

## MUNICIPAL CREDIT IMPLICATIONS: HURRICANES & OTHER NATURAL DISASTERS

In light of the recent hurricanes, which severely impacted both Houston and much of Florida, we thought it wise to address more broadly the credit implications in the municipal bond market from these and other natural disasters. The Atlantic hurricane season runs from June through November, reaching a peak in mid-September. In August 2017 alone, four named storms formed in the Atlantic, with all growing to hurricane strength, two of which, Harvey and Irma, became major storms; with time remaining in the 2017 season, it is possible that we could see more activity.

The full toll of storms and other disasters, including the assessment of both personal and physical loss, take time to fully realize. However, the impact of these storms and disasters on the broad municipal bond market has historically been very contained.

Over the course of various natural and other disasters, there is a strong historical precedent that the value of municipal bond holdings has remained unimpaired. Debt service payments, typically through electronic processing, have continued to be paid even during times when operations are disrupted due to damaged buildings and infrastructure. Honoring debt obligations remains a top priority for governmental entities, as efficient access to the capital markets is a critical element to begin or proceed through the rebuilding process.

What we typically could see during these times, however, is an immediate disruption in operations; think of, for example, a flooded toll road or an emergency room of a local hospital that has sustained severe damage. Nonetheless, many municipal entities have various liquidity reserves at their disposal to handle fluctuations in cash flow or even a short-term interruption in operations. Governmental entities already exhibiting financial strain or stressed operations before the storm could be disproportionately affected and may experience rating pressures. We would expect that municipal entities with sufficient resources, solid management and access to capital will continue to adequately manage their finances throughout the clean-up and rebuilding efforts after initial impact to maintain credit quality. Following these disasters, and especially in federally designated disaster areas, we have historically observed that the insurance proceeds, federal aid, state financial support, and private contributions have ultimately provided a boost to economic activity in the impacted local and regional areas due to the rebuilding effort.

THE ECONOMICS OF PAST DISASTERS - IN BILLIONS OF TODAY'S DOLLARS					
Disaster	Region Impacted	Date	Economic Loss	Economic Aid	Economic Aid as a % of Economic Loss
Hurricane Matthew	So Atlantic Coast	Oct 2016	\$ 15.5	\$ 4.4	28.6 %
Superstorm Sandy	Northeast	Oct 2012	73.0	82.8	113.4 %
Hurricane Irene	Northeast	Aug 2011	13.3	7.0	52.8 %
Hurricane Katrina	Gulf of Mexico	Aug 2005	174.5	185.7	106.4 %
Hurricane Ivan	Gulf of Mexico	Sept 2004	17.1	17.0	99.3 %

Sources: ISO, Insurance Information Institute, Moody's Analytics

Issuers within the municipal bond market have a long, established track record of addressing and recovering from natural and other disasters with debt service and access to capital remaining a priority. We remain comfortable at this time with our credit exposure in the areas impacted by these recent weather events. As part of our assessment of credit worthiness, we evaluate an entity's management experience and practices, financial resources, and flexibility. We maintain diversified portfolios of municipal bonds in hopes of minimizing the impact of any one significant event. We believe our credit evaluation and investments are with long-standing, financially strong, and viable entities that have the necessary tools and resources to manage through the unexpected.

As we encounter these events we will assess any impact they may have on credits held at Appleton, including any possible investment opportunities that may arise in the aftermath. We also take any necessary action to reduce exposures if we feel that this action is warranted.

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