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# Rating Monoline Financial Guarantors In the Public Finance Sector

Financial guarantors are monoline insurance companies that issue insurance policies designed to provide credit enhancements to debt instruments. Specifically, they unconditionally and irrevocably pledge to make timely payment of principal and interest when due in the event of defaults by insured obligors. Because financial guarantors are fundamentally insurance companies, *Best's Credit Rating Methodology (BCRM)* remains the governing document that provides a comprehensive explanation of A.M. Best's general rating process, including the complete set of rating criteria employed in the rating. This criteria procedure highlights rating considerations unique to the evaluation of financial guarantors that provide credit enhancements primarily to U.S. municipal bonds, such as the calculation of reserve risk, which depends heavily on the credit quality of the insured portfolio, and the reliance on claims-paying resources to fund these reserves.

## The General Rating Process

A.M. Best's rating process for both established insurance companies and new company formations (i.e., start-up ventures) involves quantitative and qualitative assessments of balance sheet strength, operating performance, business profile, and enterprise risk management. In the case of a start-up venture, given the additional degree of uncertainty and lack of a track record, assessing the long-term sustainability of earnings and cash flows – keys to the interactive rating process – requires additional rigor in all areas of the rating process. These include the review and analysis of business plans; the assumptions underlying the company's projections; and operational controls. In addition, to reflect the heightened level of uncertainty inherent in reviewing a newly formed entity, more stringent quantitative and qualitative metrics are applied during the rating process. Extensive conversations with, and an assessment of, management are central to this process. This assessment of management includes developing an understanding of the organization's risk management and financial management framework and expertise.

## Municipal Bonds and Financial Guarantors

State and local government entities issue municipal bonds to finance a broad array of long-term public projects, to provide working capital for government projects, and to finance nongovernmental needs that benefit the public such as multifamily housing, hospitals and nursing homes, airports and seaports, solid waste disposal facilities, student loan programs, industrial development projects and other endeavors. Municipal bonds have two major categories, general obligation, and revenue bonds. It is the source of debt service payments that differentiates the two types of municipal bonds. The debt service associated with general obligation bonds is satisfied by the full faith credit and taxing power of a government entity while the repayment of revenue bonds comes from a specified revenue stream associated with the cash flow from public project operations, discretionary appropriations, grants, or a dedicated specialized tax payment among other channels.

## The Special Nature of Financial Guarantors

This criteria procedure focuses on the evaluation of the balance sheet strength of financial guarantors – particularly the underwriting risk component. The balance sheet strength addresses the financial leverage, which may involve evaluation of any debt that is carried at a parent or holding-company level; underwriting leverage, including direct premium leverage

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and dependence on reinsurance; loss-reserve leverage; investment leverage and its impact on liquidity; credit risk; market risk; and risks relating to geographic concentration, the regulatory environment, and changing economic and market conditions.

A company's underwriting, financial, and investment leverage is subjected to an evaluation through Best's Capital Adequacy Ratio (BCAR). Capital represents a very important part of the financial strength of a financial guarantor. Reserves, surplus, unearned premium, and other claims-paying resources form a buffer to protect policyholders against losses in the event claims are presented. A.M. Best's capital formula uses a risk-based capital approach whereby net required capital is calculated to support the three broad risk categories: investment risk, credit risk, and underwriting risk. The BCAR model calculates the Net Required Capital to support the financial risks of the company associated with the exposure of assets and underwriting to adverse economic and market conditions, and compares this required capital to economic capital.

The capital factors used in the BCAR model to determine the capital charges for the underwriting risk components it addresses were derived from historical loss ratio data associated with multiple lines of insurance business. The financial guarantor space, however, has changed since the 1990s, when these insurers moved away from just wrapping municipal bonds into also wrapping structured finance securities. This makes it difficult to develop capital factors unique to these financial guarantors specializing in the municipal space. An additional challenge in developing capital factors for public finance guarantors is that historical defaults in the municipal space have been lower than historical defaults of corporate bonds.

Estimating reserve risk – particularly the amount of capital to be held to withstand losses within specific confidence levels – requires evaluating the credit risk of the municipal bonds that are being insured by financial guarantors. The process involves performing Monte Carlo simulations to produce the aggregate default profile of the portfolio of municipal bonds and translating

## Exhibit 1 Municipal Bonds - A.M. Best Risk Classifications

Risk Classification	Classification Description	Risk Class Relativity	Recovery Rate	Default Period
1	State and Local Government General Obligation Utilities: Water, Sewer, Solid Waste State Government Special Tax Obligation: Sales, Income, Gas, Other Public Colleges and Universities State Revolving Fund: Environmental Projects Housing: FHA Insured and State Agency Obligations	0.25	95%	2 Years
2	State & Local Government: Lease Appropriation and Other General Fund Obligations Local Government Special Tax Obligation: Sales, Income, Excise, etc. Public Power: Electric and Gas Airport and Port General Revenue Toll Roads, Transit and Bridges: Established Federal Grants and Leases	0.50	90%	2 Years
3	Local Government Tax Increment and Assessments Resource Recovery Private Colleges and Universities: Broad-Based Tuition & General Obligation Local Agency Single Family Housing Health Care Systems: Hospital and Other	0.75	80%	2 Years
4	Private Colleges and Universities: Auxiliary Facilities Housing Other: Affordable Housing-Section 8, Military, Mobile Home, and Misc. Development: Hotel, Convention Center, Stadium Toll Roads and Bridges: Start-up Special Facilities: Airport, Port, Single Site Parking Health Care Single-Site Facilities: Hospitals, Life-Care Centers Not-for-Profit: Charter Schools, Cultural and Other	1.0	60%	2 Years

Source: A.M. Best

such a profile into projected claim assumptions against the financial guarantors. This simulation process establishes a view of the default risk associated with the rated municipal credits, the level of recoveries following default, potential default correlations, and other factors.

### *Establishing Default Risk of Municipal Securities*

Claims against a financial guarantor are primarily driven by the credit quality of the bonds it insures, so it is important to evaluate historical default risk and determine whether it is appropriate to apply these data to current and future insured municipal bonds.

Today, the nearly \$4 trillion municipal bond market includes an array of financing types/structures such as private-entity issuers/participants, which appear to have higher default rates than general obligation bonds whose debt service relies solely on the taxing authority of municipalities. Still, recent studies by major rating agencies, though generally showing an increase in municipal bond defaults, have not shown default rates approaching those of corporate bonds.

In reviewing the major default studies on municipal bonds – both by academics and rating agencies – it is clear that historical defaults in certain segments of the municipal bond market are below defaults as observed in the corporate bond market. This is largely true for essential-purpose bonds such as state and local general obligation bonds. Other segments of the municipal bond market, such as the housing and health care sectors, exhibit default rates that come closer to those of corporate bonds. A.M. Best's view of municipal bond default rates will be partially based on 1) the historical municipal bond ratings transition tables found in regulatory filings and default studies performed by Nationally Recognized Statistical Rating Organizations (NRSRO) that have the largest portfolio of municipal bond ratings, 2) supplemental information gleaned from Depression-era municipal bond defaults associated with more recent municipal bond markets, and 3) relevant statistics associated with more recent municipal bond defaults.

In modeling claims associated with insuring municipal bonds, A.M. Best will apply a fraction of the default rates in *Best's Idealized Issue Default Matrix (Exhibit 2)*. The matrix shows the idealized cumulative default rates for A.M. Best's senior issue credit ratings on the issuer credit rating (ICR) scale. In cases where A.M. Best does not rate a municipal bond or has not provided a credit assessment, A.M. Best will translate the rating of other rating agencies to the scale on this

## Exhibit 2

### Best's Idealized Issue Default Matrix

(%)

Years	aaa	aa+	aa	aa-	a+	a	a-	bbb+	bbb	bbb-	bb+	bb	bb-	b+	b	b-	ccc+	ccc	ccc-	cc	c
1	0.03	0.08	0.11	0.14	0.16	0.20	0.22	0.28	0.35	0.45	0.84	1.23	1.56	3.28	3.73	4.77	6.74	10.33	13.85	19.53	23.30
2	0.07	0.11	0.13	0.21	0.24	0.30	0.42	0.62	0.80	1.00	1.87	2.97	3.83	6.53	7.30	9.03	12.42	15.53	18.59	24.28	27.55
3	0.11	0.14	0.17	0.28	0.33	0.41	0.62	0.96	1.26	1.56	2.90	4.68	6.02	9.73	10.80	13.08	17.66	20.41	23.11	28.87	31.74
4	0.15	0.18	0.22	0.35	0.42	0.52	0.82	1.30	1.72	2.11	3.92	6.34	8.13	12.91	14.23	16.99	22.60	25.05	27.47	33.32	35.87
5	0.19	0.23	0.28	0.43	0.52	0.64	1.04	1.65	2.18	2.67	4.94	7.98	10.18	16.04	17.60	20.77	27.28	29.50	31.69	37.65	39.94
6	0.24	0.29	0.34	0.51	0.62	0.76	1.26	2.00	2.64	3.23	5.95	9.57	12.15	19.13	20.90	24.44	31.75	33.79	35.79	41.85	43.93
7	0.28	0.35	0.42	0.60	0.73	0.89	1.50	2.36	3.10	3.79	6.97	11.14	14.07	22.19	24.15	28.02	36.03	37.91	39.77	45.93	47.84
8	0.33	0.42	0.50	0.69	0.84	1.02	1.74	2.72	3.56	4.35	7.98	12.67	15.93	25.20	27.35	31.50	40.13	41.90	43.65	49.89	51.67
9	0.38	0.50	0.59	0.78	0.96	1.16	1.98	3.08	4.03	4.91	8.99	14.18	17.74	28.18	30.49	34.91	44.06	45.75	47.41	53.73	55.40
10	0.42	0.58	0.69	0.88	1.09	1.31	2.24	3.45	4.50	5.48	10.00	15.65	19.50	31.11	33.58	38.23	47.84	49.46	51.07	57.44	59.04
11	0.47	0.67	0.79	0.98	1.22	1.46	2.50	3.82	4.97	6.05	11.01	17.10	21.22	34.01	36.62	41.47	51.47	53.05	54.62	61.03	62.57
12	0.52	0.75	0.90	1.09	1.36	1.62	2.78	4.20	5.44	6.62	12.02	18.52	22.90	36.86	39.60	44.63	54.95	56.52	58.06	64.49	65.99
13	0.57	0.85	1.01	1.20	1.51	1.79	3.06	4.58	5.92	7.19	13.03	19.91	24.55	39.67	42.53	47.72	58.29	59.86	61.40	67.81	69.29
14	0.62	0.94	1.13	1.31	1.66	1.96	3.34	4.96	6.40	7.76	14.05	21.28	26.18	42.43	45.40	50.73	61.50	63.08	64.63	71.00	72.46
15	0.68	1.04	1.25	1.43	1.82	2.14	3.64	5.35	6.88	8.33	15.06	22.63	27.78	45.16	48.23	53.67	64.58	66.18	67.75	74.05	75.50
	aaa	aa+	aa	aa-	a+	a	a-	bbb+	bbb	bbb-	bb+	bb	bb-	b+	b	b-	ccc+	ccc	ccc-	cc	c

Source: Best's Insurance-Linked Securities and Structures Methodology (BILSM)

matrix and then apply the corresponding cumulative default rates in the modeling process. If no credit rating agency has publicly rated the municipal securities being wrapped, and if A.M. Best has not provided any credit assessments, the securities will be assigned a “bb+” rating.

### *Risk Classification*

A.M. Best groups municipal bonds into four broad risk classifications to reflect municipal bonds with similar expectations of default and recoveries. The items taken into consideration in determining these risk classifications include revenue predictability and the competitive environment of the enterprises in question. Generally, insurers of low-risk municipal debt such as tax-backed general obligation bonds are expected to receive higher recoveries compared with insurers of high-risk municipal debt such as revenue bonds associated with sports stadiums. The four broad risk classifications for municipal bonds reflect risk hierarchies from 1 (lowest risk) to 4 (highest risk) as shown in **Exhibit 1**. Each municipal security is mapped to this risk classification table. For modeling purposes, the default rate assigned to a municipal bond is the corresponding default rate in *Best’s Idealized Issue Default Matrix* multiplied by the associated “risk class relativity” factor. For example, if a municipal bond is grouped in risk classification 3, the default rate of that bond would be the associated default rate from *Best’s Idealized Issue Default Matrix* multiplied by 75%.

### *Recovery Rates*

A.M. Best also assigns recovery rates to each of the risk classifications to recognize the variability in recoveries associated with the different types of municipal bonds. High recovery rates are given to low-risk municipal issuers, and low recovery rates are assigned to the highest risk class. The listed recovery rates are based on informed judgment and a review of historical recovery rates of municipal bonds. A.M. Best’s review of the available data on municipal bonds shows that although recoveries can be volatile, they are generally high for essential-

## Exhibit 3

### Net Claims for Default of a Municipal Bond in Risk Classification 3

A	B	C	D	E	F	G
Year	Annual Debt Service Scheduled To Be Paid By Obligor	Gross Claims Against FG Assuming Default Occurred In Year 5 (Column B From Default Year On)	Recoveries From Obligor On Claims In Default Period--1st 2 Years of Default (80%* Column C) -- Lagged By 2 Years	Recoveries From Obligor On Ongoing Claims (80%* Column C) From Year 7 On	Net Claims Against FG Column C+Column D+Column E	Present Value Net Claims Against FG* (Column F PV @ 4%)
1	\$ 1,000				\$ 0	\$ 0
2	\$ 990				\$ 0	\$ 0
3	\$ 984				\$ 0	\$ 0
4	\$ 978				\$ 0	\$ 0
5	\$ 973	\$ 973			\$ 973	\$ 800
6	\$ 968	\$ 968			\$ 968	\$ 765
7	\$ 956	\$ 956	\$ (778)	\$ (765)	\$ (587)	\$ (446)
8	\$ 947	\$ 947	\$ (774)	\$ (757)	\$ (585)	\$ (427)
9	\$ 942	\$ 942		\$ (754)	\$ 188	\$ 132
10	\$ 932	\$ 932		\$ (746)	\$ 186	\$ 126
11	\$ 918	\$ 918		\$ (734)	\$ 184	\$ 119
12	\$ 914	\$ 914		\$ (731)	\$ 183	\$ 114
13	\$ 905	\$ 905		\$ (724)	\$ 181	\$ 109
14	\$ 896	\$ 896		\$ (717)	\$ 179	\$ 104
15	\$ 889	\$ 889		\$ (711)	\$ 178	\$ 99
16	\$ 876	\$ 876		\$ (701)	\$ 175	\$ 94
17	\$ 870	\$ 870		\$ (696)	\$ 174	\$ 89
18	\$ 867	\$ 867		\$ (694)	\$ 173	\$ 86
19	\$ 856	\$ 856		\$ (685)	\$ 171	\$ 81
20	\$ 851	\$ 851		\$ (681)	\$ 170	\$ 78
	<b>\$ 18,513</b>	<b>\$ 14,560</b>	<b>\$ (1,553)</b>	<b>\$ (10,096)</b>	<b>\$ 2,912</b>	<b>\$ 1,921</b>

\* FG = Financial Guarantor  
Source: A.M. Best

service bonds. In general, A.M. Best expects high recoveries for insured municipal bonds due to insurers' control rights, loss-mitigation efforts, remedies, and active surveillance. A.M. Best's selected risk classifications, the associated risk class relativities, and recovery rates are reflected in A.M. Best's simulation model when deriving the loss estimates associated with a financial guarantor municipal bond book of business. **Exhibit 1** shows an overview of the selected risk classifications, the associated class relativities, and the recovery rates. To account for the volatility in recovery rates, A.M. Best will incorporate stress losses for municipal bonds that are categorized as in default.

#### *Default Period*

The default period is the period in which a financial guarantor is responsible for making all debt service payments before any recoveries. The default period may be seen as the period in which bond payments are suspended until there is resolution of the missed payment. A.M. Best research shows that these defaults are typically resolved within a two-year period and, therefore, A.M. Best assumes the default period is two years for all risk classifications shown in **Exhibit 1**.

#### *Correlations*

A.M. Best will assume that if the debt service of multiple municipal bonds issued by the same municipal obligor is made from the same source of revenue, those bonds are 100% correlated and, therefore, will be consolidated for modeling purposes. For all other municipal bonds issued within a state, A.M. Best will assume a base default intrastate correlation of 10%. Base interstate default correlations will be assumed to be 2%.

#### *Simulating Claims*

To simulate claims, A.M. Best begins with a yearly debt service schedule for each municipal bond in the guarantor's portfolio from the current period to maturity. A.M. Best assigns a default probability to each of the bonds, and then draws random numbers, correlates those random numbers and determines the timing of each municipal bond default. From the time the bond defaults, A.M. Best assumes that the financial guarantor makes the full debt service payments (instead of the original obligor) until the bond matures. A.M. Best uses the nomenclature, Net Claims, to indicate the amount of debt service the financial guarantor has to pay each period after taking recoveries into consideration.

The calculation of Net Claims represents three cash flow components. The hypothetical example in **Exhibit 3** (which assumes a municipal bond in risk classification 3 that defaults in year 5) illustrates these components, which are more fully described below:

**Gross Claims Against Financial Guarantor (Column C):** In the modeling process of the insured municipal bond portfolio, A.M. Best assumes that if a municipal bond defaults, the financial guarantor becomes responsible for making the Annual Debt Service (shown in Column B) from the time of default until maturity. In the example in **Exhibit 3**, Column C shows the debt service that the financial guarantor has to pay from the time of default (year 5) until the maturity of the bond in the 20th year.

**Recoveries from Obligor on Claims in Default Period (Column D):** A.M. Best assumes that during the first two years of the municipal bond's default (the default period), the financial guarantor makes the full debt service payment due without the benefit of any recoveries from the obligor. The recoveries from the obligor on these two years of debt service ultimately are achieved with a two-year lag based on an assumed recovery percentage commensurate with the risk classification. **Exhibit 3** assumes a recovery percentage of 80% based on risk classification 3 and that the recovery begins in the third year (assuming a two-year recovery lag

period) after the municipal bond's default. In **Exhibit 3** (Column D), the recoveries associated with the first two years of defaults begin in the seventh year and end in the ninth year. To be specific, the recovery associated with the default in the fifth year, \$778 (=80%\* \$973) would be realized in the seventh year. The recovery associated with the default in the sixth year, \$774 (=80%\* \$968) would be realized in the eighth year.

**Recoveries From Obligor on Ongoing Claims (Column E):** While the financial guarantor receives a recovery based on the obligor's first two years of defaulted debt service with a two-year lag (as described above in our example), it also receives a recovery on the defaulted debt service from the third year of the default until the bond's maturity with no lag. In **Exhibit 3**, Column E shows the recoveries based on 80% of the gross claims against the financial guarantor (Column C) starting in year 3 of the default. Therefore, in the seventh year (which represents year 3 of the municipal bond's default), the recovery in Column E is \$765(=80%\*\$956).

The summation of the three items listed above results in Net Claims that a financial guarantor will have to pay in the event of a municipal bond default. A.M. Best discounts the Net Claims to recognize the equity built into such claims. The calculation of the Net Claims per year in the example in **Exhibit 3** is shown in Column F. Column G is the present value of the Net Claims. The discount rate applied in the present value calculation is consistent with the discount rate used in BCAR.

#### Exhibit 4 1-Year Issuer Default Rates\*

Rating	Default Probability
aaa	0.08%
aa+	0.14%
aa	0.20%
aa-	0.22%
a+	0.28%
a	0.35%
a-	0.45%
bbb+	0.84%
bbb	1.23%
bbb-	1.56%

\* Derived from Best's Idealized Issuer Default Matrix

A.M. Best's Monte Carlo simulation model calculates the present value of total Net Claims against a financial guarantor on a portfolio basis after applying appropriate default, recovery and correlation assumptions. A.M. Best then chooses the claims from an array of the 100,000 or more simulated claims such that the probability of exceeding such claims is no more than the one-year default rate in *Best's Idealized Issuer Default Matrix* as shown in **Exhibit 4**, for the targeted rating level. The effective confidence level of losses is then approximately one minus the one-year default rate of the target rating. A.M. Best uses this confidence level approach because the statistical credibility associated with the expected default frequency and loss severity of insured municipal bonds, much like the statistical credibility of such measures related to excess casualty and natural catastrophe insurance, is relatively low compared with that associated with life insurance and personal automobile insurance. Thus, A.M. Best expects the loss distributions associated with financial guarantors to be positively skewed with considerable tail risk.

#### *Best's Capital Adequacy Ratio (BCAR) Results & Adjustments*

The present value of the Net Claims tabulated as described in the prior section is used in A.M. Best's BCAR model to determine the ratio of a financial guarantor's adjusted capital to its net required capital.

Collectively, the investment, credit and underwriting risk components generate the majority of a company's gross required capital. A company's gross required capital, which is the sum of the capital required to support all of its risk components, reflects the amount of capital needed to support all of those risks if they were to develop simultaneously. However, these individual components then are subjected to a covariance calculation within the BCAR formula to account for the assumed statistical correlation of these components. This covariance adjustment signals that it is unlikely that all of the individual risk components will develop simultaneously, and this adjustment generally reduces a company's overall required capital. However, in certain instances, where correlation is deemed to be present, A.M. Best will modify elements of the covariance adjustment to reflect some level of correlation among some of the components. With respect to financial guarantors, these entities may buy bonds

similar to those they insure for their investment portfolios. The aggregate loss experienced by the financial guarantor due to claims on the bonds it has insured may be correlated with the default risk of a portion of assets in its investment portfolio. In such instances, A.M. Best will add a portion of investment risk to reserve risk in the covariance adjustment formula.

The components of the financial guarantor's claims-paying resources include policyholders' surplus and contingency reserves; unearned premium reserves; net loss and loss adjustment expense reserves; the present value of future installment premiums; and third-party committed support such as soft capital facilities, liquidity facilities, collateral trust funds, and contingent capital programs. A.M. Best will assess and review the creditworthiness of any committed third-party support and determine the amount of credit to be allowed as part of the financial guarantee insurer's claims paying resources. A.M. Best may rely upon publicly available credit measures, including the credit ratings assigned to non-insurance third parties by NRSROs that have developed expertise in that particular industry, to assess the creditworthiness of any committed third-party support. These components of the financial guarantee insurer's claims-paying resources may be reflected in its adjusted policyholders' surplus calculations as part of A.M. Best's BCAR analysis.

The nature of financial guarantors is that generally their viability is threatened primarily by sudden, systemic, and severe downturns in the economy. Thus, A.M. Best believes that focusing on balance sheet strength and a guarantor's ability to withstand stress scenarios that deplete claims-paying resources such as stresses on credit ratings, recoveries, concentration, correlations, and other factors are key drivers of the rating assessment.

#### *Stresses and Sensitivities Applied*

While the loss simulation model calculates probability loss distributions, which reflect a portfolio's credit quality, maturity profile and risk distribution across the various risk classes, the level of losses in stress scenarios critically depends on recoveries, concentration risk, increased credit risk of vulnerable obligors, and idiosyncratic risks such as severe economic downturns.

In general, A.M. Best will take the following items, which indicate the increase in financial instability of the financial guarantor, into consideration: 1) the number of downgrade notches faced by the financial guarantor as a result of the stresses, and 2) whether the most severe stresses will likely move the financial guarantor's rating below a "bbb-" level. The following stress examples may be included in the calculation of loss estimates, but are not limited to:

**Recoveries:** Recoveries associated with municipal bonds appear to be volatile so A.M. Best will decrease recoveries such that loss given default is increased by 50% to 200% depending on the risk class (See **Exhibit 1**).

**Defaults:** Defaults associated with municipal bonds may increase (or become more likely) so A.M. Best will increase the default rates by 50% to 100%.

**Concentration and Credit Deterioration:** Single-issuer concentration and rapid credit deterioration can make financial guarantors susceptible to changing economic conditions. To test the resiliency of a financial guarantor's book of business, A.M. Best will downgrade the top 2% of issuers up to three notches.

**Below Investment Grade Ratings:** Substantive migration of ratings of municipal bonds to a rating below "bbb-" [from investment grade to non-investment grade] exposes financial guarantors to additional capital requirements and may also reveal weak risk management processes. A.M. Best will default municipal bonds with below-investment-grade ratings.

**Severe Economic Downturn:** A sudden economic downturn could result in both an increase in defaults as well as a reduction in recoveries. A.M. Best will assume that there is a 1.5% probability of a severe economic downturn each year resulting in 5% of the portfolio defaulting with a loss given default increased by 50%.

**Catastrophic Risk:** Catastrophe risk is incorporated into the simulation model to reflect the possibility that a municipal bond's default risk could be heightened based on the occurrence of natural catastrophes such as hurricanes and earthquakes. A.M. Best assumes that the annual probability of serious hurricane activity is 1% in specific counties in the following six states: Florida, Louisiana, Mississippi, Texas, North Carolina, and South Carolina. A.M. Best assumes the annual probability of serious quake activity is 0.40% in specific counties in the following six states: California, Alaska, Hawaii, Nevada, Washington, and Missouri. Upon the occurrence of a hurricane or earthquake in a given state, the default probability of the municipal bonds issued in that state or county is increased by 50%, which is incorporated into the simulation model.

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## METHODOLOGY

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**Best's Financial Strength Rating (FSR):** an independent opinion of an insurer's financial strength and ability to meet its ongoing insurance policy and contract obligations. An FSR is not assigned to specific insurance policies or contracts.

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