To our Clients, Colleagues, Friends and Families:

This memo started as a short note to update clients on current market volatility but turned out to be a lengthy discussion, we erred on the side of more information than less. This is a period we think is in some ways similar to other periods of high volatility but very different in other ways. In general, we believe communicating in these periods is helpful for clients and for us if it helps clients manage their investments more profitably. If we can help prevent redemptions at the bottom of a market downturn or convince clients when might a good time to buy on weakness it can help us all. As always, we welcome your analysis, input and questions so please feel free to communicate with us especially if you think we might benefit from your perspectives on the current situation.

The executive summary of the discussion is that unlike prior periods when we would normally buy on weakness our analyses suggest we are in for a more protracted economic decline and recovery that will result in more severe market declines akin to the 2008-2009 market declines. Consequently, we have taken steps to reduce exposure to more cyclical companies by reducing model weights to half normal positions and raise more cash from overweight positions. Cash balances are 5 to 10% of international and global portfolios. We could see the opportunity to raise more cash. Our research process is uncovering excellent opportunities we will take advantage of at the appropriate time.

First and foremost, we express our heartfelt sympathy for the many people who have suffered and/or succumbed to the COVID-19 virus and we give high praise for the many health care professionals beginning in China and other countries who in many cases have sacrificed their lives in nothing short of heroic efforts to save other people's lives. At Polaris Capital Management in Boston all our employees and their families are well and we are all working in a clean office thanks to the efforts of our office administrative staff led by Kathleen Deely. We have one analyst who attended at a conference where there may have been infected employees from Biogen and we are monitoring this development.

<u>Medical opinions</u>

We reference the advice we are getting from health authorities. Quoting the CDC website: "COVID-19 is an outbreak of respiratory disease caused by a novel (new) coronavirus that was first detected in China and which has now been detected in almost 90 locations internationally, including in the United States. The virus has been named "SARS-CoV-2" and the disease it causes has been named "coronavirus disease 2019" (abbreviated "COVID-19")." The number of cases is being updated daily. The rate the disease spreads appears to be fast and is now known to spread from person to person. It is not clear if all people who have been infected have been reported and counted. Therefore, the rate of death may not be accurate. This uncertainty means that the fear of infection and death may be exaggerated. The number of annual deaths from common influenza is much larger that COVID-19 deaths at this point. But the fear of that a higher rate of death (estimated at 2-3% currently) leads to speculation that COVID-19 deaths could exceed influenza if the disease becomes a pandemic. The CDC website further states: "That this disease has caused severe illness, including illness resulting in death is concerning, especially since it has also shown sustained person-to-person spread in several places. These factors meet two of the criteria of a pandemic. As community spread is detected in more

and more countries, the world moves closer toward meeting the third criteria, worldwide spread of the new virus." We are all aware most people have mild symptoms and discomfort, however in high risk patients the illness can result in death. Our view is that viruses often take 18 months to cycle through 2-3 outbreaks before people develop resistance and immunity to the organism. So it is possible we will be hearing about coronavirus for many months.

Boston Impact and Disaster Recovery Plans

We are working at the office and of course anyone who may have been exposed or feeling ill will work from home. The Boston area has a small number of COVID-19 cases which we expect will increase. Around Boston life is somewhat normal with small reductions in public transportation. Many of our upcoming meetings and conferences have been cancelled so our travel is limited. February and March are normally very busy with company visits from companies who publish their annual calendar year results and pay visits to investors to review the year and upcoming outlook. We have had several of these meetings which have been quite helpful in getting a handle on the impact of the Corona crisis on the business of our investments. However, upcoming in-person meetings are increasingly being postponed or changed to conference calls. Polaris has a very robust Disaster Recovery Plan which we test at least annually. If needed, we can all work from home and can conduct all our administration, client communication, investment research, trading, settlement, and any other business remotely. We believe we are far more capable to conduct remote operations than most of our large institutional counterparties. We do not think we will need to conduct full remote operations. As a small firm we feel we are flexible and nimble to deal with any situation we are faced with.

Market Volatility

This response to prevent the spread of the COVID-19 is creating the most impactful period of economic change I have witnessed in my life. As referenced above the actual number of deaths is small compared to most seasonal influenza seasons as well as traffic deaths, natural disasters, and other diseases. The spread rate of contagion and 2-3% death rate as measured by the number of deaths divided by the number infected is creating rapid responses to contain both. As also mentioned above we really don't know the total number of infected people for many reasons but it is likely the death rate is overstated but that is no solace to those who have perished and small revisions to the death rate will not reduce the effort to prevent transmission.

I did not live through the depression but from the many stories from grandparents and as a student of economic and financial history the period ranks as the most difficult period in modern economic times. In my opinion the 1970s in oil consuming countries was the second most difficult period of economic difficulty due to the lack of liquidity, depressed economic growth and high inflation or high inflationary expectations. The 1970s were difficult because rapid increases in a key economic input, oil, created a large drain on cash flow from oil consumers to oil producers. The spike in oil prices resulted in rapid price inflation driving higher interest rates. Various financial regulations and traditional bank asset/liability management impaired the ability of the banking system to respond to rapid changes in inflation and interest rates. The value of bond portfolios declined substantially

which was a shock to investors who thought they invested in safe fixed income. This resulted in a severe liquidity crisis. It took close to a decade to recover from the liquidity crisis and this memory kept interest rates high for longer than justified after inflation and liquidity normalized. The real return on equities for the decade of the 1970s was virtually zero.

The Great Financial Crisis in 2008-2009 was a liquidity crisis that emanated from the financial sector due to the failure of several financial institutions including the Lehman bankruptcy. These failures resulted in fear-based liquidity shortages that impacted indebted companies and consumers. This liquidity shortage reduced economic activity but as monetary and fiscal policy addressed the liquidity shortage the supply and demand balance in the economy normalized in a relatively short period of time. The lessons learned in the 1970s and other crises resulted in a shorter downturn and stronger recovery, at least in the U.S.

The current Corona economic crisis is different. It is manifest in countries and individuals substantially reducing social and civil interaction to prevent virus transmission; these precautions are shutting down demand for goods and services and simultaneously shutting down supply chains. None of the crises discussed above resulted in simultaneous shocks to demand and supply. When analyzing future uncertainty such as this and to make decisions under uncertainty it is useful to think about the various extreme outcomes. We have spent hours extrapolating the consequences of the many actions being taken around the globe. There are many permutations of the events facing the global economy and hardships in some geographies and sectors can be gains for others. The decline in demand for most goods and services is of heightened concern to us. Unlike the depression, the 1970s, and the GFC the reduction in demand in the current economy will reduce sales and incoming cash flow for many companies and will precipitate a demand created liquidity problem. This is more difficult to solve than the supply driven liquidity problems in the periods mentioned above. At the other extreme companies producing health care goods and services, disinfecting products, etc. will benefit from strong short-term demand and will accumulate cash and liquidity. How long the demand reduction will last is a function of when the constraints on civil and social interaction and fear of contagion begins to fade into the past. The conservative analysis above suggests a flu virus could take 18 months to cycle through the seasonal changes. At each cycle it is likely the impact will lessen. The incredible ability of humans to respond to crises and solve problems will eventually solve the scientific challenges and will result in solutions just like they have in past health scourges. We no longer fear diseases like polio, infections, SARS, etc. It appears from our reading COVID-19 may be an easier challenge than past health crises.

The other aspect of the current economy is that in addition to significant demand reduction in the economy we are also experiencing sudden supply reduction. Restoring supply and coordinating supply chains will depend on the ability and willingness of workers and companies to return to offices and factories in a coordinated manner. We have spoken with companies who are continuing to run factories throughout the down-turn. This is predominantly in companies with smaller numbers of employees in their production processes such as chemical operations. But if logistics are unavailable products cannot be shipped and that assumes their customers are operating and able to take delivery of inputs to production and then sell products to end consumers. If car buyers are not buying eventually inventory will build up in showrooms and eventually just-in-time production systems will

need to slow down or shut down. It is possible that we can wake up tomorrow and the collective thinking that presents as reality could change abruptly and consumers will return to their normal behavior. Our view at this time is that a sudden return to normal economic activity, even if it happens, will take most of 2020 to get the global economy back to a normal state. Meanwhile we expect that some economies like China will return to some semblance of increased production. The ability of the centrally controlled China economy to shut down so quickly will likely restart in a similar manner. As an export driven economy even if production returns, the goods produced may not be in demand as other economies slow down to stop virus transmission. Inventory, accounts receivable and payable and servicing debts could be difficult in an economy already showing working capital stress. Domestic demand destruction in China was so rapid and deep that consumer confidence and actual buying will take some time to recover. This is needed since our view is that the China economy was already slow due to trade frictions. Looking at the conservative downside risk we ask what other events could derail a recovery in China? Possibilities include a second round of transmission as activity and interaction resume, another different viral outbreak, financial failures, etc. Should any of these occur consumer confidence would obviously be negatively affected. Prior to the Corona outbreak the U.S. economy was relatively strong with record low unemployment and strong consumer confidence. How much this will change is to be determined but we know the economy is already experiencing layoffs in travel and other sectors.

Polaris Capital Investment Response

In a “normal” crisis or black swan event we respond by buying distressed companies at great valuations as other investors sell indiscriminately. In the current crisis we are of the belief the global economy will be slower to recover from the current demand and supply shocks. We expect the economy will not recover by June and could take until year-end to gain solid footing. More importantly, until just a few weeks ago central banks continued to inflate asset values through accommodative monetary policy. During January we saw signs that the European central bank may have been starting a return to a more normal interest rate policies, with the Swedish Riksbank (Sweden’s Central Bank) leading the way in December by raising rates. Monetary policy will be unable to cure viruses and at this point investors are driving interests rates below central bank rates so all central banks can do is follow, not lead interest rate policy.

In a bottom-up fundamental analysis a short-term decline in demand could reduce cash flow for companies in 2020. A strict measure of the impact of 2020 cash flows on the value of a firm could justify a 5-10% reduction in the value of the firm. This analysis would be correct if the capital structure of the firm can withstand the reduction in cash flow but if the firm cannot service its debts then the value of the firm in financial distress is much lower. In financial distress equity holders may have to wait much longer for cash flow to be returned in the form of dividends or stock buy backs. The longer this takes the smaller the present value of future cash flows. This is our concern for many companies in emerging economies who were already feeling the stress of trade frictions. In the developed world corporate and high-risk debt is at a higher level than prior to the GFC so it is possible financial stress in developed economies will become more acute. Latin America is already in difficult shape. Europe was still struggling to regain pre-GFC economic growth and Europe’s largest economy,

Germany, has experienced a downturn due to weak exports to China. Growth covers all management mistakes and when growth disappears untold mistakes appear.

Polaris Response

We have raised cash. In prior crises we have adhered to the general strategy to hold companies we believed were good value and could weather a downturn. The only downside to this strategy in 2008-2009 for instance is that when we sought to buy companies that dropped sharply we had to sell existing holdings that also dropped sharply. In hindsight it would have been better in that crisis to have had some "dry powder" or cash to buy distressed companies. Without cash in hand we need to sell investments in a market with low liquidity and we cannot buy until we know how much cash we raised from selling investments. Secondly, we might miss the opportunity to buy a new company at a time when shares are available as other investors are selling. Therefore, we made the decision in early February to rebalance portfolios and again in early March to raise cash outright. In February we determined there were a small number of companies that performed well in 2019 and became overweight. We felt it was prudent to reduce the weight of these securities and reinvest in some investments that were underweight. This was done in those client portfolios where the securities were overweight and underweight.

As reports of the Corona virus spread to other countries and despite the reduction in cases in China we decided to further reduce downside risk and reviewed all our model portfolios stock by stock to determine which companies represented the highest downside risk. We decided fifteen investments could experience reduced cash flows for an extended period of time and we cut the model weights for these position by 50%. Specifically, if a company was a full weight in our global and international portfolios of 1.3% and 2.0% we cut the weightings to 0.67% and 1% respectively. We later reduced two additional investments to model weight. These trades were largely complete in a day in Asia and Europe with few exceptions. We were pleased that despite somewhat large sell orders across our entire client base we were able to complete trades in a day or so. This translated in cash positions in various accounts of 5 to 10% across international or global mandates respectively. In the following few days markets rebounded and the decision looked questionable. However, we believed the analysis about economic decline was correct and stood behind the decision. At this writing another wave of heavy selling is underway and we are glad to have cash and the reduced weighting in more cyclical companies is helping performance if we had not acted as decisively as we did. The dramatic fall in interest rates to historic low levels – less than 1% for 30-year government bonds and much lower for shorter maturities is creating a difficult outlook for bank net interest margins and possible loan losses if the economy stays weak and loan losses increase. Bank stocks are declining as a result. We reduced bank weightings in non-U.S. banks (primarily Asian exposed banks) but are holding small and regional U.S. banks at this time.

We will provide a more extensive analysis of specific companies in the upcoming first quarter report to be released in a few weeks. We are still considering raising additional cash where we see fit but see no point in selling some companies at current valuations that are beginning to look compelling.

Market Liquidity

We are also concerned about the trillions invested in passive funds such as index funds or ETFs that mimic index performance. The mass liquidation of such funds has not been tested in a downturn. Up to this point it appears that some funds are experiencing inflows while other funds are seeing net redemptions. The net impact up to March 9 is not a great deal of net selling out of ETF funds. On March 9 markets are falling precipitously so it is possible we are seeing net selling and this could explain why circuit breakers are being triggered in the S&P Index futures contracts.

Oil

We have forecast oil prices to trade in the $30 to $70 range. The low end is based on the cash cost of lifting oil out of the ground in the lowest cost producers like the national oil companies in the Middle East. Cash lifting costs are $10 - $20 per barrel for the lowest cost producers. In an oversupply of any commodity prices will fall to a small margin above the cash cost of production of the lowest quartile producers. This justifies the low end of our range. At $50 - $70 per barrel U.S. shale producers make good returns and at these prices we expect increasing production volumes that will meet incremental demand. This analysis has been very correct and just this weekend Saudi Arabia decided to grab market share by setting prices at the lower bound of the above range. This was reportedly done in response to Russia not agreeing to cut production to respond to weak economic growth and the dramatic reduction in fuel demand from airlines, trucking, shipping, and personal transportation. It appears Russia is intent on also trying to drive U.S. shale producers into financial distress. This will certainly hurt oil producers and some downstream industries like chemical companies. Fortunately, our portfolio sales already reduced our exposure to most of these investments. The bright side of a dramatic fall in oil prices was detailed in our previous analyses of sharp increases and decreases in oil prices. Falling oil prices hurt a very small number of countries but it is a large stimulus to oil consumers which represent the vast majority of the world's population. We are very doubtful monetary or fiscal stimulus can solve the current crisis of fear. Whether intended or not the Saudi action on oil prices is without doubt the most effective way to provide lasting stimulus to the global economy. How long low prices last will be important to watch but as long as they stay low we are optimistic this could have a positive economic impact.

A Word on Asset Allocation

Many investors allocate their investment portfolios across different assets along the risk spectrum from low to high. These allocations are often adjusted on a regular basis such as monthly, quarterly or annually. I have come to believe the best time to adjust asset allocation is in periods of market dislocation. It is during these periods that deviations from actual to planned allocations are greatest. We think now is the time to revise portfolios by reducing holdings of bonds that have substantially increased in value as interest rates have plummeted while asset equity values are much lower. The precise timing may be uncertain but a gradual adjustment seems to make sense over the next months.

Polaris Capital Management 25th Anniversary April 1, 2020

At our annual client seminar January 22, 2020 and in subsequent communications we announced we would be celebrating the 25th anniversary of the founding of our firm on April 3, 2020 at the Boston Harbor Hotel. In light of the current travel restrictions and with many attendees travelling to Boston

we decided to postpone the celebration to a later date. We are in the process of determining when that will be so keep posted.