBA market allows a mortgage originator, for example a bank, to make a binding quote of a rate to a potential homebuyer. These binding quotes allow the buyer to shop around, thus enhancing competition in the mortgage market. The binding quote also lets the buyer lock in a rate so she knows she can afford the purchase. Without the TBA market, the binding quote could leave the originator exposed to interest rate risk, but the TBA market makes it possible for the originator to lay off that risk. Specifically, the TBA market is one on which forward contracts on mortgage-backed securities can be bought and sold, even though the specific mortgages that would make up an individual MBS have not yet been specified.

A government guarantee is key to the smooth functioning of the TBA market. Legal issues aside, were there only private guarantees, then different private guarantors would in general have different risk profiles and the forward contracts traded on this market would not be interchangeable. Because these risk profiles would be only partially observable to participants, there would be a classic asymmetric information problem, the so-called “market for lemons.” Although there currently is heterogeneity in the TBA market associated with differing prepayment risk across mortgage pools, this prepayment risk is limited by restrictions on

deliverable mortgages. It is hard to see how a private guarantor could credibly provide full insurance because of its inability to diversify against severe common, or macro, risk. The presence of a government guarantee, as opposed to a private guarantee, resolves the credit risk asymmetric information problem associated with MBSs that do not yet have their constituent mortgages fully specified. With this asymmetric information problem resolved, the TBA market provides liquidity, hedging, and price discovery to the mortgage market.

This discussion, along with a large body of literature, supports four conclusions:

First, in normal economic times the private sector should take the lead in the mortgage market. The crisis is over, the housing market is on the road to recovery, and the Dodd-Frank Act is putting in place new macroprudential and consumer-protection regulations on private-sector mortgage lending. It is therefore now time to reduce the government's role and to place private capital at the center of the housing finance system.

Second, financial market failures result in externalities that justify macroprudential regulation of financial markets in general, but they also justify paying special attention to the effect of these failures on the cyclically sensitive housing sector.⁵ In particular, there is a theoretically and empirically justified role for government support of providing liquidity to the housing market in times of financial stress.

Third, even in normal times there is a role for the government in supporting liquidity, as I discussed in the context of the TBA market.

Fourth, the housing finance system needs a cyclically resilient institutional design to minimize the need for government intervention.

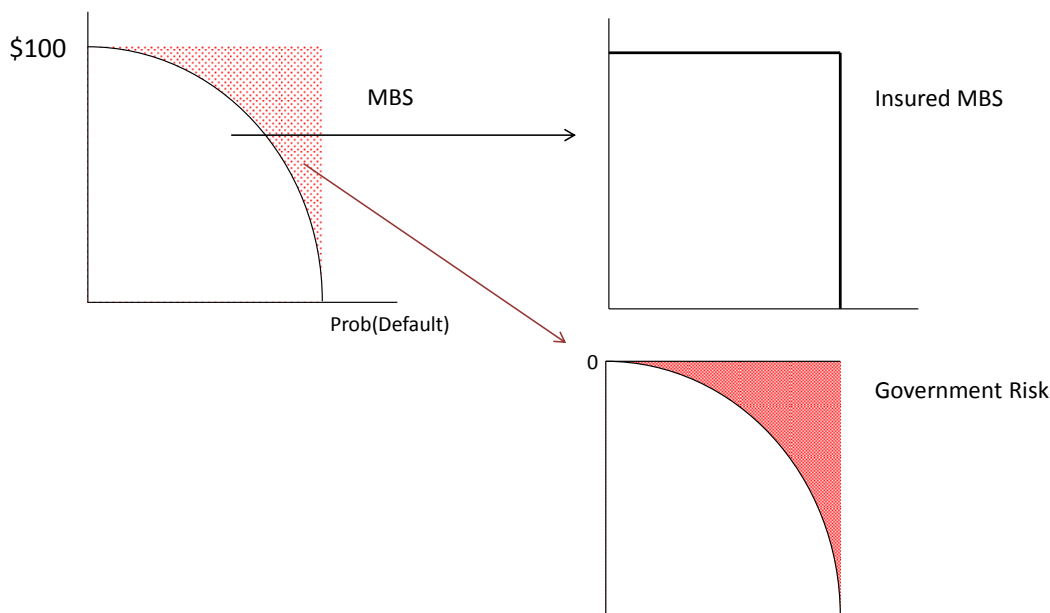
Together, these conclusions point to a government role in housing finance that is both cyclically resilient and limited in normal times. How, then, should that role be executed in a reformed housing finance system? Although my focus is cyclical resilience, other considerations also

⁵ Leamer (2007) explores the important role of housing markets in business cycles.

enter to ensure that the overall framework is consistent with the President's principles. These considerations include making sure that no institution or actor is provided an implicit guarantee, as were Fannie and Freddie, and that there are no more bailouts. They include making sure that private capital bears the substantial majority of the losses associated with mortgage defaults in normal times. And they include making sure that the taxpayer is protected by collecting actuarially-fair premiums for any guarantee the government provides.

The next set of figures illustrates, in a highly stylized way, the economics of a government role that is consistent with these foregoing considerations. To get started, Figure 5a considers the GSE system as it stands today. The black line in the upper left shows a stylized payoff function

Figure 5A. GSE System of Risk-Sharing



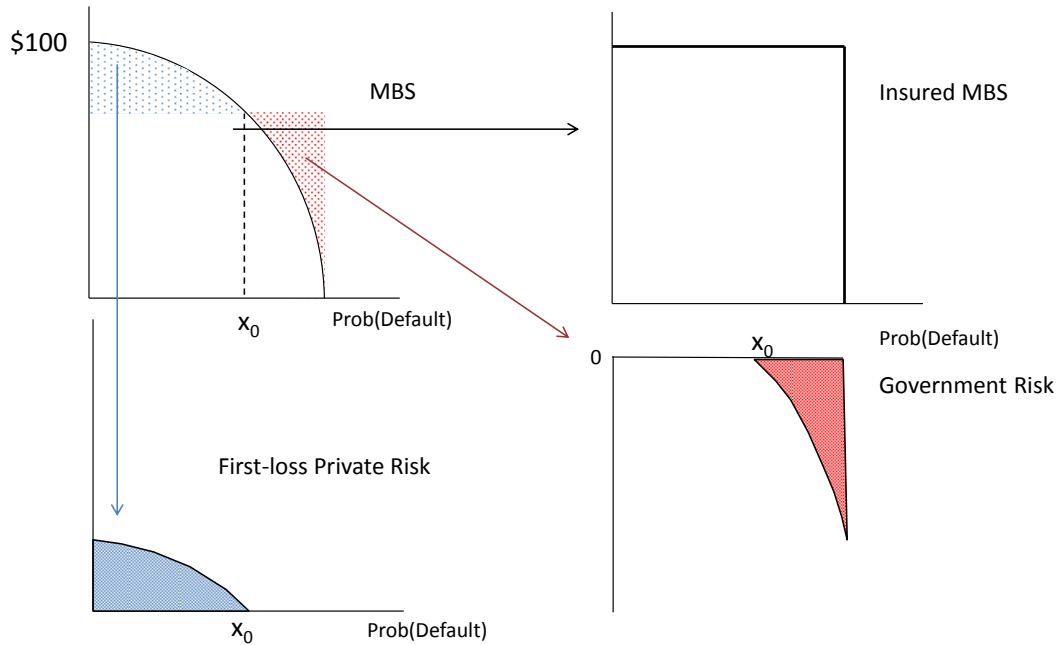
from a mortgage-backed security with face value of \$100. The x axis is the default rate on the underlying mortgages. When there are no defaults, the MBS pays off \$100, but the payoff decreases as defaults rise. This is a highly simplified picture which ignores the intricacies of a real-world MBS, including prepayment risk, the multiperiod nature of interest and principal

payments, putback risk, mortgage insurance for high LTV loans, and so on. However, these simplifications allow me to focus on the sharing of credit risk and on the countercyclical points that are the focus of this talk. Because I am framing this in the context of a payoff function on a MBS, it is convenient to use a financial market framework, and financial market jargon, to discuss risk sharing. I should stress, however, that the countercyclical risk-sharing described here could be accomplished via a number of different institutional and financial structures.

Under the current GSE system, the GSEs provide a guarantee to this MBS, thereby eliminating the credit risk in exchange for a guarantee fee. This creates a new asset, which is the government-guaranteed MBS, and leaves the government (through the GSE) holding the risk. These two payoff functions are illustrated on the right side of the figure, with the guaranteed MBS having a payoff function that does not depend on the default rate and the residual asset bringing claims against the government in bad times. For simplicity, I have not shown the guarantee fee in these diagrams, but that fee offsets the negative payout on the government portion. If the g -fee were actuarially fair, it would equal in expected value the rose payout function in the lower right diagram. .

One way to limit mispricing and to reduce the residual risk held by the taxpayer is to reduce the total risk borne by the government. Realistically, in any system, the government will be left holding the risk of extreme events, commonly called tail risk. By its nature, this tail risk arises from macro shocks that cannot be diversified. Thus reducing government risk entails shedding first-loss risk and retaining the tail risk. Conceptually, this is illustrated in Figure 5B, in which there are now three assets: a new, risky asset which bears the first-loss risk, an asset without credit risk because of the government guarantee, and the residual claim against the government. The first-loss risk asset, which has the blue payoff function shown in the lower left, pays off positive amounts until some critical point x_0 , at which point the asset loses all value. The asset with the government guarantee pays out a fixed amount. The government, shown lower right, is left with the residual tail risk. It charges a fee for holding this risk, so up to and just beyond the point x_0 it receives a positive fee, but thereafter is responsible for tail risk payments to the guaranteed security. This diagram therefore illustrates the private sector taking on first-loss risk.

Figure 5B. Private Capital Risk-Sharing in Normal Times

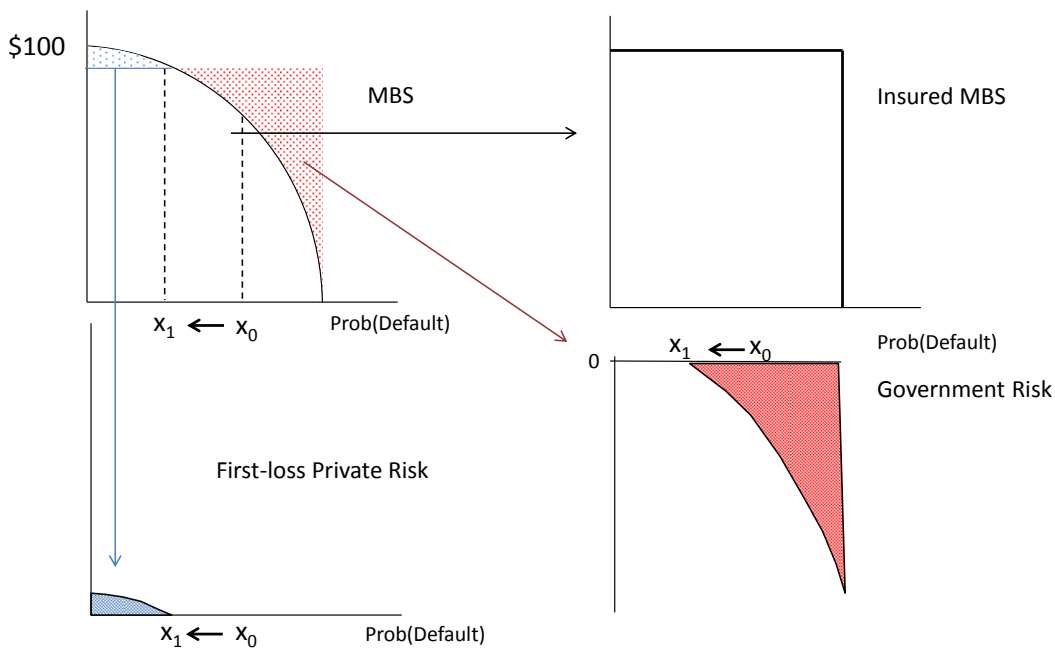


This conceptual risk-sharing structure has several virtues. Private capital is placed first, in that most of the risk is borne by the private sector, which is better equipped to price this risk. The risk exposure to the taxpayer is much less than under the old GSE system, and the government gets paid for holding the tail risk. Because the amount of risk borne by the government is quite limited, there is much less scope for government mispricing. And this structure creates a government-guaranteed MBS that in principle should be tradable on the TBA market, thereby supporting market liquidity in normal times.

Let me return to the countercyclical theme of this talk, and consider what would happen in times of financial stress. If there is a negative financial shock, whether it emanates from the housing market or elsewhere, investors might place a particularly large premium on bearing the risk in the risky asset or might not be willing to bear that risk at all, making it difficult or impossible to sell the risky asset in blue in the lower left. Without any government response, the flow of funds to the mortgage market could dry up, and financial shocks would spill over into real housing

activity. As is illustrated in Figure 5C, the government can counteract these negative financial shocks by countercyclically and temporarily taking on more risk on new MBS. In the figure, this is illustrated by reducing the private-sector risk point from x_0 to x_1 . Thus the amount of risk for new MBS borne by the private sector can be reduced, if needed, by allowing x_0 to move countercyclically.

Figure 5C. Private Capital Risk-Sharing in Time of Stress



For this mechanism to ensure liquidity, two things must happen. First, x_0 must be reduced to the point that private capital is willing to bear the reduced amount of first-loss risk. The details of how this would be done become institution-specific, but to the extent that it involves market-based shedding of that risk then direct feedback would be available through market prices as x_0 is reduced. Second, the market must still demand the guaranteed securities, that is, the insured MBS in the upper right. Historical experience during the financial crisis suggests that this is unlikely to be a problem. Indeed, research by Krishnamurthy and Vissing-Jorgenson (2013) has shown that there was high demand during the crisis for debt which carried a full faith-and-credit guarantee of the Federal government, although government-guaranteed MBS and Treasuries were not perfect substitutes.

The core idea expressed in these diagrams is that a government countercyclical willingness to bear credit risk on new originations constitutes a vehicle for achieving the goal of providing liquidity to mortgage markets in good times and in bad. But this conceptual device requires an institutional implementation. Although I will not talk about any specific institutional structure, five general remarks on institutional design do follow from this discussion of cyclical resiliency.

First, financial shocks can hit quickly, so the government must be able to respond quickly: substantial delays could lead to the negative spillovers to real housing activity that go against the goal of cyclical resilience. In terms of the diagram, the government might need to move quickly from risk-bearing point x_0 to x_1 . This means that the institutional structure for the government taking on the tail risk needs to be there in the first place. Accordingly, the technical expertise and infrastructure needed to take on the normal-times tail risk should be fundamentally the same as is needed to take on enhanced risks in the face of a financial market shock. Moreover, even though the government is taking on only a small amount of risk in normal times, it needs the infrastructure to handle more risk, and possibly more business, when it expands in a time of financial stress.

Second, the extent to which it is necessary to exercise this countercyclical authority depends on financial market conditions, that is, it is state-dependent not time-dependent. One can imagine a sharp but brief disruption which requires a brief response. Alternatively, a more widespread and lasting disruption could require a more sustained response. So the duration of this response, and the degree of risk borne by the government – in the diagram, the point x_1 – needs to depend on economic conditions, not the calendar.

Third, the design of the system needs to ensure that the pipelines, or plumbing, of the housing finance system are also cyclically resilient. By pipelines and plumbing, I mean the complex securitization infrastructure through which a loan moves from the originator to the MBS market, and funds move from MBS market investors down to the potential homeowner. This infrastructure, that is, these pipelines, must themselves survive financial markets shocks and housing price shocks. One reason that the government's implicit guarantee of the GSEs was

unavoidable was that the GSEs played a critical role in the pipeline of new mortgage funding: if the GSEs were to have ceased operation, then the ability of the mortgage market to match the ultimate MBS investors with individual borrowers would have been critically impaired, so that liquidity in the mortgage market would have dried up – precisely what the discussion so far has been trying to avoid. This observation suggests at a minimum that pipeline-critical institutions in a reformed housing finance system should not bear macro or nondiversifiable risk. Additionally, if a pipeline-critical entity bears diversifiable risk, then the system should be sufficiently resilient that such entities could safely fail without tempting a bailout.

Fourth, the system needs to continue to provide liquidity in the event of a moderately-sized macro shock, or a large idiosyncratic shock, without requiring government intervention

Fifth, if all this is not yet sufficiently daunting, the mortgage finance system must be able to meet future challenges that we are only dimly able to imagine today. As Figure 4 (above) illustrates, the mortgage finance system has seen considerable evolution and variation in institutional structures. It is hard to see how expert standing in 1990 would have been able to imagine the institutional changes that would have occurred over the following twenty years. It is equally difficult to imagine that standing here today we will be able to envision the challenges to and innovations in this system over the next two, three, or four decades. We have a good sense of where the challenges came from during the financial crisis, but future challenges might, indeed likely will, look different than past ones. As we think through the difficult details of the design of the system, we need to be humble about our ability to predict the source of future strains, yet aim for a system which will be resilient in the face of the cyclical challenges that lie ahead.

Thank you, I'm happy to take questions.

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