MassMutual Funds

Market Review and Q2 2020 Outlook

as of June 30, 2020

Past performance is no guarantee of future results. The information contained in this document represents the views of the MML Investment Adviser. LLC portfolio management team. This material is provided for informational purposes only and is not intended to be investment advice or a recommendation to take any particular investment action.

The views contained herein are as of June 30, 2020 and may have changed since that time.

Asset Allocation Views

The views contained herein are as of June 30, 2020 and may have changed since that time.

Asset Allocation

MML Investment Advisers, LLC portfolio management maintains a neutral position for equities versus fixed income – The opportunity to take on more equity risk has passed with the equity markets rebounding strongly and valuations returning to their previously elevated levels. A combination of falling COVID-19 global case counts, unprecedented monetary and fiscal stimulus and progress on therapeutics and vaccine research has convinced investors to stay invested in global equities. While the prospect of lower financing costs, labor costs, energy costs and levels of capital expenditures only adds to the bull case. While uncertainty will always be present, the economic and market impact of the COVID-19 crisis is likely temporary, as it has been with past disease outbreaks.

Equity & Commodity Related

Positive on U.S. large cap – Larger companies appear best suited to weather the uncertainty of the COVID-19 crisis and extract the benefits of monetary and fiscal stimulus.

Negative on U.S. small cap – Smaller companies are expected to continue to be challenged during the COVID-19 crisis and benefit less from monetary and fiscal stimulus.

Negative on international developed – A global economic slowdown, rising debt levels and more labor focused policies make foreign companies less attractive.

Neutral on emerging markets – Uncertainty around global economic growth and high reliance on trade offsets relatively inexpensive valuations.

Negative on U.S. REITS – Inflationary pressures are weak and REITs are expected to be challenged during the COVID-19 crisis.

Underweight on commodities – Global demand recovery expected to be slow.

Fixed Income

Negative on duration – Unprecedented global fiscal and monetary stimulus support economic growth which in turn supports rising interest rates.

Underweight on U.S. Treasuries (downgrade) – Yields and inflation expectations are modest. Wide corporate bond spreads have lessened the attractiveness of U.S. Treasuries.

Neutral on investment grade – Higher yields and supportive monetary and fiscal policy mean that the risk-return trade-off is better for below-investment grade bonds.

Neutral on high yield – High yield bonds are expected to continue to be challenged during the crisis offset by attractive yield spreads versus U.S. Treasuries and investment-grade corporate bonds.

Underweight on U.S. Treasury Inflation-Protected Securities (TIPS) – A global economic slowdown and falling demand is expected to reduce inflationary pressures in the near-term.

Neutral on international bonds – Yield differentials and currency exposures remain compelling.

	Fixed Income* –	Neutral	Equity* +
Overall Position		◆	

Equity*	–	Neutral	+
U.S. Large Cap			◆
U.S. Small Cap	◆		
Intl Developed	◆		
Emerging Markets		◆	
U.S. REITS	◆		
Commodities	◆		

Fixed Income*	–	Neutral	+
Duration	◆		
Treasuries	◆	◇	
Investment Grade		◆	
High Yield		◆	
TIPS	◆		
International		◆	

Current Position ◆

Previous Quarter ◇

* Equity include equities and alternatives. Fixed income includes fixed income and cash.

Investors have responded positively to global efforts to combat COVID-19 and support the global economy.

Q2 2020 Economic Review

- Economic activity fell sharply in the second quarter of 2020 as the global community fought the spread of COVID-19. By the end of the quarter the worst appeared behind us with economic activity slowly starting to rebound with the transition back to work and back to a more normal way of life. Real GDP growth in the second quarter is forecast to be -33% and -4.2% for 2020 (Goldman Sachs).
- The response by the U.S. government was as unprecedented as the virus itself. A national emergency was declared to combat the spread and the Federal Reserve and Congress delivered extraordinary amounts of monetary and fiscal stimulus to support the U.S. economy and financial markets. The global response has been similar in magnitude.
- Earnings expectations for 2020 are sharply negative (Factset) as the actions being taken to combat the spread of coronavirus have disrupted global supply chains and reduced retail spending. Investors have responded positively to efforts to halt the spread of COVID-19 along with advancements in therapeutics and vaccine development. Earnings for 2021 are expected to be see a rebound back to prior levels.
- The prospects of a trade war between China and the U.S. have also ratcheted up. The U.S. Senate approved legislation that could force Chinese companies to delist from U.S. exchanges. If a tariff war were to begin again, it could directly impact markets.
- The price of West Texas Intermediate has rebounded sharply after May contracts went negative in April for the first time in history. Increased demand as the global economy starts back to work and an agreement between OPEC and Russia to cut production has helped to offset record demand destruction.

Q2 2020 Markets Review

- Investors started the second quarter of 2020 facing skyrocketing COVID-19 deaths, record unemployment and expectations for an unprecedented decline in economic activity.
- Despite this, global markets recorded one of their best quarters ever as investors responded positively to massive amounts of monetary and fiscal stimulus, progress in combating COVID-19 and increasing economic activity with the transition back to work.
- Central banks supported bond market liquidity and keep interest rates low through government and corporate bond purchases.
- A resurgence of the COVID-19 cases in the U.S. in June weighed on investors, but progress on therapeutics and vaccine research helped to offset investor concerns.

Asset Class	QTD (%)	YTD (%)	1 Year (%)	Benchmark
U.S. Large Cap Stocks	20.54	-3.08	7.51	*S&P 500 Composite*
U.S. Mid Cap Stocks	19.95	-18.09	-11.81	*Russell Mid Cap*
U.S. Small Cap Stocks	25.42	-12.98	-6.63	*Russell 2000*
U.S. Value Stocks	14.55	-16.74	-9.42	*Russell 3000 Value*
U.S. Growth Stocks	27.99	8.98	21.94	*Russell 3000 Growth*
Developed Market Stocks	14.88	-11.34	-5.13	*MSCI EAFE (net)*
Emerging Market Stocks	18.08	-9.78	-3.39	*MSCI EM (net)*
U.S. Bonds	2.90	6.14	8.74	*Barclays US Agg Bond*
Developed Market Bonds	3.38	0.61	0.71	*Barclays Gbl Agg Ex US*
Emerging Market Bonds	11.21	-1.87	1.52	*JPM EMBI Global*
U.S. High Yield Corporate Bonds	10.18	-3.80	0.03	*Barclays US Corp High Yield*
U.S. Long Duration Treasuries	0.12	21.61	25.96	*Barclays US Treasury 20+ Yr*

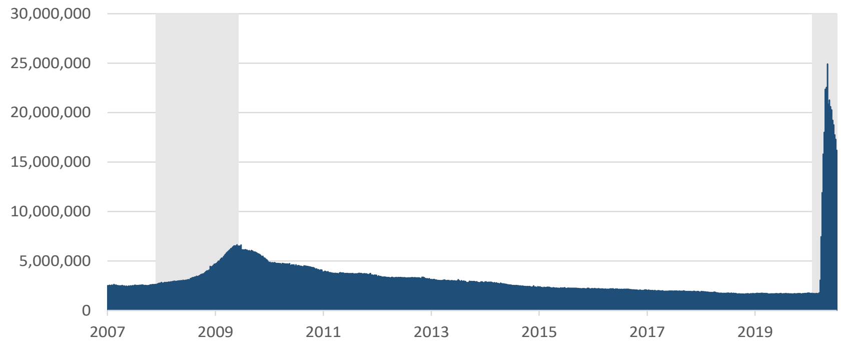
Source: Morningstar Direct℠ as of 6/30/2020

Past performance does not guarantee future results.

Consumers confidence has plummeted with record unemployment and a resurgence of COVID-19.

Closed businesses, unprecedented layoffs of workers, travel bans and uncertainty of when conditions will return to normal are impeding spending.

Continued Claims (Insured Unemployment), Number, Weekly, Seasonally Adjusted



Source: U.S. Employment and Training Administration

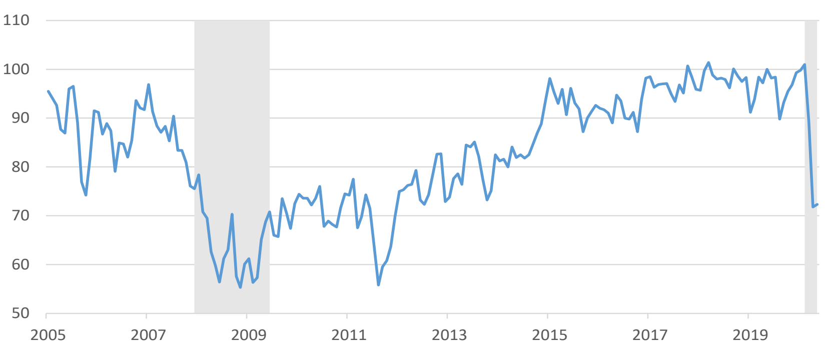
The unemployment rate reached 14.7%, levels far exceeding the financial crisis, with many businesses closed down and their workers laid off.

Workers are starting to return to work and retail sales have rebounded sharply from April lows. Congress and the White House acted quickly in response to the shutdown of businesses by getting $1,200 into workers hands and strengthening the unemployment insurance program. Expectations that the government will do what it takes to restart the economy should prevent a worst case scenario.

Consumer confidence has weakened to the lowest level since 2011 as Americans remain socially distanced and out of work.

Confident consumers spend while anxious consumers save. Personal consumption expenditures have fallen sharply as consumers are working less and have few places or reasons to spend their money. Conversely, savings rates are increasing and once the COVID-19 crisis is behind us elevated levels of savings will most likely translate into higher future spending.

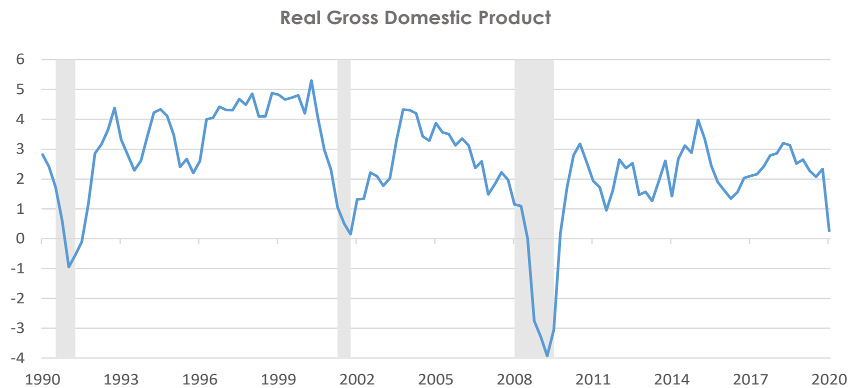
University of Michigan: Consumer Sentiment, Index 1966:Q1=100, Monthly, Not Seasonally Adjusted



Source: University of Michigan

Unprecedented monetary and fiscal stimulus has helped soften the impact of the slowdown in economic activity.

Lower borrowing costs, generous bailout packages and reduced labor cost pressure are expected to help companies recover once the COVID-19 threat is under control.



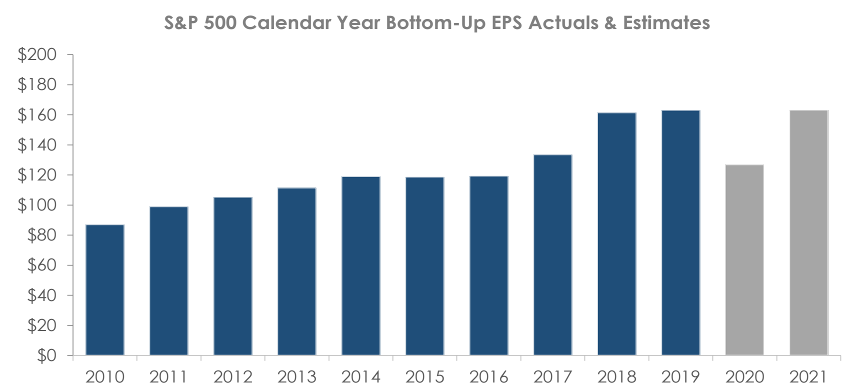
Source: U.S. Bureau of Economic Analysis

The U.S. is now officially in a recession though unprecedented monetary and fiscal response is expected to temper the blow and allow for a more rapid recover.

Economic activity is impeded and will remain that way until businesses reopen and society gets back to work and back to a more normal life. This will take time and as a result real GDP growth in the second quarter of 2020 is currently forecast to be -33% and -4.2% for 2020 (Goldman Sachs).

Corporate revenue and earnings are expected to be significantly impacted for the rest of 2020 and rebound strongly in 2021.

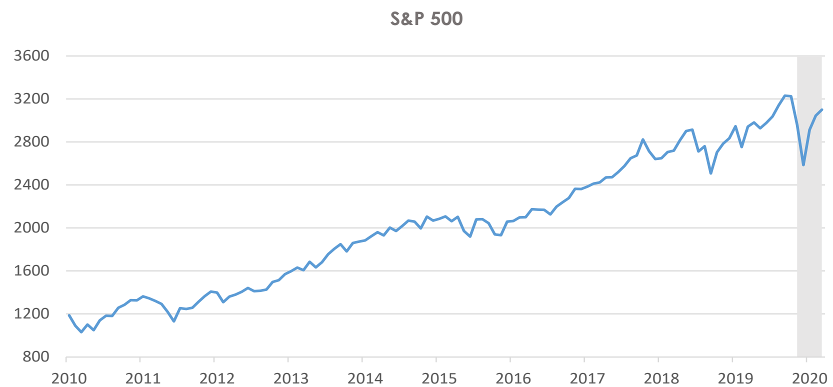
Second quarter earnings will be challenging with analysts expecting S&P 500 earning per share to decline by 44.1% and revenue per share to decline by 11.0%. While revenue and earnings are expected to fall, attempts to forecast the magnitude remain guesses at this time. That said, the government's continued willingness to shelter businesses from lost revenue along with lower energy and labor costs should continue to be supportive of stock prices.



Source: FactSet

U.S. stock markets appear to be extended and valuations high especially given the high level of uncertainty.

Markets have responded positively to massive amounts of stimulus, progress against COVID-19 and increased economic activity with the transition back to work.



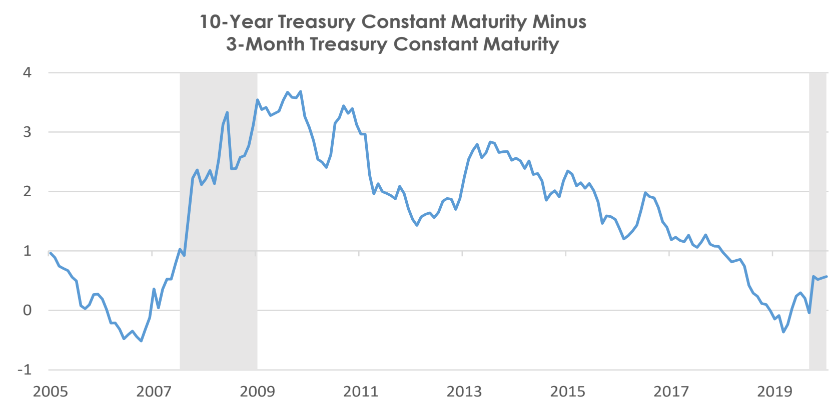
Source: S&P Dow Jones Indicies LLC

S&P 500® index ended the quarter up nearly 20% aided by massive amounts of stimulus and signs that the global economy was transitioning back to work.

An unprecedented social, monetary and fiscal response by the U.S. government, and a commitment for more, helped to calm investors and push stocks markets back towards their previous levels despite a high level of uncertainty regarding the threat of COVID-19, economic growth and corporate earnings.

Interest rate cuts by the Fed have helped to steepen the U.S. Treasury yield curve and lower financing costs for corporations and consumers.

The reality seems to be that failure is not an option for the U.S. and that the Federal Reserve and Congress, and their global brethren, will do whatever is needed to ensure an economic and market recovery. Investors have seized on this and the markets have moved higher.



Source: Federal Reserve Bank of St. Louis

Disclosures

Past performance in no guarantee of future results. The information contained in this document represents the views of the MML Investment Adviser, LLC portfolio management team. This material is provided for informational purposes only and is not intended to be investment advice or a recommendation to take any particular investment action. The views contained herein are as of June 30, 2020 and may have changed since that time.

Risk Disclosures for Certain Asset Categories – Please note that your plan may not offer all of the investment types discussed below.

- Risks of investing in bond and debt securities investments include the risk that a bond issuer will default by failing to repay principal and interest in a timely manner (credit risk) and/or the risk that the value of these securities will decline when interest rates increase (interest rate risk).
- Risks of investing in inflation-protected bond investments include credit risk and interest rate risk. Neither the bond investment nor its yield is guaranteed by the U.S. government.
- High-yield bond investments are generally subject to greater market fluctuations and risk of loss of income and principal than lower-yielding debt securities investments.
- Investments that track a benchmark index are professionally managed. However, the benchmark index itself is unmanaged and does not incur fees or expenses and cannot be purchased directly for investment.
- Investments in value stocks may remain undervalued for extended periods of time, and the market may not recognize the intrinsic value of these securities.
- Investments in growth stocks may experience price volatility due to their sensitivity to market fluctuations and dependence on future earnings expectations.
- Investments in companies with small or mid market capitalization ("small caps" or "mid caps") may be subject to special risks given their characteristic narrow markets, limited financial resources, and less liquid stocks, all of which may cause price volatility.
- International/global investing can involve special risks, such as political changes and currency fluctuations. These risks are heightened in emerging market equities. Other trading restrictions may apply. Please see the investment's prospectus for more details.
- A significant percentage of the underlying investments in aggressive asset allocation portfolio investments have a higher than average risk exposure. Investors should consider their risk tolerance carefully before choosing such a strategy.
- An investment with multiple underlying investments may be subject to the expenses of those underlying investments in addition to those of the investment itself.
- Investments may reside in the specialty category due to 1) allowable investment flexibility that precludes classification in standard asset categories and/or 2) investment concentration in a limited group of securities or industry sectors. Investments in this category may be more volatile than less-flexible and/or less-concentrated investments and may be appropriate as only a minor component in an investor's overall portfolio.
- Participants with a large ownership interest in a company or employer stock investment may have the potential to manipulate the value of units of this investment option through their trading practices. As a result, special transfer restrictions may apply. This type of investment option presents a higher degree of risk than diversified investment options under the plan because it invests in the securities of a single company.
- Investments that invest more of their assets in a single issuer or industry sector (such as company stock or sector investments) involve additional risks, including unit price fluctuations, because of the increased concentration of investments.
- A participant will be prohibited from transferring into most mutual funds and similar investments if they have transferred into and out of the same investment within the previous 60 days. Certain stable value, guaranteed interest, fixed income and other investments are not subject to this rule. This rule does not prohibit participants from transferring out of any investment at any time.

Please consider an investment option's objectives, risks, fees and expenses carefully before investing. This and other information can be found in the applicable prospectuses or summary prospectuses, if any, or investment profiles (fact sheets) for the investment options listed, which are available from your plan sponsor, on the plan participant website at www.retiresmart.com (login required), or by contacting our Participant Information Center at 1-800-743-5274 between 8:00 a.m. and 9:00 p.m. ET, Monday through Friday. Please read them carefully before investing.

8/2020 RS-41566-13