

COVID-19 Update: Economic and Asset Impact





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July 31, 2020

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Introduction

The SARS-CoV-2 coronavirus, which causes the disease named “coronavirus disease 2019” (COVID-19),¹ was first identified in December 2019 in China, beginning a worldwide pandemic that continues. The pandemic has impacted businesses around the world, and financial markets and governments have reacted to the resulting lower levels of economic activity. Some countries placed restrictions on travel and trade to slow the spread of the virus and to retain critical supplies. While many countries that shut down early in the pandemic have reopened to various degrees, other countries have begun to experience the pandemic only more recently.

The Society of Actuaries (SOA) published its first COVID-19 research brief on March 10, 2020, followed by regular updates and expansions through June 12, 2020. The comprehensive report included a section of statistics that highlight the pandemic’s impact on economies in the U.S. and Canada. This report shows updates to the Economic and Asset Impact section of the comprehensive report.

Macroeconomic Variables

MONETARY AND FISCAL POLICY

While China implemented stimulus measures starting in February 2020, March 3 marked the first of several U.S. Federal Reserve actions that quickly lowered the benchmark U.S. interest rate to nearly 0%.² Soon after, the Bank of England, Bank of Japan and European Central Bank loosened monetary policies.³ These actions supported liquidity and stabilized the banking system.

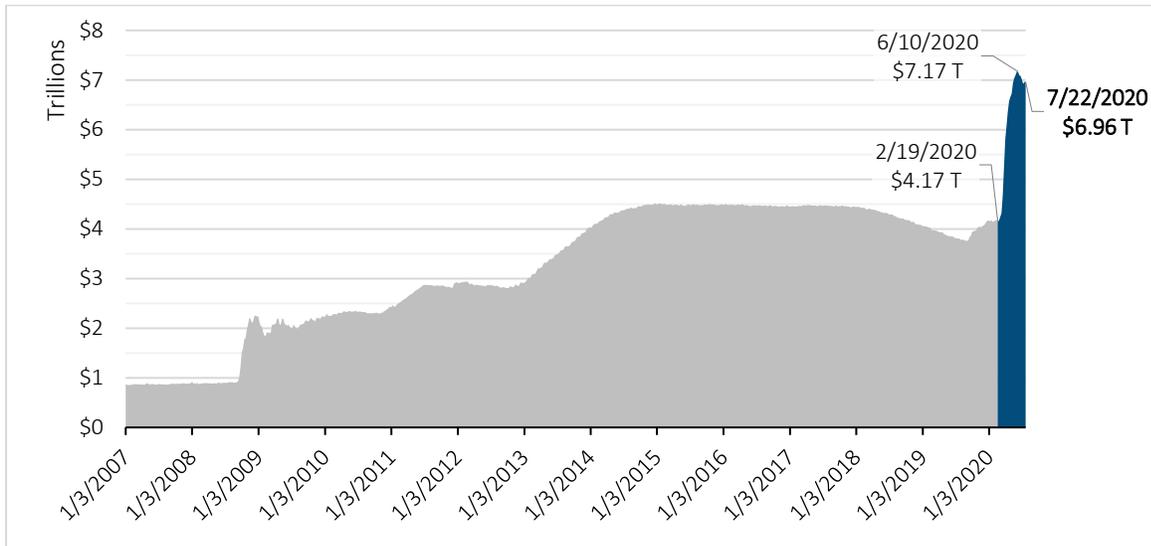
Central banks around the world have continued to use monetary policy levers to help stimulate economic activity. In March 2020, the Federal Reserve rolled out an array of temporary emergency lending programs so that companies and governments can cover current expenses and potentially avoid laying off employees. Many of these programs bring back those used during the Financial Crisis of 2007–2009, but some go further. The Treasury now manages entities called Special Purpose Vehicles (SPV) that are allowed to own assets that the Federal Reserve can’t, such as corporate bonds, asset-backed securities and municipal bonds. For the first time in its history, the Federal Reserve began buying corporate bonds, including fallen angels that started off as investment grade but later downgraded to junk.⁴ On July 28, 2020, the Federal Reserve announced that it would extend the program—which had been set to expire at the end of September 2020—through December 2020.⁵ Similar programs have been implemented by central banks in other countries. These actions provide liquidity for many asset classes utilized by insurers and pension funds.

Legislative branches of many countries also developed ways to use fiscal policy to maintain economic activity amid the COVID-19 pandemic. For example, the U.S. enacted a \$2.2 trillion economic stimulus law in late March. At the time of writing, federal lawmakers are negotiating a second stimulus package. European Union leaders agreed on July 21, 2020, to a €750 billion COVID-19 recovery package to help rebuild EU economies. Slightly more than half of the package will be grants that will not need to be repaid, and the remainder will be loans.⁶

While these policy changes help to offset the impact of low economic activity resulting from COVID-19, they come at a cost. Figure 1 looks at the U.S. Federal Reserve Bank total assets less eliminations from consolidation: Wednesday

level (WALCL) from 2007 to present. By June 10, 2020, the Fed’s balance sheet had increased to \$7.17 trillion, a significantly greater level than the height of the Financial Crisis of 2007–2009. As of July 22, 2020, the balance sheet stood at \$6.96 trillion.

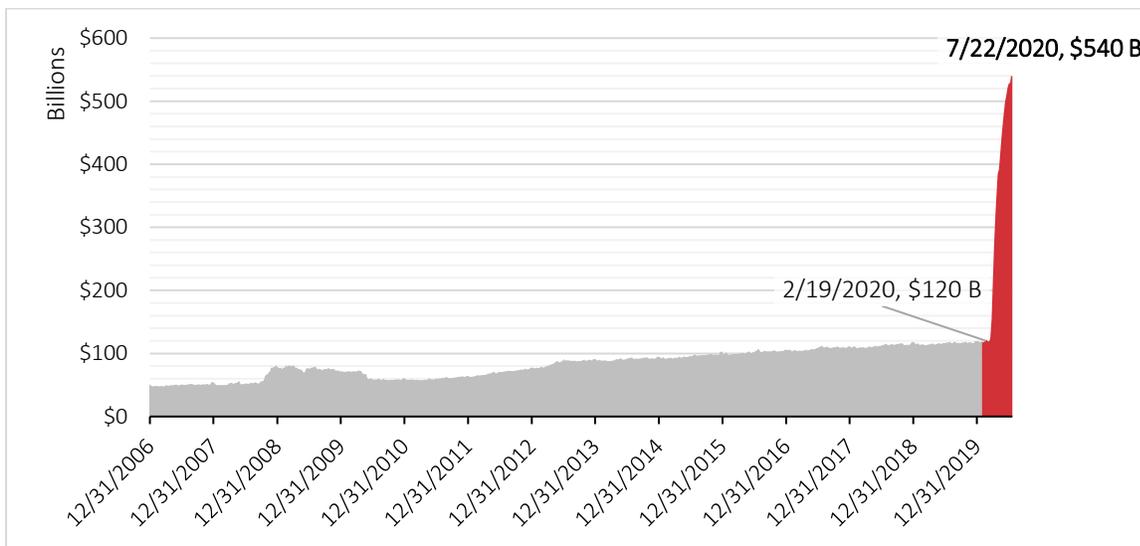
Figure 1
U.S. FEDERAL RESERVE BANK TOTAL ASSETS AND LIABILITIES (USD)



Data source: FRED Economic Data, Federal Reserve of St. Louis, “Total Assets (Less Eliminations from Consolidation): Wednesday Level,” <https://fred.stlouisfed.org/series/WALCL>.

The Bank of Canada balance sheet (Figure 2) also spiked from \$120 billion CAD on February 19, 2020, to \$540 billion CAD on July 22, 2020.

Figure 2
BANK OF CANADA ASSETS AND LIABILITIES (CAD)



Data source: Bank of Canada, “Assets and Liabilities Weekly Series,” <https://www.bankofcanada.ca/rates/banking-and-financial-statistics/bank-of-canada-assets-and-liabilities-weekly-formerly-b2/>.

EMPLOYMENT

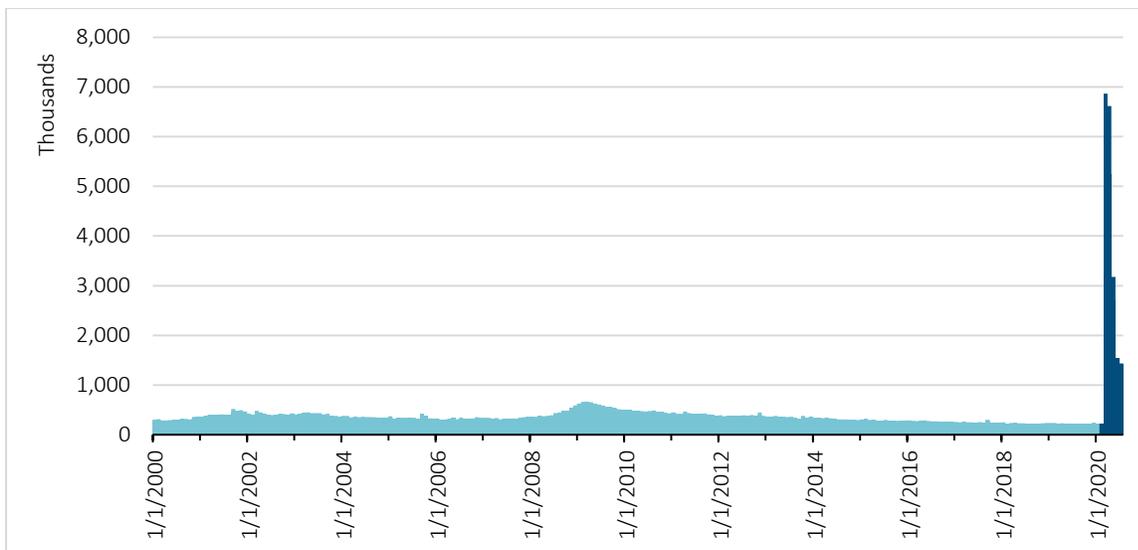
COVID-19 has heavily influenced employment in key economic markets around the world. With travel restrictions in place by government decree, employer policy or personal choice—and anticipated to be in place for extended periods of time—the transportation, travel planning, and leisure and hospitality labor sectors have been among the industries highest for reduced work or unemployment.⁷

In the U.S., researchers estimate that through May 2020, 5.4 million persons who lost their jobs because of the pandemic lost their health insurance simultaneously.⁸ Employees who have been furloughed continue their coverage. Some firms have halted stock buy-back programs and cut 401(k) matching contributions and dividend payments.

Among the most dramatic and indicative economic reports received in many years were the series of U.S. Department of Labor’s (DOL) Unemployment Insurance Weekly Claims reports (Figure 3). Weekly claims reports from March 26 through July 30 each reported millions of initial claims, for a total of 54.1 million initial claims from March 14, 2020, through July 25, despite some workers being called back to work as some businesses have reopened (Figure 4).⁹ University of Chicago researchers project that “32 to 42 percent of COVID-induced layoffs will be permanent.”¹⁰

Figure 3

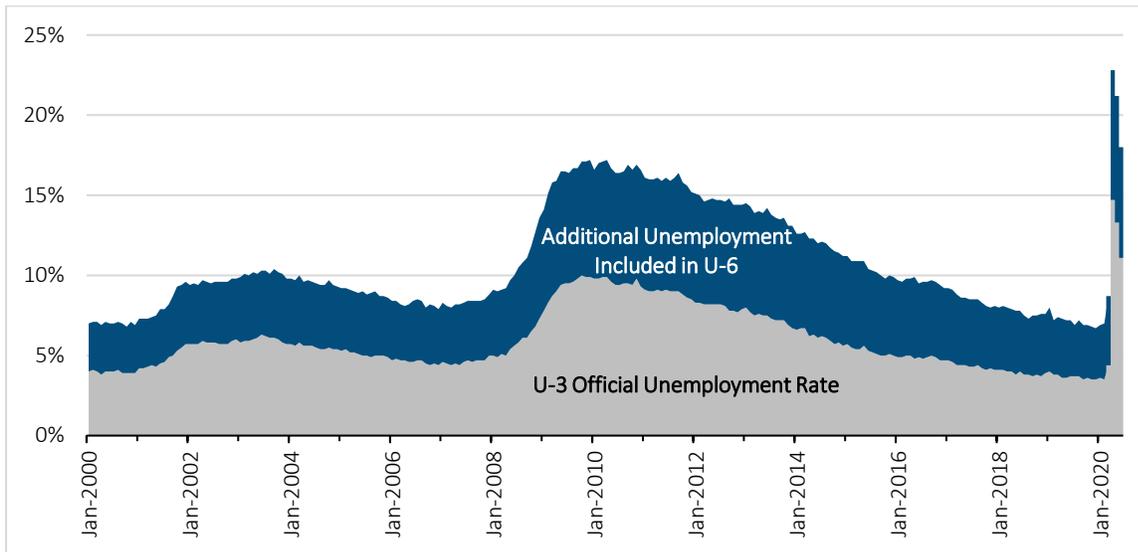
U.S. WEEKLY INITIAL UNEMPLOYMENT CLAIMS, SEASONALLY ADJUSTED, THROUGH JULY 25, 2020



Data source: Federal Reserve Bank of St. Louis, “Initial Claims,” <https://fred.stlouisfed.org/series/ICSA>, and U.S. Department of Labor, New Release, <https://www.dol.gov/ui/data.pdf>.

The U.S. official unemployment rate (U-3) more than tripled from 4.4% for March 2020 to 14.7% for April 2020, with all major industry sectors affected, especially the leisure and hospitality industry.¹¹ The unemployment rate that includes part time workers and all persons marginally attached to the labor force (U-6) increased from 8.7% for March to 22.8% for April. For June 2020, the official unemployment rate (U-3) had declined to 11.1%, and U-6 had declined to 18.0% (Figure 4).

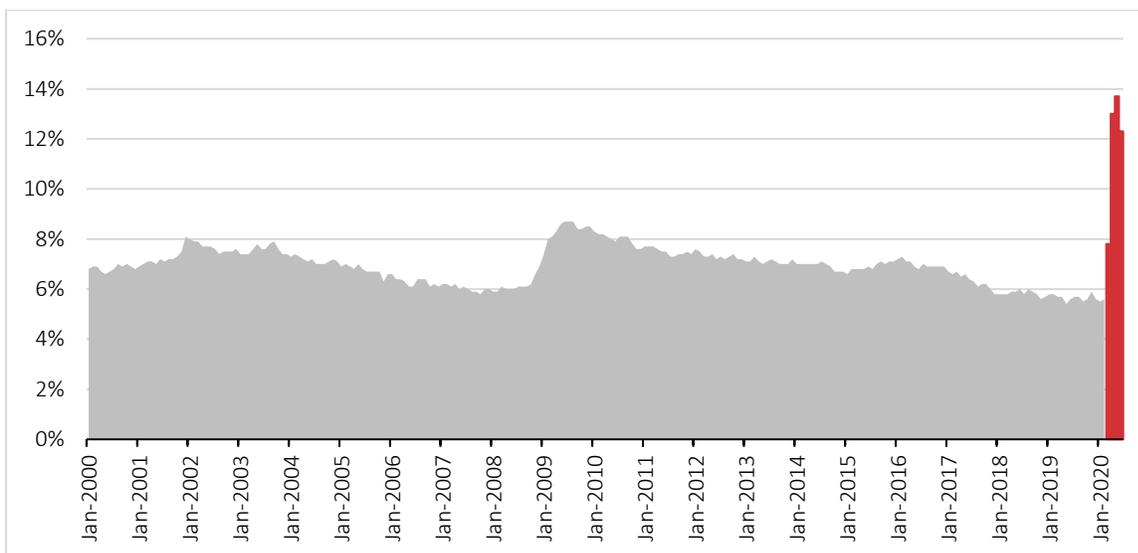
Figure 4
U.S. UNEMPLOYMENT RATES U-3 AND U-6, SEASONALLY ADJUSTED, THROUGH JUNE 2020



Data source: Federal Reserve Bank of St. Louis, “Unemployment Rate,” <https://fred.stlouisfed.org/series/UNRATE> and “Total Unemployed, Plus All Persons Marginally Attached to the Labor Force, Plus Total Employed Part Time for Economic Reasons, as a Percent of the Civilian Labor Force Plus All Persons Marginally Attached to the Labor Force (U-6),” <https://fred.stlouisfed.org/series/U6RATE>.

The employment situation in Canada is similar. Statistics Canada reports the overall seasonally adjusted unemployment rate having increased from 5.6% for February 2020 to 13.7% for May 2020 (Figure 5).

Figure 5
UNEMPLOYMENT RATE: AGED 15 AND OVER: ALL PERSONS FOR CANADA, THROUGH JUNE 2020



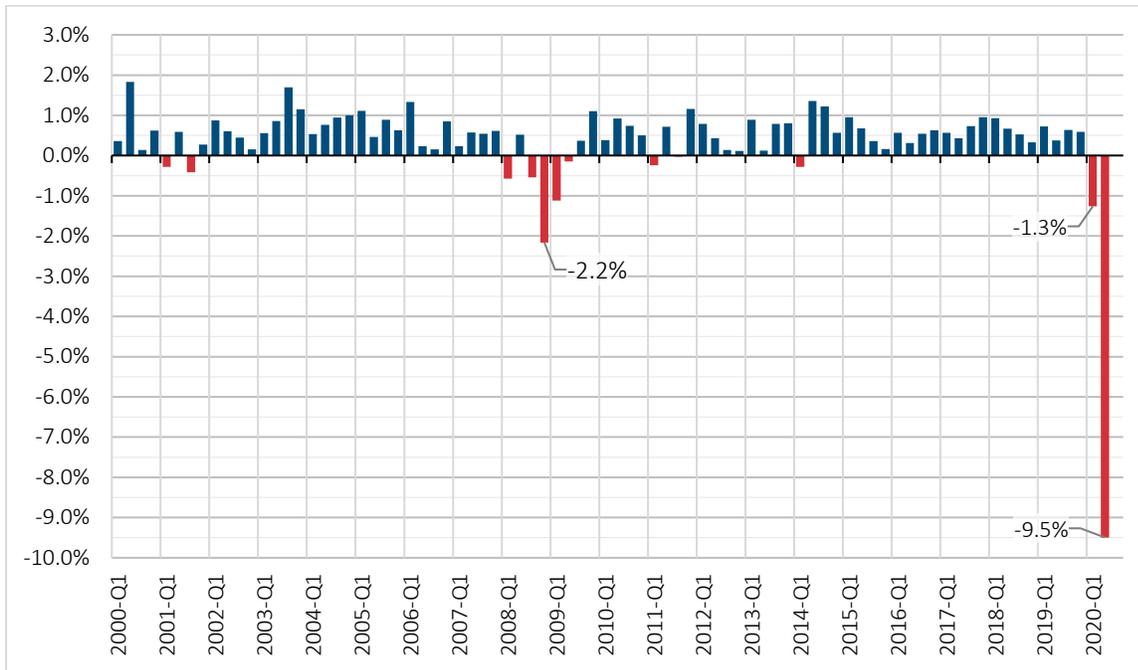
Data source: Federal Reserve Bank of St. Louis, “Unemployment Rate: Aged 15 and Over: All Persons for Canada,” <https://fred.stlouisfed.org/series/LRUNTTTTTCAM156S>, and Statistics Canada, (2020, July 10), “Labour Force Survey, June 2020,” <https://www150.statcan.gc.ca/n1/daily-quotidien/200710/dq200710a-eng.htm>.

On June 10, 2020, the U.S. Federal Reserve projected that 2020 would end with an unemployment rate of 9.3%, and that the rate would remain elevated for years. The Fed also predicted that output would contract by 6.5% at the end of 2020 compared to the end of 2019, before rebounding by 5% in 2021.¹²

GROSS DOMESTIC PRODUCT

On June 8, 2020, the National Bureau of Economic Research determined that the U.S. economy entered a recession in February 2020, ending a record-length 128-month expansion.¹³ The Bureau of Economic Analysis announced on July 30 that second quarter 2020 GDP fell at an estimated annual rate of -32.9%.¹⁴ For comparison, during the Great Depression, from the peak in August 1929 through the trough in March 1933, GDP fell a total of 30%.¹⁵ Figure 6 tracks GDP changes by quarter since 2000.

Figure 6
QUARTERLY CHANGES IN U.S. GDP, 2000–PRESENT



Data source: Bureau of Economic Analysis, Bureau of Economic Analysis, “Current-Dollar and “real” Gross Domestic Product,” <https://www.bea.gov/data/gdp/gross-domestic-product>, and author’s tabulations.

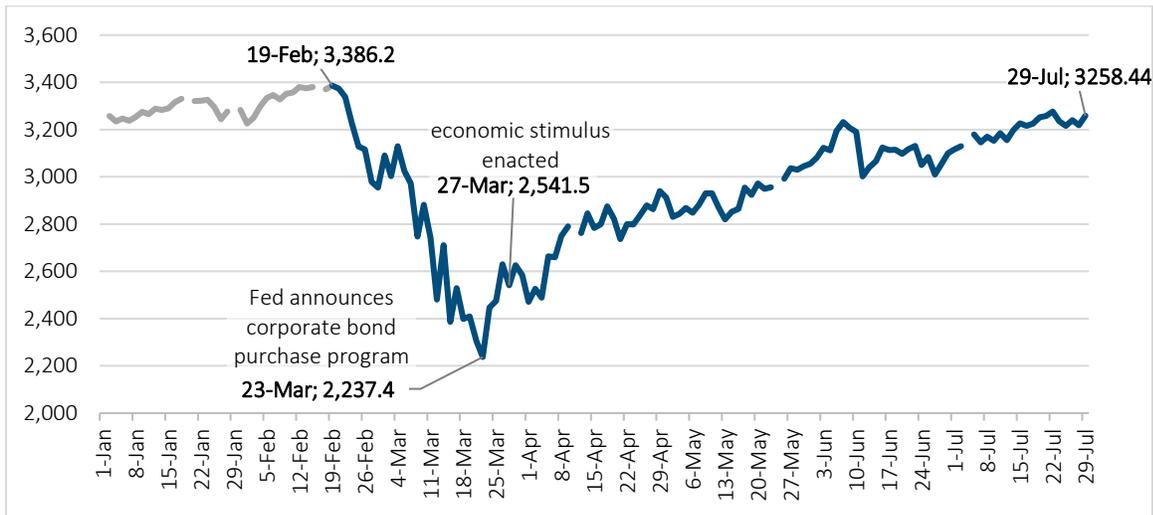
In June 2020, the International Monetary Fund projected global growth for 2020 of -4.9%, significantly lower than its April prediction of -3.0%. The June report also projects global growth for 2021 of 5.4%.¹⁶

Asset Values and Volatility

International financial markets have reacted to COVID-19 as some investors sought increasing shelter in government bonds amid uncertain future economic activity arising from the impact of COVID-19. U.S. markets have been volatile since February 19, 2020, the date generally recognized as the start of COVID-19 impact on U.S. financial markets.

Figure 7 shows the S&P 500 since February 3, 2020.¹⁷ By March 13, when the U.S. declared the COVID-19 outbreak a national emergency, the S&P 500 was down 20% from February 19. On March 23, the S&P 500 bottomed at 34% below its February 19 level, when the Fed announced that it would purchase corporate bonds of U.S. companies that were investment grade as of March 22.¹⁸ By July 29, the S&P 500 had regained most of what it had lost, closing at 3.8% below its February 19, 2020 level.

Figure 7
S&P 500 DURING 2020



Data source: Federal Reserve Bank of St. Louis, "S&P 500," <https://fred.stlouisfed.org/series/SP500>.

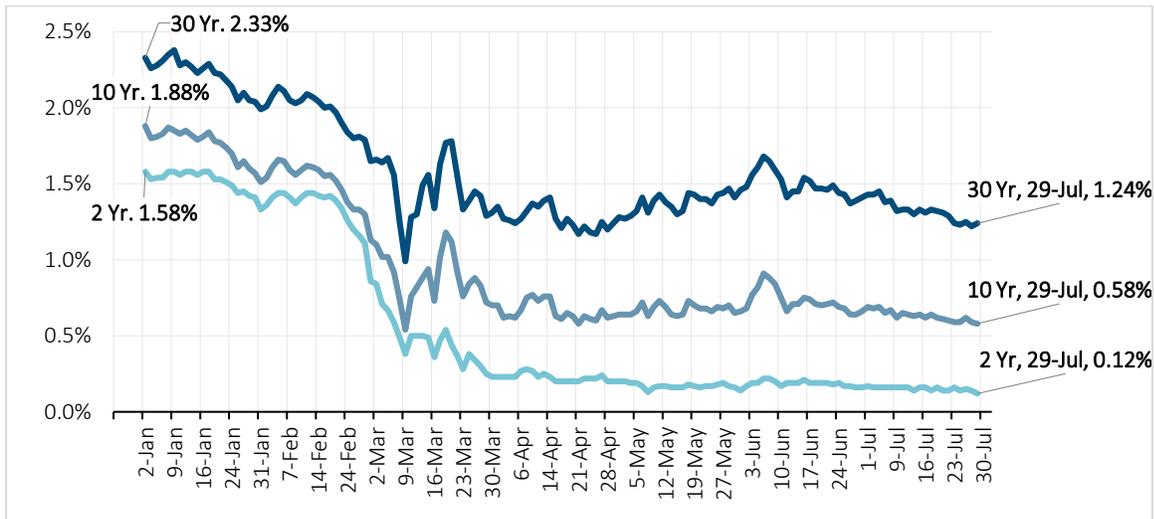
One of the most unique asset value occasions triggered by COVID-19 economic activity was the negative price of West Texas Intermediate (WTI) crude oil futures. The pandemic strongly reduced oil demand around the world while oil producers maintained high levels of supply, and WTI spot oil prices had dropped. May WTI oil futures contracts expired on April 21, and on April 20, traders who were not equipped to take physical deliveries rushed to sell their futures contracts to buyers who had storage capacity. Owners of WTI futures without storage were paying buyers to take their oil, sending the price into negative territory.¹⁹ Subsequently, crude oil prices generally rose through May and have essentially stabilized since early June. WTI crude oil prices closed on July 27, 2020, at \$41.46 per barrel, the highest level since the February 20, 2020, closing price of \$53.77.²⁰

The Fed provided a backstop to the financial ecosystem with its March 23 actions. Since then, results have diverged between Wall Street, as measured by financial markets, and Main Street, as measured by GDP growth and unemployment. Analysts will want to consider this dichotomy when contemplating stress tests and other scenario-planning exercises.

Low Interest Rate Environment

Low interest rates for investment in major international financial markets have been more the norm over recent years, and the impact of COVID-19 has further driven down interest rate levels. In early March, benchmark Treasury yields in the U.S. fell nearly 100 basis points from February 19 levels (Figure 8).²¹ The benchmark 10-year Treasury yield temporarily reached a record low of under 0.40% and the 30-year Treasury moved below 1.00% for the first time ever.²² Some reversion has occurred from the lowest interest rate levels, and the yield curve has steepened. As of July 29, 2020, compared to their February 19, 2020 levels, 30-year Treasury rates were down 77 basis points (bps), 10-year Treasuries were down 98 bps, and 2-year Treasuries were down 130 bps.

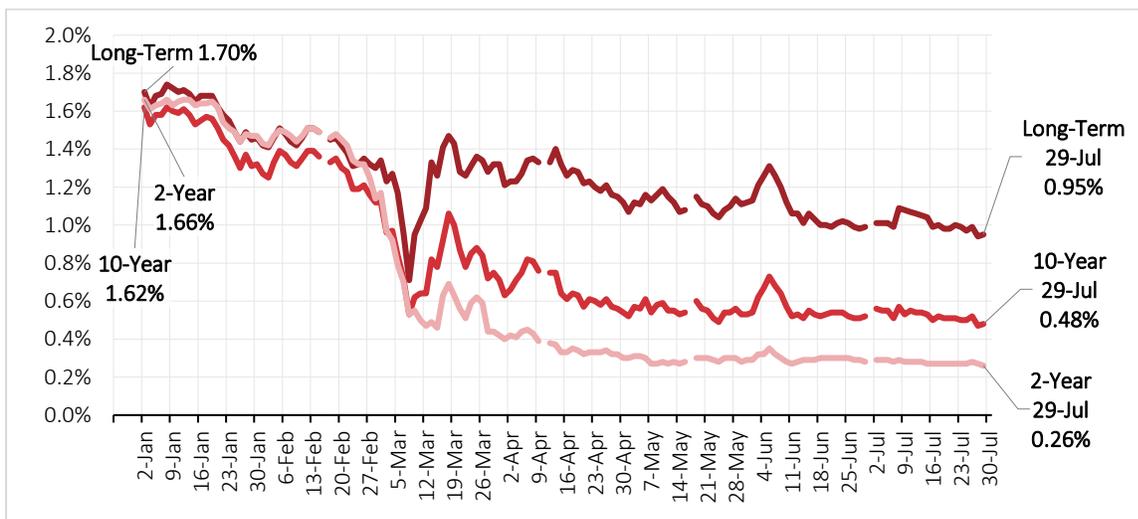
Figure 8
SELECTED U.S. DAILY TREASURY CURVE RATES DURING 2020



Data source: U.S. Department of the Treasury, "Daily Treasury Yield Curve Rates," <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2020>.

Similarly, Government of Canada Benchmark Bond yield rates dropped significantly in late February and early March. After a brief but steep increase from early to mid March, rates have followed a generally declining trend. As of July 29, 2020, the 10-year benchmark bond was 0.48%, 87 bps lower than at the start of 2020, and the long-term benchmark bond was 0.95%, 122 bps below its 2020 start.

Figure 9
SELECTED GOVERNMENT OF CANADA BENCHMARK BOND YIELD RATES DURING 2020



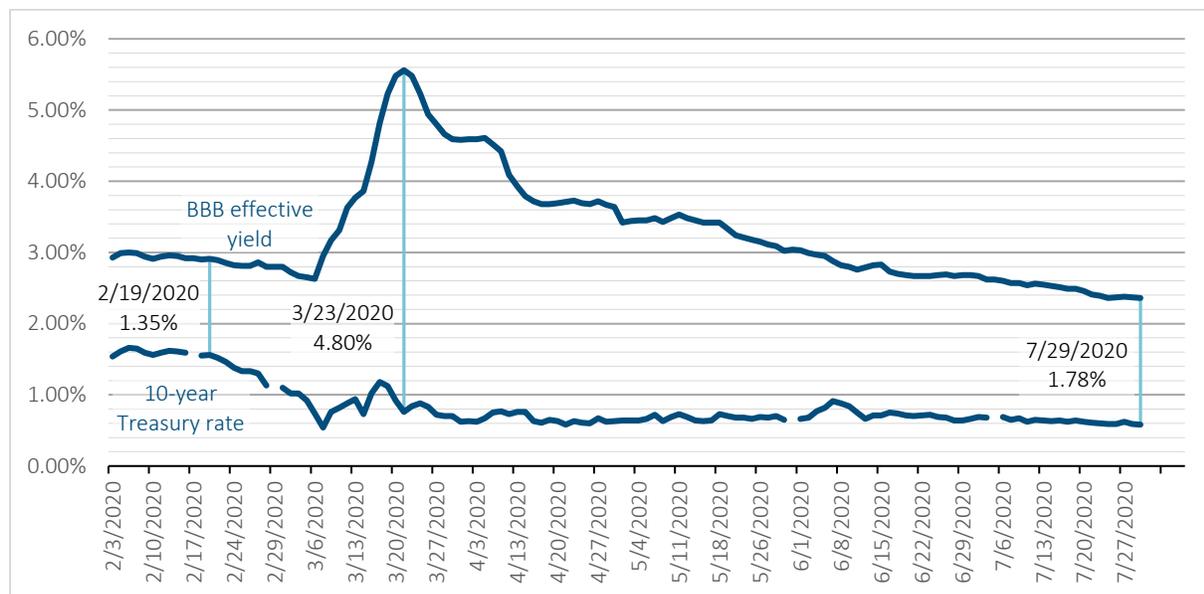
Data source: Bank of Canada, "Canadian Bond Yields: 10-Year Lookup," <https://www.bankofcanada.ca/rates/interest-rates/lookup-bond-yields/>.

Reinvestment and Default Risk

Corporate spreads widened substantially during March in both the U.S. (Figure 10) and Canada (Figure 11). At their highest point, credit spreads were still below those seen in the Financial Crisis of 2007–2009, but higher than those seen in other economic environments such as the tech bubble and Enron/MCI WorldCom accounting crises of 2002.²³ Credit spreads widen due to anticipated higher risk of defaults and an increasing probability of some bonds being downgraded to be below investment grade. The ratio of upgrades to downgrades had started to fall prior to COVID-19, and COVID-19 has accelerated the downfall. While credit spreads have narrowed significantly from April through July, they continue to exceed the spread on February 19, 2020.

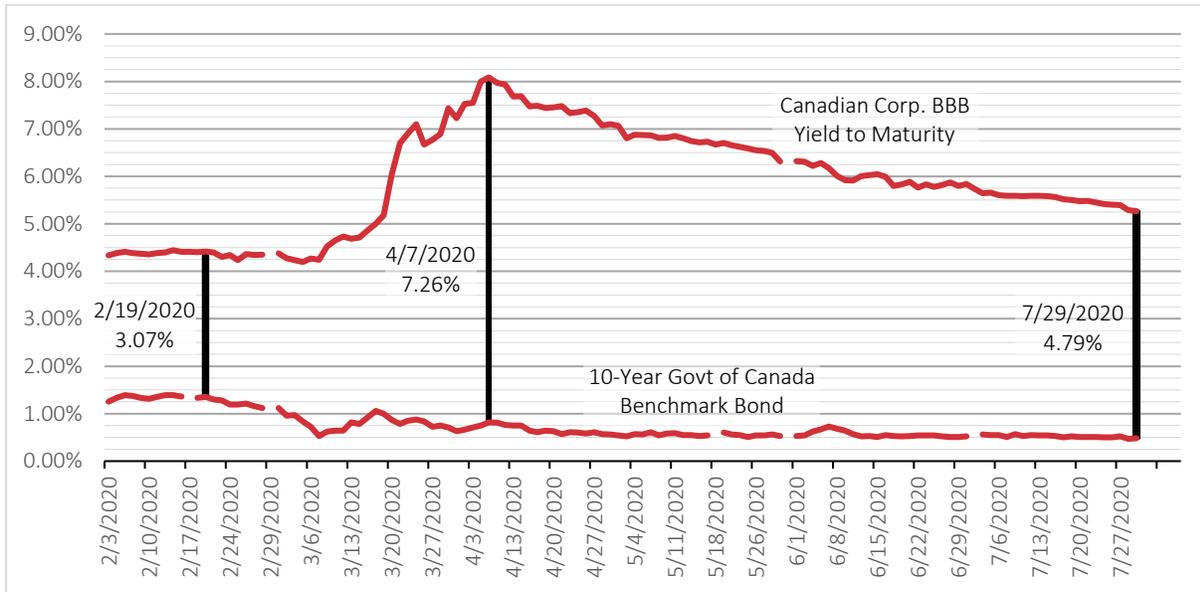
As economic pressures have increased, quality levels and the risks of default will continue to be monitored in both publicly traded and private placement investments. Higher debt levels from consumers, changes in consumer confidence and reduced levels of disposable income have been benchmarks historically indicative of companies having cash flow issues and potentially defaulting on debt payments. Many retail, entertainment and travel-related companies have declared bankruptcy since the pandemic began, and some analysts are expecting many more bankruptcies during 2020.²⁴ As of mid July, 55% of businesses on Yelp have permanently closed since March 1, 2020,²⁵ a significant increase from 41% as Yelp reported as of June 15.²⁶ Some researchers at Harvard University believe that many more small businesses closed permanently because of the pandemic.²⁷

Figure 10
U.S. CORPORATE BBB EFFECTIVE YIELD COMPARED TO 10-YEAR TREASURY RATES



Data source: Federal Reserve Bank of St. Louis, "ICE BofA BBB US Corporate Index Effective Yield," <https://fred.stlouisfed.org/series/BAMLCOA4CBBEY> and U.S. Department of the Treasury, "Daily Treasury Yield Curve Rates," <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2020>.

Figure 11
CANADIAN CORPORATE BBB YIELD TO MATURITY COMPARED TO GOVERNMENT OF CANADA 10-YEAR BENCHMARK BOND YIELD RATES



Data source: S&P Dow Jones Indices, "S&P Canada BB-B High Yield Corporate Bond Index," <https://www.spglobal.com/spdji/en/indices/fixed-income/sp-canada-bb-b-high-yield-corporate-bond-index/#overview> and Bank of Canada, "Canadian Bond Yields: 10-Year Lookup," <https://www.bankofcanada.ca/rates/interest-rates/lookup-bond-yields/>.

The Chicago Board Options Exchange created the Cboe Volatility Index, or VIX, to measure the level of the expected volatility in the market for the next 30 days (Figure 12). Greater VIX values indicate expectations of greater volatility.²⁸ VIX values in the range of 18 to 35 are typical.²⁹ On February 19, 2020, the VIX closed at 14.38, before a steeply increasing trend that culminated on March 16 at 82.69. On July 29, 2020, the VIX closed at 24.10, indicating significantly greater expected volatility than on February 19, 2020, although it is well within the typical range.

Figure 12
CBOE VOLATILITY INDEX (VIX) DURING 2020



Data source: Cboe, "VIX Historical Price Data," <http://www.cboe.com/products/vix-index-volatility/vix-options-and-futures/vix-index/vix-historical-data>.

The current interest rate environment enhances the strong need for insurers to be aware of these evolving risks, including the interactions between interest rates, credit spreads and defaults to construct products that emphasize risk management practices through financial modeling of the company's assets and liabilities. Life and health insurers typically use cash flow testing methods to perform regulatory asset adequacy analysis, as well as for internal risk management practices. Many insurers are required to perform an Own Risk and Solvency Assessment (ORSA) where they describe how they manage risk within their strategic plan. Strong scenario testing within insurance companies includes the ability for actuaries to identify key assumptions for asset modeling, as well as to be able to model assets and liabilities with contingent cash flows and risks. Strategies to mitigate these risks may also involve the use of interest rate forwards, futures and swaps.

In an April survey on cash flow testing, life insurance companies were asked if they have updated various stochastic modeling assumptions.³⁰ More than half of respondents have updated or are considering updating their mean reversion target and credit spreads.

When asked whether they are modeling negative interest rates, almost all said "no." In addition, most respondents replied that they assume a mean reversion point between 3% and 4% in their stochastic models. When asked about the widened credit spreads in the current market, most replied that they will assume spreads will narrow over time. Also, two-thirds of respondents consider the current environmental implied level scenario worse than moderately adverse.

Wrap-Up

In the end, actuaries in all practice areas will need to determine how to best reflect the impact of the COVID-19 pandemic into their specific work products. The information provided in this report is intended to pull together a variety of economic metrics that may help provide context to the challenge.

End Notes

- ¹ Centers for Disease Control and Prevention. “Coronavirus Disease 2019 (COVID-19).” <https://www.cdc.gov/coronavirus/2019-ncov/faq.html#Coronavirus-Disease-2019-Basics>. Accessed June 3, 2020.
- ² FederalReserve.gov. (2020, March 3). “Implementation Note Issued March 3, 2020.” <https://www.federalreserve.gov/newsevents/pressreleases/monetary20200303a1.htm>.
- Federal Reserve. (2020, March 15). “Implementation Note Issued March 15, 2020.” <https://www.federalreserve.gov/newsevents/pressreleases/monetary20200315a1.htm>.
- ³ Monaghan, Angela and Phillip Inman. (2020, March 19). “Bank of England Cuts Interest Rates to All-Time Low of 0.1%.” The Guardian. <https://www.theguardian.com/business/2020/mar/19/bank-of-england-cuts-interest-rates-to-all-time-low-of-01>.
- ⁴ Riquier, Andrea. (2020, April 9). “‘Fallen Angel’ ETF Takes Flight on Fed Announcement.” Market Watch. <https://www.marketwatch.com/story/fallen-angel-etf-takes-flight-on-fed-announcement-2020-04-09>.
- ⁵ Smialek, Jeanna. (2020, July 28). “Fed Extends Emergency Programs on Eve of July Policy Announcement.” The New York Times. <https://www.nytimes.com/2020/07/28/business/economy/coronavirus-federal-reserve-policy.html>.
- ⁶ Neuman, Scott. (2020, July 21). “EU Agrees to \$858 Billion in Grants, Loans to Bail Out Pandemic-Battered Economies.” NPR. <https://www.npr.org/sections/coronavirus-live-updates/2020/07/21/893408948/eu-agrees-to-858-billion-in-grants-loans-to-bailout-pandemic-battered-economies>.
- ⁷ Krishnan, Vik, et al. (2020, June 10). “Hospitality and COVID-19: How Long Until ‘No Vacancy’ for U.S. Hotels?” McKinsey & Company. <https://www.mckinsey.com/industries/travel-logistics-and-transport-infrastructure/our-insights/hospitality-and-covid-19-how-long-until-no-vacancy-for-us-hotels#>.
- ⁸ Dorn, Stan. *The COVID-19 Pandemic and Resulting Economic Crash Have Caused the Greatest Health Insurance Losses in American History*. (2020, July 17.) The National Center for Coverage Innovation at Families USA. <https://www.familiesusa.org/resources/the-covid-19-pandemic-and-resulting-economic-crash-have-caused-the-greatest-health-insurance-losses-in-american-history/>.
- ⁹ U.S. Department of Labor Bureau. (2020, July 30) “Unemployment Insurance Weekly Claims.” News Release. <https://www.dol.gov/ui/data.pdf>.
- ¹⁰ Barrero, Jose Maria, et al. (2020 June). COVID-19 Is Also a Reallocation Shock. Working Paper No. 220-59. Becker Friedman Institute for Economics at The University of Chicago. https://bfi.uchicago.edu/wp-content/uploads/BFI_WP_202059.pdf.
- ¹¹ U.S. Department of Labor Bureau of Labor and Statistics. (2020, May 8). “The Employment Situation—June 2020.” News Release. https://www.bls.gov/news.release/archives/empsit_05082020.pdf
- ¹² Federal Reserve Bank. (2020, June 10). “Table 1. Economic Projections of Federal Reserve Board Members and Federal Reserve Bank Presidents, Under Their Individual Assumptions of Projected Appropriate Monetary Policy, June 2020.” <https://www.federalreserve.gov/monetarypolicy/files/fomcproptabl20200610.pdf>.
- ¹³ National Bureau of Economic Research. (2020, June 28). *Determination of the February 2020 Peak in U.S. Economic Activity*. <https://www.nber.org/cycles/june2020.html>
- ¹⁴ Bureau of Economic Analysis (2020, July 30). “Gross Domestic Product, 2nd Quarter 2020 (Advance Estimate) and Annual Update.” News Release. <https://www.bea.gov/news/2020/gross-domestic-product-2nd-quarter-2020-advance-estimate-and-annual-update>.
- ¹⁵ Romer, Christina D. “Great Depression.” Encyclopaedia Britannica. (Accessed 2020, July 30). <https://www.britannica.com/event/Great-Depression#ref234440>.
- ¹⁶ International Monetary Fund. (2020 June). “World Economic Outlook Update, June 2020.” World Economic Outlook Reports. <https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEOUpdateJune2020>.
- ¹⁷ FRED Economic Data. “S&P 500.” Federal Reserve Bank of St. Louis. <https://fred.stlouisfed.org/series/SP500><https://fred.stlouisfed.org/series/DJIA>.
- ¹⁸ Board of Governors of the Federal Reserve System. (2020, March 23). “Federal Reserve Announces Extensive New Measure to Support the Economy.” Press Release. <https://www.federalreserve.gov/newsevents/pressreleases/monetary20200323b.htm>. (2020, April 28). “Secondary Market Corporate Credit Facility.” <https://www.federalreserve.gov/monetarypolicy/smccf.htm>.

- ¹⁹ U.S. Energy Information Administration. (2020, April 27). “Low Liquidity and Limited Available Storage Pushed WTI Crude Oil Futures Prices Below Zero.” <https://www.eia.gov/todayinenergy/detail.php?id=43495>.
- ²⁰ U.S. Energy Information Administration. “Cushing, OK WTI Spot Price FOB.” (Accessed 2020, July 30). <https://www.eia.gov/dnav/pet/hist/RWTCD.htm>.
- ²¹ U.S. Department of the Treasury. “Daily Treasury Yield Curve Rates.” <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield>.
- ²² Mohamed, Theron. (2020, March 9). “The Entire U.S. Yield Curve Plunged Below 1% for the First Time Ever. Here's Why That's a Big Red Flag for Investors.” Markets Insider. <https://markets.businessinsider.com/news/stocks/us-treasury-yield-curve-below-1-percent-red-flag-investors-2020-3-1028975968>.
- ²³ Sekora, Dave. (2020, March 23). “Corporate Bonds at Second-Widest Level in 20 Years.” Morningstar. <https://www.morningstar.com/articles/973818/corporate-bonds-at-second-widest-level-in-20-years>.
- ²⁴ Shen, Lucinda. (2020, June 29). “The 20 Biggest Companies that Have Filed for Bankruptcy Because of the Coronavirus Pandemic.” Fortune. <https://fortune.com/2020/06/29/companies-filing-bankruptcy-2020-during-coronavirus-pandemic-covid-19-economy-industries/>.
- ²⁵ Van Dam, Andres. (2020, July 23). “If a Business is Still Closed at This Point in the Crisis, It’s Probably Permanent.” The Washington Post. <https://www.washingtonpost.com/business/2020/07/23/permanent-business-closures-yelp/>
- ²⁶ Yelp. (2020, June 25). “Yelp: Local Economic Impact Report.” <https://www.yelpeconomiccoverage.com/yelp-coronavirus-economic-impact-report>.
- ²⁷ Flitter, Emily. (2020, July 13). “‘I Can’t Keep Doing This:’ Small-Business Owners Are Giving Up.” The New York Times. <https://www.nytimes.com/2020/07/13/business/small-businesses-coronavirus.html>.
- ²⁸ Chicago Board Options Exchange. “Cboe Volatility Index (VIX Index) FAQs.” <http://www.cboe.com/products/vix-index-volatility/vix-options-and-futures/vix-index/vix-faqs>. Accessed May 5, 2020.
- ²⁹ Campbell, Ryan. (2020, February 29). “The Volatility Index: Reading Market Sentiment.” Investopedia. <https://www.investopedia.com/articles/optioninvestor/09/implied-volatility-contrary-indicator.asp#:~:text=A%20quick%20analysis%20of%20the,and%20as%20high%20as%2085>.
- ³⁰ Campion, Scott et. al. (2020, April 23). “COVID-19 Low Interest Rate Environment Cash Flow Testing Survey Summary of Results.” Society of Actuaries. <https://www.soa.org/resources/research-reports/2020/covid-19-pulse-surveys/>.

About The Society of Actuaries

With roots dating back to 1889, the *Society of Actuaries* (SOA) is the world's largest actuarial professional organizations with more than 31,000 members. Through research and education, the SOA's mission is to advance actuarial knowledge and to enhance the ability of actuaries to provide expert advice and relevant solutions for financial, business and societal challenges. The SOA's vision is for actuaries to be the leading professionals in the measurement and management of risk.

The SOA supports actuaries and advances knowledge through research and education. As part of its work, the SOA seeks to inform public policy development and public understanding through research. The SOA aspires to be a trusted source of objective, data-driven research and analysis with an actuarial perspective for its members, industry, policymakers and the public. This distinct perspective comes from the SOA as an association of actuaries, who have a rigorous formal education and direct experience as practitioners as they perform applied research. The SOA also welcomes the opportunity to partner with other organizations in our work where appropriate.

The SOA has a history of working with public policymakers and regulators in developing historical experience studies and projection techniques as well as individual reports on health care, retirement and other topics. The SOA's research is intended to aid the work of policymakers and regulators and follow certain core principles:

Objectivity: The SOA's research informs and provides analysis that can be relied upon by other individuals or organizations involved in public policy discussions. The SOA does not take advocacy positions or lobby specific policy proposals.

Quality: The SOA aspires to the highest ethical and quality standards in all of its research and analysis. Our research process is overseen by experienced actuaries and nonactuaries from a range of industry sectors and organizations. A rigorous peer-review process ensures the quality and integrity of our work.

Relevance: The SOA provides timely research on public policy issues. Our research advances actuarial knowledge while providing critical insights on key policy issues, and thereby provides value to stakeholders and decision makers.

Quantification: The SOA leverages the diverse skill sets of actuaries to provide research and findings that are driven by the best available data and methods. Actuaries use detailed modeling to analyze financial risk and provide distinct insight and quantification. Further, actuarial standards require transparency and the disclosure of the assumptions and analytic approach underlying the work.

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