The Federal Home Loan Banks Support Systemic Stability

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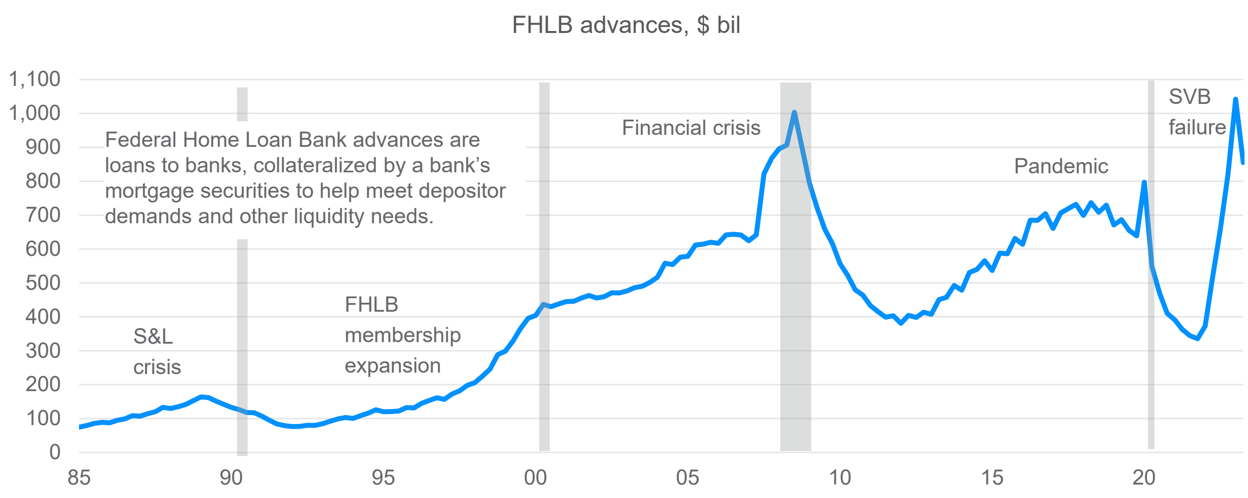
The Federal Home Loan Bank system has faced a barrage of criticisms recently, one of the most common of which has been that the FHLBs increase instability in the financial system. In this brief, we address this argument by explaining how the FHLBs stabilize the financial system in times of stress and showing how the system reduces the risk of bank failure, particularly for the nation's smaller banks.

The Federal Home Loan Bank system is a little-known network of 11 lending cooperatives established in the early days of the Great Depression to support financial institutions in the mortgage market. With the backing of the federal government, the FHLBs can borrow money at a near risk-free rate, which allows them to lend to their member commercial banks, credit unions, community development financial institutions, and insurance companies at lower rates even during the worst of economic times.

This proved invaluable during the banking crisis in March. As banks saw their depositors run for the door, many turned to the FHLBs for the cash to pay depositors and meet other obligations. The Federal Reserve eventually stood up a lending facility called the Bank Term Funding Program to help. But it took several weeks to open, and even then many banks were initially wary of the unfamiliar rules or the stigma that some in the market might attach to it. Meanwhile, the FHLB system effectively functioned as a first responder, providing its members with a liquidity lifeline between the initial outflow of their deposits and the standing-up of the Federal Reserve's new facility (see Chart 1).

The FHLB system has played this role in times past. In the runup to the global financial crisis, when the house price bubble burst and liquidity in the financial system dried up, the FHLBs stepped in with critical funding for their members. It took nearly a year for the Federal Reserve to gear up the facilities needed to backstop the market, and as with the more recent liquidity crisis, many institutions were

Chart 1: Forcing Banks to Look for Liquidity



Sources: FHFA, BEA, Moody's Analytics

initially wary of the signals tapping these facilities might send. The Federal Reserve's efforts were ultimately essential to the stability of the system, but the immediate presence of the FHLBs bought time for their members and the Fed, reducing the damage done to the economy—precisely the dynamic that played out in the more recent banking crisis.

Several critics have nonetheless argued that the FHLBs *increase* systemic instability, pointing to their funding of failed Silicon Valley Bank and Signature Bank as recent evidence that the FHLBs amplify rather than decrease risk in a time of stress. But by focusing on instances in which a member has failed in a time of stress and not on the many more in which they have not, critics are missing the overall impact of the FHLBs.

Modeling bank failure

To assess the FHLB system's impact on systemic risk, we focused on its impact on bank failures, applying a probit model to the 534 bank failures since 2001. The probability that a bank will fail is modeled as a function of year-over-year changes in standard measures of a bank's financial strength: Tier 1 capital, nonperforming assets, and liquidity, which includes cash, deposits and federal funds. These are the core measures used by the FDIC in its CAMELS rating system for evaluating the safety and soundness of a bank.

To capture the impact of FHLB lending on a bank's probability of failure, we include FHLB advances as a percent of assets and the year-over-year change in FHLB advances. The explanatory variables in the model are all lagged by one quarter, as failed banks do not submit call reports to the FDIC—the source of the bank data—for the quarter of their failure.

Not surprisingly, after controlling for bank size, the probability of bank failure declines with an increase in Tier 1 capital or a decrease in nonperforming assets (see Table 1). The probability of bank failure also increases when banks increase their liquidity as their balance sheets deteriorate. The relationship between bank failure and these measures is highly statistically significant.

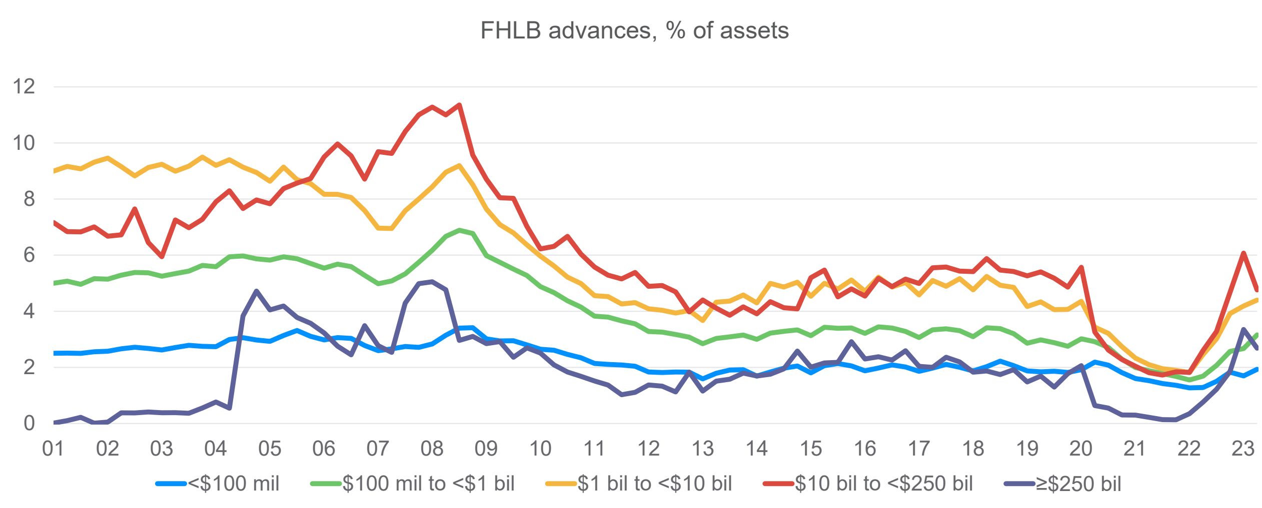
The model results also show that an increase in a bank's use of FHLB advances reduces its odds of failure. While the impact is not as large as that of Tier 1 capital, liquidity, or nonperforming assets, it is statistically significant, decreasing a bank's probability of failure by as much as a third.

This is as one would expect given the first responder role played by the FHLBs. In times of stress, member banks often increase their use of advances to fill the void left by fleeing depositors and other sources of funding, reducing their likelihood of failure.

The case is most compelling for smaller banks. An increase in FHLB advances reduces the odds of a bank failure most significantly for banks with $50 billion or less in assets. This is also intuitive since smaller banks often have less durable access to capital in times of stress, making the FHLBs particularly important to ensuring the nation can support so many small banks. The impact of FHLB advances in times of stress is less clear for larger banks. This is in part because of their access to a wider range of sources of capital through the business cycle, but also because in the most stressful market in several decades, the global financial crisis of 2008, the federal government either backstopped or found buyers for the larger institutions to forestall their failures.

While an increase in FHLB advances reduces the odds that a bank will fail, the more consistently a bank makes heavy use of FHLB advances, the greater the odds it will fail, all else equal. This too makes sense, as banks that consistently rely heavily on FHLB advances are more likely to be managing recurring stress. These banks, for which advances consistently comprise a higher percent of their assets, tend

Chart 2: Midsize Banks Utilize the FHLBs Most Consistently



Sources: FDIC, Moody's Analytics

to have assets of between $1 billion and $250 billion, many of which have complex balance sheets but not the numerous alternative funding sources available to the large systemically important banks (see Chart 2). They also tend to hold mortgage loans and mortgage-backed securities, which are inherently risky long-duration assets that face significant interest-rate and credit risk. Of course, supporting mortgage lending is a critical mission of the FHLBs, which they do by taking banks' mortgage portfolios as collateral for advances.

This underscores the only other relevant quantitative research we are aware of on the impact of the FHLBs on financial stability, which was done by the FDIC in 2005. In that study, FDIC researchers used a probit model to find that more aggressive use of FHLB advances increased the probability of a CAMEL downgrade. That is, a bank that uses more FHLB advances as a percent of assets is more likely to experience a weakening in measures of its safety and soundness and thus a lower CAMELS rating. It should not be surprising that banks use more FHLB advances in the difficult conditions that lead to a deterioration in their CAMELS ratings. That, after all, is the point of the system. Arguing that this is a problem, however, is akin to arguing that a bank's reliance on the Federal Reserve's discount window is the cause of its instability rather than an effect.

The percent of banks that failed over the last quarter century is only 0.09% (see Table 2). As this provides a crude estimate of how likely it is that a particular bank will fail, our probit model accounts for changes in a bank's financial condition to provide more useful numbers. For instance, a bank with a median level of FHLB advances and year-over-year changes in Tier 1 capitalization, liquidity, asset quality, and FHLB advances has a predicted failure probability of 0.38%. If that bank increases its year-over-year FHLB borrowing to the 95th percentile, all else being equal, its predicted failure probability falls to 0.32%, for a drop of 17%. The effect is stronger for a more distressed bank. For a bank at the fifth percentile in our other control variables, an increase in year-over-year FHLB borrowing from the median to the 95th percentile lowers the predicted failure probability from a range of 0.49%-0.55% to 0.35%-0.38%, for a drop of about 30%. For banks with $50 billion or less in assets under management, this reduction is still larger.

Our model results are robust to a wide range of specifications, period effects, and the inclusion of various other measures of banks' financial strength. In all these variations, an increase in FHLB advances results in a statistically significant reduction in a bank's probability of failure (see Table 3).

Keys to stability

The results of the analysis support our view that the FHLBs are a source of stability to the financial system, not instability. If anything, the system should be expanded rather than diminished. We have learned repeatedly over the last two decades that the financial system is overly vulnerable to liquidity shocks, and the housing finance system is no exception. Indeed, the single greatest risk to the housing finance system may well be the risk of losing funding faced by small and medium-size independent mortgage banks that now dominate the housing finance system, a risk that could be meaningfully reduced by giving them access to the liquidity lifeline offered by the FHLB system.

It is critical that the financial system have some source of liquidity available in the periods of stress before the Federal Reserve can step in with an effective emergency facility. But it is not obvious what source that might be other than the FHLBs.

The Federal Reserve's discount window is too limited to play the role. Even ignoring the stigma that makes those eligible reticent to use it, the Fed caps primary credit from the window at 90 days and secondary credit somewhere between a few days and overnight, where longer-term funding is often necessary to allay fears in a liquidity crisis. It is also largely limited to banks in good standing, putting it out of reach for many of those that would most need it in the conditions at issue here. Another problem is that the Fed is not able to take credit risk without appropriate support from the Treasury, which may require an appropriation from Congress, likely slowing down or otherwise undermining the needed response.

These limits on the Federal Reserve's discount window force policymakers to invoke section 13(3) of the Federal Reserve Act to provide more effective support in times of stress. But as we have discussed, it takes time to bring these facilities to the market in a way that is effective. Congress could create a similar facility that remained in place through the business cycle, but doing so would commit the Federal Reserve to a fiscal policy role that may conflict with its role managing monetary policy—and to managing a critical lending facility for the very institutions it is supervising.

More important, it is not at all clear that having the Federal Reserve play the role of a more active first responder would protect the financial system or the taxpayer any better than the FHLB system does today. After all, in the FHLB system, the taxpayer stands behind strong counterparty protections, overcollateralization, and the joint and several liability of the 11 FHLBs. It is not clear why policymakers should give that up so that the Federal Reserve could supplant the FHLBs as banks' primary source of liquidity every time more volatile sources of liquidity withdraw.

In the century since the FHLBs were established they have been instrumental in limiting the frequency and severity of financial crises, a role that was on clear display in the global financial crisis and again in the recent banking crisis and is borne out by the analysis here. The FHLBs could use some updating, but that means building on this critical, if poorly understood, network of institutions to serve more of the financial system, not handicapping them. We need more from the FHLBs, not less.

Table 1: Model of Bank Failure

		All banks						Banks with $50 bil or less in assets	Banks with more than $50 bil in assets	
		1	2	3	4	5	6	7	8	9
FHLB advances, 4-qtr MA	param	1.3486***		1.3430***	1.4388***	1.4352***	1.4450***	1.4404***	-7.5270	-8.3686
	p-value	(0.0000)		(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.2776)	(0.2356)
	M.E. (at median)	0.0035		0.0035	0.0020	0.0020	0.0020	0.0020	-0.0005	-0.0013
Change in FHLB advances, yr ago	param		-1.7436***	-1.4659***	-1.2924***	-1.1502***	-1.5091***	-1.3631***	24.0337***	23.4842***
	p-value		(0.0000)	(0.0001)	(0.0010)	(0.0033)	(0.0001)	(0.0006)	(0.0014)	(0.0013)
	M.E. (at median)		-0.0051	-0.0038	-0.0018	-0.0016	-0.0021	-0.0019	0.0017	0.0037
Log assets, 4-qtr MA	param	0.0331***	0.0436***	0.0318***	0.0260***	0.0281***	0.0226**	0.0251**	0.3931	0.3394
	p-value	(0.0001)	(0.0000)	(0.0002)	(0.0096)	(0.0049)	(0.0397)	(0.0219)	(0.1334)	(0.1576)
	M.E. (at median)	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Change in Tier 1 capital, yr ago	param				-3.4860***	-3.4745***	-3.4975***	-3.4829***	15.1202	15.8326
	p-value				(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.3592)	(0.2185)
	M.E. (at median)				-0.0049	-0.0048	-0.0049	-0.0048	0.0011	0.0025
Change in liquidity (broad), yr ago	param				1.7383***		1.7628***		-6.9848*	
	p-value				(0.0000)		(0.0000)		(0.0747)	
	M.E. (at median)				0.0024		0.0025		-0.0005	
Change in liquidity (narrow), yr ago	param					2.0474***		2.0665***		-4.7658
	p-value					(0.0000)		(0.0000)		(0.1727)
	M.E. (at median)					0.0028		0.0028		-0.0007
Change in nonperforming loans, yr ago	param				13.6920***	13.6316***	13.6917***	13.6316***	6.7828	4.6717
	p-value				(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.8720)	(0.9120)
	M.E. (at median)				0.0192	0.0187	0.0191	0.0186	0.0005	0.0007
Intercept	param	-3.5884***	-3.6562***	-3.5708***	-3.6872***	-3.7198***	-3.6480***	-3.6847***	-11.3369**	-10.1410**
	p-value	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0347)	(0.0372)
	N	591,447	581,266	581,266	581,265	581,265	578,063	578,063	3,202	3,202
	T	84	84	84	84	84	84	84	84	84
	Average N	7,041	6,920	6,920	6,920	6,920	6,882	6,882	38	38
	Pseudo R2	0.01	0.01	0.01	0.21	0.21	0.21	0.22	0.44	0.42

Notes: All drivers are lagged by 1 qtr. Numbers in parentheses indicate p-values for coefficient significance t-tests, using Huber-White robust standard errors. Asterisks indicate conventional statistical significance threshholds as follows: *** 1%, ** 5%, * 10%.

Sources: FDIC, Federal Reserve, Moody's Analytics

Table 2: Predicted Failure Probabilities

Model	2	3	4	5	2	3	4	5	2	3	4	5
	All banks				Small banks				Large banks			
Median 4-qtr change in FHLB advances, other controls at median	0.0858%	0.0751%	0.0387%	0.0378%	0.0854%	0.0752%	0.0385%	0.0376%	0.0000%	0.0000%	0.0000%	0.0000%
75th percentile 4-qtr change in FHLB advances, other controls at median	0.0858%	0.0751%	0.0387%	0.0378%	0.0854%	0.0752%	0.0385%	0.0376%	0.0000%	0.0000%	0.0000%	0.0000%
95th percentile 4-qtr change in FHLB advances, other controls at median	0.0663%	0.0604%	0.0316%	0.0316%	0.0640%	0.0588%	0.0304%	0.0304%	0.0006%	0.0005%	0.0000%	0.0000%
Median 4-qtr change in FHLB advances, other controls at 5th percentile if negative contributor to failure (e.g. Tier 1) and 95th percentile if positive contributor to failure (e.g. nonpeforming loans)	0.0828%	0.0707%	0.0556%	0.0493%	0.0822%	0.0715%	0.0578%	0.0513%	0.0000%	0.0000%	0.0000%	0.0000%
75th percentile 4-qtr change in FHLB advances, other controls at 5th percentile if negative contributor to failure (e.g. Tier 1) and 95th percentile if positive contributor to failure (e.g. nonpeforming loans)	0.0654%	0.0579%	0.0465%	0.0420%	0.0631%	0.0571%	0.0469%	0.0424%	0.0000%	0.0000%	0.0000%	0.0000%
95th percentile 4-qtr change in FHLB advances, other controls at 5th percentile if negative contributor to failure (e.g. Tier 1) and 95th percentile if positivecontributor to failure (e.g. nonpe-forming loans)	0.0503%	0.0463%	0.0381%	0.0351%	0.0470%	0.0444%	0.0371%	0.0343%	0.0001%	0.0001%	0.0000%	0.0000%

Sources: FDIC, Federal Reserve, Moody's Analytics

Table 3: Robustness Checks for Bank Failure Model

		1	2	3	4	5	6	7	8	9
FHLB advances, 4-qtr MA	param	1.4473***	1.4407***	1.4284***	1.5321***	1.4418***	1.4469***	1.4414***	1.4476***	1.4783***
	p-value	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	M.E. (at median)	0.0020	0.0020	0.0019	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Change in FHLB advances, yr ago	param	-1.3389***	-1.3411***	-1.1825***	-1.4605***	-1.2897***	-1.3365***	-1.3183***	-1.3367***	-1.3677***
	p-value	(0.0008)	(0.0008)	(0.0023)	(0.0002)	(0.0010)	(0.0008)	(0.0009)	(0.0008)	(0.0006)
	M.E. (at median)	-0.0019	-0.0019	-0.0016	-0.0019	-0.0018	-0.0019	-0.0018	-0.0019	-0.0019
Log assets, 4-qtr MA	param	0.0255**	0.0252**	0.0209**	0.0213**	0.0255**	0.0259**	0.0268***	0.0254**	0.0262***
	p-value	(0.0115)	(0.0125)	(0.0419)	(0.0366)	(0.0112)	(0.0104)	(0.0079)	(0.0119)	(0.0092)
	M.E. (at median)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Change in Tier 1 capital, yr ago	param	-3.9835***	-3.9560***	-3.4956***	-3.6791***	-3.4831***	-3.9975***	-4.1038***	-3.9812***	-3.4488***
	p-value	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	M.E. (at median)	-0.0056	-0.0055	-0.0046	-0.0049	-0.0049	-0.0056	-0.0057	-0.0055	-0.0048
Change in liquidity (broad), yr ago	param	1.6177***	1.6058***	-2.8376***	1.6559***	1.7397***	1.6141***	1.6444***	1.6194***	2.1132***
	p-value	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	M.E. (at median)	0.0023	0.0022	-0.0037	0.0022	0.0024	0.0022	0.0023	0.0023	0.0029
Change in nonperforming loans, yr ago	param	13.5690***	13.2158***	13.1499***	13.5745***	13.7302***	13.5385***	13.5583***	13.5786***	13.5059***
	p-value	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	M.E. (at median)	0.0189	0.0185	0.0173	0.0180	0.0192	0.0188	0.0188	0.0189	0.0187
Change in net interest margin, yr ago	param	-0.4131								
	p-value	(0.7508)								
	M.E. (at median)	-0.0006								
Change in credit loss provisions, yr ago	param		4.5268***							
	p-value		(0.0046)							
	M.E. (at median)		0.0063							
Change in net loans and leases, yr ago	param			-4.9198***						
	p-value			(0.0000)						
	M.E. (at median)			-0.0065						
Change in brokered deposits, yr ago	param				-2.6144***					
	p-value				(0.0000)					
	M.E. (at median)				-0.0035					
Change in subordinated debt, yr ago	param					-8.0700**				
	p-value					(0.0354)				
	M.E. (at median)					-0.0113				
Change in return on assets, yr ago	param						-0.3265***			
	p-value						(0.0009)			
	M.E. (at median)						-0.0005			

Table 3: Robustness Checks for Bank Failure Model (Cont.)

		1	2	3	4	5	6	7	8	9
Change in salaries, yr ago	param							6.6679***		
	p-value							(0.0000)		
	M.E. (at median)							0.0092		
Change in non-interest expense, yr ago	param								0.0071	
	p-value								(0.9513)	
	M.E. (at median)								0.0000	
Change in residential loans, yr ago	param									1.3872***
	p-value									(0.0000)
	M.E. (at median)									0.0019
Intercept	param	-3.6834***	-3.6793***	-3.6491***	-3.6496***	-3.6815***	-3.6879***	-3.7000***	-3.6819***	-3.6916***
	p-value	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	N	580,342	580,342	581,263	581,260	581,265	580,321	580,339	580,342	581,265
	Pseudo-R2	0.21	0.21	0.23	0.22	0.21	0.21	0.21	0.21	0.21

Notes: All drivers are lagged by 1 qtr. Numbers in parentheses indicate p-values for coefficient significance t-tests, using Huber-White robust standard errors. Asterisks indicate conventional statistical significance threshholds as follows: *** 1%, ** 5%, * 10%.

Sources: FDIC, Federal Reserve, Moody's Analytics

About the Authors

Damien Moore is a director of economic research at Moody's Analytics. He covers U.S. financial markets, provides research on finance-related topics, develops market risk models for stress-testing and other applications, and works on various Moody's Analytics models and tools related to government and corporate finances. He has broad expertise in financial economics including asset pricing, valuation methodologies, portfolio analytics, macro finance, and financial econometrics.

Prior to joining Moody's Analytics, Damien spent 12 years at the Congressional Budget Office, most recently as the head of the agency's Financial Analysis Division, where he supervised projects analyzing the federal role in the financial system and the costs of federal financial programs. Under his supervision, the division produced numerous reports including analyses of polices to rescue the U.S. financial system during the 2008 financial crisis, the federal conservatorships of Fannie Mae and Freddie Mac, the federal role in housing and mortgage markets, the Pension Benefits Guarantee Corporation, and federal student loan programs. Before his time at the CBO, Damien was a lecturer in the School of Business at the University of Sydney. He taught classes in investments, fixed income securities, and corporate finance.

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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 is on the board of directors of MGIC, the nation's largest private mortgage insurance company, and is the lead director of PolicyMap, a data visualization and analytics company, used by policymakers and commercial businesses.

He is a trusted adviser to policymakers and an influential source of economic analysis for businesses, journalists and the public. Dr. Zandi frequently testifies before Congress and conducts regular briefings on the economy for corporate boards, trade associations, and policymakers at all levels.

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 360º 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 is host of the Inside Economics podcast.

Dr. Zandi earned his BS from the Wharton School at the University of Pennsylvania and his PhD at the University of Pennsylvania.