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# Evaluating PATH

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The issue of housing finance reform is heating up in Congress, with the most recent effort the Protecting American Taxpayers and Homeowners Act.<sup>1</sup> The PATH contains a comprehensive but ultimately unviable proposal to wind down Fannie Mae and Freddie Mac and privatize the nation's housing finance system. If fully implemented, the PATH would lead to significantly higher mortgage rates, particularly in tough economic times, and would put 30-year fixed rate mortgage loans out of reach for most Americans (see Chart 1).<sup>2</sup>

## PATH plan

The PATH does three key things. First, it puts Fannie and Freddie into receivership and sells off their assets. Second, it reforms the Federal Housing Administration. Third, it privatizes the rest of the housing finance system.

Winding down Fannie and Freddie is the least controversial aspect of the PATH, although it is not without controversy. Fannie and Freddie's footprint in the mortgage market would be steadily reduced by lowering conforming loan limits and requiring the two agencies to make only qualified mortgage, or QM, loans. Fannie and Freddie would also raise guarantee fees, engage in risk-sharing with private investors, and steadily reduce the size of their retained portfolios. Save for the change to conforming loan limits, all of this is more or less already happening. Fannie and Freddie's affordable housing goals would also be formally eliminated, and they would provide no subsidies to disadvantaged groups. Fannie and Freddie would be put into receivership and dissolved within five years of the PATH's passage.

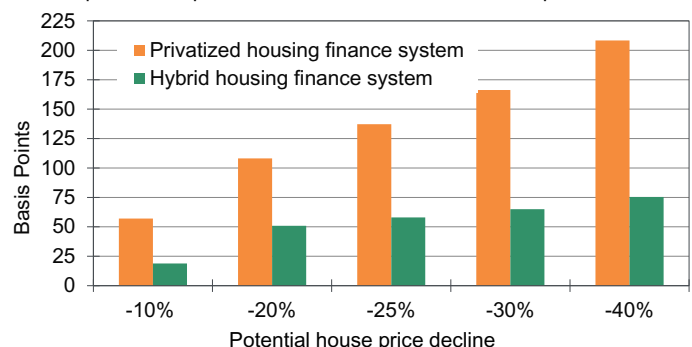
The act would also limit the FHA's footprint in the mortgage

market, permitting it to insure mortgages only for first-time homebuyers and for low- and middle-income households.<sup>3</sup> The FHA would have to reduce its insurance coverage on mortgage loans from the current 100% to 50%, while sharing the risk with private investors. The cost of FHA insurance would likely rise because of required changes in its premium policy and the doubling of its reserve fund from 2% to 4%. The FHA would be spun out of the Department of Housing and Urban Development and reconstituted as a separate agency.

Most controversially, the PATH would privatize most of the nation's mortgage market. The

**Chart 1**  
**Mortgage Rates Are Higher in Privatized System**

Rate impact at a capitalization rate consistent with house price declines of...



Source: Moody's Analytics

legislation encourages development of the private mortgage market by establishing a securitization platform that would be a nongovernment, nonprofit utility open to all mortgage security issuers. Like the common securitization platform that the FHA, Fannie and Freddie are currently working on, the PATH platform would help set standards for mortgage origination, servicing, pooling and securitization. The PATH also provides a legislative and regulatory framework for covered bonds, another financing mechanism currently used mostly by large European banks. Various parts of the Dodd-Frank financial regulatory reform and Basel III international banks standards would also be either repealed or delayed, with the goal of encouraging more private mortgage lending.

If the PATH becomes law, the FHA would account for no more than one-fifth of the mortgage market on average through the business cycle. The rest of the market would receive no government support.

### Plaudits for PATH

The PATH is laudable in its effort to reform Fannie and Freddie along with the FHA while making other changes to the banking system and private securitization market. Most proposals to resolve Fannie and Freddie do not consider the rest of the mortgage market, which could leave significant inconsistencies in the system. Balancing the FHA's role with other sources of government support and the private market is difficult unless the system is considered as a whole. Of course, this balancing is easier for the PATH since it gives the government no additional role beyond the FHA. The task is greater for those reform efforts that include a catastrophic government guarantee.

The promotion of risk-sharing among Fannie, Freddie, the FHA, and the private mortgage market is also a positive step. Risk-sharing reduces taxpayers' exposure to mortgage risk and fosters the development of financial instruments that can handle that risk in the private market. With guidance from the Federal Housing Finance Agency, Fannie and Freddie are already moving in this direction, while the FHA appears to be considering it.<sup>4</sup> The PATH would formalize this effort.

Fostering development of a securitization platform is also worthwhile. Without a common securitization platform, the blizzard of mortgage securities could reduce liquidity and significantly raise mortgage rates. It is difficult to see how a "to-be-announced" (TBA) market would survive in the PATH, but without a securitization platform there would be no prospect for one. The TBA market is vital to reducing transaction costs and mortgage rates.

Yet while a securitization platform is a good idea, it is not clear why mortgage security issuers would use the version created under the PATH. Other reform proposals allow those who use a securitization platform to receive a catastrophic government guarantee for their securities. Not so under the PATH. Issuers would presumably receive some benefit from the greater liquidity gained from using the platform, but this would be offset by the extra cost of agreeing to the platform's terms. It is not clear that issuers would find that the benefits outweigh the costs.

The PATH's effort to develop a covered bond market is also a positive step. Covered bonds are used in Europe, where big banks issue securities backed by loans, including mortgage loans. Investors in those securities are protected from losses by the structure of the securities as well as by the banks' capital. The banks backstop the securities. For various institutional and regulatory reasons, there is no covered bond market in the U.S. The PATH addresses these constraints to help jump-start this market. This is important, since without any form of government guarantee in the PATH, banks will need to provide much more capital to the mortgage market. The PATH's authors hope a well-functioning covered bond market will allow this to work better.

Yet it will be very difficult for a covered bond market to attain significant scale. Covered bonds work in Europe in significant part because large banks there are treated as too big to fail and are backstopped by their governments. There is no doubt that German or French taxpayers would support Deutsche Bank or BNP Paribas if they got into trouble. In the U.S., regulators are moving rapidly in the opposite direction. Big U.S. banks are under

pressure to reduce leverage, eliminate riskier activities, and reduce their wholesale funding needs. It is hard to reconcile all this with the PATH's reliance on a large covered bond market that would require big banks to get bigger.

The PATH also correctly aims to make the private securities market more competitive. In this vein, it eliminates the Dodd-Frank qualified residential mortgage, or QRM, rule, which demands a lender hold 5% of any nonqualified loan, and share the losses if it later goes sour. The approach makes sense in principle, but the details are quite complicated, reflecting the Federal Reserve's fear that lenders will try to circumvent any rule.<sup>5</sup> Complexity adds to costs, however, and non-QRM loans threaten to have meaningfully higher mortgage rates than QRM loans.<sup>6</sup> The Fed is expected to issue a final ruling on QRM by the end of the year, which will hopefully address these concerns, ensuring it is no longer a significant issue by the time housing finance reform legislation comes up for a vote.

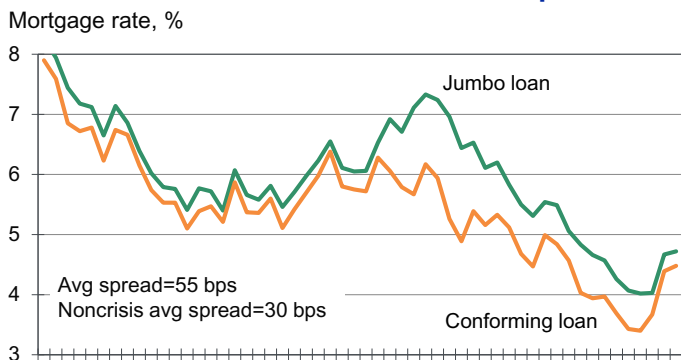
### Assessing privatization

The PATH's main goal is privatization of the housing finance system. The federal government would have no role outside of the FHA and some modest regulation by the much-diminished FHFA.

The principal advantage of a privatized system lies in its stronger incentives for prudent mortgage lending. Mortgage originators, issuers, rating agencies and investors would understand that if things go badly and defaults rise, they will suffer the consequences. Of course the incentive depends on how strongly investors believe that the government will not intervene, even in bad times. Moreover, the collapse of the private-label securities market during the recent housing bust demonstrated that imprudent risk-taking can occur in a private market, even where enormous losses are possible.<sup>7</sup>

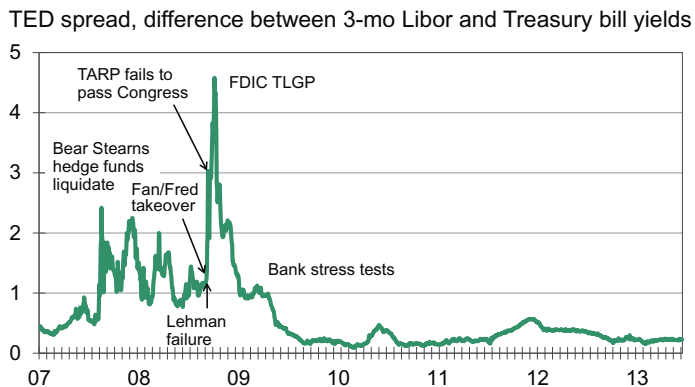
A privatized system would also protect taxpayers by restricting the government's ability to provide implicit subsidies to the mortgage and housing markets. The FHA would still be a potential source of subsidy, but this would be explicit. There is thus less risk that capital would be misallo-

**Chart 2**  
**A Privatized Market Would Be Less Liquid**



Sources: Bankrate.com, Moody's Analytics

**Chart 3**  
**The Cost of No Government Backstop**



Sources: Federal Reserve Board, Moody's Analytics

cated toward housing and away from more productive activities.

The systemic risks borne by taxpayers should also be reduced, at least in theory. In a truly competitive private market, Fannie's and Freddie's roles would presumably be filled by smaller institutions that would not threaten the system if they fail. However, given scale economies in mortgage lending and servicing and historical precedent, it is very possible that the market would become more concentrated, with greater too-big-to-fail risks.

Complete privatization is much more plausible in theory than it would be in practice. Private capital is not limitless, and there are plausible catastrophic scenarios, similar to the Great Recession, that would completely wipe it out. At that point, the government would have little choice but to intervene, or the system would collapse. Regardless of what policymakers say, global investors will almost surely continue to believe the U.S. government would step in if housing foundered. This was amply demonstrated in the financial panic when the government rescued Fannie and Freddie, after saying for years that it would not do so. After Congress' approval of the Troubled Asset Relief Program and the bank bailouts, investors believe Washington will inevitably act if the broader financial system is in danger.<sup>8</sup>

The potential advantages of privatization would also be overwhelmed by disadvantages in the form of much higher mortgage rates and a much less stable source of mortgage funding across the economy's ups and downs.

The 30-year fixed-rate mortgage, the bedrock of mortgage lending since the Great Depression, would also be significantly diminished.

Under the kind of system envisaged in the PATH, providing the system with enough capital to withstand a mortgage default loss rate of 5%—about the system's current capitalization level—would drive mortgage rates nearly 90 basis points higher than they currently are.<sup>9</sup>

The estimated mortgage rate impact of privatization depends on three important assumptions. First, it assumes that financial institutions providing capital to a privatized mortgage system will require a 25% return on equity. This is greater than the 15% ROE that the private mortgage insurance industry has typically obtained during times of normal market conditions with a government backstop, but less than the 30%-plus return that unsecured credit card issuers have traditionally sought. Investors providing capital to a fully privatized system will need a higher return to compensate for greater risks when the government is not backing them up.<sup>10</sup>

A second assumption is that investors in a privatized market would assess a liquidity-risk premium of 10 basis points. A private system will likely feature a greater variety of securities, resulting in a smaller, shallower market. The benefit of a deeper market is evident in the interest-rate spread between jumbo and agency-backed mortgage securities, which has ranged from 10 to 30 basis points in normal periods (see Chart 2). In times of stress, the spread has been much greater.

If anything, a 10-basis point liquidity premium is too low, as it is hard to see how the TBA market would function in the absence of some form of government guarantee. The TBA market is critical to liquidity in the current market for Fannie and Freddie securities, and the market in turn depends on the willingness of investors in mortgage securities to accept any security backed by a pool of loans delivered with a given coupon and maturity.<sup>11</sup> This is acceptable as the government guarantee gives all pools the same credit risk, leaving prepayment behavior as the only potential difference. Thus without a government guarantee, investors would be required to analyze the credit risk of each mortgage pool, including any differences in their credit-enhancement structures. Some investors, such as global central banks, are not able to take on any credit risk, and many others are not equipped to do so. The TBA market would likely fall apart.

A third assumption is that investors in a privatized market would require a financial market risk premium of 25 basis points. Investors would want some compensation for the additional risk of investing without a government backstop. Just how much compensation is difficult to determine, but it is instructive that the TED spread—the difference between three-month Libor and Treasury bill yields—surged from 25 basis points just prior to the financial crisis to a peak of almost 400 basis points at the height of the financial panic, when investors were seriously questioning whether the government would support the financial system (see Chart 3).<sup>12</sup> After the

TARP and other government interventions, the TED spread came full circle, reflecting the widespread belief that the government would not allow major financial institutions to fail.

To further test this assumption, a vector autoregressive model of the 30-year fixed mortgage rate was constructed (see Box). The mortgage rate is explained in the model by the 10-year Treasury bond yield, house price growth, and the TED spread—the difference between three-month Libor and three-month Treasury yields. The model was simulated under the assumption that the TED spread narrows by 100 basis points, which is not quite the average TED spread over the model’s estimation period back to the mid-1970s. The exercise effectively simulates the impact on mortgage rates of the counterfactual in which the entire financial system is nationalized. Since money-center banks are part of the government in this scenario, they are willing to lend to each other at the risk-free Treasury interest rate. The 30-year fixed mortgage rate narrows by an average of nearly 50 basis points in this simulation of the model. The assumption that investors will require only a 25-basis point financial market risk premium in a fully privatized system seems conservative.

This assessment of the mortgage rate impact of privatization is also conservative, as it does not account for the institutional constraints impacting investor demand in global fixed income markets. Some global institutional investors, mutual funds, and pension funds are not able to invest in assets with credit risk because of their charters or even by law. These investors, who are willing buyers of government-backed mortgage securities, would be unable to purchase mortgage securities issued in a fully privatized system. These barriers may or may not come down in the future. To the degree they do not, mortgage rates would be necessarily higher in a privatized system. Given the difficulty in quantifying and categorizing the variety of mortgage securities investors, we recognize the impact these restrictions could have but are unable to measure them.

Looking overseas for guidance to determine the impact on mortgage rates of a privatized mortgage finance system is not

## Description of VAR Model of Fixed Mortgage Rates

A vector autoregressive model of the Freddie Mac 30-year fixed mortgage rate was constructed to quantify the impact on mortgage rates of eliminating the federal backstop for the financial system. The model was estimated on monthly data from 1977 to 2012 and includes the 10-year Treasury yield, TED spread (the difference between three-month Libor and three-month Treasury bill yields), the difference between current 10-year Treasury yields and a five-year moving average of 10-year Treasury yields to capture the impact of prepayment risk, and house price growth.

### Vector Autoregressive Model of Fixed Mortgage Rates

*Dependent variable is the Freddie Mac 30-yr fixed-rate mortgage*

*Model is estimated on monthly data from 1977 to 2012*

Explanatory Variable	Coefficient	t-statistic
Constant	2.340	2.28
10-yr Treasury yield	1.011	9.50
TED spread	0.242	6.99
Difference between 10-yr Treasury yield and 5-yr MA of 10-yr Treasury yield	-0.450	4.23
House price growth	-1.377	-1.78
AR(1)	0.973	78.93
MA(2)	-0.254	-1,400.05

Source: Moody’s Analytics

very helpful. While few advanced economies provide direct government support to their mortgage finance systems, many provide substantial indirect support through their banking systems. Mortgage lending is dominated by the banking system, which is generally very concentrated, and in most of the rest of the world, much too big to fail. Also common overseas is the widespread use of prepayment penalties and recourse mortgages with lenders routinely pursuing deficiencies against defaulting borrowers. This keeps mortgage rates much lower than in the U.S., where such practices are much less common.

A fully privatized mortgage finance system will have difficulty providing stable

mortgage funding during difficult financial times. Mortgage securities markets are prone to investor runs, much like the bank runs that occurred before FDIC deposit insurance.<sup>13</sup> It is all too true that investors are willing buyers of securities and providers of capital in good times, but will run for the door in bad times. Risk premiums and interest rates spike in a financial crisis, and lenders will make only the highest quality loans for their own portfolios. The resulting credit crunch further undermines housing demand, driving down prices and unleashing a vicious cycle.<sup>14</sup> The PATH attempts to address this concern by allowing the FHA to expand its lending in times of crisis. But this would likely happen only after significant damage

had been done, and it is unclear whether the FHA could quickly fill the void.

The 30-year fixed-rate mortgage would become much less prevalent in a fully privatized mortgage finance system. Financial institutions have historically found it very difficult to manage the interest rate risk inherent in such mortgages: As the cost of funds changes, the rates received from homeowners remain fixed. The savings and loan industry collapsed largely because it mismanaged this interest rate risk during the 1980s, and even Fannie and Freddie got into trouble using inappropriate interest-rate hedging techniques to manage their earnings in the early 2000s.

It thus is not surprising that 30-year fixed-rate mortgages are very uncommon in other countries, where interest-rate risk resides with lenders and not in securities markets. Indeed, fixed-rate mortgages are common only in the U.S., Denmark and France.<sup>15</sup> Fixed-rate mortgages persist in the U.S., because of the government's support of the mortgage finance system; in Denmark, because of that nation's very unique "principal of balance" framework that equates individual mortgages and bonds; and in France, because of restrictions on prepayment.<sup>16</sup>

A privatized U.S. market would come to resemble other nations' mortgage markets, where adjustable-rate mortgages are the primary offering. Based on international comparisons, use of fixed-rate mortgages in the U.S. would decline to between 10% and 20% of the mortgage market compared with a historical average of closer to 75%.<sup>17</sup> ARMs are not inherently bad loan products, but they do shift interest rate risk to homeown-

ers. This would be a significant adjustment for many U.S. homeowners who are not well equipped to handle such risk.<sup>18</sup>

### Access problems

The PATH also fails to provide adequate access to the privatized mortgage market to small lenders and disadvantaged households. For small lenders, the PATH envisages the Federal Home Loan Banks serving as aggregators of their loans. It is unclear how or whether this would work to give small lenders access similar to that afforded large lenders. A key assumption is that the FHLBs would be able to obtain similar terms for pools based on loans from a potpourri of small lenders, as large lenders would receive from the securitization platform. At the very least, the FHLBs would have to backstop small lenders' reps and warranties.

Government support for disadvantaged households seeking affordable single-family and rental housing would also be limited under the PATH. This is more important in the wake of the Great Recession, which destroyed trillions of dollars in homeowners' equity, and in light of quickly changing demographics. Under the PATH, the FHA would continue to support these households, but the statutory program definitions under which the FHA operates make innovation difficult, and there would be no additional dedicated funding for experimentation. Experimentation is challenging for the private housing finance system, in part because good ideas take time to prove but once proven are easily replicated. Maintaining a supply of unsubsidized affordable rental housing

made up of small properties will also require innovation. Such housing accounts for the bulk of unsubsidized rental units and a high percentage of all affordable units, and often needs refinancing, renovation and repair, but has limited access to private capital.

### Conclusions

The recent flurry of congressional activity on housing finance reform is encouraging. The status quo, with Fannie and Freddie in conservatorship, is a growing problem. Taxpayers are on the hook for potential losses on most of the nation's mortgage loans, worth hundreds of billions, that Fannie and Freddie insure each year. This is not necessary: Private investors are willing to take on much of this risk, and with some safeguards are capable of doing it.

The housing finance system needs reform. But reform's success depends on striking the appropriate balance between the benefits of the private market and the backstop of the federal government. Finding the right balance will strengthen the housing market, stabilize the financial system, and lead to a healthier economy.

The PATH as currently written does not find that balance. The housing finance system it envisages is largely privatized, providing no government backstop under any economic circumstances. The result will be measurably higher mortgage rates, the marginalization of the 30-year fixed-rate mortgage loan, and a less stable housing market. Larger lenders will likely grow larger in the PATH, and disadvantaged households will have less access to affordable housing.

### Endnotes

- 1 House Financial Services Committee Chairman Jeb Hensarling (R-TX) is the principal author of the PATH, which can be found at <http://online.wsj.com/public/resources/documents/Timiraos.pdf>. The PATH legislation became public in early July. Senators Bob Corker (R-TN) and Mark Warner (D-VA) introduced housing finance reform legislation on June 25, 2013, which can be found at [http://www.corker.senate.gov/public/\\_cache/files/1bc94e87-5a8a-4f07-a709-30bb19f15873/06-25-13%20BILL%20TEXT.%20Housing%20Finance%20Reform%20&%20Taxpayer%20Protection%20Act%20.pdf](http://www.corker.senate.gov/public/_cache/files/1bc94e87-5a8a-4f07-a709-30bb19f15873/06-25-13%20BILL%20TEXT.%20Housing%20Finance%20Reform%20&%20Taxpayer%20Protection%20Act%20.pdf). For an assessment of the Corker-Warner plan, see "Evaluating Corker-Warner," Moody's Analytics white paper, July 2013, Mark Zandi and Cristian deRitis. <http://www.economy.com/mark-zandi/documents/2013-07-08-Evaluating-Corker-Warner.pdf>
- 2 The mortgage rate impact shown in Chart 1 is based on a privatized system like that proposed by the PATH. The hybrid system includes a catastrophic government guarantee, similar in structure to that proposed in Corker-Warner, although Corker-Warner requires a 10% attachment point compared to 5% in the chart.
- 3 In most places, lower-to-middle income includes households with incomes below 115% of an area's median household income.
- 4 Risk-sharing is part of the FHFA's strategic plan and scorecard: <http://www.fhfa.gov/webfiles/25025/Scorecard2013.pdf>
- 5 This includes the premium capture rule, which the PATH would also eliminate.
- 6 See "A Clarification on Risk Retention," Moody's Analytics special report, Zandi and deRitis, September 20, 2011 at <http://www.economy.com/mark-zandi/documents/2011-09-21-Zandi-A-Clarification-on-Risk.pdf> and "Reworking Risk Retention," Moody's Analytics special report, Zandi and deRitis, June 20, 2011. <http://www.economy.com/mark-zandi/documents/Reworking-Risk-Retention-062011.pdf?src=MZ>
- 7 According to Moody's Analytics data, the loss rate on private-label mortgage-backed securities originated in the housing boom have had loss rates of more than 20%.
- 8 The \$700 billion Troubled Asset Relief Program, established during the height of the financial panic in late 2008, committed as much as \$250 billion to provide capital to troubled banking institutions.
- 9 This is for a typical full-doc mortgage loan to a borrower with an 80% LTV, 750 credit score, and 31% debt-to-income ratio on average through the housing and business cycle. This is based on a guarantee fee calculator described in detail in "Evaluating Corker-Warner," Moody's Analytics white paper, July 2013, Mark Zandi and Cristian deRitis. <http://www.economy.com/mark-zandi/documents/2013-07-08-Evaluating-Corker-Warner.pdf>. A 5% loss rate is also consistent with the loss rates experienced by Fannie, Freddie, and the private mortgage insurers in the Great Recession.
- 10 To gauge the sensitivity of the results to this assumption, consider that if the ROE required by financial institutions in a privatized system was 15%—the same as the private mortgage insurance industry in normal times—privatized mortgage rates would be 65 basis points higher than now.
- 11 See "TBA Trading and Liquidity in the Agency Market," Vickery and Wright, Federal Reserve Bank of New York Staff Report 468, August 2010. [http://www.ny.frb.org/research/staff\\_reports/sr468.pdf](http://www.ny.frb.org/research/staff_reports/sr468.pdf)
- 12 Libor is the interest rate large money-center banks charge for borrowing and lending to each other. The TED spread is a very good proxy for anxiety in the global banking system. The 25-basis point TED spread that prevailed just prior to the crisis was a record low, as the period was characterized by substantial euphoria and even complacency regarding global financial conditions.
- 13 See "An Analysis of Government Guarantees and the Functioning of Asset-Backed Securities Markets," Hancock and Passmore, Federal Reserve Board Finance & Economics Discussion Series, 2010-46, August 2010. <http://www.federalreserve.gov/pubs/feds/2010/201046/201046abs.html>
- 14 This concern is well-articulated in "The Future of Mortgage Finance in the United States," a speech given by Federal Reserve Chairman Ben Bernanke at the University of California Symposium, "The Mortgage Meltdown, the Economy, and Public Policy," Berkeley California, October 31, 2008. <http://www.federalreserve.gov/newsevents/speech/bernanke20081031a.htm>
- 15 A very good survey of mortgage lending internationally is provided by "International Comparison of Mortgage Product Offerings," Lea et al, Research Institute for Housing America, September 2010.
- 16 The Danish system allows borrowers to prepay their loans when rates fall, as in the U.S., and allows them to buy back their bond when rates rise. This feature allows the borrower to adjust to interest rate increases and decreases and facilitates deleveraging when rates rise, reducing the incidence of negative equity.
- 17 This is based on data from the FHFA available since 1985.
- 18 The implications of this lack of experience are evident in the extraordinarily high default rate on subprime mortgages, most of which were two-year ARMs. According to Equifax credit file data, nearly one-fourth of subprime loans originated in 2005 defaulted when they hit their first payment resets two years later. These defaults ignited the financial crisis and Great Recession.

# About the Author

## Mark Zandi

Mark M. Zandi is chief economist of Moody's Analytics, where he directs economic research. Moody's Analytics, a subsidiary of Moody's Corp., is a leading provider of economic research, data and analytical tools. Dr. Zandi is a cofounder of Economy.com, which Moody's purchased in 2005.

Dr. Zandi's broad research interests encompass macroeconomics, financial markets and public policy. His recent research has focused on mortgage finance reform and the determinants of mortgage foreclosure and personal bankruptcy. He has analyzed the economic impact of various tax and government spending policies and assessed the appropriate monetary policy response to bubbles in asset markets.

A trusted adviser to policymakers and an influential source of economic analysis for businesses, journalists and the public, Dr. Zandi frequently testifies before Congress on topics including the economic outlook, the nation's daunting fiscal challenges, the merits of fiscal stimulus, financial regulatory reform, and foreclosure mitigation.

Dr. Zandi conducts regular briefings on the economy for corporate boards, trade associations and policymakers at all levels. He is on the board of directors of MGIC, the nation's largest private mortgage insurance company, and The Reinvestment Fund, a large CDFI that makes investments in disadvantaged neighborhoods. He is often quoted in national and global publications and interviewed by major news media outlets, and is a frequent guest on CNBC, NPR, Meet the Press, CNN, and various other national networks and news programs.

Dr. Zandi is the author of *Paying the Price: Ending the Great Recession and Beginning a New American Century*, which provides an assessment of the monetary and fiscal policy response to the Great Recession. His other book, *Financial Shock: A 360° Look at the Subprime Mortgage Implosion*, and *How to Avoid the Next Financial Crisis*, is described by the New York Times as the "clearest guide" to the financial crisis.

Dr. Zandi earned his B.S. from the Wharton School at the University of Pennsylvania and his PhD at the University of Pennsylvania. He lives with his wife and three children in the suburbs of Philadelphia.

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Cristian deRitis is a senior director at Moody's Analytics. He performs consumer credit modeling and analysis with the firm's Credit Analytics group and contributes to the analysis for CreditForecast.com. Before joining the Moody's Analytics West Chester PA operation, Cris worked for Fannie Mae and taught at Johns Hopkins University in Washington DC. He received a PhD and MA in economics from Johns Hopkins University and graduated summa cum laude from Michigan State University with a bachelor's degree in economics.

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Moody's Analytics added Economy.com to its portfolio in 2005. Now called Economic & Consumer Credit Analytics, this arm is based in West Chester PA, a suburb of Philadelphia, with offices in London, Prague and Sydney. More information is available at [www.economy.com](http://www.economy.com).

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