

Federal Housing Finance Agency
Office of Financial Analysis and Modeling
400 7th Street SW, 9th floor
Washington DC, 20219

October 7, 2016

Re: Single-Family Credit Risk Transfer Request for Input

Dear Sir or Madam,

We are pleased to respond to the Single Family Credit Risk Transfer Request for Input.

We applaud the FHFA for undertaking a commitment to expand the credit risk transfer process (CRT). Back-end CRT has been a critically important channel to shift a significant part of the GSEs' credit risk to the private market. But we believe it is important to consider CRT not just as a risk mitigation tool for the GSEs, but also for what it means for the future housing finance system and the stability of the broader financial system. From this perspective, we are pleased to offer our comments on how front end risk sharing transactions, in particular lender recourse and deep MI, could become more programmatic, building on the strength of the CAS and STACR programs. The advantage of a wider toolkit is that it also gives policy makers a chance to judge which approaches make the most sense under different market conditions, a critical component for building a future housing finance system.

The attached report contains our thoughts. Note that since we prepared this document, the GSEs have announced a pilot program for private mortgage insurers, which is a significant step towards our suggestion for a deep cover MI program. We were very pleased to see that development.

This comment letter represents the views of the four individuals that authored this report, and does not necessarily represent the views of their institutions.

Regards,

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How to Improve Fannie and Freddie's Risk Sharing Effort

AUGUST 2016

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How to Improve Fannie and Freddie's Risk Sharing Effort

BY LAURIE GOODMAN, JIM PARROTT, ELLEN SEIDMAN AND MARK ZANDI

The government-sponsored enterprises' credit risk transfer process is one of the most important innovations in the housing finance system since the financial crisis. Although there is broad agreement that the taxpayers' dominant role in assuming credit risk in the mortgage market coming out of the crisis should be reduced, significant uncertainty remains over who should bear that risk instead and in what form. The credit risk transfer programs established by the GSEs have provided a way out of the impasse by shifting the taxpayers' risk to the private market incrementally, giving policymakers a chance to judge which approaches make the most sense as they develop. This pragmatic way of reducing taxpayer exposure in the mortgage market is not only an intelligent way to put today's system on more solid footing, but it helps lay the foundation for building the future housing finance system.

The credit risk transfer process has come a long way since the GSEs began their de-risking effort more than three years ago. In the early CRT deals, the GSEs transferred only synthetic mezzanine risk to a relatively small group of investors in capital market transactions. Today, the GSEs are transferring actual first loss and mezzanine risk to a broader range of investors. The GSEs and their regulator, the Federal Housing Finance Agency, have accomplished much in a short time.

To fulfill its significant potential, though, CRT still has a way to go. The FHFA rightly recognizes this, asking for guidance on the path forward and a thoughtful framework within which to think about the issues involved in its recent *Request for Information* on CRT. Our primary criticism of the framework is that it focuses almost exclusively on how various risk sharing structures might effectively reduce the current risk to the GSEs. The FHFA focuses too little on how such structures might contribute to a housing finance system that is more stable and robust over time, and not at all on how these structures might impact consumers or the broader financial system. Given that the U.S.

mortgage market is second in size only to the U.S. Treasury market in the global financial system, the FHFA and the GSEs should not consider their activities in a vacuum. We thus offer thoughts on the best path forward within this broader framework.

To date, credit risk transfers have been dominated by back-end transactions to transfer mezzanine risk to capital markets. As of the end of 2015, the GSEs have transferred at least some of the risk on \$693.2 billion of unpaid principal balance through Fannie Mae's CAS (Connecticut Avenue Securities) and Freddie Mac's STACR (Structured Agency Credit Risk) transactions (see Table). That compares with only \$131.1 billion through their back-end insurance and re-insurance transactions, and \$12.7 billion through front-end risk sharing.

We recommend expanding the CRT effort to include greater focus on a wider range of structures and sources of private capital to provide the broader experience and price discovery needed to understand what mix of structures and sources of capital will best serve the housing finance system, not just today but through the business cycle and over the long term.

These include:

- » Lender recourse transactions across lenders of all sizes;
- » Deep cover mortgage insurance;
- » Back-end capital market transactions by loan-to-value ratios and credit score ranges; and
- » Catastrophic risk transfers.

This expanded vision for CRT will no doubt extend the experimental phase of the exercise, but now is precisely the time to help answer the critical questions about who should take risk ahead of the taxpayer and how, so that when legislators do finally return to the challenging question of long-term reform they are armed with the information needed to lead us down the right path. And although we believe our recommendations are consistent with the FHFA's existing authority, if the FHFA believes that any are not, then we suggest that it work with Congress to enable the FHFA and the GSEs to continue to make progress on this increasingly critical endeavor. Given the broad bipartisan support for its objectives, it is likely to find a receptive audience.

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Lender recourse

The GSEs have executed only a small number of front-end lender recourse transactions to date, all of which have been opaque, customized deals with select mortgage lenders. Because these transactions have not been transparent, scalable, or available to a wide range of lenders, we have not seen a market develop for them, leaving policymakers unable to adequately assess their potential. We thus recommend that the FHFA and GSEs make these transactions more transparent, standardized and accessible to lenders of all sizes.

Since the inception of CRT, the GSEs have executed 12 front-end lender recourse risk sharing transactions. Of these, Freddie Mac has done two deals, in which the originating lenders have retained the credit risk. Fannie Mae has done 10 deals, seven in which lenders have retained the risk and three "L-Street" transactions in which lenders have sold most of the risk to other investors. The terms on these deals are impossible to determine in any detail, and pricing is opaque.

This is in contrast to the GSEs' back-end capital markets transactions, for which they have thoughtfully developed a relatively open, transparent and robust market. The GSEs started with transactions that they thought would gain wide investor acceptance most quickly, including loans with a 60% to 80% loan-to-value, structured with a 10-year final maturity and a preset severity. As these gained acceptance, the GSEs expanded the transactions to include a wider range of loans, losses driven by actual losses, and the transfer of first-loss credit risk. The GSEs published, updated and eventually expanded significant loan-level credit data for these transactions, showing loan characteristics, the subsequent payment history of the borrower and, where applicable, the costs associated with the loan's liquidation. The consistency, size and transparency of these transactions have encouraged investors to dedicate the time and resources needed to compete effectively for each deal, which has not only allowed a relatively deep market to develop, but also provided policymakers with important information about

Table: Credit Risk Transfer Volumes

Unpaid principal balance, \$ bil

	2013	2014	2015	Total	% of total
Total	75.0	345.9	417.0	837.9	
Capital markets	66.9	315.2	312.0	694.1	82.8
Fannie Mae	25.0	209.6	179.1	413.7	49.4
Freddie Mac	41.9	105.6	132.0	279.5	33.4
Debt issuance (CAS, STACR)	66.9	315.2	311.1	693.2	82.7
Fannie Mae	25.0	209.6	179.1	413.7	49.4
Freddie Mac	41.9	105.6	132.0	279.5	33.4
Senior/subordinate transaction	0.00	0.00	0.93	0.93	0.1
Fannie Mae	0.00	0.00	0.00	0.00	0.0
Freddie Mac	0.00	0.00	0.93	0.93	0.1
Institution-based	8.1	30.7	105.0	143.8	17.2
Fannie Mae	5.2	10.2	49.7	65.1	7.8
Freddie Mac	2.9	20.5	55.3	78.7	9.4
Insurance/reinsurance	8.1	28.4	94.6	131.1	15.6
Fannie Mae	5.2	7.9	40.3	53.4	6.4
Freddie Mac	2.9	20.5	54.3	77.7	9.3
Lender recourse transactions	0.00	2.28	10.40	12.68	1.5
Fannie Mae	0.00	2.28	9.38	11.66	1.4
Freddie Mac	0.00	0.00	1.02	1.02	0.1

Note: Lender recourse transactions are the only front-end CRT to date.

Sources: Authors, FHFA, Moody's Analytics

the effectiveness of these risk sharing structures in the current market.

To similarly standardize lender recourse transactions, the FHFA and GSEs should consider structures in which the FHFA stipulates the notional amount and representative mix of loans in the transaction, and the amount of risk each lender retains. In these transactions a lender would bid by specifying the reduction in guarantee fees that it requires to absorb the predetermined amount of the credit risk on their production. The winning bidder would deliver loans into the GSEs on a flow basis until the representative mix is achieved. If the notional amount of loans is large, lenders could lay off their risk to the capital markets.

The GSEs and FHFA would circulate a draft of the documentation proposed for the transactions for comment by lenders. But, to maximize standardization, lenders would not be able to negotiate their own language. In order to show how competitive the process was, after the transaction is

completed they would publish the second highest bidder.

To further promote transparency, the GSEs should consider simultaneous bidding on several different amounts of risk retention, and provide information on the guarantee fee discount to lenders taking recourse on the first 1%, 2%, 3%, etc. of credit losses. Each level should be appropriately collateralized, either fully as has been required to date or somewhat less if they view the risks differently. The terms should be set and published in advance, without negotiation.

There are additional variations to these structures worth considering, including those that provide smaller lenders with a meaningful way of participating. For instance, the GSEs could pilot a program in which small lenders take credit risk together through the Federal Home Loan Banks. In choosing among alternatives, the objective should be to create structures that allow for maximum participation across lenders of all

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sizes, transparency, and scalability so that a broad and deep market develops.

Deep cover mortgage insurance

Deep cover private mortgage insurance has not been part of the CRT process to date, largely because of the GSEs' concern with increasing their already-substantial exposure to private mortgage insurers. Given the possible benefits of this structure, we recommend that the FHFA and GSEs adopt a pilot program to test it, addressing their concerns with counterparty risk through changes to the Private Mortgage Insurer Eligibility Requirements and CRT program design.

By their charter, the GSEs are required to lay off the credit risk on mortgages with a loan-to-value ratio of more than 80%. Mortgage insurance has historically been the principal way of achieving this charter requirement. Under standard private mortgage insurance for a 30-year loan with a 95% LTV, for example, the MIs cover the first 30% of loss, bringing the effective LTV to 65%. On a 90% LTV loan, standard coverage is 25%. According to the FHFA, the seven MIs currently have \$184.5 billion in risk-in-force on an unpaid principal balance of \$724.5 billion, averaging out to 25.5% coverage.

The GSEs could share additional credit risk through this channel by having some MIs cover a deeper level of first loss, down to, say, an effective LTV of 50%. So-called deep cover MI has several attractive features. First, it extends a structure already in wide use, making it easy for lenders of all sizes to adopt. Second, in contrast to the front-end structures used to date, it is equally available to and can be equally priced for lenders of all sizes. Third, it is completely transparent. And finally, it will be the most stable source of capital to take mortgage credit risk through risk transfers, far less fleeting than capital market transactions such as CAS and STACR, and somewhat less fleeting than the reinsurance and lender recourse deals. Since mortgage insurance is the only product the MIs offer, they will provide capital in good times and bad.

However, deep cover MI poses some challenges for the FHFA and GSEs. First

among them is counterparty risk, which includes concerns over the willingness and ability of the MIs to meet their contractual obligations. The counterparty risk to the GSEs from the MIs is heightened because they are both taking mortgage credit risk. So when the GSEs are under the most strain from increasing credit risk the institutions on which they are relying for help will be under precisely the same strain. Moreover, the GSEs also do not select their MI counterparties on individual loans, and are thus unable to control the concentration of their exposure to an individual MI. The MI that wins a deep cover transaction could be exactly the MI to which the GSE has the most concentration.

Though counterparty risk is a significant issue that the GSEs are right to be concerned about, they have the tools to address it under the new PMIERS. Deep cover MI is a new mortgage insurance product, and a different set of rules under PMIERS can and should apply to this product. Through this framework any number of measures could be taken to manage counterparty risk. For example, the GSEs could require MIs participating in deeper cover transactions to hold more capital against the additional risk, share some of that risk on the back end with third parties, or post collateral against the risk as is done in CAS and STACR deals. They could also structure the deep cover transactions with a pool policy maximum, which would allow the GSEs to put a ceiling on the exposure to any one MI.

The FHFA and GSEs also worry that because all GSEs' loans are covered by the Homeownership and Equity Protection Act, the duration of the protection provided by deep MI is less than that provided through other risk transfers. Under this law, in certain circumstances a borrower who has paid for mortgage insurance may terminate it once their loan amortizes to an 80% LTV, and in any case it terminates automatically once the loan gets to 78%. To put that in perspective, a 30-year fixed-rate loan with a 95% LTV will reach 80 LTV in 11 years. This concern appears overdone, however, as this is comparable to other vehicles. For example, the original CAS and STACR deals had a 10-year maturity, and

began to pay down immediately, making the average life of the risk coverage much shorter than that with MI. In one of the deals the M-1 bonds have prepaid entirely and the M-2 is not far behind. This concern could also be addressed by limiting deep cover MI to lender-paid MI which is not subject to the termination requirements of HOEPA.

Finally, some consumer groups have expressed concern that deep cover MI programs would lead to an increase in pricing for higher-risk borrowers. In these, and all risk-transfer transactions for that matter, there should not be an increase in pricing for any set of borrowers, higher-risk or otherwise. The GSEs should reduce their guarantee fees to reflect the risk they transfer to the private mortgage insurers, shifting any subsidy to their remaining fee. The reduction in the GSEs' fees should be equivalent to the increase in the MIs' fees if the GSEs' implicit capitalization and return on capital is consistent with that of the MIs. This appears to be the case under PMIERS and current expected returns in the MI industry.¹

We would recommend a targeted pilot program of deep cover MI to test a range of solutions to these challenges. The program requirements, volume, and the representative mix would all need to be pre-specified, with the interested eligible MIs competing over pricing the coverage of the risk down to the deeper level. The objective should be a scalable and transparent series of transactions that paves the way for the creation of an active market for whatever structures the GSEs and FHFA find most effective. We also note the importance of circulating the documentation in advance of the pilot, and allowing the MIs the opportunity to give input.

Back-end capital market transactions by LTV and credit score range

Back-end capital market transactions have been the principal form of credit risk transfers to date. By offering a consistent series of transparent, predictable and scalable transactions, the FHFA and the GSEs have succeeded in creating a relatively deep and liquid market for these transactions, despite a number of constraints to the investor base that are beyond their control.² These trans-

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actions have been based only on the LTV of loans, however, which limits the ability of policymakers to better understand how cross subsidization works in the system.

This is an issue because there is a broad consensus that the future housing finance system should ensure access to underserved communities, which depends in part on charging some higher-risk borrowers less than is needed to meet the overall targeted return, by charging lower-risk borrowers more than is required to meet such a return. Unfortunately, it is difficult to determine how much cross-subsidization exists in the system today, making it all but impossible to build on the lessons of this system to improve or replace it.

To improve transparency around this issue, we recommend that the FHFA and GSEs structure their back-end capital market transactions through a more granular breakdown of the credit risk involved. The CAS and STACR transactions are currently segmented into loans with LTVs of 60% to 80% and above 80%. This could be expanded to include more granular LTV and credit score ranges, and perhaps other credit characteristics. For example, the 60% to 80% LTV bucket could be broken down into three or four credit score ranges. To the degree that parsing these transactions raises a liquidity challenge, Freddie and Fannie could pool their risk in these buckets for bidding, or allow investors to recombine loans with common credit score ranges from different LTV buckets into single securities, with the appropriate weights.

The FHFA and GSEs could also modify lender recourse transactions to help with price discovery. For example, the GSEs could put each LTV/credit score bucket in a given pool out to bid separately, publishing the second highest bids. Again, they would need to modify their LLPAs consistent with the credit risk that they are transferring.

Catastrophic risk transfers

The credit risk transfer process to date has focused on transferring mezzanine credit risk and, to a lesser extent, first-loss risk to private markets. In transferring the first-loss risk, the GSEs allow investors to cover the

initial losses on defaulted mortgage loans in a guaranteed pool. In transferring the mezzanine risk, the GSEs transfer those losses that are greater than the first loss but less than the losses that occur only in the most severe economic and housing market downturns, which we call the catastrophic risk.

The FHFA and GSEs have been reluctant to transfer the more remote catastrophic risk, largely because they fear the private market would be unable to cover much of this risk at a reasonable cost. The GSEs are able to cover this risk cheaply at scale primarily because they are fully backstopped by the U.S. Treasury. This is not to say that the private market is not in a position to take on any of the catastrophic credit risk at a reasonable cost. Indeed, in a normal market we would see it bearing a significant share of catastrophic risk, but current challenges have rendered the private-label securities market through which that risk would be taken all but moribund.

We thus recommend that the FHFA and GSEs engage in a pilot program to transfer some catastrophic risk to private markets. These transfers could occur on the front end to private mortgage insurers, on the back end to capital markets, or both. The GSEs would take the catastrophic risk alongside or on a *pari passu* basis with private markets. For example, the first 5% of loss on a pool of mortgages could be transferred to private markets, and the remaining 95% of the loss could be divided up between the GSEs and private investors.³

The execution on this is admittedly challenging. If the catastrophic risk is sold as a fully funded security, investors would likely require a yield premium to compensate for the liquidity risk they would face. If the transaction is done without full funding, allowing for margin calls if necessary, then the GSEs would be taking counterparty risk and thus have to limit the pool of bidders to those of substantial financial strength. In either case, it is likely wise to limit such a pilot to well-capitalized, diversified institutions. These challenges and limitations notwithstanding, it is worth considering ways to design a pilot given the policy interest in creating some mechanism for market-testing the

government's pricing of this risk. A pilot is by far the most cost-effective way to determine the long-term viability of such a mechanism.

Credit risk transfer in the broader financial system

The housing finance system is a critical part of the global financial system. So as risk sharing becomes more firmly embedded in the housing finance system, the FHFA should consider the various credit risk transfer structures through the prism of what risk transfers mean for the safety and soundness of the entire system.

The GSEs currently guarantee \$4.2 trillion of U.S. single-family residential mortgage debt. This is more than 40% of the \$10 trillion in mortgage debt outstanding and almost 20% of the \$26 trillion in U.S. nonfinancial private sector credit outstanding.⁴ How the GSEs share the bulk of the risk on this lending thus has enormous implications throughout the financial system and the economy and cannot be responsibly considered in a vacuum.

When considered from this perspective, the FHFA and GSEs should be cautious about relying so heavily on back-end capital market transactions, given the volatility of the capital involved. Investors in these transactions—asset managers, hedge funds, and other capital market participants—are more likely to use short-term borrowing, including repurchase agreement funding, to finance their participation in the market.⁵ This type of short-term financing generally requires market participants to come up with additional funds as the price declines. They often must sell securities to do so, putting further downward pressure on prices.

Federal Reserve Board Governor Daniel Tarullo made this point eloquently in a recent speech.⁶

Rather than dwell on definitions...I think it more productive to focus on the characteristics of shadow banking-related financial activities and institutions that are most likely to pose risks to financial stability and to the economy more generally. Front and center among these risks is that of runnable liabilities... As has been frequently observed, the

recent financial crisis began, like most banking crises, with a run on short-term liabilities by investors who had come to doubt the value of the assets they were funding through various kinds of financial intermediaries. The difference, of course, was that the run was not principally on depository institutions, as in the 1930s, but on asset-backed commercial paper programs, broker-dealers, money market funds, and other intermediaries that were heavily dependent on short-term wholesale funding.

Lacking enough liquidity to repay all the counterparties who declined to roll over their investments, these intermediaries were forced into fire sales that further depressed asset prices, thereby reducing the values of assets held by many other intermediaries, raising margin calls, and leading to still more asset sales. Those financial market actors who did have excess liquidity tended to hoard it, in light of their uncertainty as to whether their balance sheets might come under greater stress and their reluctance to catch the proverbial falling knife by purchasing assets whose prices were plummeting with no obvious floor.

This is precisely the dynamic we could see with a risk transfer market dominated by

capital markets players. In times of stress, these investors would not only demand a much higher return to cover the risk, forcing the GSEs to absorb the cost, pass it on to borrowers, or pull back on their risk sharing when the risk is most critical to share, but they would themselves face enormous pressure to cover their own levered investments, putting broader strain on the financial markets at the worst possible time.

Investors who put their institution's equity on the line, on the other hand, are much less vulnerable to these swings. Not only are they forced to price through the cycle, so that their pricing should not spike in times of crisis, but they do not face the same downward spiral of debt-calling and declining asset values described by Governor Tarullo. It is thus critically important to the stability of the broader financial system for the FHFA and GSEs to ensure that a significant portion of their risk is shared through transactions that rely on so-called institution-based capital, such as reinsurance, lender recourse, or deep cover MI.

With this in mind we strongly recommend that the FHFA and GSEs work to create a market in which investors willing to put up institutional equity can compete for the GSEs' credit risk. Doing so will help stabilize the CRT effort over the longer term and give policymakers a much better handle on what kind of mix of structures is needed

for the long-term health of the housing finance system. And while this approach means introducing some counterparty risk to the transactions, this risk is manageable and well worth taking given the benefits to the system.

Conclusion

The FHFA and the GSEs are to be commended for significant progress on one of the more important policy efforts coming out of the financial crisis. They are gradually transforming how the housing finance system works in ways that can make the system we have today more stable and robust and also lay the groundwork for a better system in the future. They have also provided a useful framework within which to think about the objectives, challenges and risks in CRT.

To improve and expand the effort, we recommend steps to improve price discovery and broaden participation by various sources of private capital, particularly institution-based capital. We also recommend that FHFA and the GSEs more fully consider the broader implications of their effort, not just to the housing finance system we have today, but to the one we will build for tomorrow, and not just to the housing finance system in isolation, but to the larger financial system in which it plays such a critical part.

Endnotes

- 1 To the degree that the GSEs are currently underpricing credit risk for some categories of higher-risk borrowers, the FHFA will need to make sure the GSEs reduce their fees sufficiently to maintain current pricing for these borrowers.
- 2 See Laurie Goodman and Jim Parrott, "A Glimpse at the Future of Risk Sharing," Urban Institute, February 2016.
- 3 This is an idea central to the GSE proposal put forward by Congressmen Delaney, Carney and Himes, introduced most recently in March 2015 as The Partnership to Strengthen Homeownership Act.
- 4 Federal Reserve Board, Flow of Funds data.
- 5 See Laurie Goodman, Jim Parrott and Mark Zandi, "Delivering on the Promise of Risk Sharing," Moody's Analytics and Urban Institute, December 1, 2015.
- 6 See Daniel K. Tarullo, "Opening Remarks at Center for American Progress and Americans for Financial Reform Conference Exploring Shadow Banking: Can the Nation Avoid the Next Crisis?" Washington DC, July 12, 2016.

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About the Authors

Laurie Goodman is the director of the Housing Finance Policy Center at the Urban Institute. The center is dedicated to providing policymakers with data-driven analyses of housing finance policy issues that they can depend on for relevance, accuracy, and independence. Before joining Urban in 2013, Goodman spent 30 years as an analyst and research department manager at a number of Wall Street firms, including Amherst Securities Group, LP and UBS. Goodman was inducted into the Fixed Income Analysts Hall of Fame in 2009. Laurie currently serves on the board of directors of MFA Financial, a Real Estate Investment Trust, is an advisor to Amherst Capital Management, and is a member of the Bipartisan Policy Center's Housing Commission, and the Federal Reserve Bank of New York's Financial Advisory Roundtable. She has published more than 200 journal articles and has co-authored and co-edited five books. Goodman has a BA in mathematics from the University of Pennsylvania and an MA and PhD in economics from Stanford University.

Jim Parrott is a senior fellow at the Urban Institute and owner of Falling Creek Advisors, which provides financial institutions with strategic advice on housing finance issues. Jim spent several years in the White House as a senior advisor on the National Economic Council, where he led the team of advisors charged with counseling the cabinet and president on housing issues. He was on point for developing the administration's major housing policy positions; articulating and defending those positions with Congress, the press and public; and counseling White House leadership on related communications and legislative strategy. Prior to his time with the NEC, Jim was counsel to Secretary Shaun Donovan at the Department of Housing and Urban Development. He has a JD from Columbia University School of Law, an MA from the University of Washington, and a BA from the University of North Carolina.

Ellen Seidman is a senior fellow at the Urban Institute, focusing on housing finance and community development. From 1997 through 2001, she was the director of the Office of Thrift Supervision and concurrently served on the board of directors of the Federal Deposit Insurance Corporation and as chair of the board for the Neighborhood Reinvestment Corporation. Ms. Seidman has also been a visiting scholar in the Community Development Department of the Federal Reserve Bank of San Francisco (2012-2014), held various senior positions at ShoreBank Corporation and its affiliates (2002-2010), served as senior counsel to the Democratic staff, House Financial Services Committee (2001-2002), served as special assistant to the president for economic policy (1993-1997), and has held senior positions at Fannie Mae, the Department of the Treasury, and the Department of Transportation. She has been on the Consumer Advisory Board of the Consumer Financial Protection Bureau since 2012. She chairs the boards of Coastal Enterprises Inc. (CEI) and of Aeris Insight and is a member of the board of City First Bank of DC. Ms. Seidman received her MBA in Finance and Investments from George Washington University, her JD from Georgetown University Law Center, and her AB from Radcliffe College.

Mark 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 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 BS 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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