

# MORE

The 10,000 year rise of the world economy

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The world economy involves the mixture of big and small on a daily basis.

Around 90 % of the world trade is carried by ship. Humans have been trading for thousands of years, trading is different from sharing.

Trade requires the conscious recognition of a mutually beneficial exchange. You have something I want, I have something you want.

At the global level, trade occurs because resources are unevenly distributed.

Early trade may have started as mutual gift giving, as still occurs in a modern society when we celebrate each other's birthdays, or bring wine when invited for dinner.

The global economy has been formed by the complex interplay of competition, government intervention, consumer preferences and the distribution of natural resources.

Modern political debate all too often descends into a sterile debate along the lines of 'capitalism is evil' and 'government interference is wrong'. Successful countries have always benefitted from a thriving private sector that uses the infrastructure the government provides.

In 1800, no country in the world had a life expectancy of higher than 40, now the world average is around 70.

Economic change can also lead to environmental destruction. This is not simply the result of 'capitalism' a word that tends to be used in a very slippery fashion.

Economic growth comes from getting more from the same worker or reorganizing production, processes.

Specialization – dividing work into tasks with individual workers focusing on each one is often the key to productivity improvement. It was one of the insights of Adam Smith's book – The wealth of nations.

17 th century Britain was short of coal, that encouraged the use of coal, which needed to be dug from deep mines. Pumping water out of mines became a priority, leading to the development of the steam engine, steam engines in turn, were put on rails as a form of locomotion.

We have moved from the iron age to the information age, it has not been a smooth progression.

Economic power is shifting away from Europe and North America , where it resided for the last 300 years and back to Asia. This is a return to normal in some ways since the middle east, the Indian ocean and the south china sea were for a long time the heart of the global trading system.

Stones and tools are some of the best clues we have to economic life for much of human history. Early humans were hunter gatherers and left no written records.

The most important technological innovation of all time has been the ability to harness fire. Fire allowed human beings to cook, cooked food is a lot easier to digest and cooked food is easier to digest. This innovation meant that our guts shrank and our brains expanded.

The first great change in economic activity came with the move from hunter gathering to full time agriculture.

As people moved from one area to another, by land or by sea, they took their seeds and livestock with them , spreading agriculture as they went.

The first written name in history is kushim,  
who inscribed his name on Sumerian tablets.

As cities became more complex, they developed more rules, the code of Hammurabi, a Babylonian king was the start. The code contains 282 laws, the concept of judicial fairness legal liability etc.

After 750 BCE , the golden era of ancient Greek began. Its hold on modern imagination remains strong with the words they gave us- democracy, phobia, economics

The use of precious metals as money was a significant economic development. Each coin had the symbol of the monarch or a symbol associated with the state – to give people the confidence that it was genuine and also to reassert the power of the monarch.

The romans were amazing builders and engineers, their roads were not equaled in Europe till the 18 th and 19 th centuries. They invented a form of concrete and used it to build arches far greater than any civilization had previously achieved.

There was a form of Universal basic income in 58 BCE when corn was distributed to every citizen irrespective of income level.

Roman craftsmen started the concept of guilds like corpora and collegia and are credited with starting the fashion for brand names. Factory built lamps with brands like fortis and strobili stamped on their bases have been found in northern Italy.

It is always wrong to confuse the welfare of the people with the welfare of the elite.

Per capita incomes in roman conquered areas went up by 50 % in two centuries, house sizes went up, food consumption and human height increased.

As recently as 1950, farming employed two thirds of the global workforce. If the proportion of workforce employed in agriculture is less than 20 % , then it is a developed country.

There have been five types of land ownership:  
1. land held in common, 2. land owned by the monarch and nobles and to be farmed by peasants, 3. land rented from larger landlords in return for cash or crop, 4. ownership by individual farmers and 5, land is owned by large agricultural companies.

The world has 250,000 plant species, of which 50,000 are edible, and humans regularly eat 250.

As humans travelled around the world, they took their plants and animals with them with devastating effects on the flora and fauna.

New fertilizers and the addition of more cultivated land were two of the four big factors in agriculture's 20th century success. A third reason was mechanization – tractors, harvesters. Harvesters were more efficient than horsepower and also freed up the quarter of arable land that was earmarked for feeding horses.

The fourth development was the creation of new seed varieties. In 1942, Norman Borlaug, a Mexican scientist tested various strains of wheat. By 1954, Mexico was raising 14 times more wheat and by 1964, it had become a net exporter of wheat.

Mr. Borlaug then headed to Asia and tried to convince the Indian and Pakistan governments of this wheat seed variety. The governments were suspicious of his motive but some disastrous harvests and loss of American aid forced them to adopt Mr. Borlaug's seeds and India became self sufficient by 1974. He also convinced Ashok Mehta, the deputy Pm to increase fertilizer production.

Mr. Borlaug received the Nobel peace prize and the congressional medal of honor, a combination reserved for Martin Luther king and nelson Mandela. It is estimated that 2 billion people had food thanks to his work.

Agriculture cannot afford to stand still. There will be another billion people on the planet by 2035 and another 100 mln tons of rice will be needed to feed them, that is 30 % more than current levels. This would mean that rice yields have to move up to 1.2 to 1.5 5 per year, which is double that of current rate.

Global warming may reduce crop yields by 3.1 to 7.4 % for each degree rise in temperature.

Population had a ripple effect. As one tribe moved into the area of the other tribe, there would be a fight. Persia built a 125 mile wall (!!!) to keep the invaders at bay and Rome helped to finance it. It was a sandcastle against the advancing tide.

India enjoyed a golden age under the Gupta regime, which ruled much of India in the fourth to sixth centuries. The Gupta empire controlled quality, prices and training regimes for certain occupations. It was during this period that Indian mathematicians developed zero which Arab traders later picked up and in Europe it was referred to as Arabic numerals.

Silk was a significant part of trade, Chinese soldiers were paid in rolls of silk and that was very useful on their travels.

The Arabs levied taxes on land and on non Muslims, an approach that encouraged conversion.

Another Italian financial innovation was public debt. Rich Venice citizens were compelled to make loans to the city for a 5 % return.

The next innovation in trade was the trade fairs developed in champagne in the 12th century. Merchants paid a toll and fees to exhibit and these fairs lasted two months.

In early 15 th century, Chinese had ship building technology that was way ahead of everyone else. However by 1500, Chinese turned on themselves and put a death penalty on anyone who built a ship with more than two masts and coastal authorities were ordered to destroy ocean going ships.

It is hard to state the importance of energy in development. Between 1500 and 2000, the real cost of energy use fell dramatically, without this benefit we cannot power the machines that run our households.

Humans and energy have four main tasks : to provide heat, to generate light, to power machines and for transport.

The key measure is energy return on investment EROI, which is the energy delivered by a particular fuel to society and the energy expended to capture that energy.

Use of coal which started in England was key to moving from wood as a source of energy, it also meant that fewer trees would be cut down. Coal also gave rise to another movement – the trade union movement – since conditions in coal mines were poor, the workers organized themselves into trade union movement.

Electricity was a general purpose technology in that it made many new devices and activities possible. our houses became full of gadgets, skyscrapers became possible.

The shift to oil happened in the 20 th century. The dependence on oil made the British to secure a determined supply source. A new company Burmah was created to take over a concession in Persia. This eventually became BP.

Before the second world war, the Middle east produced 5 % of the world's oil, by 1959 it was 25 % and by 1970 it was 30 %.

As of 2015, 32 % of the world's energy came from Oil, 28 % from coal and 22 % from gas. We take electricity for granted in the western world, but even in 2016, only 88 % of the world had access to electricity.

The period around 1500 was marked by European exploration and also by the renaissance, a flowering of art, architecture and philosophy.

The original holidays were holy days. England abolished 49 holy days in 1536 and over the next two centuries Netherlands, France and Austria did the same. The practice of taking 'saint Monday' off to recover from the excesses of the weekend also declined.

When the British left India, India had a life expectancy of 27 years, a literacy rate of 16 % and 90 % of the population was living below the poverty line.

Asia is the hub of modern manufacturing. Between 2000 and 2015, Asia's share of value added in global manufacturing rose from 35.1% to 47.5%. China moved from 6.5% to 23.6% in the same period. The Us share of value added fell from 25.1% to 17.7% and Europe dropped from 12.1% to 9.25%

In the 1880s, 20 % of all deaths in Pittsburgh were from steel mills. Small wonder that these big plants had very turbulent industrial relations.

Today more than half the global workers have a job in services, up from 33.7 % in 1991. The number of lines in a software code for a high performance car jumped from 10 mln in 2010 to 150 mln in 2016. In contrast the Boeing 787 aircraft has just 6.5 mln lines of code.

China has 131 people per 1000 owning cars compared to 850 in the US.

Deloitte has suggested that 510 million people will be added to the middle class between 2015 and 2025, so global manufacturers will have plenty of demand in the years ahead.

In modern manufacturing, designs and brands are usually created in the rich nations and manufacturing in the developing countries,. This creates high profits for western manufacturers and low prices for consumers.

Ronald Reagan famously said that the 9 scariest words were " I'm from the government and am here to help"  
Ian Morris says that the ten scariest words are " there is no government and I'm here to kill you"

In world war 1, 19 million people died, in world war 2, 60 million people died. In this period, leaders rejected globalization in favor of localization, exports were 14 % of global GDP in 1913, just under 12 % in 1929 and dropped to 5 % in 1935. This did not revive to pre depression levels till 1974.

Governments needed to spend more after every war, and role of government increases after every war.

After the war, there was a move to the gold standard. This came with its problems Britain, France and Germany had half the levels of reserve gold from the pre war days and the US had three times as much gold reserves as all three of them out together.

In the gold standard system maintaining the exchange rate took precedence over the health of the economy. Britain raised rates followed by Germany.

The depression was just not about the stock market collapse as much as increasing nationalism. The Us increased tariff rates on imports from 35.65 % to 41.4 %. The increase seems small but in a falling price context, the effective rate became 59 %

600 US banks went bankrupt in the last two months of 1930. a run on a bank in a crisis becomes self fulfilling, the more the run, the more the chances that the bank will collapse.

On September 19, 1931, Britain abandoned the gold standard. At one stage 47 countries were on the post war gold standard, at the end of 1932, only 7 were still with it.

1000 US banks closed every year from 1930 to 1933.

After world war 2, all the factories making armaments shifted to domestic goods. The first refrigerator was sold for \$ 900 in 1916, costlier than the Ford Model T car. New materials were created, Du Pont produced nylon stockings in 1939 and the first 4 million pairs were sold in 48 hours.

The time taken to produce a ship in California dropped from 355 days to 12 days, the advancement of technology and engineering was phenomenal.

The next big shift was railways, railways sucked up a lot of investment in America and Britain. Trains changed our concept of time. Passenger railways needed a time table to work and the British parliament passed the Time act of 1880. before this many cities in Britain had different times, varying by about 10 minutes!

London opened the world's first underground railway in 1863, the next one was Budapest in 1896.

The next big transport innovation was the car. Initially it was for the rich till Henry Ford started the Model T.

Henry Ford wrote in 1920 that Jews were the worlds foremost problem. As late as 1939, henry ford sent a cheque of \$50,000 to Adolf Hitler for his birthday.

I think there is something about being a pioneer in a fast expanding industry that creates delusions of grandeur.

Henry Fords first car business failed, he was sacked from the second ( which became Cadillac motor company) and then the third was Model T.

Cars created a whole new eco system, gas stations, drive in, fast food joints, motels etc. Most important cars needed roads. A young Lt Colonel Eisenhower took 62 days to go coast to coast. When he became president in 1953, he pushed for 46,000 miles of roads which he paid through a fuel tax.

Building more roads creates a bigger problem – traffic jams. Every increase in road space creates more traffic, this is called the ‘tragedy of the commons’. Drivers in the world’s largest cities lose \$ 1000 a year by being stuck in traffic jams.

In the 1950s, a business man called Malcolm Mc lean introduced an innovation that changed the global supply chain forever – the container. He standardized it so that his company could be more efficient. He started the TEU – the twenty foot equivalent, and then modern boxes went to 40 foot long.

Without computerization, it would be impossible to have a global supply chain, lower costs and lower inventories.

The next big transport innovation was the flight. In 1903, the Orville brothers flight travelled 37 meters in the air. Almost five years went by before a plane could fly one kilometer. By 1930, the DC 21 was large enough to take 21 passengers. Shirley temple , the Hollywood child star was the first passenger to buy a sleeping ticket on a flight.

In the early years of flying, flying was for the rich and people dressed up to take a flight. The ability to travel the Atlantic in one stop destroyed the ocean liner business. In 2000 10.5 million Chinese travelled abroad, by 2017, that was 145 million.

The combination of car, truck, plane and container ship means that the ordinary person can live farther from work, travel further for a holiday and buy goods from further away than ever before.

After World War 2 we saw the creation of the IMF and the World bank. A tradition developed so that the World bank was run by and American and the IMF by a European.

All currency systems are subject to a trilemma, in which countries can choose two options but not all three. The three options are a fixed exchange rate, an independent monetary policy and free capital movement.

The Marshall plan lent Europe \$13 billion between 1948 and 1952 to finance trade deficits, this was 5 % of US GDP, the Europeans used that to buy American goods.

Alfred Muller Armack coined the expression 'social market economy' for a structure that is midway between socialism and a laissez-faire economy. This attempted to balance the aims of economic efficiency and income redistribution. Welfare programs are a key part of this program.

Thomas Piketty argues that when return on capital employed is more than GDP growth, then the rich( who own most of the capital) get all the benefits.

Taxes remained high after the war. US highest tax rate was 91 % in 1962, Britain in the late 70s was 83%. Rich people did everything to avoid taxes. The Rolling stones fled to France to record Exile on Main street.

No one could have predicted the success of the south Korean and the Taiwan economic model. South Korea had the following elements – outward looking focus, partnership between government and industry and a well educated workforce.

The collapse of the Bretton Woods system was a watershed for the global economy. Gold and silver had played a monetary role for thousands of years. Paper currency was a claim on those reserves.

This collapse led to an increase in inflation. US inflation in 1980 was 13,5 %, in Britain it was 22.7 % in 1975, in Japan it was 23 % in 1974.

Rather than tighten fiscal or monetary policy , many governments opted for voluntary freeze on wages and prices.

The combination of a weak economy and higher prices led to stagflation.

The 1960s saw student unrest, the assassination of the Kennedy brothers and Martin Luther King. This was a time when 'equality' was lower than at any point in history, but the world saw 'rights' politics.

People worried about clean air, Britain passed the Clean air act, the Club of Rome published a book on the limits to growth etc.

Central banks are accused for keeping monetary conditions too tight , leading to misery, for bailing out banks that go astray or pumping up asset prices and boosting the wealth of the rich. In a sense this criticism reflects an underlying problem – governments have asked central banks to pursue several goals at once.

In 1913, 40 % of US banknotes in issue had to be backed by gold, which means that 60 % of the notes were not guaranteed by gold. What was the sanctity of 40 % , why not 20 % or 5 %?

In the end it was the faith in the central bank that was important for the acceptability of the currency.

Playing the role of lender of last resort opens central banks up to criticism from both sides. Central banks should be able to distinguish between banks that have a liquidity problem and those that have a solvency problem. All banks can run into liquidity problems.

After the failed effort of monetarism, economists argued that the key to fighting inflation was 'credibility' consumers and business should have confidence that the central bank could deliver low inflation. Credibility required making central banks more independent, that started in New Zealand in 1989, and Britain, Japan followed suit. The central bank was given an inflation target and asked to get on with it.

When the credit bubble burst in 2007 and 2008, central banks lent more, kept interest rates low and introduced quantitative easing.

There is a fundamental problem with handing over policy decisions to central banks on grounds of their expertise. Economics is a social science. Making precise forecasts is not possible in the way it is in chemistry.

Four of the most decisive turning points in modern history occurred within 12 months at the end of the 70s. In 1978, Deng Xiaoping made a speech pushing china on an economic reform pat, in January 1979, the Shah of Iran fled into exile, in my 1979 Margaret Thatcher became PM and in December 1979, Russia invaded Afghanistan which weakened Russia and created a recruiting ground for Islamist militants.

Globalization tends to be project that benefits the rich elite. In the four decades from the 1970s, we have seen a significant reduction in poverty levels, gains in life expectancy.

In 1948, only 30 % of American women went to work, in 2000, it was 60 % of the women population.

Margaret Thatcher and Reagan were elected because their predecessors left a mess. Among their first acts was to cut taxes. By the time they left office, the tax was 28 % in the US and 40 % in the UK.

When thatcher took office, nationalized industries contributed to 12 % of GDP, by the time she left it was 2 %.

The push for smaller government , lower taxes was encouraged by business lobbying.

In 1998, \$ 1.6 billion was spent on lobbying in the USA , in 2018, the same number was \$ 5 billion. Even after adjusting for inflation, this is a huge increase. The highest spenders on lobbying were Alphabet, AT&T, Northrop Grumman, a defence and aerospace company.

A study in 2016 showed that 50 % of retiring senators and 33 % of retiring house members registered as lobbyists, the same number was 5 % in the 1970s. The result is that rich constituents get listened to more than the average constituent.

This led to free flow of capital and the next big industry was born – the asset management industry. Fund managers look after the assets of individuals and institutions. By pooling assets they reduce that any one investment can go wrong. Many fund managers claim that they will beat the market, very few have actually done it, in the long run that's never possible.

Corporate takeovers often using borrowed money were common in the 1980s and 1990s. The main function of the takeover was to break a conglomerate and force companies to focus on a single industry. In the decade of 1980, 28 % of the largest 500 companies had been bought.

Another driver of the takeover phenomenon was a new class of investment vehicle called private equity funds. These funds raised money from traditional institutions like pension schemes and insurance companies.

The private equity funds benefited from the US tax rules which made interest payments on debt tax deductible. They also thrived when interest rates were falling since this made it cheaper to do deals.

There were more billionaires in 2018 from the field of finance than any other sector.

Whether all this financial activity and innovation was useful is a debatable question. Paul Volcker claimed that the only social financial innovation so far has been the ATM

Robert Shiller of Yale University had looked at the long term history of house prices. The increase between 1890 and 1997 was just 12 %. Then in the 8 years between 1998 and 2006, prices went up by 85 %. Nothing like this was seen before.

The cost of buying a house vs renting it doubled between 1997 and 2006.

An economy based on manufacturing and services is a lot more complex than an agriculture economy. In the agriculture economy, the big concern was food shortage.

Education has played a key role in development. In 1800, literacy level was 12 %, in 1900 it was 21 %, by 1950 it was 35 % and today it is 85 %.

Prussia introduced compulsory education in 1763, but the drive for a more general education developed in the 19<sup>th</sup> century.

In the last few years, healthcare costs have gone up. In the US, it is 17.9% of GDP in 2016. more than half of the total American health care spending is devoted to people above 55.

Healthcare spending is an example of a policy trilemma in which all three goals cannot be simultaneously achieved – these are the three C s, - costs, choice and coverage.

Napoleon once famously said “let china sleep, when she wakes, she will shake the world”. In 1980, China GDP per capita was lower than Chad or Bangladesh, by 2012, it had increased 30 fold over the 1980 level.

Deng's philosophy was that it doesn't matter if a cat is black or white as long as it catches mice. He developed the markets first before creating institutions

In the early phase, china focused on low value goods where its low wages gave it an advantage. By 1990 china was the largest in Textiles, then they moved to electronics and now account for more than half of all electronics.

Between 2011 and 2013, China used 6.6 gigatons of concrete, which is more than what US has used in the whole of the 20 th century.

The India transformation is not as dramatic as China. In 1991, India had to airlift 47 tonnes of gold to the bank of England as collateral for an IMF loan. India grew at 7 % for 20 years after that.

In 1980, the CEO pay to worker pay was a ratio of 32. By 2017 it was 312. A lot of this is about the share options. The way boards justify is that it is still a very small percentage of the total market value of the company, because in this system, the measure is stock price.

In Japan where share prices have struggled, the ratio is very low. You need the same talent to run a company in the US or Japan.

Assortive mating is another trend that's been seen. In 1960, 25 % of university degree men used to marry women who ha a similar educational background. By 2008, that number was 48 %.

One big shift over the last 100 years is that wealth tends to be earned and not inherited.

In the past innovations spread slowly as humans passed on their knowledge when migrating. In the last five centuries, technology and innovation have spread more quickly. The printing press allowed ideas to be passed between people who would never meet.

Innovations turns out to be the key factor in long term economic growth. Between 1909 and 1949, only 12 % of worker increase productivity in the Us was down to capital, everything else was to innovation and other factors.

Knowledge is a 'non rival' good. An idea can be pursued by anyone on the planet.

The full benefits of the internet are amazing. While that is well documented and argued, there are downsides too. 89 % of employees at work admitted to wasting time online at work every day. Conversely, technology blurs the line between work and leisure and home.

Economists call the era from 1982 to 2007 'the great moderation' – a long era of steady growth and low inflation.

Stagnation in real wages is another issue. Between the 1970s and 2017, the wages of the median American worker grew just about 0.2 % a year, labor's share of GDP dropped from 65 % to 57%.

There have been many explanations for sluggish wage growth: on the political right many have blamed immigration. However immigrants are not just workers, they are consumers too, they add to demand.

A study by the IMF found that half the decline in labor's share was the impact of technology, another quarter was globalization.

The sluggish growth that followed the financial crisis led Larry Summers to go back to an expression from 1938 – secular stagnation. The fear was that no level of interest rates would ‘permit the balance of savings and investment at full employment’

The challenge for a universal basic income is to determine what would be the income that is high enough to provide an acceptable standard of living without costing so much that the resulting tax burden would be crippling.

In 1991, developed economies contributed to more than 63 % of global GDP, in 2008 emerging markets moved ahead and by 2018, the share of developed countries is only 40.8 %.

In 2016, the world turned more nationalist. Britain voted to leave the EU, Donald Trump was elected even though he lost the popular vote by 3 million.

It is hard to know how Trumps trade war with China will play out.

In his negotiations with Mexico and Canada, Trump seemed to follow a strategy of making big threats and settling for small concessions. The same thing might happen with China.

The worry is Trump's underlying assumptions – he believes that a trade deficit is a loss for US and a sign that the other side was cheating. The second is that he thinks that the foreign companies pay the tariffs, in fact those who import the goods pay the tariffs.

It is possible that local manufacturers might spring up, but these suppliers will have high costs, if they were competitive, imports would not happen in the first place.

The Tax Foundation, a US think tank, calculated that if all the tariffs were imposed as threatened, then US GDP will be 0,6 % lower and wages would be reduced by 0,4% and employment will fall by 460,000.

Change and trade are conjoined twins.  
Economic history is all about connections, the more people with whom we can connect, the more likely that the connections will be useful.

Trade is good, a study of high growth countries in the post war period found that those who achieved per capita annual income growth of more than 3 % or more saw similar growth in their trade.

The modern economy is a place of dizzying complexity and vast interconnections. Politicians who think they can disrupt the entire system and start again are taking a big risk.

Climate action is a classic 'collective action problem'. In this consumers, government, businesses are all reluctant to curtail their own energy consumption till others do the same.

When the great depression struck, knowledge of economy was low. A US senate committee authorized a brilliant economist Simon Kuznets to establish a measure of national income and that's how GDP came into being.

Before the first world war, politicians argued that the health of the economy was beyond their control while central bankers focused on holding exchange rate or controlling domestic inflation, the depression created the demand for politicians to manage the economic cycle.

The GDP is the best number even given its challenges of measuring services in a digital era.