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FAMILY WEALTH ADVISORS

TO	Signature Clients
FROM	Signature Investment Committee
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Commentary

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"Shall we play a game"?

"Joshua" from the film War Games (1983)

Often, as you have come to realize, the letters I write do not speak to current portfolio concerns directly but rather look down the road at distant issues we at Signature consider and debate. Issues that if not dealt with well, could negatively impact the world's ability to grow and create wealth. Issues that if not dealt with well, could have notable consequences for our portfolio return expectations.

Automation's inexorable advancement throughout the workforce has been occurring for as long as manual labor and human ingenuity have co-existed. In 1870, almost 50% of the U.S. population was employed in agriculture – today that figure is approaching 1%. Partly because of automation, the United States today is the world leader in agriculture. Equally important, the jobs created over time to employ those who formerly would have worked in agriculture, is often cited as a reason to assure us that technological change is not to be feared but rather embraced. The machines we designed to play a role in agriculture saved humans from back-breaking manual labor and allowed us to move off the farms and into occupations where we could utilize our intelligence rather than simply our physical bodies.

Today that attitude toward automation is under attack. Technological change is coming much more quickly than in the past and the machines are not simply working "for us". Today, they are beginning to compete "with us" – to compete with our intelligence. As Artificial Intelligence (AI) continues to improve, the question may become "What is left for us?" if humans find themselves struggling to compete physically and mentally against their own creations.

AI has been hyped for generations, first in science fiction books and then in films, but today we are seeing AI finding a true place not only in manufacturing but across our economy in formerly "safe" sectors such as the legal profession, the medical profession, and the investment industry. In the past we could take comfort that machines could only execute what we "taught" them. Today, however, if you believe machines are not capable of actual learning – you are mistaken.

AI programs – specifically machine learning software - are how autonomous cars are able to function. The more they drive our roads the more data they collect. The more data they collect

the more capable they are of making decisions just as human drivers do. We are seeing software programs built to defeat the most skilled humans in rules-based games such as chess and AI is now winning in games with no rules such as GO and Texas Hold'em poker. While this may seem fun and interesting today – it should serve as a warning that machines will not only augment humans' physical labor in the future but may replace us in many "white collar" occupations as well. How many humans do you see plowing their fields behind a horse today? Now think about how many taxi drivers and truck drivers there are. Now think about how many cashiers you see at fast food chains, department stores or grocery stores.... and realize Amazon and others have eviscerated the physical stores at our local malls while Amazon and Safeway are now opening grocery stores without greeters or check-out personnel.

We have a potential situation, where the owners of assets (equities) may do quite well over time as AI gains a larger foothold in our economy, potentially delivering greater revenues and profit margins to corporations, while people displaced by AI struggle to find new satisfying employment. This may lead to a more divided electorate with political outcomes that are quite different from what we have come to rely upon. The majority of the population may, under those circumstances, choose to elect leaders who will promise to "protect them and their livelihoods". The population may demand this protection from anyone (immigration) or anything (automation) that threatens their way of life.

Hasn't America always initiated and embraced change and been the envy of the world for it? Isn't this why the venture capital industry exists? Let's do a cursory check on how many people we may be talking about in just two industries that are quickly moving towards utilizing automation or AI to become more efficient and profitable. In the taxi and livery industry there are over 300,000 drivers. In trucking there are over 3.5 million drivers. In total almost 10% of all jobs in America involve driving a vehicle of some sort. There are also over 3.5 million people working as cashiers in this country. As automation continues to move forward and these occupations continue to disappear how will we employ these people productively? This is only the tip of the iceberg. Consider the scenario of autonomous cars truly taking market share – very few may wish to pay for a wasting asset like a car that sits idle in the garage when they can call up an autonomous car on their phone. What happens to all the jobs attached to car production and maintenance since we will need to produce and maintain significantly fewer cars if we are going to share them rather than own them?

The positives of automation and AI are real and usually the primary focus of the conversation: positives such as less energy needed to drive fewer cars, less pollution, fewer accidents (ah, but also reduced need for insurance agents or companies). It will be easier for the handicapped and elderly to become mobile, etc. I believe in progress and would never advocate we stop or roll back automation or AI, but we must as a society understand that humans are facing technological change in a way and at a speed that we have never witnessed before. This is occurring at a time when our political system has never seemed less capable of crafting solutions to our national concerns. If we do not begin to address this issue now, it will only become more intractable and contentious over time.

Let's revisit those asset owners who are most likely to benefit from these trends – roughly 50% of Americans own equities today in some form (directly, 401K, etc.) – that is down from 72% just 10 years ago. So fewer people own equities today, yet more people's occupations are at risk. Hence the issue of income inequality is ever present and growing. The focus, today, on a higher

minimum wage by some politicians is particularly disingenuous in this environment. The issue is not "should a worker earn $12 or $15 an hour" – the question is "will that person have any job at all in 10 years' time"? Bear in mind both McDonald's and Wendy's restaurant chains vowed to fully automate their restaurants on a faster timetable once the minimum wage was increased in certain states as the cost benefit analysis moved in favor of automation and AI. Of course, this is not just a U.S. concern. The Bank of England estimates that 15 million jobs in the UK are at risk of disappearing to automation and AI in the near future. Down the road, it is estimated that two-thirds of all jobs in the U.K. are at risk of being impacted. The lost jobs numbers on a global basis could be staggering.

One "answer" bandied about is to tax the robots. This would obviously be a tax on corporations for becoming more efficient as governments would fear losing income tax revenue as fewer people would be employed. The tax would be intended to go toward retraining the displaced humans – although the form of this training or its hoped-for structure has never been articulated by proponents of this tax. Given that there are no viable training programs today, the risk exists that the tax revenue would simply disappear into the Government, never to be seen again. Another idea gaining traction in some countries is that of a universal income. The idea here is that Government will simply send funds to every citizen regardless of income status to allow them to meet their basic needs. The utopian idea is that the machines will allow the humans to all have lives of leisure – full time. Think of the humans in Pixar's film "WALL - E" who had to sit in lounge chairs the entire time because their bones could not support their weight. Switzerland's population voted on a universal income referendum last fall. The measure was defeated 77% to 23%. Many surveyed afterwards felt that simply handing money over to people without regard as to whether they worked or even looked for work was a step too far – it incentivized people to be "lazy" and could eventually lead to severe negative societal impacts. This discussion will not fade away, however, as the easy solution for politicians will always be to mail a check to their fellow citizens, which serves to further indenture a population to its government. In addition, since Government does not create wealth, the basic income stipend would simply be taxed from the population and then "distributed" by the Government to that same population. If some of you are rolling your eyes at this idea gaining traction in the United States, please note that Richard Nixon introduced a basic income bill in the U.S. during his tenure. It passed the House of Representatives but stalled in the Senate.

Why am I writing about these issues and how do they impact your portfolio? The use of AI and machine learning are clearly becoming more prevalent among investment firms. Some highly-sophisticated investment firms are utilizing algorithms to construct "smart beta" portfolios or deploying machine learning programs to analyze huge quantities of data and select the holdings in portfolios. We at Signature will continue to work to determine if quantitative investing firms have a place in your portfolio. Before anyone thinks "quants" cannot compete with human investors – know there is a quantitative firm named Renaissance Technologies, which has been running money in just this style since 1982. One of their funds – named Medallion – has averaged a 40% annualized return, after fees, over the past 30 years. Berkshire Hathaway has annualized at 20% over the same period. To put that in perspective, $1 invested with Warren Buffett over that time frame would now be worth roughly $240, while $1 invested with Medallion over that period would be worth $24,000.

The broader point of this missive, however, is more important than investment manager selection. It really is a simple recognition that Government has not dealt with the issue of

automation and AI's impact on our job market. Just as free trade benefits society as a whole, but can have severe consequences for individuals, so it is with automation and AI. The main point is that now the machines are not simply augmenting us in the field but are becoming capable of replacing us across many "thinking" occupations. The future is always exciting and the investing opportunities are myriad in a world of ever-advancing AI. I personally am a proponent of machine learning programs in the investment arena. At the same time, the impact on individuals and society must be addressed and solved for before too much time has passed so that we can all benefit from this progress and so that no one will wish to slow or stop our movement forward. We have always been an innovative and risk-taking country. It may be the one trait of America's most admired by the rest of the world. We must remain comfortable with innovation and risk taking if we wish to retain our leadership in capital formation, allocation and generation in the years and generations to come.