



## U.S. Municipal Bond Market

# The U.S. Municipal Bond Market in 2020, in the Last Decade, and in the Next

### Summary

- We took a look back at several events that helped shape what we describe as the most eventful decade for the municipal bond market, ever.
- We summarized and outlined lesson(s) learned from them and they include:
  - The 2009 Recovery Act
  - Moody's negative outlook for local governments
  - Public pensions
  - Issues from Obamacare
  - Increased regulation
  - BP oil spill
  - Monetary policy
  - Build America Bonds
  - Simpson-Bowles
  - 60 Minutes, Dec. 2010
  - Chapter 9 became real
  - Recalibrated ratings
  - Debt-ceiling crisis of 2011
  - Superstorm Sandy
  - The taper tantrum
  - The rise of algorithmic and electronic trading
  - The comeback of California's credit
  - Chicago's downgrade
  - Puerto Rico
  - Detroit resurrected
  - S&P state government warning
  - Weather-related events
  - Tax Cut of 2017
  - Municipal insurers
  - Municipal broker-dealers
- We outline the topics we think will help shape 2020, including (p.10):
  - Our volume forecast (p. 12)
  - A new municipal taxable market
  - Increased federal government action/inaction on municipals
  - The threat to the municipal bond tax-exemption
  - Municipal credit conditions
  - No good news about pensions
  - Infrastructure
  - Cybersecurity
  - Artificial intelligence and other forthcoming technologies
  - U.S. presidential election of 2020

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## The Last Decade was the Most Eventful Ever for Municipals

Not only are the final days of the month of December and 2019 in front of us, but the final days of what can accurately be described as the most eventful decade in the modern history of the municipal bond market are as well.

In January 2010, former President Barack Obama gave his first State of the Union Address to Congress and the American people. For several decades, U.S. Presidents passed on information about the state of the union. However, President Obama's first address was particularly unique because he took office in the midst of the worst economic conditions since the Great Depression, which began in 1929 and ended in 1938.

The new President spoke of the anxiety of the time and defended corrective measures taken by the federal government, some of which are highlighted below. State and local governments and other municipal entities saw the national housing market plummet and revenue streams weaken. Commentators called California the next

Greece. The municipal bond market was impacted significantly as well. In many ways, it would never be the same.

*What were the events that helped shape the municipal market from 2010 through 2019?*

What were the events that helped shape the municipal market from 2010 through 2019? We review several of the more meaningful happenings and the lessons learned from them as the calendar is set to turn to a new decade.

### **The American Recovery and Reinvestment Act of 2009 – Protected Municipals**

Although controversial at the time, the \$831 billion American Recovery and Reinvestment Act of 2009 (ARRA) has typically been considered by most as a resounding success. It softened the blow of falling revenues and gave state and local governments, including school districts, time to prepare for the real estate-related revenue shock to come. While the Recovery Act did not fall after 2010, its importance to the municipal market cannot be overstated; the outcomes in the decade to come would have been significantly different if not for its passage.

**Lesson(s) learned:** The federal stimulus had a positive impact on the U.S. economy and municipal bond market credit quality. However, there was strong opposition to the Recovery Act from Republicans and especially tea party Republicans. Not one Republican House member voted for the stimulus and only three senators voted for it.<sup>1</sup> The 2009 Recovery Act, which amounted to a total of \$831 billion, was highly controversial at the time. Although there were rumblings in 2010 of a stimulus part two, it did not happen because of a lack of political support. This political animosity only worsened as the decade progressed.

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### **“Negative” Outlook for the Entire U.S. Local Government Sector, Moody’s**

Technically, Moody’s placed a “Negative” outlook on the entire U.S. public finance local government sector in April 2009, but we think this unprecedented move important enough to overlook just nine months. And, from a credit perspective, we believe the move encapsulates the mood and lack of confidence that characterized that point in time.

**Lesson(s) Learned:** Close to unprecedented events can result in unprecedented rating agency action. Keep in mind that the rating report did not even include the word, “pension.”

### **Finally Public Pension Liabilities Were Noticed**

The Pew Center published a state-by-state look at pension funding levels in February 2010 titled, “The Trillion Dollar Gap, Underfunded State Retirement Systems and the Roads to Reform.” This report helped bring attention to the public pension-funding situation. In 2012, the Governmental Accounting Standards Board (GASB) released GASB statements 67 and 68, which improved the disclosure of pension liabilities.<sup>2</sup> However, pension funding remains a significant issue in public finance. A 2019 poll of municipal bond analysts found that “public pensions” remained the most important issue or trend facing the municipal bond market.<sup>3</sup> And, in a 2018 report, the Center for Retirement Research warned: “These worse-off plans will likely require intervention beyond traditional reforms to change the trajectory of their funded status.”<sup>4</sup> More recently, a Moody’s analysis considering different asset-loss scenarios concluded, “Some governments face material credit risk from pension investment losses under a moderate downside scenario,” and, “The likelihood of more governments facing severe pension challenges is material.”<sup>5</sup>

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**Lesson(s) learned:** In October, we published the commentary, [“Barriers to Fully Funding Public Pensions: Largely, a Problem of Asymmetric Information,”](#) where we highlighted inappropriate discount rates and underfunding as key reasons why plans remain inadequate. And, if funding is not going to improve leading up to, or in, the 11<sup>th</sup> year of one of the longest U.S. economic expansions, then it is not likely to improve.

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#### **Credit Issues from Patient Protection and Affordable Care Act**

President Obama signed The Patient Protection and Affordable Care Act, or Obamacare as it commonly became known, into law in March 2010. Many considered Obamacare the most significant expansion of government healthcare since Medicare and Medicaid was formed in 1965. Medium and long-term credit pressure for healthcare providers and U.S. state governments was expected as a result of the new federal legislation.<sup>6</sup>

**Lesson(s) learned:** State governments are likely to continue to feel the impact of this legislation, as will nonprofit healthcare providers. Lasting political ramifications remain because of a lack of Republican support for the legislation. Healthcare remains a key issue for the 2020 Presidential election.

#### **New Era of Federal Regulation Generally, and for Municipals Certainly**

President Ronald Reagan identified that “government was the problem” in 1981. Fifteen years later in his 1996 address, President Bill Clinton said the “era of big government was over” – just after the 2008 Financial Crisis lawmakers changed their tune. The Dodd-Frank Wall Street Reform and Consumer Protection Act became effective in July 2010.<sup>7</sup> It expanded the role of the Municipal Securities Rulemaking Board (MSRB) and subjected municipal advisors and rating agencies to new, stricter regulations. The Securities and Exchange Commission upped its enforcement of municipal disclosure through the Municipalities Continuing Disclosure Cooperation initiative.

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**Lesson(s) learned:** Views on regulation can shift fast and become expensive. Attention to regulation and compliance is likely to continue to build into the next decade, especially as more focus is placed on situations like Puerto Rico.

#### **No Credit Impact from Deepwater Horizon Oil Spill**

In April 2010, the Deepwater Horizon oil spill began, lasted for months and ended up being one of the largest and more significant industrial and environmental disasters in U.S. history. States most at risk were Louisiana, Mississippi, Alabama and Florida. While there was a financial toll on state and local governments dealing with the spill, the overall credit impact was rather light.

**Lesson(s) Learned:** There was not a broad credit-related impact on state and local government or related municipal issuers as a result of the BP oil spill that occurred in the Gulf. In fact, the overall credit impact was rather minimal. Disaster aid and legal awards helped as well.

#### **A New Age of U.S. Monetary Policy**

The U.S. Federal Reserve (the Fed) was required to dip into its toolbox and utilize unconventional monetary policies such as quantitative easing and asset purchases time after time.<sup>8</sup> The second wave of quantitative easing measures (QE2) undertaken by the Fed came about in November of 2010.<sup>9</sup> Investors and observers paid close attention to the details of every Fed action, statement and all economic releases. This was an era when good news was bad and bad news was good. It took years for the market to become content with how U.S. monetary policy was likely to react to

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economic releases, and it is still questioned. Although the recession ended in 2009, the Fed kept interest rates at 0.00% until it finally began to raise rates in December of 2017.

**Lesson(s) Learned:** We learned that the Fed probably started to raise rates too fast. We also learned that there always seems to be something that the Fed can do to help achieve its mandate, even in the absence of U.S. fiscal policy.

#### **Two Years of Build America Bonds Were Enough for Federal Lawmakers**

One of the more successful programs included in the Recovery Act of 2009 were the subsidized taxable municipal bonds officially called Build America Bonds, or BABs. BABs were created in order to expand the market for municipal debt. The ARRA only approved BABs for two years. Some expected that an additional federal allocation could come from Congress to extend BABs past their end of 2010 deadline, but it was not in the cards. In total, about \$185 billion of taxable BABs were sold in 2009 and 2010.

**Lesson(s) Learned:** Although BABs were considered an ARRA success, it is possible that BABs were not renewed for that reason. At the time, Republicans were not likely going to allow the White House to enjoy re-upping a Recovery Act program considered a success.

#### **The Rise of the Threat to the Tax-Exemption from the Simpson-Bowles Commission**

The National Commission on Fiscal Responsibility and Reform was a bi-partisan Presidential Commission on deficit reduction that presented its policies in, "The Moment of Truth," a report released on Dec. 1, 2010. The recommendations were not considered and voted on by Congress because a majority of the required commissioners did not approve them. However, one of the more notable items included in the recommendations was the elimination of the municipal bond tax-exemption tax-expenditure.

**Lesson(s) Learned:** While there was not a market reaction, the Simpson-Bowles Commission report signaled a rising threat to the municipal bond tax-exemption in the face of potential deficit reduction.

#### **60 Minutes Interview, December 2010**

The first year of this decade ended with one of the more memorable events for municipal investors, credit analysts and other municipal market observers. In the months leading up to December 2010, Meredith Whitney (formerly a bank equity analyst at Oppenheimer & Co.) created the Meredith Whitney Advisory Group (MWAG). MWAG published a report for private clients that focused on state government titled, "Tragedy of the Commons." Whitney also appeared on CNBC and wrote newspaper opinion pieces concentrating on public finance. In November 2010, she made a presentation to transition her MWAG into a Nationally Recognized Statistical Rating Organization (or a NRSRO).

Then, during a 60 Minutes television broadcast on the evening of Dec. 19, 2010, Whitney forecasted a "spate" of municipal market defaults for 2011. She said we could end up seeing 50 to 100 sizeable defaults within the next 12 months. Now even before Whitney's appearance, investors had already begun to withdraw money from municipal funds, but this headline risk did not help reduce anxiety.

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**Lesson(s) Learned:** One of the key lessons learned was that municipal fiscal distress typically does not play out that quickly, for sure not in one year. So, why did the market react as it did? In October 2007, Whitney correctly described Citigroup's undercapitalized position at a time before the financial crisis when most doubted her analysis. However, she was right. Following her 2007 call on Citigroup, she appeared on the cover of Fortune magazine and was named one of the 50 Most Powerful Women in Business. Therefore, she built credibility as someone who advised against the grain. In November 2014, Bloomberg's Joe Mysak wrote an extensive account of the events surrounding the 60 Minutes interview in ["The Muni-Meltdown that Wasn't."](#) A final important takeaway is, "Beware of inept advice."

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### **Chapter 9 Municipal Bankruptcies Became "Real" this Decade**

Municipal bankruptcy laws were barely tested prior to this decade. The need for municipal bankruptcy became real in the wake of the Financial Crisis of 2007 and 2008, and the Great Recession that finally ended in June 2009. While they still remained few and far between,<sup>10</sup> especially for local governments, a few U.S. local governments sought to restructure under federal bankruptcy law:

- Central Falls, Rhode Island, filed for Chapter 9 (Chp. 9) in August 2011 mostly because of unsustainable pension and other retiree benefits and was allowed to exit about a year later.
- Harrisburg, Pennsylvania, was put into receivership in October 2011 (tried to file for Chp. 9 protection but was not able to per state law and Act 47 rules) because the capital of Pennsylvania failed to make good on guaranteed incinerator-related debt. A recovery plan was filed in August 2013.
- Jefferson County, Alabama, filed for bankruptcy because of high debt levels sold to repair an aging sewer system, and complications from other financial products. Exited Chp. 9 in December 2013.
- San Bernardino, California, filed for bankruptcy in August 2012 because of insolvency and unsustainable pension debt. Exited Chp. 9 in 2017.
- Vallejo, California, filed for bankruptcy in May 2008 and exited in November 2011.
- Stockton, California, was able to file April 1, 2013, and allowed to exit Oct. 30, 2014.
- Detroit, Michigan, filed for bankruptcy in July 2013 because of service insolvency and unsustainable debt including public pensions. Exited December 2014.

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**Lesson(s) learned:** Bondholder recoveries in San Bernardino, California (55%); Stockton, California (50%); Vallejo, California (60%); and Detroit, Michigan (25%) were all less than the cities' primary pension recoveries. Primary pensioner recoveries were 100% in San Bernardino, 100% in Stockton, 100% in Vallejo and 82% in Detroit.<sup>12</sup> Also, it is not likely that there will be a federal bailout in the case of municipal bankruptcy. Even in Detroit, when the auto bailouts were occurring close to the same time, it would have been possible for the Obama administration to combine some aid for Detroit – yet nothing came from Washington, D.C.<sup>13</sup> We should reiterate that while bankruptcies became real, and the stigma lessened, the occurrence of them in the decade was still very low. Finally, Kevyn Orr, Detroit's Emergency Manager, argues, "Delay yields no benefit whatsoever." He further explains that delaying a restructuring is often expensive because "economic cycles are necessary for growth and development."<sup>14</sup>

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### **Rating Agency Recalibrations (Revised S&P Local Govt. Ratings Criteria, 2013)**

Moody's Investor Service and Fitch Ratings raised many of their general obligation bond ratings one-to-three notches in order to "recalibrate" them closer in line with corporate ratings. This was announced in April 2010. Standard and Poor's did not officially announce a ratings recalibration but S&P's upgrade to downgrade ratio

was significantly higher from 2008 to 2011 and some refer to this period and S&P's "shadow recalibration." A new batch of S&P public finance upgrades began in 2014 after the rating agency revised its local government criteria. Eighty-five percent of S&P's 625 public finance related upgrades in 1Q14 were due to their new local government criteria.<sup>15</sup>

**Lesson(s) Learned:** It helps to understand the history of public finance rating actions and activity.

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#### **Political and Credit Impact from the United States Debt-Ceiling Crisis of 2011**

Standard and Poor's downgraded the United States sovereign rating to AA+ from AAA in August 2011 because of political brinkmanship involved in the Budget Control Act of 2011, which also resulted in the federal sequestration process and the Jan. 1, 2013, "fiscal cliff." Some public finance ratings that had a direct and indirect correlation with the U.S. rating were also impacted.

**Lesson(s) Learned:** Federal lawmakers were pressured more than in the past during this summertime showdown, and this potentially ended the era of semi-compromise in Washington, D.C. These events also reinforced that rating agencies are watching and considering the political ramifications or possibilities.

#### **Superstorm Sandy – Raises Questions About Future Disaster Aid**

Sandy was not only the strongest storm of the 2012 hurricane season but one of the costliest Atlantic hurricanes ever causing about \$73.5 billion of damage on the eastern seaboard of the U.S. There was a small credit impact on mostly New Jersey and some New York credits as a result of Sandy damage. But, federal government relief amounting to about \$50 billion helped to minimize the long-term credit influence.<sup>16</sup>

**Lesson(s) Learned:** While federal aid was finally approved, there was an increased political battle in order to get aid to those affected.<sup>17</sup> This could mean there will be an increased amount of scrutiny and potentially less national political support for regions in the U.S. in response to future disaster requests.

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#### **The Taper Tantrum**

Monetary policy uncertainty was back at center stage during the summer of 2013 when the taper tantrum roiled the general and municipal markets.<sup>18</sup> On May 22, 2013, Fed Chairman Ben Bernanke said, "If we see continued improvement and we have confidence that that's going to be sustained then we could in the next few meetings ... take a step down in our pace of purchases."<sup>19</sup> Rates and municipal to Treasury ratios rose for weeks. Money flowed out of municipal funds and volume built up.

**Lessons learned:** Monetary policy was still king and it still could significantly impact municipal maneuverings.

#### **Rise of Electronic and Algorithmic Municipal Trading**

Some have suggested municipal trading would never move in the direction of electronic, algorithmic or trading over alternative trading systems (ATS) because of the thousands of CUSIPs and lack of activity among them. But, in the past decade electronic and algorithmic municipal trading and ATS systems have proliferated. Headlands Technologies executed its first municipal trade in February 2014, and while it was not the first, Headlands is symbolic because the firm was not traditionally involved in municipals. Other platforms such as MarketAxess are available for municipal trading and some participants have created their own internal electronic

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and algorithmic trading systems or procedures. Kevin McPartland of Greenwich Associates wrote that 12-15% of municipal trading is now done electronically in May 2019.<sup>20</sup> That percentage is certainly poised to continue to rise as acceptance increases.

**Lesson(s) learned:** Even the municipal market is not immune from technological innovation. These systems are going to find a way to coexist and potentially supplant day-to-day municipal transactional business.

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### The Comeback Story of California's Credit

California began the decade with a multi-year structural imbalance and some of the lowest credit quality in the state sector. The state was paying creditors with IOUs. However, what may be one of the more significant comeback stories of the decade is ending 2019 Aa2/AA-/AA-rated. How did Golden State lawmakers do it? Budget deficits were corrected mostly through lower state spending. Two specific reforms certainly had a policy impact, but also had an ongoing financial benefit for the general fund – public safety realignment and redevelopment elimination.<sup>21</sup> The temporary benefit from California's Prop 30 played a role in paying down debt.<sup>22</sup> Moody's rated California as low as Baa1 until its general obligation was upgraded to A3 in May 2004. The rating fell again to Baa1 in 2009 before it was recalibrated to an A1 in April 2010 and finally upgraded to a Aa3 in June 2014. S&P had California's rating as low as BBB back in 2003 and 2004 before it was finally upgraded to an "A" in August 2004. The S&P rating went up and then down until it was upgraded to "AA-" on July 2, 2015.

**Lesson(s) learned:** A rare example of political willingness that is often misunderstood as only an improving economy.

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### Chicago, Ill., Downgraded to Below Investment Grade

Half way through the decade Chicago's general obligation underlying rating was downgraded to below investment grade – to Ba1 with a "Negative" rating, by Moody's – in May 2015. The rating outlook was moved to "Stable" in 2018 based on a three-year time horizon.

**Lessons learned:** The key issue is that the impact of unfunded public pension liabilities can be significant. There is a classic question of ability versus willingness to pay in public finance at the issue's core. This is ultimately going to be a story about recognizing when the city no longer has or had an ability to pay. We will eventually likely learn that there is a limit to what taxpayers can fund. We will also eventually see that someone – which could include bondholders, pensioners, or taxpayers – will ultimately pay.

### "The debt is not payable. This is not politics, this is math," Gov. Alejandro Garcia Padilla

About a year after Puerto Rico sold its last bond issue, mostly to hedge funds, Governor Alejandro Garcia Padilla announced that Puerto Rico's \$72 billion debt burden was unpayable.<sup>23</sup> A year later the U.S. federal government set up the Puerto Rico Oversight, Management and Economic Stability Act (PROMESA) that created a financial oversight board to help restructure the island's finances and liabilities.

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**Lesson(s) Learned:** There is much uncertainty about how Puerto Rico and its restructuring are likely to impact public finance and the U.S. municipal bond market. This is an ongoing process and we will need to continue to observe the restructuring in order to understand all the lessons learned. At first glance, we can see that the process is raising questions about the general municipal market security pledge. These types of questions are going to be important in the coming decade, especially if the market

is faced with larger problems surrounding willingness and ability from state and local governments and lease pledges.

A Puerto Rico-related area already influencing the broader market has to do with the evolving topic of “**Special Revenues**” in a municipal restructuring or bankruptcy. Just this year doubt entered the municipal arena about the confidence of the security pledge attached to special revenues in bankruptcy. A 2018 ruling by Judge Laura Taylor Swain – the judge overseeing the Puerto Rico restructuring – was upheld by the U.S. Court of Appeals for the 1<sup>st</sup> Circuit in March 2019. The Appeals court upheld Judge Swain’s decision that Puerto Rico is not required to pay “special revenue” debt service on highway revenue bonds during the restructuring. This affirmed ruling contradicts much of the municipal market’s understanding and experience about protections to special revenues in bankruptcy.<sup>24</sup> The consequences of the ruling could flow through to other municipal market special revenue pledges linked with state and local governments. So far, the decision only has legal implications for entities in the 1<sup>st</sup> Circuit, but without clarification or without being overturned the decision could be interpreted more broadly. It is possible the court could re-hear the case.<sup>25</sup>

Rating agencies have reacted. For example, in May Moody’s put \$13.8 billion of water and sewer debt on review for downgrade.<sup>26</sup> And, Cleveland’s, Chicago’s and Dallas’ water ratings have already been downgraded. Illinois highway bonds have also been downgraded. Assured Guaranty and National Public Finance Guarantee Corporation filed a petition in the Supreme Court in December 2019.<sup>27</sup> We will now wait to find out the results of the petition and review to see if further rating agency action occurs, as well as monitor market digestion of the potentially impactful court decisions.

### **Detroit Resurrected – To Bankruptcy and Back**

Nathan’s Bomey’s play by play of the Detroit bankruptcy published in April 2016, “Detroit Resurrected – To Bankruptcy and Back,”<sup>28</sup> reads like a public policy manual for how to shed \$7-plus billion of liabilities,<sup>29</sup> mostly bonds and some pension benefits for only \$170 million.<sup>30</sup>

**Lesson(s) learned:** This book is a must-read for those interested in public policy and certainly for those interested in, or participating in, public finance. It reviews the classic question of willingness versus ability to pay. Bomey relays many valuable conversations as though the reader is sitting in the room with the speakers. Among the insightful passages are:

- “We in bankruptcy impair contracts all day every day...That is what we do.”<sup>31</sup>
- “Don’t they understand they can’t eat principles.”<sup>32</sup>
- “It is now time to restore democracy to the people of the City of Detroit. I urge you to participate fully in it. And I hope you will soon realize its full potential.”<sup>33</sup>

Alas, a key takeaway from the book and the process itself is summed up in a passage penned by Bomey himself. Bomey described the “Rhodes Test. Conscience dictates fairness.”<sup>34</sup> This is how Bomey described Judge Steven Rhodes’ legal perspective on the fairness of the bankruptcy plan to creditors. Many since have found Judge Rhodes’ legal interpretation and the precedent it potentially sets disturbing.

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### S&P Warns About: A New Dawn of Public Finance Problems, in the Hill

In April 2017, Gabe Petek, while at S&P Global, published a commentary piece uncharacteristic of a rating agency in The Hill warning about the upcoming problems states were soon to face. Petek writes:

U.S. states have entered a new era characterized by chronic budget stress. For the past 130 years, states have mostly been financially resilient through a range of economic conditions. In fact, no state has defaulted on its debt since Arkansas in the 1930s. This long period of relative calm may have lulled some people into complacency when it comes to state finances. It shouldn't have.<sup>35</sup>

*"This long period of relative calm may have lulled some people into complacency when it comes to state finances. It shouldn't have," wrote Petek.*

**Lesson(s) learned:** There are plenty of warnings about the current fiscal reality facing U.S. state governments, but this is one coming from a rating agency.

### Impact from Weather-Related Events: 2017 Hurricanes and Recent California Fires

Hurricane Harvey was a Category 4 hurricane that landed on Texas and Louisiana in August 2017. It is considered one of the costliest storms (\$125 billion of damage) on record. However, there was a very limited municipal credit impact from Harvey.<sup>36</sup> Hurricanes Irma and Maria were Category 5 hurricanes that swept through the Caribbean, including Puerto Rico, in September 2017 with only two weeks separating each storm. The storms were an additional challenge for an already weakened Puerto Rico economy and the island was downgraded as a result. In addition, warming conditions and electrical malfunctions are contributing to an increase in California wildfires.<sup>37</sup> Paradise, California, a town of about 27,000 was destroyed by fire in 2018. The California power supplier PG&E filed for bankruptcy as a result of losses and recently filed an amended reorganization plan after reaching a \$13 billion settlement with victims.<sup>38</sup>

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**Lesson(s) learned:** The larger and more frequent weather events may be a trend that U.S. public finance need to more strongly consider. A considerable worry is if the U.S. federal government begins to decrease disaster relief after future weather events/disasters. Also, investing in order to not only earn a return on principal but to make a positive, measureable contribution to society has become more appealing to investors. This type of Environmental, Social and Governance (or ESG) investing is still in its infancy and scoring is evolving,<sup>39</sup> but we certainly see it as something that could become more meaningful in the coming decade.

### The Tax Cuts and Jobs Act of 2017 – The Return of the Threat to the Tax-Exemption

The first draft of what would become the Tax Cuts and Jobs Act of 2017 only first appeared in November 2017, but the final legislation signed in December is likely what most municipal market participants and observers think of when remembering 2017. From a broader policy perspective, the 2017 Tax Cut is mostly viewed as though it was neutral to negative.<sup>40</sup> Polling data from the beginning of this year shows that public opinion mostly still disapproves with the 2017 tax law.<sup>41</sup> Then and now, uncertainty surrounds the 2017 Tax cut even to this day.

**Lesson(s) Learned:** The strongest danger to the municipal bond tax-exemption since 1986 appeared and threatened to eliminate private activity bonds and actually did eliminate advance refundings with tax-exempt bonds. Observers should remember advance refundings were lost for a tax cut, not for deficit reduction. When lawmakers get serious about deficit reduction the threat to the municipal bond tax-exemption will be high.

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### Municipal Insurers, Only Two Left Standing at the End of the Decade

In 2007, the penetration rate – or the percentage of all primary market issuance insured by one of Aaa/AAA rated insurers such as MBIA Insurance Corp., Ambac Assurance Corp., Financial Guarantee Insurance Corporation (FGIC), Financial Security Assurance (FSA), and Assured Guaranty (AG) – was almost 60%. Through the financial crisis, the insurer's Aaa/AAA ratings disappeared and some firms closed or were consolidated.<sup>42</sup> In 2017, a rating agency downgrade rendered MBIA successor National Public Finance Guarantee Corp unable to write new business. Now only two insurers, Assured Guaranty and Build America Mutual, are actively writing new business. The penetration rate for municipal insurance was 5.6% as of the end of November 2019.

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**Lesson(s) learned:** Insurance still often helps issuers save on financing costs and can be a claims easing benefit for investors. This is a segment of the market that could continue to evolve.

### Bond Dealers, In and Out of the Market

It has been common through decades past for different dealers to be absorbed by others and some underwriters to decide from time to time the municipal bond market is no longer for them. This decade was no different. Long-time regional offices continued to be gobbled up by acquirers. However, what may have been most notable at a larger scale was this was the first decade, in some time, without Bear Stearns, Lehman Brothers and UBS (former PaineWebber until acquired by UBS in summer of 2000. That is, until UBS decided to jump back into the municipal business at the end of the decade.

**In the next decade:** It is likely market share held by the top national firms will remain bunched, and both national and regional bond dealers will continue to be pressured by tightening spreads and rising costs for technology and compliance. Firms that can differentiate themselves outside the ordinary suite of products and services are those who will be able to distinguish themselves.

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### Looking Forward to 2020

Now, after an extensive review of the last decade, we take a look at what 2020 may have in store for the municipal bond market. Again, we created and are going to work off a list of topics that we believe will be among the most impactful and talked about for the next year and beyond.

- Volume forecast – some optimism to begin the next decade
- New municipal taxable market
- Increased federal government action/inaction on municipals
- Threat to the municipal bond tax-exemption
- Overall municipal credit conditions
- No good news about pensions
- Infrastructure
- Cybersecurity
- Artificial intelligence and other future tech
- U.S. presidential election of 2020

### The “Uncertainty” Decade is Finally Over

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uncertainty. The doubt influenced every political, business and social arena, and much of the lack of confidence was a result of residue from the Great Recession, including general gridlock. Some of this stalemate was political, for sure. This uncertainty made it difficult for investors to allocate capital. It made it difficult for business leaders to create multi-year strategic plans. And, the insecurity influenced public finance entities that were trying to determine what the above parties were likely to do next.

### **We Expect Some Moderate Optimism to Kick-Off the New Decade**

If there is a key influence that can be considered as a takeaway from the last decade, it is that U.S. monetary policy has been a notable driver of municipal market activity and performance. In the last half of 2019 and going into 2020, that is still the case. U.S. monetary policy remains at center stage.

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At the end of 2018, it seemed like the Fed was going to follow through on several interest rate hikes. The Fed raised rates in December 2018 for a fourth time in 2018, but signaled to the market that it expected to only raise rates twice, not three times, in 2019. We also began to see some political interference develop between the President and the Fed.<sup>43</sup>

Not only did the Fed fail to follow through on those hikes, interest rates were cut three times over three months in the middle to end of 2019. At this point, it seems as though the Fed is likely to pause before adding additional accommodation. And, as of their most recent meeting in December 2019, the Fed indicated that it expects to hold rates steady for the next year.<sup>44</sup>

It seems as though public finance participants considering action in the municipal bond market are interpreting the recent moves lower as an opportunity to take advantage of the attractive interest rate environment. We believe this may be the clearest sense of certainty for public finance entities that we have seen in some time.

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### **Optimism is Shining Through**

Their optimism is shining through quantifiably. Public finance issuers have sold a total of \$210 billion of debt from August to December 2019, compared to only \$145 billion in 2018. November 2019 saw about \$45 billion of issuance compared to last year's \$27 billion, and December 2019 (assumed \$34.9 billion) and January 2020 are both likely to be heavy months as well.

Interestingly, after reading all of the previous pages, who would have thought that the "decade of uncertainty" would end with our most optimistic municipal bond market volume forecast ever? We need to set up the reasons why we believe there will be a record amount of municipal bond issuance in 2020. In a way, this prediction flies in the face of the uncertainty that has existed and even still exists today to a degree. Think about it: there are impeachment proceedings against President Trump, risks from the trade-war with China remain high, there are questions about the U.K. elections, and individual municipal credit concerns continue to exist as well. Additionally, in the middle of the 11<sup>th</sup> year of an economic expansion, there are still a high number of rating downgrades. State ratings are under pressure, too, and potential stress from a ramping up of pensions costs is out there.

Yet, low rates and the concern issuers now have about missing out on them are what will drive them to raise funds in the near term. Also, it does not hurt that there are, in some cases, ten-ish years of pent-up demand for spending. In addition, there are other needs including affordable housing, homelessness,<sup>45</sup> mental illness,<sup>46</sup> green initiatives, climate risks,<sup>48</sup> cybersecurity protection and education projects that are going to drive 2020 issuance. Election results from 2019 have also proven to be very pro-bond, as estimates from Bloomberg and The Bond Buyer report at least \$17

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billion and as high as \$27 billion of approved issuance, respectively. Texas reported record approvals as voters approved \$14.5 billion out of \$16 billion of bond issues that were on the ballot in the November election, as well.<sup>49</sup>

### A Second Chance for Bond Issuance

“Sometimes you need a second chance because you weren’t ready for the first,” is an appropriate saying we believe summarizes how some issuers may be viewing the current market circumstance. Qualitatively we think that issuers may have been remorseful about not taking advantage of the low rates before the end of 2018. Ann Arbor, Michigan, school district just passed a billion dollar bond proposal. Proponents of the issuance were said to have convinced voters of the importance of acting now to save on issuance costs. Voters approved the issuance plans by a 53% to 47% margin. And it is important to note that the school district decided to put to vote the largest of three proposals after responses to a survey over the summer concluded there was enough support for the billion dollar option.<sup>50</sup>

Now, whether it is because of the new options (taxable mainly) that exist related to refunding strategies or because the low rates are too good to pass up, we think the time is right for record issuance supported by issuer demand for new money. Not only have issuers been shrugging off the risks since August, but we think they will continue to believe the pros outweigh the cons in 2020, especially as rates remain low (10YR MMD near 1.40%) or move even lower (close to 1.25% 10YR MMD in August).

## Municipal Bond Market Volume Forecast for 2020

We estimate total primary market municipal bond issuance will be \$450 billion in 2020, a record amount. Our estimate just surpasses the \$449 billion sold in 2017, a large portion of which was driven by the 2017 Tax Cut scare in the final two months of the year.

### U.S. Municipal Bond Issuance Forecast Breakdown

Type	Forecast (in \$) 2020	Forecast 2020 (as a % of Total)	Full Year* (in \$) 2019	Full Year* 2019 (as a % of Total)
New Money	\$297,000	66%	\$282,705	69%
Refunding	153,000	34%	129,868	31%
Total	\$450,000	100%	\$412,572	100%
Tax-Exempt	\$360,000	80%	\$343,197	83%
Taxable	90,000	20%	69,375	17%
Total	\$450,000	100%	\$412,572	100%

Source: Thomson Reuters and HilltopSecurities. \*Dec. 2019 issuance forecast at \$34.9 billion.

Next year’s new money issuance is going to come in at \$297 billion (66% of overall issuance), approximately 5% higher than new money issuance in 2019. Refunding issuance is likely to amount to \$153 billion, or about 34%, of overall issuance. While the percentage breakdown is not quite as high as the 50%+ levels we saw before the 2017 Tax Cut eliminated tax-exempt advance refundings, it is well above 2018’s 24% and slightly above 2019’s 31%.

### Refunding Volume is Dependent Upon Interest Rates

One of the issues of the day in the municipal bond market has to do with this recent trend of taxable issuance. We think that if interest rates stay near where they are now or drop, the taxable refunding trend could continue. A small amount of non-refunding taxable issuance will remain, but the majority of the \$90 billion of taxable

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issuance we expect to see in 2020 will be for refundings. This will amount to about 20% of overall issuance and is just under the percentage breakdown of taxable issuance compared to tax-exempts sold from August through November 2019. While all of the above-mentioned variables are sensitive to interest rate movements, this component is especially susceptible and very much driven by future interest rate action. The remaining \$360 billion of issuance will be tax-exempt and include a portion of bonds subject to the Alternative Minimum Tax.

### More on Municipal Bond Supply and Demand as it Relates to Volume

The supply and demand dynamic is of utmost importance in every market. The relationship can be a primary driver of price discovery. Generally, if there are more buyers for scarce goods then prices tend to rise, from an economic theory perspective. The supply and demand dynamic is often an important driver in the municipal bond market. The dynamic was again a contributing factor in 2019 as a record amount of investment dollars flowed into municipal funds (49 straight weeks of flows as of Dec. 16) helped lower already compressed yields.

In 2020, we expect retail and institutional demand for municipals to remain strong. The Tax Cut and Jobs Act of 2017 limited the State and Local Tax deduction individuals can claim to \$10,000, thereby increasing the demand for other ways for individuals to minimize taxable gains. We think this has been and will continue to be a driver of tax-exempt demand. Bank demand has been small to non-existent since the 2017 Tax Cut, mostly because of a lower relative value as a result of the lower corporate tax rate. Bank demand has been down still as of third quarter 2019 numbers. However, we can report that we have not seen as much bank selling of municipals in recent months as we did in 2018 and in the beginning of 2019.

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### A New Municipal Taxable Market

The 2017 Tax Cut influenced supply again in 2019 and will likely influence it in 2020, too. The elimination of tax-exempt advance refundings is one way the Tax Cut influenced supply. Another and related way the Tax Cut influenced municipal supply is with the rise of taxable advance refundings, which began at the end of the summer of 2019 because of the relatively extra-low interest rate environment. We think municipal issuers will continue to utilize taxable refundings in 2020, and they could become even more utilized if rates continue to fall as some suspect they may. As this increase of taxable refundings continues, the municipal market will need to maintain a firm grasp on demand in order to stabilize the market when volatility increases and/or flow demand lessens.

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### Increased Federal Government Action/Inaction to Impact Municipals

A key theme of our above decade in review was that there was an oversized or more than typical impact on public finance and municipal bond market in the last decade as a result of federal government sources. This was sometimes a positive, as in the case of the 2009 Recovery Act. Sometimes this increase in involvement was a negative, as in the case of the 2017 Tax Cut. We expect this increased involvement is going to be a recurring theme, not only in 2020 but also for the next decade.

An item to look out for in coming years is whether or not the market can expect the federal government to institute a PROMESA-like (Puerto Rico Oversight, Management, and Economic Stability Act) board for U.S. states that experience distress. However, U.S. state governments will not likely sign over political or government control to the U.S. federal government the way Puerto Rico did under PROMESA. What future federal involvement in municipals looks like is likely to be different going forward. It is most likely to be more restrictive than helpful. And, the political and federal deficit conditions make potential state and local government stimulus or bailouts less possible.

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## The Threat to the Municipal Bond Tax-Exemption

Another takeaway from our decade in review should be that the threat to the municipal bond tax-exemption was and has been high. The elimination of the tax-exemption tax-expenditure in the 2010 Simpson-Bowles deficit reduction plan was an early decade shot across the bow. The actual elimination of tax-exempt advance refundings in the 2017 Tax Cut was a shot into the hull, and now the ship is slowly taking on water. This is not an overstatement of the risk.

Private activity bonds were put on the chopping block and advance refundings with tax-exempt bonds were eliminated not because of deficit reduction, but for a tax cut. This was a significant development in the evolution in the threat in the last part of the decade. This indicates to us that there will be another level of threat to the municipal bond tax-exemption anytime changes to federal tax policy are considered in the future.

And don't forget, the nation's fiscal health is weakening. A 2019 Government Accountability Office (GAO) analysis of the nation's fiscal health reported, "The federal government's current fiscal path is unsustainable ... Other agencies join GAO in saying that the longer action is delayed, the greater and more drastic the changes will have to be."<sup>51</sup> At some point in the next decade, policymakers are likely to begin to get serious about the fiscal threat. When that happens the municipal bond tax-exemption will for sure be in lawmakers' crosshairs.

Something to think about: The increased use of taxable bonds by municipal issuers may prove to contribute to the threat to the tax-exemption. At some point the attractiveness of taxable debt will decrease as interest rates rise, which very well could be a variable that is lost on lawmakers if, or when, the policy is considered at a future time.

To neutralize the threat, it is imperative that the public finance community embrace, support and add to the educational efforts championed by organizations like the Government Finance Officers Association and the Municipal Bonds for America Coalition of state and local government officials. Educational efforts increased last decade, especially before the fiscal cliff. But with lawmakers coming and going and the ever-evolving political landscape, this is an effort that requires constant and updated attention.

## Overall Municipal Market Credit Conditions

There are troubling patches of weakness in municipal bond credit quality, even though we are in the middle of the 11<sup>th</sup> year of an economic expansion. You can read our individual municipal bond sector outlooks in our August 2019 commentary, "[What are the Real Factors Driving Municipal Credit Now? Municipal Bond Sector Outlooks.](#)"

We assigned "Positive" outlooks to the Airport and Housing sectors. We assigned "Stable" outlooks to the Public Power, Toll Facilities and Water & Sewer sectors. We assigned "Cautious" outlooks to the State Government, Local Government and School District sectors. And, we assigned "Negative" outlooks to the Healthcare, Higher Education and Tobacco Sectors. We are not considering, at least in the near term, increasing our outlooks for the Healthcare or Higher Education sectors.

In a Nov. 15, 2019, report, Moody's indicated that their public finance upgrades were higher than downgrades for a ninth quarter in a row.<sup>52</sup> And the annual trend has been going in the right direction as well – a credit positive. However, there are still a higher than expected number of downgrades still occurring in the local government sector especially. This is something we are going to be watching not only in 2020, but also in the next decade.

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*There are troubling patches of weakness in municipal bond credit quality, even though we are in the middle of the 11th year of an economic expansion.*



## There is Still No Good News on the Public Pension Front

There is still no good news on the pension front. We wrote about why public pensions are still underfunded recently in our October 2019 commentary, [“Barriers to Fully Funding Public Pensions: Largely a Problem of Asymmetric Information.”](#) In short, we reported that inaccurate assumptions, mostly in the form of discount rates that are too high, are to blame. Also, where pensions are concerned: we have seen Kentucky’s second largest plan approach asset depletion. Chicago is moving closer and closer to that point as you can see after analyzing the numbers. The consultants preparing the actuarial reports for Chicago’s largest pension plan have already warned about the threat of asset depletion. Chicago is in such dire straits that the city’s new mayor already requested state-help during the week of 2019’s 4th of July holiday. And Moody’s, on page five of a May 2019 report, indicated that Connecticut, Illinois and New Jersey will only have four-to-six years of pension assets left after what they refer to as a “shock” scenario occurs to investments.<sup>53</sup>

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## Infrastructure

The American Society of Civil Engineers gave U.S. infrastructure a “D+” grade in their most recent Infrastructure Report Card. For years, U.S. infrastructure investment has needed resources and the issue has received some, but not enough, political attention. Part of the platform President Trump ran on included \$1 trillion of investment for infrastructure that would have occurred over a 10-year period. The issue did not see the light of day after he was elected. The President made another run at infrastructure in the middle of 2019 but could not gain traction.<sup>54</sup>

For several years, there has been talk about bringing back a BAB-like infrastructure federal financing tool. While this is still possible, we have not heard any promising developments out of D.C. related to it. Let’s not forget how frustrated many municipal entities have been with BABs because of the subsidy cuts from sequestration. In other words, we are not certain how much support there would be for a revamped tool if the subsidy flowed in the same way.

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## Cybersecurity

A relatively new and increasing risk to the municipal bond market exists in the area of cybersecurity. Threats such as phishing and ransomware (and others) have been rising. Just last week, New Orleans declared a state of emergency as a result of phishing attempts and ransomware.<sup>55</sup> Other attacks in Pensacola, Florida and to Oklahoma’s pension fund have also been reported. The threat exists at a regional and national level as well. The GAO warned in September of the [Actions Needed to Address Significant Cybersecurity Risks Facing the Electric Grid – Critical Infrastructure Protection.](#)

So far municipal credit impact has been very minimal from cyberattacks. In April, S&P lowered the outlook to “Negative” of a West Virginia hospital, Princeton Community Hospital (BBB+), partially because of a cyberattack, for example. And although the credit impact has been minimal so far, we believe it is a topic that will continue to evolve and the potential influence could rise, not only in 2020 but in the next decade as well. We addressed the topic in more depth in our September 2019 commentary, [“Threat of Cyber, Ransomware Attacks Remains.”](#)

*A relatively new and increasing risk to the municipal bond market exists in the area of cybersecurity.*

## Artificial Intelligence and Other Future Technology in Municipals

Technological innovation and Wall Street are typically synonymous. If trades can occur faster using new technology, there are typically ways a capitalist can thrive as a result. Michael Lewis covered this in his 2014 book, *Flash Boys*, for example. Those in municipals have been decidedly behind the times where technological innovation is

concerned. Before this decade, it was the MSRB's creation of its Electronic Municipal Market Access (EMMA) website and database that was one of the industry's chief technological improvements. EMMA was certainly an improvement over microfiche, but it was not groundbreaking by any means.

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The backwardness in municipals is starting to change. We cannot yet communicate that technological innovation and the municipal market are synonymous, but it is getting better. We wrote about the rise of electronic and algorithmic municipal trading above, for example. The use of artificial intelligence is beginning to sneak into the municipal industry as well. This and other technological innovations are going to continue to take hold in 2020 and into the next decade. Smart city technology is starting to become more utilized.<sup>56</sup> Artificial Intelligence (AI) is being applied not only by investors and dealers looking to sift through piles of actual, but also digital, information.<sup>57</sup> AI is also being used on the government side, too. Public entities such as the Minnesota Pollution Control Agency, the state of Vermont and the city of Atlanta, Georgia, are using AI technologies for public benefit.<sup>58</sup> Other technological innovations, like the use of the eXtensible Business Reporting Language already approved for use by the state of Florida, will increase transparency by investors and issuers of municipal bonds.<sup>59</sup>

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## U.S. Presidential Election of 2020

Recent Presidential administrations have produced numerous memorable moments for the country and the municipal bond market. The Barack Obama campaign's use of social media and its "Hope" poster, designed by Shepard Fairey, captured and integrated voters in support of the formerly unknown candidate. The lasting impact of the Obama administration on municipals was very much captured in the above pages. We experienced in 2016, as we did in 1948, that it is dangerous to rely strictly on polling data. Donald Trump defeated Hillary Clinton and became the 45<sup>th</sup> U.S. President in what was a surprise result for many. So far the impact to municipals from the Trump administration has been made mainly in the areas of tax and trade policy.

Looking forward to the potential impact of the 2020 U.S. election(s), we believe there is a bias to thinking that the status quo is likely to continue. The Millennial generation (born 1981-96) currently outnumber the Baby Boomer generation (born 1946-64).<sup>60</sup> Millennials are therefore posed to make an impact politically. Presidents Clinton, Bush and Trump were all born in 1946 at the beginning of the boomer period, while President Obama was born in 1961 toward the end of the period. At some point this boomer stranglehold will end. The rise of Millennials could be a key demographic trend that will likely impact future elections, but for now the influence will be limited to supporting roles, the periphery and catchphrases like, "Ok boomer."<sup>61</sup>

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The policy areas that are most concerning to investors have to do with fiscal policy, tax policy and trade policy (especially with China). And these are subjects that are, like usual, difficult to predict no matter who stays or enters the White House. But, we know that no matter what the results of the election(s) are these policy areas will be impactful in some way. Campaign proposals in topics such as healthcare and environmental policy are likely to continue to gain more press attention than political support. The impeachment proceedings will persist and continue to absorb media and important political energy, unfortunately. All in all, it is more likely than not that the more consequential or potentially transformative policy proposals will not gain enough attention or bi-partisan support in order to become law.

- <sup>1</sup> Please see Govtrack.us for the [2009 Recovery Act voting history here](#).
- <sup>2</sup> See more in [Pension Standard for State and Local Governments](#); GASB website.
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- <sup>5</sup> Vulnerability to pension investment losses remains high despite slowing costs; Moody's; Dec 11, 2019.
- <sup>6</sup> Please see [Long-Term Credit Challenges of Healthcare Reform Outweigh Benefits for Not-for-Profit Hospitals](#), Moody's; April 13, 2010 and [Healthcare Reform Expected to Create Long-Term Financial Pressure for States](#); Moody's; April 22, 2010.
- <sup>7</sup> Please see: [10 Year Later: Laws and Rules That Reshaped the Muni Market](#); Lyne Hume; the Bond Buyer; Oct 22, 2018.
- <sup>8</sup> Please see: Rudebusch, Glenn D.; [A Review of the Fed's Unconventional Monetary Policy](#); the Federal Reserve Bank of San Francisco; Dec. 3, 2018.
- <sup>9</sup> Please see: [Chronology of Fed's Quantitative Easing & Tightening](#) by Yardeni Research.
- <sup>10</sup> Please see: [Chapter 9 Municipal Bankruptcy Statistics: Use by Number, Type and Year](#). Jim Spiotto. MuniNetGuide; June 14, 2018.
- <sup>11</sup> Judge Christopher Klein, the bankruptcy judge in Stockton wrote that that pensions could be altered, but the final restructuring did not alter pensions. Please see [Stockton bankruptcy judge puts key CALPERS rulings in writing](#); Dale Kasler; Sacramento Bee; Feb 5, 2015 and see the text of Judge Klein's [Opinion Regarding Confirmation and Status of CALPERS](#); Feb 4, 2015.
- <sup>12</sup> Please see [San Bernardino, CA- Bankruptcy Plan Pains Bondholders, Leaves City Facing Hurdles with Pensions, Public Safety and Infrastructure](#); Moody's; April 19, 2017.
- <sup>13</sup> Bomey writes about Detroit's request for federal aid being turned down twice, on page 132 of [Detroit Resurrected](#).
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- <sup>15</sup> [Are S&P's Local Government Ratings Too High?](#) Janney Capital Markets; July 14, 2014.
- <sup>16</sup> [Approval of \\$50 Billion in Superstorm Sandy Aid is Credit Positive for Affected Governments](#); Moody's; January 13, 2013.
- <sup>17</sup> Please see [Congress approves scaled-back Sandy aid bill](#); Halimah Abdullah; CNN; Jan. 4, 2013.
- <sup>18</sup> Please see [Pisani, Bob; Bernanke Taper Tantrum!](#); CNBC; June 19, 2013.
- <sup>19</sup> Please see: [Key events for the Fed in 2013: the year of the "taper tantrum"](#); Reuters; Jan. 11, 2019
- <sup>20</sup> McPartland, Kevin; [The Modernization of Municipal Bond Trading](#); Greenwich Associates; May 6, 2019.
- <sup>21</sup> Please see: [Budgeting With Revenues Growing Means California Must Confront its Past](#); Standard and Poor's; Jan. 28, 2015; page 5.
- <sup>22</sup> Petek, Gabe; [Prop. 30, prudence helped California budget's balancing act](#); San Francisco Chronicle; Jan 27, 2015.
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- <sup>30</sup> *Ibid* page 237.
- <sup>31</sup> *Ibid* page 89.
- <sup>32</sup> *Ibid* page 161.
- <sup>33</sup> *Ibid* page 239.
- <sup>34</sup> *Ibid* page 238.
- <sup>35</sup> Petek, Gabe (of S&P); [Your State is Probably Facing a New Dawn of Public Finance Problems](#); The Hill; April 4, 2017.
- <sup>36</sup> Please see: [Hurricane Harvey exposes affected local governments to various credit risks](#); Moody's; Sept 18, 2017 and [Hurricane Harvey damage fails to stop revenue growth in most affected areas](#); Moody's; Aug 21, 2018.
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- <sup>51</sup> [The Nation's Fiscal Health: Action is Needed to Address the Federal Government's Fiscal Future](#). U.S. Government Accountability Office; April 10, 2019.
- <sup>52</sup> [Rating Revisions: Upgrades top Downgrades in Q3 2019 for a Ninth Quarter in a Row](#); Moody's; Nov. 15, 2019.
- <sup>53</sup> Most states have the financial flexibility and reserves to manage a recession; Moody's; May 20, 2019; page 5.
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<sup>57</sup> Please see the commentary written by Jeff Curie the President of Bitvore, which is a provider of A.I. based products for the municipal market titled: [Artificial intelligence is radically changing muni risk assessments](#); The Bond Buyer: March 20, 2017.

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<sup>60</sup> Fry, Richard; [Millennials projected to overtake Baby Boomers as America's Largest generation](#); Pew Research Center; March 1, 2018.

<sup>61</sup> For an explanation please see: ["OK boomer" isn't just about the past. It's about our apocalyptic future.](#); Aja Romano; the Vox; Nov 19, 2019 and ["OK Boomer Marks the End of Friendly Generational Relations](#); Taylor Lorenz, the New York Times; Oct 29, 2019.

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