Civilisation

Investing in the past

Dede Eyesan - 15 August 2021

Table of Contents

Executive summary

Over the past few weeks, the Jenga team studied civilisation and how humans transformed from the industrial revolution to the computing age. The mid-1700s to the early 1900s brought great insights into the evolution of businesses, capitalism, and technological advancements impact on western society. Our report below merges a descriptive and analytical lens to infer trends and transformations during the industrial age.

Steel and electrification were seen as the two most important technologies of the industrial revolution. For the 20th-century computing age, we see these as the transistor/integrated circuit and the internet. As steel was the backbone of industries like railroads, machinery and construction, the transistor revolutionised electronics. It paved the way for the personalisation of radios, calculators and computers.

The patterns between both revolutions were also similar. Technologies moved from silo experiments to industrial/enterprise use, and then the ability to personalise products brought widespread adoption of new technologies in homes. Oil wasn't widespread until it could be applied in the home as a paraffin lamp, while Apple and Microsoft couldn't solidify their status in the technological age until they brought their hardware and software, respectively, to every home via the personal computer.

We highlight six fundamental shifts society faced, such as the growth of leisure time post-1900s, income growth and the intensification of globalisation. Our analysis of these shifts provides great insights for investors, and we conclude by sharing ten crucial lessons for investors from civilisation.

Is investing an art or science? Does history repeat itself, or does it matter? Should we be bothered about timing economic cycles? Should investors ignore China’s growth? Can one gain an edge in the market? Should you bet against America?

History isn’t complete without understanding its implications for the future, so we conclude by answering these key questions that our study of civilisation informs us.

A short personal observation

To explain our motivation for looking into the past, particularly at civilisation during the industrial revolution, I feel it's important to share a short personal story. I spent my formative years between the United Kingdom and Nigeria. The stark contrast between life in Lagos and London was immense. In one region, the under-five mortality rate was 20,000 per 100,000 live births, while the other had 8 deaths per 100,000. One region had 80% of its young people with access to computers while the other was only 4%. At moments, it felt like I was living between two different civilisations. The contrast is also a testament to how much progress western civilisation experienced over the past century. It's important we study this from an investor's lens.

History does repeat itself. But to deduce our conclusions, we first explore the industrial revolution chronologically.

Civilisation - Industrial 1.0

When we think about the industrial revolution, we think about steel and cement, factories emitting smoke and heavy noise and environmental pollution, iron machines across the farm and industrial plants. One may also see images of finely made porcelain tableware in upper-class homes, ready-to-wear garment factories with the proliferation of fashion and style for both dresses and in the three-piece suit and the stovepipe hats on men. Both descriptions portray life during the industrial revolution. It's said to have started in the 1760s, but the initial decades were slow, and Great Britain and the rest of Western Europe didn't truly feel the industrial age until the 1830s-1840s.

By then, key technologies were increasingly adopted and will later transform society.

The beginning. The steam engine and hot blast iron furnace

If digital logic and the integrated circuit were said to have kick-started the digital or computing age, the steam engine and the hot blast iron began the industrial period. The industrial revolution surrounded two primary purposes; (1) to build and (2) to transport.

To build, we needed cement, iron and steel. To transport, we needed the steam engine, the locomotive and later oil. Civilisation had previously depended on charcoal in initial blast furnaces to smelt pig iron, but James Neilson in 1828, while in Scotland discovered ways to make the smelting process a lot more efficient with less than a third of the coal previously used and more than double the previous furnace capacity. The carbon monoxide produced served as additional heat for the hot blast furnace.

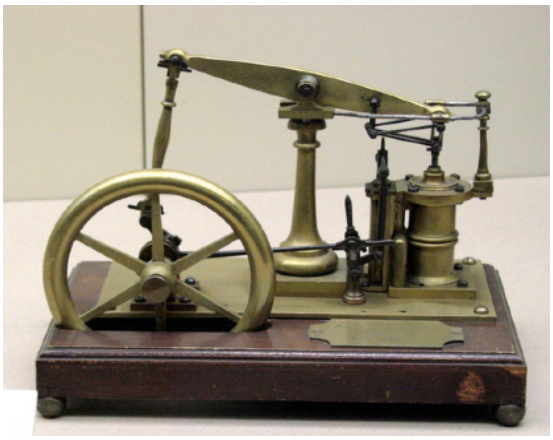

Image 1: A model of the steam engine

Image 2: A hot blast furnace

A decade later, William Aspdin accidentally produced calcium silicates which was a vital step for making the Portland Cement that was introduced into the rotary kiln process, allowing cement to be made at a continuous manufacturing process.

The efficiencies gained from the smelting of iron and the cement production process was huge. It significantly increased the production available for construction work. But it was vital to find a more efficient method of transportation than by horse. There had been early experiments in the steam engine technology of transferring heat to mechanical energy dating back to the Ottoman Egypt era in the 16th century. Society will have to wait till the 18th century for the first commercially successful steam engine invented by Thomas Newcomen as it used a piston rather than a water pump. The steam engine was applied to the railway system in the early 19th century in the United Kingdom. As we'll see in industrial 2.0, further advancements in the developments of the steam engine was the use of the steam turbine applied mainly in the 20th century.

The locomotion of rail transport was vital for transporting heavy materials across the United States and Western Europe. It also reduced the pressure on the shipping industry and meant civilisation could finally have a quicker method of transporting materials.

Alongside the core iron and cement sectors, other industries like textile, paper machine, and glass-making also had many innovations.

The industrial-enabled

Today, we often say old-economy industries like hospitality and automotive have been tech-enabled as their processes and services have been made more efficient and less costly due to technological advancements. In the industrial revolution, the textile is said to have been "industrial-enabled." Pre-industrial revolution, the textile industry heavily relied on slaves and migrants, and individuals would spend mornings and nights weaving

Image 3: A model of the flying shuttle

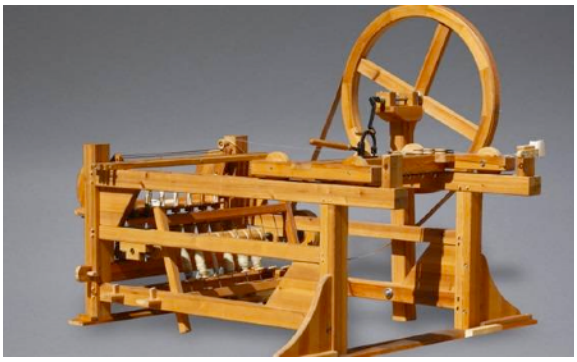

Image 4: The spinning jenny

wool and linen. The textile industry has remained labour-intensive, but we've seen significant advancements.

The 1730s saw the first batch of inventions in textile machinery. The flying shuttle invented by John Kay doubled the output of a weaver and became widely used in Lancashire, United Kingdom. His son, Robert, developed the dropbox, which facilitated the changing of thread colours. Again in Lancashire, the spinning jenny by James Hargreaves was invented in 1764, which became the first practical spinning frame with multiple spindles. Richard Arkwright will later develop more inventions and create the cotton mill, which brought the textile industry into factories. Steam power accelerated production in cotton, wool and silk factories. In 1750, Britain used about 2.5 million pounds of raw cotton per year, and by 1850, it had increased to 588 million per year.

Similarly, the glass making process became "industrial-enabled" as the cylinder process to create sheet glass became widespread. As older economy industries grew, more sectors and services emerged from the United Kingdom. Industrial developments also shifted to the USA. From a macro view, we also saw the rise of institutions, culture, capitalism and the great divergence. Income and population grew, society saw increased urbanisation, human wants and needs expanded.

Other countries also caught up quickly. In 1871, the Iwakura Mission by Japan was a diplomatic voyage by leading politicians and scholars of the Meiji period to learn western techniques, and this voyage is said to have significantly contributed to the modernisation of Japan. We'll later see the four Asian Tigers, South Korea, Taiwan, Hong Kong and Singapore, imitate this before their 1960s rapid industrialisation.

In the late 19th century, many British financiers saw business in the USA as barbaric. It seems humans tend to react this way when presented with significant change, and opportunities. When we reflect on the western investment community's perception of China in the 1990s, we see many similarities. The United States was much bigger than the UK in population. Similarly, China was also bigger population-wise than the USA. The government system between the USA and UK were different, and so is the Chinese one-party system different from the American federal republic style. American businesses

initially listed their bonds in the 1850s to British financiers, but many of them wouldn't even consider the deals or opportunities, and so did many American investors ignore the Chinese ADRs due to perceived risks. As we'll see in the industrial 2.0, opportunities in the USA grew exponentially and what was once seen as a chaotic region to finance became the land of opportunities. If history does repeat itself here, it's vital that investors embrace the change in civilisation as it presents opportunities.

Image 5: Iwakura Tomomi, he would lay the foundations for how nations can catch up in technology

Image 6: Other leaders of the Iwakura mission by Japan to the USA and the UK

Industrial 2.0

If the internet, cloud computing and artificial intelligence drove stage two of the computing age, then steel, petroleum and later electrification powered industrial 2.0. The transition also coincided with the emergence of industrial entrepreneurship, which has been portrayed as the "Gilded age Robber Barons." These entrepreneurs, along with various scientists, found ways to produce the different resources at scale. The idea of increasing returns to scale is also an essential phenomenon in the technological age, and it's why companies like Standard Oil and Amazon were able to grow over many years and improve profit margins despite the size of their operations.

The first indication of industrial 2.0 was the emergence of commercial steel.

Bessemer Process

Steel was the most critical material of industrial 2.0. Steel meant we could build more durable roads, railways, buildings and other infrastructure. Mass production of steel from molten pig iron was made possible by the Bessemer process. As civilisation has constantly shown, humans always seek ways to make processes easier, faster and unlock economies of scale. Before the Bessemer process, the puddling process was of

widespread use. The problem with the puddling process was that slag impurities weren't entirely removed, and it needed an excessive amount of coal.

The Bessemer Process relied on oxidation via blowing air through the molten pig iron to remove impurities in pig iron. The fewer impurities, the stronger the steel could be made. The Bessemer process was also cost-efficient and quick. It reduced the cost of processing one ton of steel from £40 to £6 and required 15 minutes to convert 4 tons of iron into steel.

The efficiency of the process attracted entrepreneurs like Andrew Carnegie. He would later use the Bessemer process as the backbone of Carnegie Steel's growth and reduced steel rails costs from $100 to $50 per ton between 1873 and 1875. The drop in steel costs meant more railways could be constructed, and the overall capacity of both the USA and the UK economies expanded.

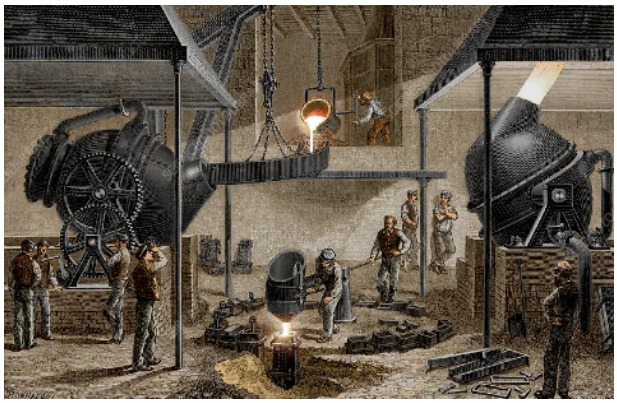

Image 7: The Bessemer process for steel

Image 8: A refinery in Cleveland

From science to entrepreneurship

The fields of physics and chemistry advanced significantly as communication among scientists increased and as the financial benefits became more lucrative. Crude oil had been discovered a long time ago, but a commercial refining product hadn't yet been established until the chemist James Young found a slow distillation process to obtain paraffin wax. The breakthrough for oil occurred during the discovery of oil wells in Pennsylvania. The main uses of oil were for lamps and heaters via kerosene, which replaced vegetable oil. The refining process became profitable by the 1870s and attracted many entrepreneurs looking to capitalise on the unique opportunity. John D. Rockefeller, the co-founder of Standard Oil, found ways to turn the refining and marketing process into a conglomerate that will dominate the American oil industry over the next century. Its subsidiaries such as Exxon, Mobil and ConocoPhillips still exist today.

In electricity, a similar occurrence happened. Through research and experiments, Michael Faraday discovered the magnetic field and the direct current established the basis of

electromagnetism. Scientists turned entrepreneurs like Joseph Swan and Thomas Edison found ways to make the single most crucial engineering achievement of the 20th century into a business via light bulbs and later the creation of assembly lines, mass production and electric power generation.

In Rubber, John Dunlop developed the first practical pneumatic tyre in South Belfast in 1887, which assisted both Karl Benz and Henry Ford build their respective automobile companies.

The 1880s was a crucial period for science and entrepreneurship. The initial scientists will make the first inventions, others built on initial results and entrepreneurs found ways to build an industry out of each commodity. Many of these commodities and innovations needed each other to thrive. Henry Ford and Karl Benz needed the technology of John Dunlop; John D. Rockefeller needed the automotive industry to grow, while Thomas Edison needed the improvements in steel for construction to place his light bulbs in buildings.

These trends are similar to the technological age with Microsoft, Apple, IBM, Intel and later Alphabet and Amazon feeding off each other's services and technologies. It's no surprise why we also saw 'the concentrated creation' in Silicon valley where businesses that led the technological advancements needed each other for growth. This teaches us

All four would lead companies that shaped the second industrial revolution

Image 9: John D. Rockefeller of Standard Oil

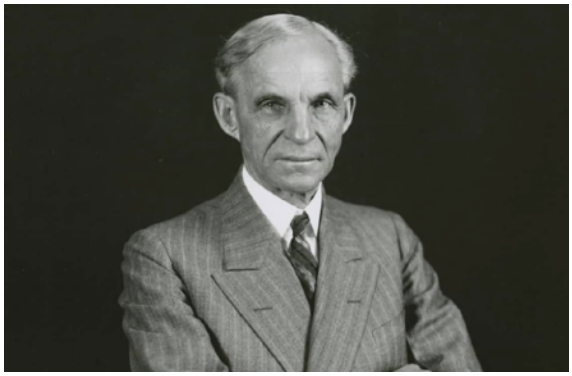

Image 10: Henry Ford of Ford Motor

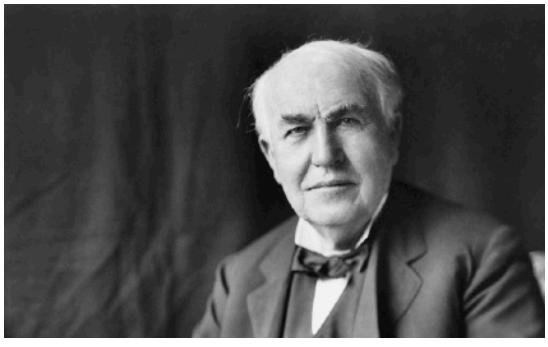

Image 11: Thomas Edison of General Electric

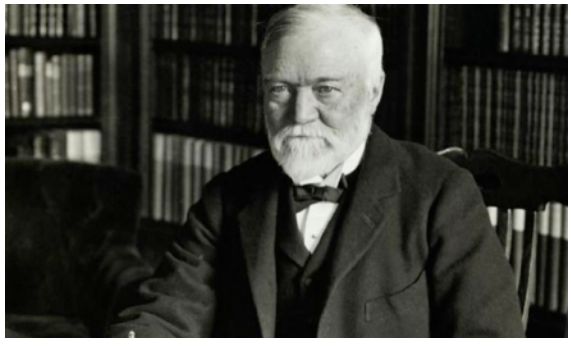

Image 12: Andrew Carnegie of Carnegie Steel

an important lesson on investing and how close transformative processes are. When assessing the next Amazon, also examine companies within its supply chain.

With developments in entrepreneurship came the corporate financial system. Banks and financial participants had previously focused more on the central banking ecosystem. The Bank of England and the Stockholms Banco focused on government loans, but the industrial revolution brought an increased focus on entrepreneurship funding. Merchant-banking families in the UK transitioned from underwriting loans to providing advisory and financing for the industrial revolution. The House of Morgan played an essential role in stabilising and consolidating the railroad industry, US Steel, and General Electric. The influence of John Pierpont Morgan laid the foundations of modern banking, and the stock market will evolve with finance. In the future, banks will see more competition from insurance asset managers, pension funds, private equity, and technology companies as well. This emergence of new players has had its implications on both the banking industry and the stock market.

Mass production, Modern Business Management, Accounting and Consumerism

The machinery and electrification of the industrial revolution created a new production process termed Mass production. Ford Motor Company realised more cars could be produced when the assembly line technique and division of labour were prioritised. These had previously been explored by Charles Babbage in his book, 'On the Economy of Machinery and Manufactures' and will later become the backbone of the modern American factory.

The complexities of managing such a vast amount of business operations meant a centralised process wasn't reliable anymore. Railroads and the Steel companies first developed the application of scientific processes to corporate structures and the relationship between managers and workers. Toyota and the lean manufacturing process of today's industrial processes were derived from this. The scientific process meant companies could more easily track the efficiency and internal flow of operations and was later called railroad accounting. It heavily influenced what we now know as managerial accounting.

Finally, the growth of wealth, resources and trade meant the middle class could finally afford homes and premium goods. Mass production, coupled with later technologies like radio and broadcasting, meant more businesses produced more items at scale. As advertising grew, new wants emerged, consumerism intensified. In Thorstein Veblen's best-known book, The Theory of the Leisure Class (1899), Veblen coined “conspicuous consumption and leisure.” The concept of a 'Veblen good' was born.

The dawn of consumerism brought the need for personalisation. If we assess the history of computing, the next stages have always brought more personalisation from the ENIAC computers to the Apple computer and then the mobile phone. In the current age of software intangibles, applications can gain further personalisation due to the capabilities of Artificial Intelligence on data. From a pricing view, personalisation has reduced the cyclicality of prices. Users had to accept the market price of oil or steel, but today, users can dictate what features they want and, thus, the pricing they pay. For example, Adobe users can select preferred plans based on what suits their personal needs. This is the backbone of Software-as-a-service (SaaS).

Why is the study of civilisation important?

The study of history is both important for the operators and investors. During one of his earlier interviews, Steve Jobs once likened the role of Apple computers to that of the fractional-horsepower in electric motors. The fractional-horsepower helped personalise the use of electric motors from its previous scale functionality. It enabled the soda industry, drugstores, and appliances like washing machines and refrigerators.

Although the technologies are different, the patterns of "enablement" between both civilisations are pretty similar. Of course, studying the Steel Bessemer process isn't going to provide unique insights into the valuation of steel companies but what it does provide for investors is the sharpened ability of pattern recognition across society. While one may argue that technological advancements have slowed over the last few years, the enablement of incremental changes in technologies has increased. A single improvement in machine learning capabilities can easily disrupt various industries at once. As we will share in the later parts of this report, many investment cases from restaurants, insurance, and gaming could have been spotted by recognising societal patterns and changes.

We explore six of the most crucial shifts that occurred to society between the industrial and computing ages.

Shifts during the 20th Century

1. **Work versus Leisure**

In 1930, John Maynard Keynes predicted labour-saving technologies would lead to a 15-hour workweek when his grandchildren came of age (2030). While we are still not close to the dream 15-hour workweek, the hours spent at work have indeed decreased over the years. The Weeks Report and the Aldrich Report provided by the USA Department of Labour showed the annual workweek data for the first half of the industrial age (Chart 3). On average, the typical labourer worked for 69 hours a week in the 1830s. By the turn of

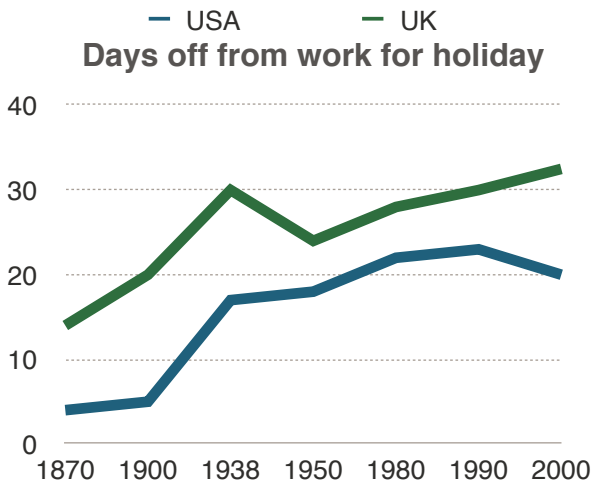

Chart 1: Days off from work for holiday per year (Days)

the century, this figure had decreased by 9 hours to 60 hours.

Between 1900 and 1930, we saw a significant fall in annual working hours per week by 26%, driven by the increased machinery in manufacturing factories (Chart 2). Not only did the number of hours fall, but the days off from work for the holiday also increased from four days per year in 1870 to 20 days by 2000 in the USA (Chart 1). We note there might be some inaccuracies in the first survey prepared in 1893 by Commissioner of Labor Caroll D. Wright, but we believe this is a fair estimate.

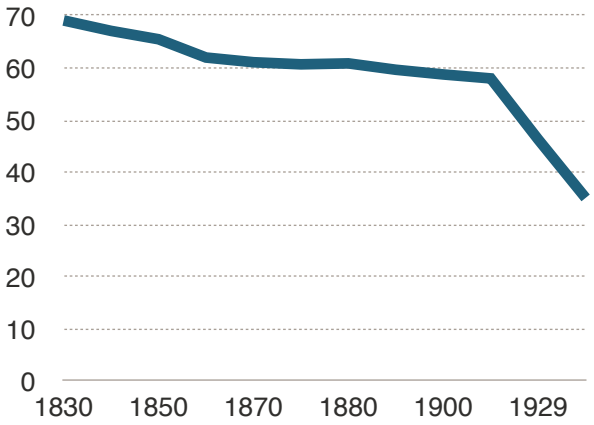

Chart 2: Annual working hours per week (hours)

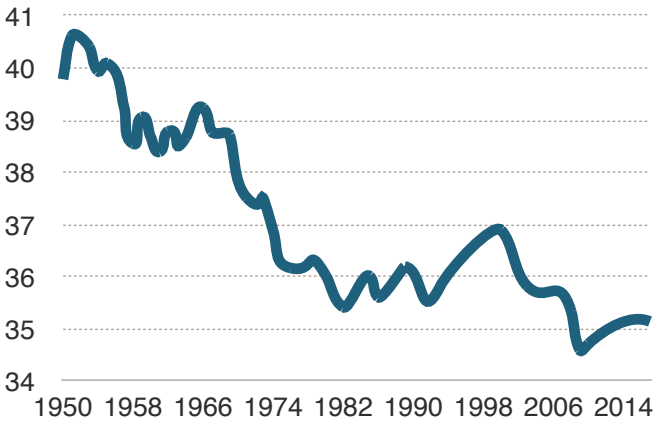

Chart 3: Annual working hours per week (hours)

A direct beneficiary from the reduced time spent at work is increased time for leisure which promoted the rise of travel, entertainment, social activities, sports or hobbies. The roaring 1920s experienced the rise of moving pictures, jazz and sound movies. Entertainment companies like The Walt Disney, Warner Bros and Columbia Pictures were formed during this decade and prospered from the increased demand for entertainment. Since then, the entertainment industry has exponentially grown, and entertainment expenditure now represents 5% of total income expenditure (Chart 5). This explains why gaming is currently one of our most prominent themes, alongside advertising and streaming companies.

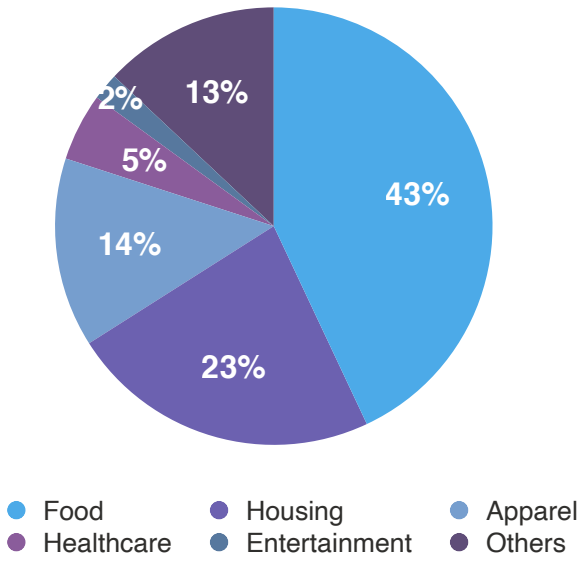

Chart 4: Household expenditure in 1900

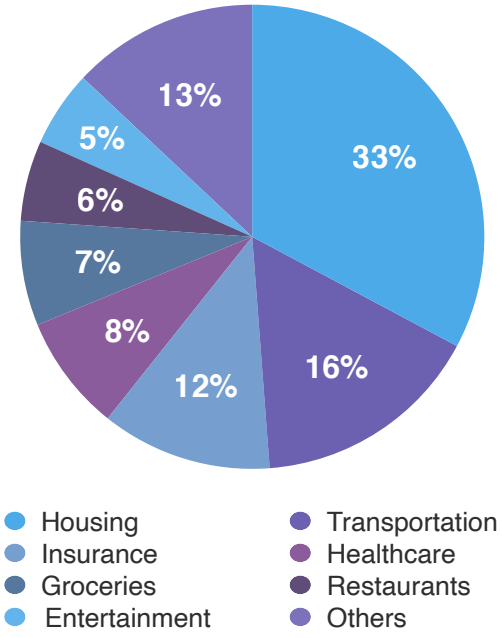

Chart 5: Household expenditure in 2019

2. Income, wealth and expenditure

With industrialisation and the development in commerce and trade, the global economy saw an exponential rise in its GDP per Capita. The USA experienced a significant increase in the GDP per capita driven by its middle class. Between 1840 and 1940, the country had a 260% increase in its GDP per capita. It took almost half the time (56 years) for the USA to experience the same GDP per capita increase of 260% after 1940. This shows that the magnitude of the computing age effect on income growth was more significant than the industrial revolution.

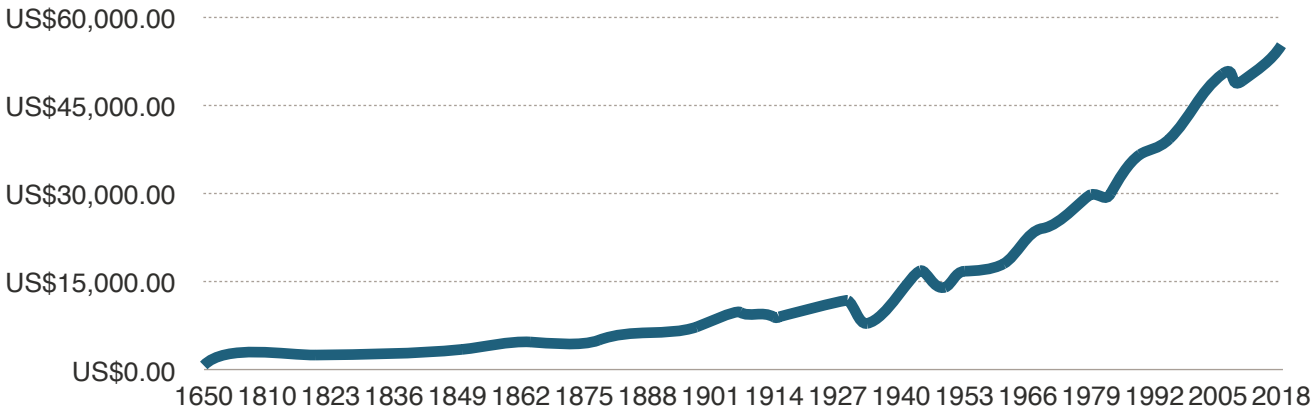

Chart 6: The US GDP per Capita

Not only did income grow, but spending habits also dramatically shifted. Charts 4 and 5 depict the average household expenditure in 1900 and today. Food fell from 43% to 12% (groceries and restaurants).

The first fast-food restaurant in America by White Castle was launched in 1921. By the 1960s, other franchises like KFC and McDonald's were already well-known. Assuming you were a fast-food enthusiast and purchased shares in McDonald's after tasting the big Mac in 1971, an investment in McDonald's would have grown by 660x!

Image 13: A McDonald's chain in the 1990s

Image 14: A Starbucks cafe in the 1980s

In a recent survey by the National Coffee Association, it was discovered that 64% of Americans drink one cup of coffee every day. We could look at restaurant chains like Starbucks that specialised in coffee. It greatly benefitted from the growth of coffee and explained why its share price appreciated by 36,000% in the last 30 years.

The price of the average home increased by a factor of 768x between 1900 and today. It's no surprise that real estate has become an important asset class within alternative assets.

Another noticeable trend has been the emergence of insurance which dates back to the First Babylon Empire. It was not until 1935 that the American government mandated some form of insurance via the Social Security Act in 1935. Insurance now represents 11.9% of the typical household budget and explains why insurers like UnitedHealth grew by 51,884% over the last 30 years. These businesses could have been spotted by assessing consumer spending habit changes.

3. Youth and women empowerment

Youth empowerment

Child labour was the norm in the 1900s. Parents often hired children in textile mills during this period. A census showed 1.8 million children between the ages of 5-15 were employed, constituting more than 18% of the industrial labour force. The National Child Labour committee was only formed in 1904. Society had to wait 34 years for a fundamental change in child labour laws as congress passed the fair labour Standard Acts regulating the employment of those under 16 or 18. The new laws, however, excluded the agricultural sector.

Image 15: A group young people in a farm in 1900s

Image 16: A group of young people playing video games

A century later, civilisation has had significant advancements for young people, from the rise of colleges in the mid-20th century to creating various laws like the National School Act and the Handicapped Children Act. The income growth of parents also trickled down to children as allowances for school increased.

Today, Gen Z recently surpassed millennials to become the largest segment globally at 32% of the global population. The importance of youth in the overall economy is also reflected in trends. The fastest growing social media app, TikTok, with over 1 billion users, has an average age between 18-24. Apple's fastest-growing business segment, AirPods, is currently driven by its 18-25 age segment, which is 60% of total demand. In China, WeChat, the multi-purpose messaging app developed by Tencent, shared its largest users by age group was the under 24 segment.

With the proliferation of the metaverse world, younger people will likely become more incorporated in the global economy. Roblox, the game platform, already has over 160 million users, with more than half of its users below 15. With the rise of virtual currencies and gaming studios that support microtransactions, the trends are already here. Creators with games on Roblox top 100 already earn up to $400,000 per year.

Women empowerment

For too long, society failed to recognise women in civilisation. It was only until the 19th Amendment in 1920 women were granted voting rights pushed by the two million members of the National American Women's Suffrage Association (NAWSA). In the 1900s, single women were not allowed to own, or control landed properties and were omitted from the Married Women's Property Act. The Equal Pay Act was passed in 1963, which only marginally improved the gender unequal pay. During the 60s, women were still not entitled to have a credit card without their husband's consent.

The second and third waves of feminism brought further developments. From a finance view, we also saw a rise in investing participation. In 1973, the London Stock Exchange finally admitted women and elected ten newly elected female members. Consumer spending reflected the changes too. A study by Morgan Stanley showed that women now direct 83% of all consumption in the USA.

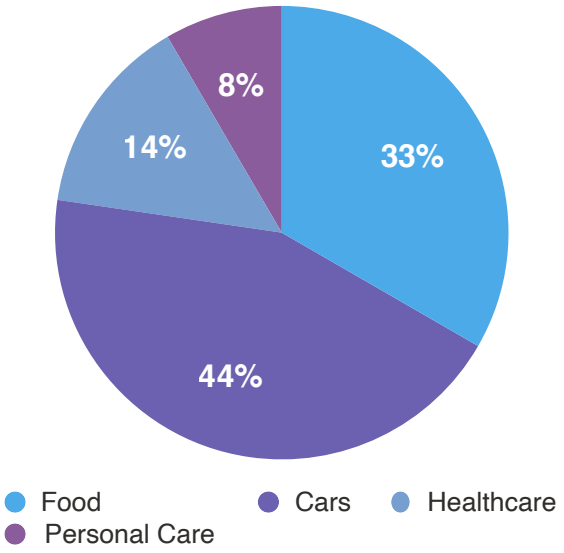

Chart 7: Average single men expenditure on top items

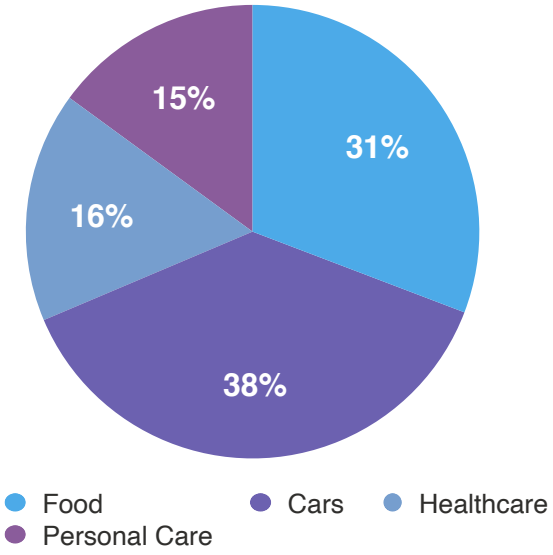

Chart 8: Average single women expenditure on top items

We highlighted the proportion of four key items within the spending budgets of both single men and women in the USA in charts 7 and 8 above. We discovered that men were more likely to spend a higher proportion of their income on cars than women. In comparison, women were more likely to spend a larger proportion of their income on personal care and healthcare.

Companies like Estée Lauder, L'Oréal and Shiseido greatly benefitted from this. L'Oréal, for example, has been profitable every year over the last 30 years and has never made a return on equity below 12% during the same period. This explains why its share price has appreciated by 4,000% over the last 30 years, outpacing the broader market's return.

Today, two of the largest Eastern European e-commerce companies, Wildberries and Trendyolcom, are both founded and led by women.

In the future, we expect to see a wave of more 'Femtech' companies. These encompass digital health tools aimed at women's health, including wearables, internet-connected medical devices, apps and innovative hygiene products. Elvie, a silent breast pump, recently raised £58 million and is currently valued at £200 million after only launching eight years ago. Its founder Tania Boler said in her first discussions with investors, she was told her products were 'too niche.' The Femtech market is now valued at approximately $22.5 billion and is expected to grow at a CAGR of 16.2% over the next seven years.

4. **Societal challenges**

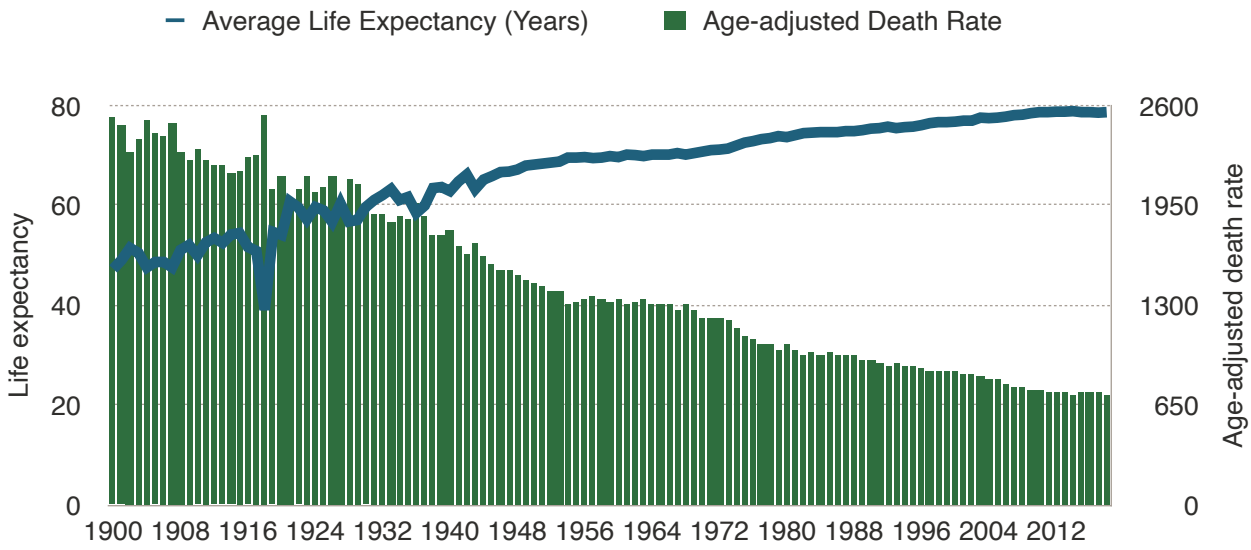

Chart 9: A graph of the age-adjusted death rate and average life expectancy

As industrialisation and advancements in technology changed the paradigms of civilisation, what we classify as societal challenges also evolved with it. The rapid industrialisation meant workers were forced to migrate to urban areas searching for jobs, worked long hours, were poorly nourished and lived in overcrowded conditions. In 1900, the three leading causes of death were pneumonia, tuberculosis and diarrhoea, which together caused one-third of all deaths. Of these, 40% were among children aged less than five years. Today, the leading causes of death in the USA mainly consist of non-communicable causes such as heart diseases, cancer, Alzheimer's, and diabetes. Pharmaceutical breakthroughs like Insulin, the discovery of the effects of Penicillin by Alexander Fleming in 1928 and the Merck vaccines against measles, chickenpox and mumps meant infections and diseases could be better managed.

In chart 9, we see a gradual rise in life expectancy, excluding the 1918 pandemic. Similarly, we also see continuous improvements in the age-adjusted death rates driven by advancements in healthcare.

It is no surprise that pharmaceutical companies like Novo Nordisk, the Danish healthcare group with about 28% of the $48 billion diabetes market prospered on the stock market. Between 1992 and 2021, its share price appreciated by approximately 10,660% and currently earns a return on capital of more than 50% as it solves a problem of the 21st century.

Image 17: Penicillin

Image 18: Novo Nordisk Insulin

5. Globalisation

Before World War 1, commercial and financial integration was more limited. The first wave of globalisation occurred during the mid 19th century to 1914 and was driven by improvements in transportation capabilities. The pigeon post was a common form of communication between Paris and London. Bankers and military officials often communicated with text on tissue paper. In some instances, a bulk package of documents was sent from Paris to London by balloon. The improvements in shipping capabilities and the railroads meant industrial goods like iron and textile could be transported across the world. The construction of various canals, such as the Suez Canal in the 1860s, dramatically increased the trade capacity, and by the 1900s, the value of exported goods as a share of GDP climbed to 11.7%. The world wars led to the decline in globalisation and as shown on chart 10, there was a steep decline in exports as a proportion of total GDP post-1914. During the inter-war period, Europe witnessed significant nationalism, particularly in eastern and central regions.

The advancements in technology propelled the second wave of globalisation. The price of Sea freights, passenger air transport and international calling cost significantly declined post-1940s. As a result, migration, financial integration and trade openness also improved. Computerisation in the 1960s meant businesses could now record inventory management and forecasting systems that streamlined logistics and created better

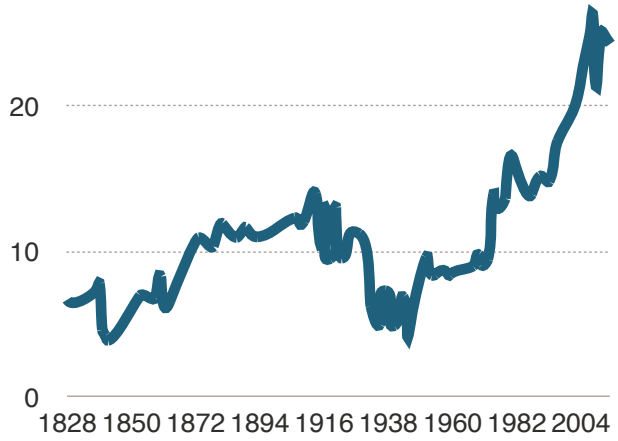

Chart 10: Export as a % of total GDP

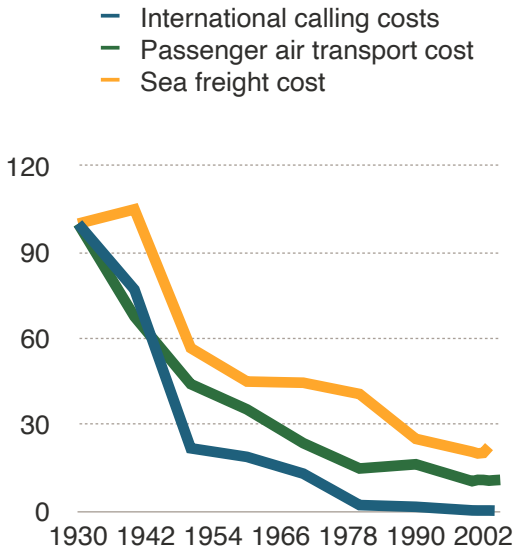

Chart 11: Costs of transport rates

warehousing storage and truck routing. Businesses today now show the true impacts of globalisation. Freight companies like UPS and DHL have made the transportation of goods easier. Aeroplanes have made it safer for individuals to migrate to new countries, and government policies have eased the migration process for many.

With the internet becoming more widespread than before, the flow of information will only increase, and cities will become more cosmopolitan. This leads us to our final observation.

6. The Information age

The most apparent shift we saw was the emergence of the digital age. From transforming steam and combustion power, society transitioned to the transformation of information processing. The ENIAC was the first real glimpse into the capabilities of computing, as it was 'Turing complete.' One could add or subtract 5000 times in a second which was 1000 times faster than any other machine. Post-war, the transistor was perfected at the Bell Labs, which replaced the vacuum tubes and gave rise to the integrated circuit and the microcomputer. There's been an exponential growth in computing capabilities over the past decades.

Devices have also become more personal over the decades. The first computers were designed for weather calculations. The next generation was tailored to companies via time-sharing, and the next stage with Apple and Xerox brought the personal computer. Today, we have computers in our pockets, providing access to unlimited information. We can check up on what several friends are up to in seconds or can ask a virtual assistant to read the latest news on any topic.

At the backbone of computing, is the semiconductor industry. The EUV by ASML is said to keep the Moore's law that transistors per silicon chip will double every year

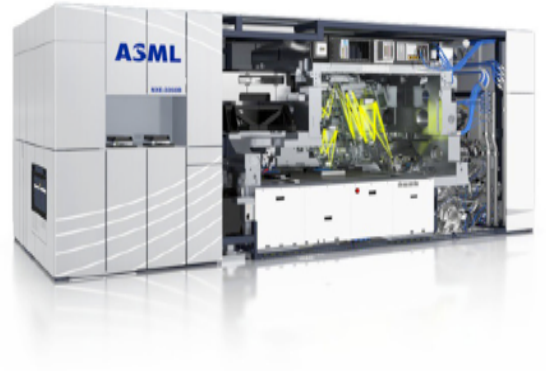

Image 19: The Extreme Ultraviolet Lithography by ASML

Image 20: A lab in Taiwan Semiconductors

The software technology enables both enterprises and consumers to a range of tools and apps that may have been unimaginable decades ago. These apps have provided more convenience and efficiency. Between 1950 and now, the average human works 5 hours less but has tripled their overall output.

It's no surprise that the technology sector has provided many winners on the stock market. We learnt from the industrial age that whenever a company delivers a purpose for humanity faster, cheaper and more convenient, there's potential value for both the company and the shareholders.

10 Lessons for the Investor

Our study about how civilisation transformed over the past two centuries has brought great learnings in assessing human nature, habits, the role of commerce and businesses, and the impact of technological advancements. Our task as investors is really to understand how the world works and find opportunities that will generate a high return on capital over the long term. By no means do the ten lessons promise to bring outsized returns over the following days or months. Instead, we believe these are principles that will benefit an investor for decades.

1. Stock picking > Industry picking

Whenever a new and innovative industry promises to be game-changing for humanity with potential lucrative outcomes, history repeats itself. Entrepreneurs flock to these industries to be the next Henry Ford while investors, rather speculators, promote various emerging businesses as 'the next XYZ.' During bull markets, all companies within the hot

Image 21: The Ford Model T of the 1900s

Image 22: The latest Ford Fusion

industry typically appreciate together despite more than 90% having no real future. We've seen similar patterns in the Automotive and radio industry in the 1900s, the internet stocks of the 90s and more recently with the green energy companies today.

Industry picking is very different from stock picking. Many companies will often disappear in these 'hot sectors', and the overall industry may produce only two or three long-term winners.

The automotive sector of the 1900s

The American automotive industry began in the 1890s when mass production technologies and the internal-combustion flat engine by Karl Benz merged. The Ford Model T is often depicted as the automobile of the 1910s. It was the first affordable car available to middle-class Americans.

The use case of cars was obvious. Over time, they became faster than horse drawn wagons, more comfortable and could travel over longer distances. While many would have been right to pick the automotive industry, picking a winner(s) would have been far more challenging. We assessed the directory of all American auto companies registered between 1900-2000, and what we found was astonishing.

It's estimated that there were approximately 2800 companies in the automotive industry at the start of the century. By 1930, less than fifty were in operation. If you look at the first alphabet alone, just over 100 companies started with the letter A. 90% of them were formed between the 1880s and 1920s. Today, only AM General, the parent company of Hummer, exists.

Also, there are only 10 American car manufacturers founded in the 20th century operating, Ford is the only manufacturer to have never gone bankrupt. This highlights the difficulty of picking stocks versus picking industries.

Rules for picking stocks in hot industries

By no means do we say investors should avoid these hot industries. Instead, we believe investors must follow some rules to prevent the risk of significant losses when attempting to pick winners in these industries.

1. Wait for the profits or unit economics to be profitable
2. Examine the uniqueness of its product or service over rivals
3. Assess the management behind the company
4. Don’t pay crazy prices for shares

Case Study: The technology trio (Apple, Microsoft and Intel)

The success of International Business Machines (IBM) had proved the importance of the computing and information age. The IBM mainframes dominated the computer market of the 1960s, and its applications for businesses and scientific research were diverse. Young entrepreneurs like Steve Jobs, Bill Gates, and Gordon Moore, alongside their co-founders, saw the opportunity for innovation, creating companies that led hardware, software, and semiconductors, respectively.

All three had different management styles. Gordon Moore was the technical leader at Intel and had great scientific prowess and precision. Steve Jobs was autocratic and had a huge focus on design across all Apple products. Similar to Gordon Moore, Bill Gates was technical but also had an aptitude for the business side. Focusing on the management analysis may not have provided conclusions on the future of all three, but assessing the financials and product quality would have. Below, we evaluated all three income statements during the respective IPO's. From a growth view, all three companies had outsized revenue growth while also earning a net income margin of at least 10%. The solid profitability and minimal debt meant these businesses could reinvest in R&D and explore new products. Apple, for example, moved into printers, floppy disks and input devices while Intel reinvested into building the semiconductor memory market after the 3101 Schottky TTL bipolar in 1969. None also had any interest-bearing debt.

From a valuation view, Intel was valued at $8.225 million, 2x its 1970 revenue. Apple was valued at $1.3 billion, 11x its 1980 revenue (5x its revenue 1981 revenue), while Microsoft was valued at $777 million, 5x its revenue of 1985.

Were these crazy prices to pay for these companies? Considering the growth and profitability, not at all.

Of course, some other companies had solid financials at IPO too and still failed. Other excellent companies in 'hot industries' like Amazon (8 years) didn't show profits for a while, and waiting till it shows profitability may mean one will miss out on significant

	1970	1971	1972
Total Revenue	4.24	9.41	23.4
Cost Of Goods Sold	-5.69	-9.8	-19.3
Operating profit	**-1.45**	**-0.4**	**1.98**
Extraordinary item	0.48	1.43	1.1
Net Income to Company	-0.97	1.02	3.08

Table 1: Intel Financials pre-IPO

	1983	1984	1985
Total Revenue	50	97	140
Cost Of Goods Sold	-39	-68	-99
Operating profit	**11**	**29**	**41**
Net Income to Company	6.49	15.9	24

Table 2: Apple's Financials pre-IPO

	1978	1979	1980
Total Revenue	7.89	47.9	117.1
Cost Of Goods Sold	6.3	37.8	93.7
Operating profit before tax	**1.55**	**10.1**	**24.2**
Net Income to Company	0.79	5.1	11.7

Table 3: Microsoft Financials pre-IPO

opportunities. However, we believe the benefit of waiting outweighs the risks for most investors.

As the money within the private market continues to increase, businesses will likely stay private for longer and prioritise scale over profitability for longer.

2. Lessons from the economist: John Maynard Keynes

John Maynard Keynes was well known as an English economist whose ideas fundamentally changed the theory and practice of macroeconomics and the economic policies of governments. Keynesian economics, which argued for fiscal and monetary policies to influence aggregate demand in an economy, dominated economic thinking in many governments between the 1930s and 1970s. His second life as a classical opera

and dance supporter in the Royal Opera House was also well documented. From securing government funding to various art venues and establishing the Arts Council of Great Britain, historians kept track of his art interests. A less known fact about John Maynard Keynes was his investment life. It seems economists have tried to suppress the painful truth about over-relying on economic models in investing.

The economist turned value investor

King's College, Cambridge and the Provincial Insurance companies offered Keynes the opportunity to manage money. In 1924, he became the first bursar of the King's Chest fund and sold all properties to speculate in the stock market. His sound understanding of economic cycles spurred him into making investments based on currency and government data expectations. However, the great depression of 1929 was a turning point in his investment approach. He admitted the failings of economic modelling in investing and why long-term investors should instead focus on the fundamentals of a business. While the market continued falling, the new Maynard Keynes began buying stocks in American companies.

His manifesto in 1938 explained the philosophy behind his investing style, which are:

1. Careful selection of few investments priced below their intrinsic value
2. Steadfast holding through thick and thin
3. Balanced investment position with a variety of risks

His Chest fund later grew by 380%, while the UK Stock Market lost -15%.

John Maynard Keynes switch in investing provides great lessons for us. First, speculating and attempting to forecast interest rates, inflation data, and other economic indicators is difficult, even for the greatest economists. Yet, the majority of investors today still pick investments based on expectations of these unpredictable factors.

We believe it's essential to understand how different economic scenarios may affect its future earnings and growth capabilities. However, history has taught us that stocks shouldn't be bought based on economic predictions alone. This brings us to our next point.

3. Observe. Don’t Predict

Our study of great companies from Standard Oil to Walmart to Apple and Facebook brought great insights into which investment skills can drive returns. One skill that seemed to have been overlooked by the majority is the ability to observe.

10 years too late

Investing in quality companies that operate in industries humans need and can compound its growth over a prolonged period of time while earning a decent profit and return on capital has proved to be a winning formula for success in investing.

Similar Standard Oil, Walmart, Apple, Microsoft, Amazon, Alphabet and Facebook, operated in industries that moved from a want to a need. Crude oil's use dates back to ancient China, more than 2,000 years ago, but it wasn't until the industrial revolution did crude oil become a need for society as it powered manufacturing, heating and lighting and later cars.

Similarly, IBM had established computers as a niche for just businesses and scientific research, but Apple turned it into a need for each home from studying, designing, communicating, entertainment, among others. The internet brought new business models, and companies like Amazon, Facebook, and Alphabet created services that will become essential for our current society.

In the USA alone, Amazon has over 44% of its population as Amazon Prime members, Facebook has over 2.89 billion monthly active users worldwide, while Google has over 4 billion users worldwide of its search engine. The sheer size of the addressable market and value to society means they can continue to grow either by increasing users or achieving higher average revenue per user.

Investors like us will say we couldn't predict an e-commerce company or search engine ever happening. To make successful investments, you don't need to make predictions of how the future will look. The ability to observe society is superior to making predictions of the future. We explore four great companies an investor could have been 10 years too late in and still significantly earn outsized returns.

McDonald's

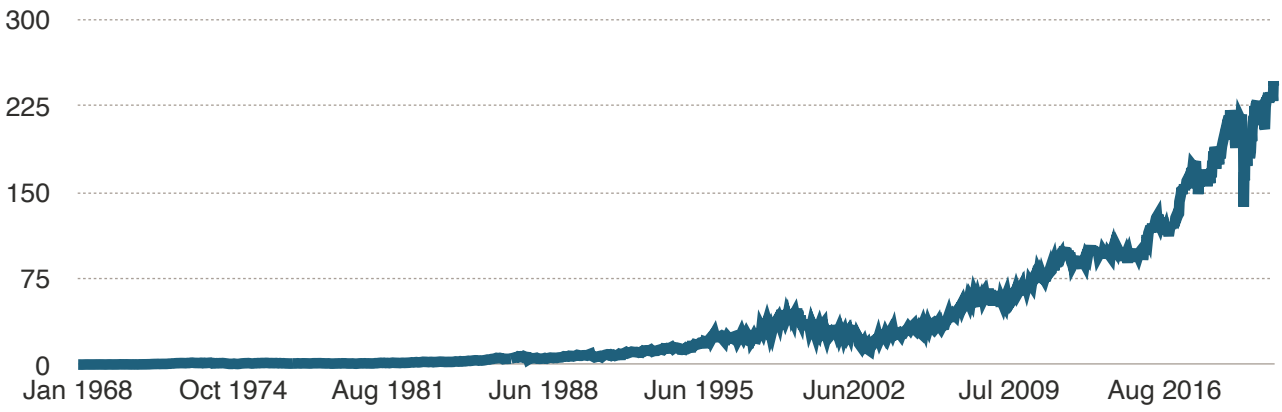

Chart 12: McDonald share price

Fast-foods started in the 1950s, and by the 1970s, there were already 60,000 fast-food outlets belonging to 315 nationwide chains and accounted for more than $20 billion in 1978. McDonald's went public in 1965 and assuming you were 10 years late and invested in 1975 for the share price of $0.73, it will return 33,080.63% over 45 years, a compounded rate of 14% per year.

Walmart

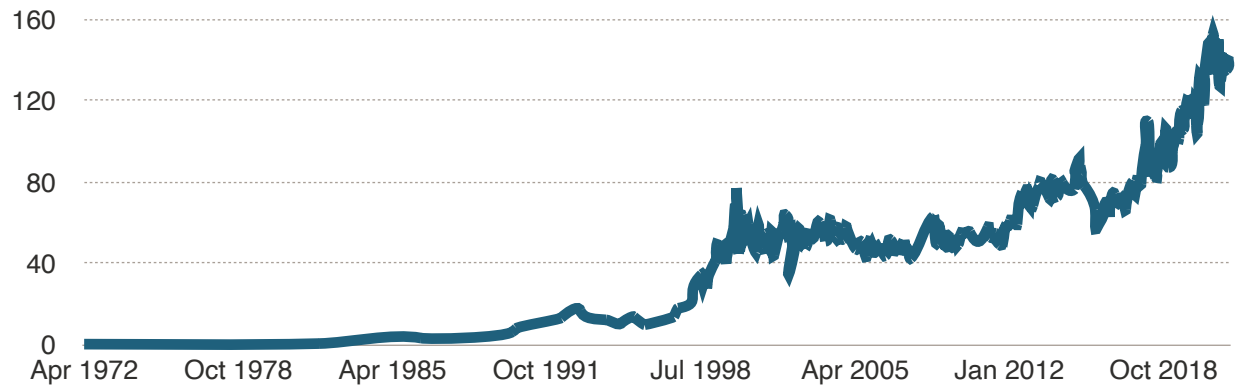

Chart 13: Walmart share price

Similar to McDonald's, Walmart operated in a market that transitioned from a niche to a necessity. The supermarket concept initially started in 1930 with the opening of King Kullen. By 1960, supermarkets were already selling 70% of the nation's groceries. Walmart was founded in 1962 and went public in 1970 with 38 stores. 10 years later, Walmart had 276 stores. Assuming you invested in 1980, Walmart would still have produced a total return of 108,834% over 40 years, a compounded rate of return of 19% per year.

Amazon

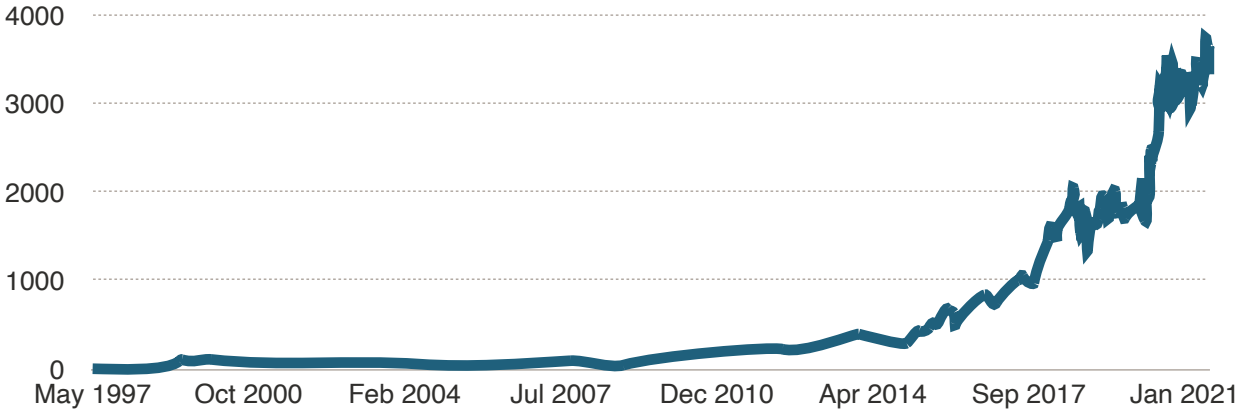

Chart 14: Amazon share price

In the wake of the internet age, Jeff Bezos realised he could build an e-commerce store online and set off to build Amazon in 1994. Amazon later went public in May 1997 and was very unprofitable. Assuming you stayed away and waited 10 years for Amazon to become profitable and invested in 2007, your investment would have returned 8,498% over the next 13 year period, a compounded rate of return of 41% per year.

Alphabet

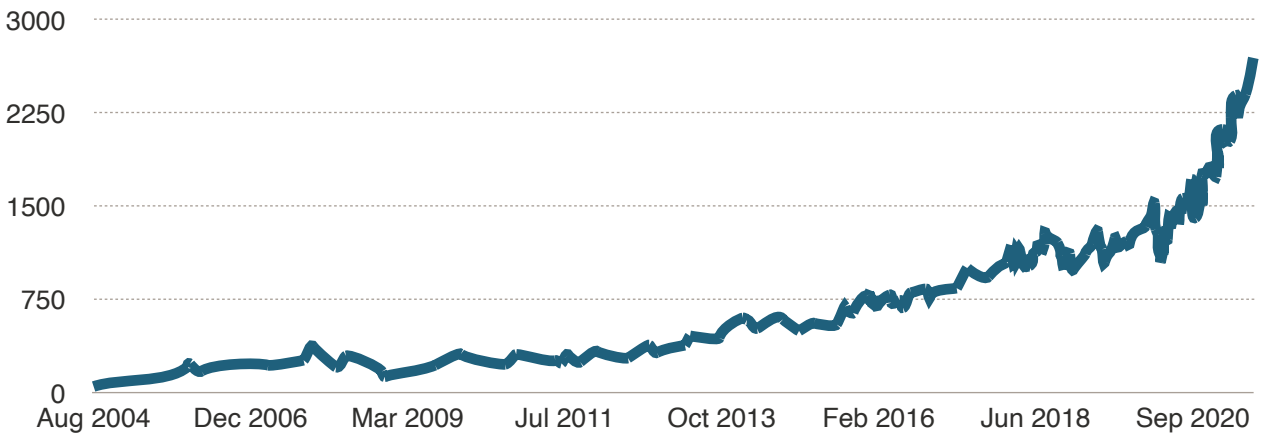

Chart 15: Alphabet share price

Google, the driving force of Alphabet was founded in 1998 by Larry Page and Sergey Brin during their PhD. Both believed the internet needed a search engine, and competitors like Yahoo, AOL and MSN had already been established. Google went public in 2004, and by this time, Google had 35% of the market share for searches done. Let's say you still hadn't figured why Google will be successful and waited 10 years post IPO and invested in 2014. An investment in Alphabet will return 384% over the next six years, a compounded rate of return of 29% per year.

This shows you don't have to predict how the world will be in the future, what investors need to prioritise is figuring out the things society needs and observe what people are using/need every day.

4. Invest in purpose, not technology

All four examples in our lesson above serve a purpose for civilisation. Both Walmart and McDonald's help us eat, while Amazon and Google serve several purposes from discovering, learning, trading items and even entertainment. The mistake we growth investors make is we focus on the technology rather than purpose. Technologies change, and as we mentioned in the transition from the industrial revolution to the age of computing and information, many business models disappeared. More powerful flash

drives and hard drives replaced floppy disks and CD's, and now cloud computing is disrupting the relevance of flash drives for consumers.

Kodak once had a market share of more than 25% in photographic film but began struggling, and the emergence of the digital camera and phones with cameras like Apple forced it into bankruptcy in 2012.

Technologies change, but purposes don't. Civilisation has directed us towards tools that make achieving a purpose more comfortable, faster, efficient or cheaper to access. With the emergence of new technologies like Web 3.0, further advancements in artificial intelligence or blockchain, tools or services we currently use may become extinct. However, humans will always need to eat or seek entertainment. Today, Walmart may still be the first choice for the majority to buy groceries, but it's possible that the emergence of food delivery, meal kits, and improvements in e-commerce could further dent its market share and growth.

Investing with a specific technology dampens an investors creativity but investing in purpose allows one to consider a broader range of outcomes, and thus, investment winners.

5. Invest Long-term, but don’t forget the thesis

As we've identified in lessons 2-4, the stock market benefits those willing to focus on the fundamentals of what drives a business, think long-term, and avoid short-term profit-taking and market timing.

Between 1994 and 2021, Amazon never had y-o-y revenue growth of less than 14%. Even though growth fluctuated over various quarters, its customer service delivery never got slower; they never reduced the offerings for customers and members. Yet, its share price fell by more than 20% in a quarter, approximately 30 times!

If you purchased Amazon's stock with a stop-loss set at 20%, you'd probably have never bought Amazon after its fifth 20% drop. A long-term horizon of at least a 3-5 year period is vital to achieving outsized returns as a stock picker. What makes an excellent long-term investment?

1. Good business economics
2. Competitive advantages relative to peers
3. A good management team
4. A sensible price for its future earnings

For point 4, the higher the growth, operating margin and moat, the higher the relative valuation multiple you can pay for a business. You could have paid 100x revenue for

Amazon in 1997, and by 2003, six years later, that will be valued at 2.7x its revenue. The power of growth!

By focusing on the growth and quality of the future earnings of a business, investors can gain an edge in the market.

Short-termism may be one of civilisations greatest threats going forward. Humans have historically struggled with assessing the long-term impact of things. According to research at Princeton, the brain has two areas, one associated with our emotions, while the other with abstract reasoning. In the market, the former tends to outweigh the latter.

So when do you sell?

The difficulty long-term investors face is when to sell. We have no perfect answer to this. Each of the companies we assessed experienced periods of operational underperformance. This was between 2009 and 2016 for Microsoft when it struggled during the Steve Ballmer era. For Apple, this was during the 90s when both founders left. Investing requires you to also watch your companies once in a while.

We've so far concluded that long-term investors can also sell an investment when:

1. The story changes. A growth company stops growing, a high margin business stops earning high margins, or an industry becomes less relevant to society
2. A competitor performs its purpose better
3. A better investment case is found elsewhere

We call this the “buy-and-hold-but-sell-when-story-changes” investment approach.

6. Innovation and growth aren’t all that matters

Our next lesson slightly contradicts what we highlighted in the lesson above. While growth in earnings and revenue is a key element for the long-term investment, this isn't all that's required. We introduce three types of growth history shows we should stay away from.

Expensive Growth - Radio Corporation of America (R.C.A.)

To explain what we mean by expensive growth, we'll have to go back to the 1920s.

R.C.A. was one of the hot stocks of the 1920s. It was initially a patent trust owned by General Electric and was at the forefront of the growing radio industry in the early 1920s as a major manufacturer of radio receivers. There were many reasons to be excited about a company at the forefront of radios in the early 20th century. Between 1923 and 1930,

60% of American families purchased radios. Televisions weren't yet founded, and many would gather around their radios for news and nighttime entertainment. By 1927, advertising was introduced in radios, and this made the radio necessary for mass marketing.

The 1920s was also a frenzy period in the market, and market participants got too excited about the prospects of RCA.

"If you had to pick one stock to buy in 1921, it would have been R.C.A. - Robert Sobel, a historian on the stock market.

By 1929, R.C.A. had appreciated to a PE ratio of 60x, despite only having an annual percentage change in earnings per share of 16.2%. Its stock price rallied from $11 per share in 1927 to $115 in 1929. Over the following months, the stock fell by 97%. Every company has a price, but when the stock price appreciation is out of touch with the actual earnings growth, history shows investors pay an expensive price for expensive investments.

Fraudulent growth - Wirecard AG

The stock market has seen many fraudulent companies over its time. Most have been shell companies or those promising a future cutting edge technology or mines that will produce millions of gold. We've also seen those like Enron, Lehman Brothers and Wirecard that seemed like good investments.

Quantitatively, Wirecard looked like an exciting growth business in the innovative payments industry as a payment processor and offered risk management services. It maintained a revenue growth of over 25% over many years and earned an operating profit margin of around 20-24% in the last final years.

However, various allegations of accounting malpractices and international financial scandals were reported about the company in 2019, but many ignored them. A deeper study into Wirecard showed it had lots of red flags. Its accounting had been called into question in 2008, 2015 and 2016. In its last decade, it has purchased over 20 companies worth €1.3 billion, debt grew significantly, and the inconsistencies between the financials of companies it claimed to be in business with were increasing.

It was only until June 2020 Wirecard admitted €1.9 billion was missing, and the inevitable happened, Wirecard fell to zero. Growth on paper may be nice, however, it must be real. One can only verify this with a deeper analysis of a company's product, management, and accounting numbers and practices.

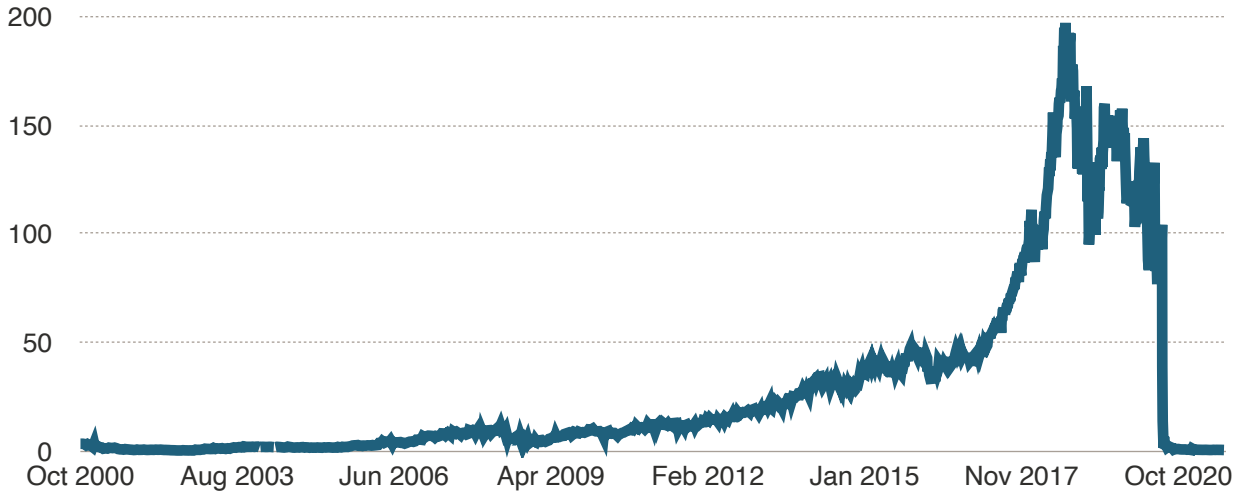

Chart 16: Wirecard goes to zero

Unsustainable growth - General Electric

Growth can sometimes be unsustainable, and we tend to find unsustainable growth among companies that rely heavily on acquisitions for growth.

While General Electric was one of the pioneers of the industrial revolution, it also had unsustainable growth in the 1990s and early 2000s. Jack Welch, nicknamed 'Neutron Jack', powered GE via many acquisitions ranging from financial services to industrial and communication services like NBC. By the late 90s, 40% of its profits came from financial services, far from its initial electrical energy focus. Its revenue had more than doubled between 1990 and 2000 while operating income tripled during the period. The market initially rewarded GE with higher P/E multiples but the difficulties of running such an acquisitive strategy began to show in the culture, managerial mistakes and financial numbers. Debt/capital increased and reached a peak of 80.2% (Chart 18), acquisitions began to underperform initial expectations, and GE continued to overpay for acquisitions. During the 2000s decade, its shares fell by approximately -70%.

For investors, the growth must be (1) undervalued, (2) real, and (3) sustainable for one to gain any future compounding rewards.

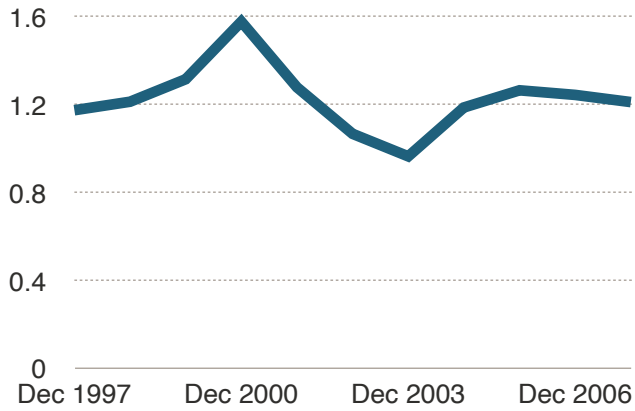

Chart 17: General Electric Altman Z-Score

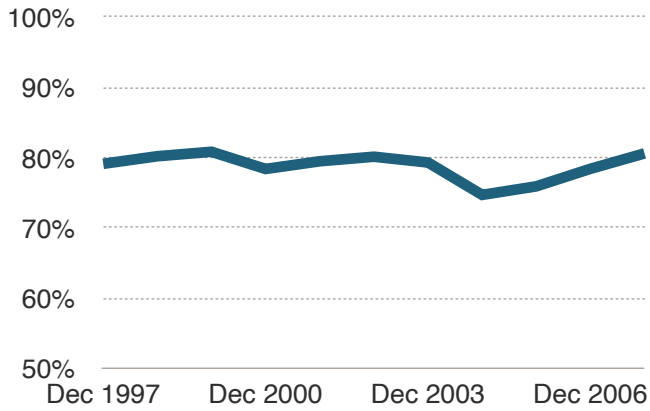

Chart 18: General Electric Debt over Capital

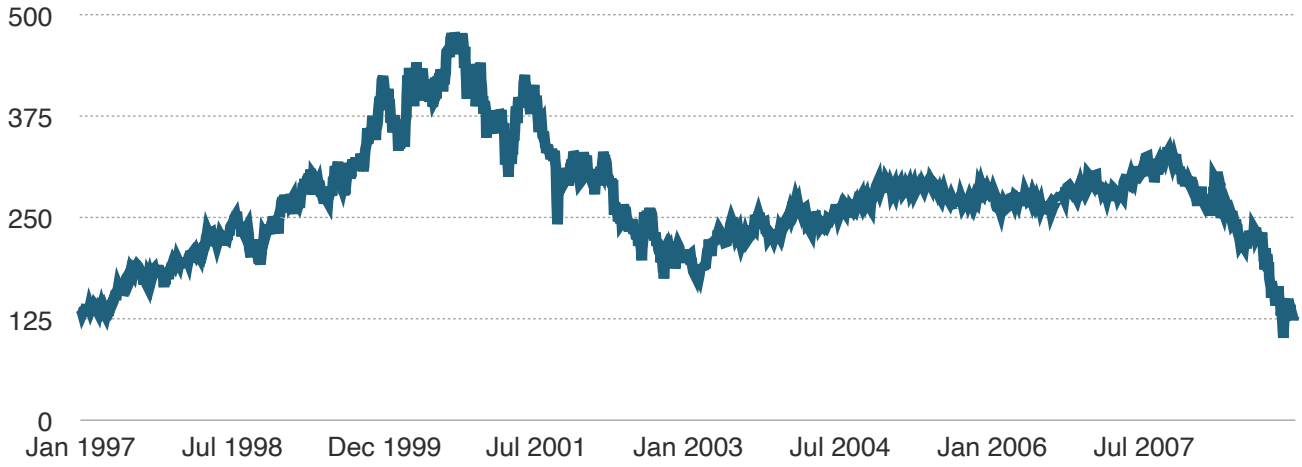

Chart 19: General Electric Share price

7. Surviving the test of time

Fundamental investing requires investors to make a judgement about a company's future earnings and cash flow. Two businesses may have similar predictions in future earnings and price, but one may be a superior investment over the other. This is due to its ability to weather unforeseen circumstances. For example, a cyclical business is typically more prone to sector headwinds than those in non-cyclical or defensive industries. This often leaves cyclical businesses at lower multiples versus compounders. In another scenario, a company may have survived the hands of bad management, intense competition, secular shifts and trends and still managed to grow its earnings. We like these businesses and will pay a higher price for them.

This group of companies that have survived the test of time tend to make more favourable long-term stocks for those trying to protect potential losses of capital. We use the 40-year mark and 4 different management teams as the benchmark for a company that's survived the test of time (4/40 rule). In the consumer space, Ferrari, Coca-Cola, L'Oréal, Nestlé S.A., Hermès are examples of businesses that have survived the test of time and are still continuously grown their earnings. In the industrial sector, Caterpillar Inc, The Boeing Company, Canadian Pacific Railway, Rockwell Automation, Lockheed Martin and Rational Aktiengesellschaft have survived the test of time. In the technology sector, there are fewer examples, but Apple, Microsoft, Motorola, Texas Instruments and Visa Inc. fit our description.

Not all have gone through terrible management team periods. L'Oréal, for example, has had only 6 CEOs in its 111-year heritage. However, it has faced several moments of controversy and competition from peers during this period but still maintained its market leadership position. Apple went through a difficult 15 year period between 1985 and 2000 and still managed to revitalise the Apple brand with the return of Steve Jobs.

In industrials, Caterpillar also once came close to bankruptcy in the early 1980s, losing $1 million per day due to the sharp economic downturn and Komatsu, a Japanese rival increasing their product offerings. The embargo against the Soviet Union further worsened its situation. However, the culture change and reduction in its hierarchical structure and improvement in incentives across its global arms saw the company rebound well and has now gone about 28 years without making a loss, despite operating in a highly cyclical industry.

These businesses that have proved to be resilient deserve a slight premium when valuing them relative to newer peers that haven't proved their ability to go through economic shocks and bad management teams.

8. The old economy gets enabled

Image 23: Ferrari

Image 24: Caterpillar

Image 25: Coca-cola

Image 26: Canadian Pacific Railway

When we think about technological change, we immediately think about high-tech sectors like enterprise software, consumer technology, biotech or semiconductors. Investors often overlook the ability of old-economy business models to reinvent their processes and capabilities with new offerings technological advancements bring. If we look back to the industrial age, agriculture also got 'enabled' by technological developments.

Improvements in the chemical processes meant scientists could explore more chemical compounds, and the chemist's Carl Bosch and Fritz Haber in Germany created the Haber process, which allowed ammonia to be manufactured at scale. Ammonia was important for crops because fertilisers significantly improved the yield of crops. This, coupled with the benefits of a faster railroad system and crop machinery, will make the agricultural industry see more change than it did in the previous 13,000 years. Similarly, we see changes in the old economy sectors as new technologies emerge. We examine how technology has enabled new ways of delivering value and thus profit growth in the three old-economy sectors.

Construction

From the mines to plants and the construction sites, companies within the construction chain have found ways to use technology to either drive lower costs or reach more clients and improve revenues. McKinsey predicts the average cement plant can reduce a further $4 to $9 per ton of cement by pursuing digitalisation and sustainability levers. From using advanced analytics to digital twins, factories can simulate and optimise various processes while also improving the cost of maintenance. Dangote Cement, Africa's largest cement producer worth $10 billion, has achieved a decade CAGR of 20% revenue and maintained an operating margin of at least 30% over the last ten years by leveraging increased automation of its machinery.

Caterpillar has been using high-tech industrial automation solutions since the 1980s in the welding of large structures at the core of its machines. It's also benefitted from the advancements in simulation technology from virtual vibration tests to examine the durability of machines and other stress analysis. The group recently earned its highest operating profit margin of 15% in 2018 and 2019 due to its volume and product quality in the industrial machinery sector.

Fashion

The fashion industry is one of the old economy industries that's significantly taken advantage of what technology has to offer. From a revenue lens, fashion houses and brands reach a broader range of customers via advertising on the internet and selling products on e-commerce sites like Tmall and Farfetch. Brands can track new trends and customer feedback much faster via social media analytics and respond more swiftly than they ever could. From a costs lens, while brick-and-mortar is still relevant, its importance for retailers and fashion groups have diminished over time.

Companies like boohoo developed brands without opening a retail store. For those with stores, technology has made the store experience more seamless and efficient. Beauty companies like L'Oréal recently introduced augmented reality to allow its millions of buyers to discover new products while in stores. More than 100+ years after being

founded, L'Oréal recently earned its all-time high operating profit margin of 19% and double-digit revenue growth in 2019.

Hospitality

In the modern sense, the hotel industry actually dates back to the 18th century in western Europe and North America. More luxurious chains started towards the end of the 19th century, such as the Savoy Hotel in London and the Ritz chain of hotels in Paris. More than two centuries later, Marriott International and Hilton Worldwide continue to lead the hotel industry.

Despite being a capital-heavy business that's exposed to economic shocks, Marriott has compounded its share price at about 10% per year over the last 20 years, outpacing the broader S&P 500 return of 7% per year and the S&P 500 Information Technology index. Marriott has embraced technological change across all operations, from strengthening its brand loyalty via the Marriott Bonvoy to improving staff quality. The loyalty app makes hotel booking and check-in easier across its portfolio of over 6,700 hotels. Guests can use a mobile key to enter hotel rooms and chat with representatives via chatbots during their stay. The Alexa for hospitality also allows guests to access a range of services at minimal costs for Marriott.

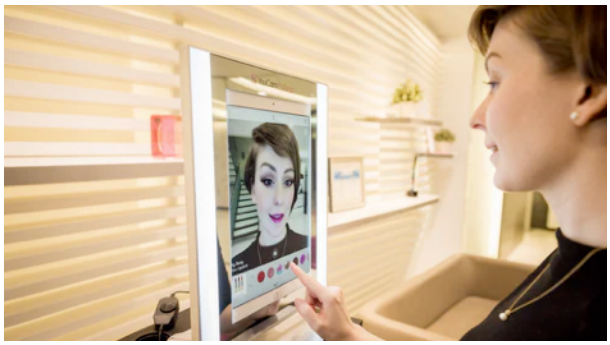

Image 27: Augmented reality in a beauty store

Image 28: A loyalty card

There are many more examples of old-economy industries using technology to broaden their offerings and deepen their competitive advantages over rivals. It's vital that investors also consider these industries and opportunities when available for cheap. While we like growth compounders, we also see immense value in turnaround and cyclical opportunities too.

As F Scott Fitzgerald famously said, "The test of first-rate intelligence is the reality to hold two opposed ideas in the mind at the same time, and still retain the ability to function."

9. Optimists are rewarded, Pessimists look smart

If our study of the stock market has taught us anything, it's two facts:
1. Never bet against America
2. Opportunities are born even during crisis

When researching the stock market history, you are more likely to see articles about bear markets and recessions than those about bull markets. On goodreads.com, there are over 1,200 books written about the 1930s great depression and over 300 books on the 2008 financial crisis. Historical stock market blogs typically highlight market crashes but don't explore investing in the bullish years. If we assess the statistics, there's only been one decade the Dow Jones Industrial Average earned a negative return, and that was during the 1930s with a loss of -0.63%.

Between 1985 and 1999, it only experienced one down year and returned double-digits for 11 out of the 14 years. Overall the DJIA has annualised 9.8%, assuming dividends were reinvested.

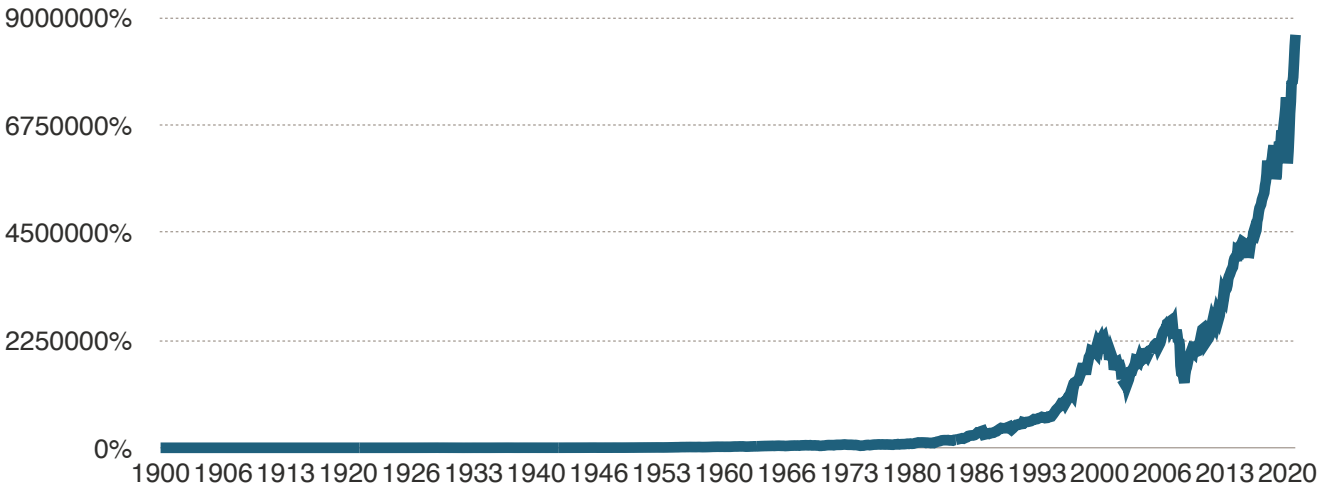

Chart 20: Dow Jones between 1900-2019

So why do investors today spend so much time focusing on the downside and the forever coming 'next year market crash' despite history and market statistics being widely against them?

The USA has gone through two world wars, 24 economic recessions, several terrorist attacks, three severe pandemics and two presidents assassinated while in power since 1900, however, the American economy and stock market have exponentially grown with its GDP up 34-fold during the last 120 years.

Without derivatives, the maximum you can lose is 100%, while the maximum you can gain is infinity. Yet, a considerable amount of talent goes into betting against America by shorting the market every year. Our analysis of the overall American stock market has shown that those who are optimistic about the market have been rewarded more over time. The rewards are also more when coming out of a crisis. In contrast, those who have spent a considerable amount of time betting against the market have looked smart.

10. The stock market has changed

In the 1900s, the stock market was mainly controlled by few families, companies reported less data on risks and financial performance and was also less frequent. The lack of the internet and other communication devices meant information and news spread slower. The private markets were also much smaller, which meant companies had to go public earlier to access larger capital pools.

Today, most of these features have changed. The internet allows you to access stock research and reports in seconds, company prospectuses and annual reports are now several hundreds of pages filled with boilerplate statements on risks, the abundance of cash in the private markets keep companies private for longer, and many more participants ranging from insurance funds, private equity, passive funds & ETFs, and an army of retail investors are present. The average holding period for stocks in the 1930s was eight years, but today, it's fallen to less than a year, and it's estimated by Mordor Intelligence algorithm trading represents about 65% of total trades in the market. Chart 20 and 21 show how the industry weighting changed between 1900 and 2019. Rail was once a giant 38% of the overall market but now represents 2%. Industries like Information Technology and Health Care hadn't appeared as industry categories but now represent more than 20% of the overall weighting.

The big question now for most investors is will we see bargains on the market?

Institutions will continue to be forced sellers due to daily redemptions and ETF rebalancing. The human nature of acting on emotions will leave stocks oversold when quarterly earnings estimates are missed stocks. The inability for most to make long-term investments in the market will mean great businesses at wonderful prices will continue to be available for the longer-term holders. Stocks will continue to be sold off upon bad news because one will assume the next person is selling too. Many will use CAPM to price stocks and thus undervalue quality management teams, strong competitive advantages and future growth. If there’s anything history has taught us, the market will always present bargains for investors.

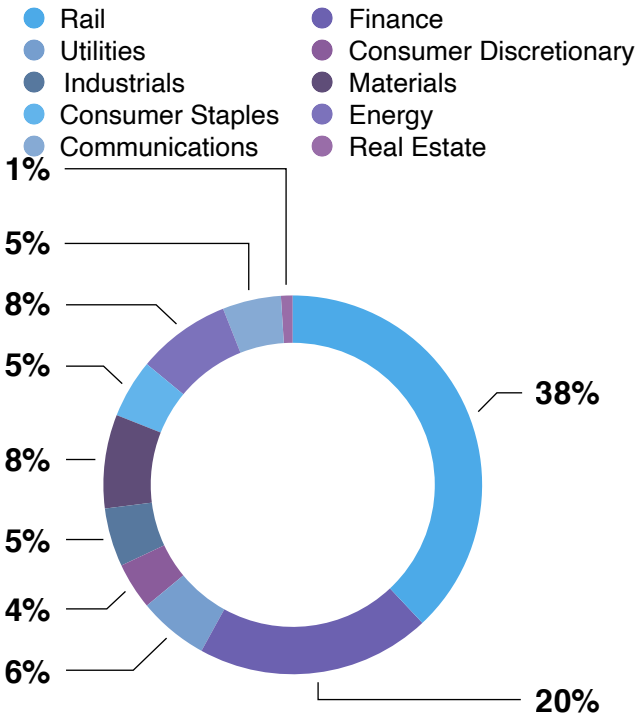

Chart 21: US Market Industry weighting in 1900

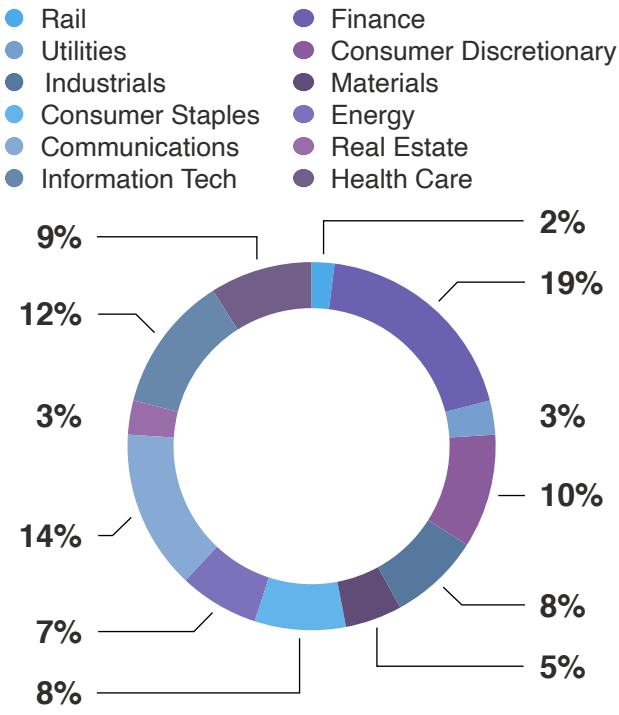

Chart 22: US Market Industry weighting in 2019

Investing in the future

We titled our report investing in the past, but we really meant finding clues from the past to guide our future investments—history matters for investors. New technologies are created, it goes through years of improvements until it has a purpose for society. These then expand into businesses and transform how we function as a society. The emergence of steel created an increasing return of scale. Similarly, computing brought faster and more efficiency to society. Over time, companies found ways to build a product, improve the delivery of service and increase the perception of its brand, which allowed them to gain increasing returns to scale.

On the other hand, many business models became extinct. Some were accelerated by the complacency of management and the lack of barriers to entry. The stock markets responded to these trends. Over the last 120 years, the Dow Jones compounded roughly 10% per year despite the many corporate failures, 26 recessions, world wars and unforeseen occurrences.

Investing is about the future. What do all these mean for us? Will investing become an art or science? Will the rise of algorithms remove the efficiencies in markets? Will corporate

earnings continue to grow? Will we have future boom and bust cycles? Do stock pickers become less relevant over time? Should investment professionals ignore China's growth?

The answers are all hidden in the clues history provides.