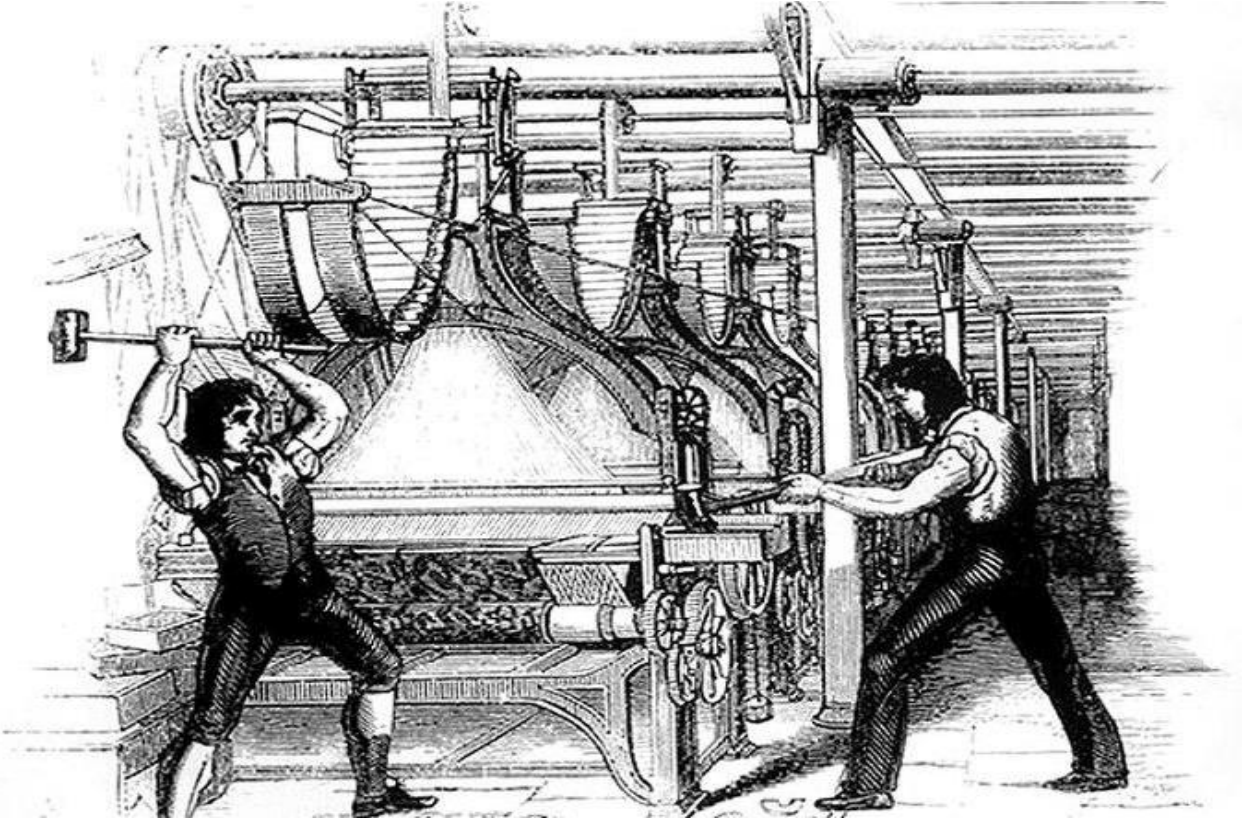


SYSTEMS THINKING IN FORESIGHT- FUTURE OF ECONOMIC SYSTEMS

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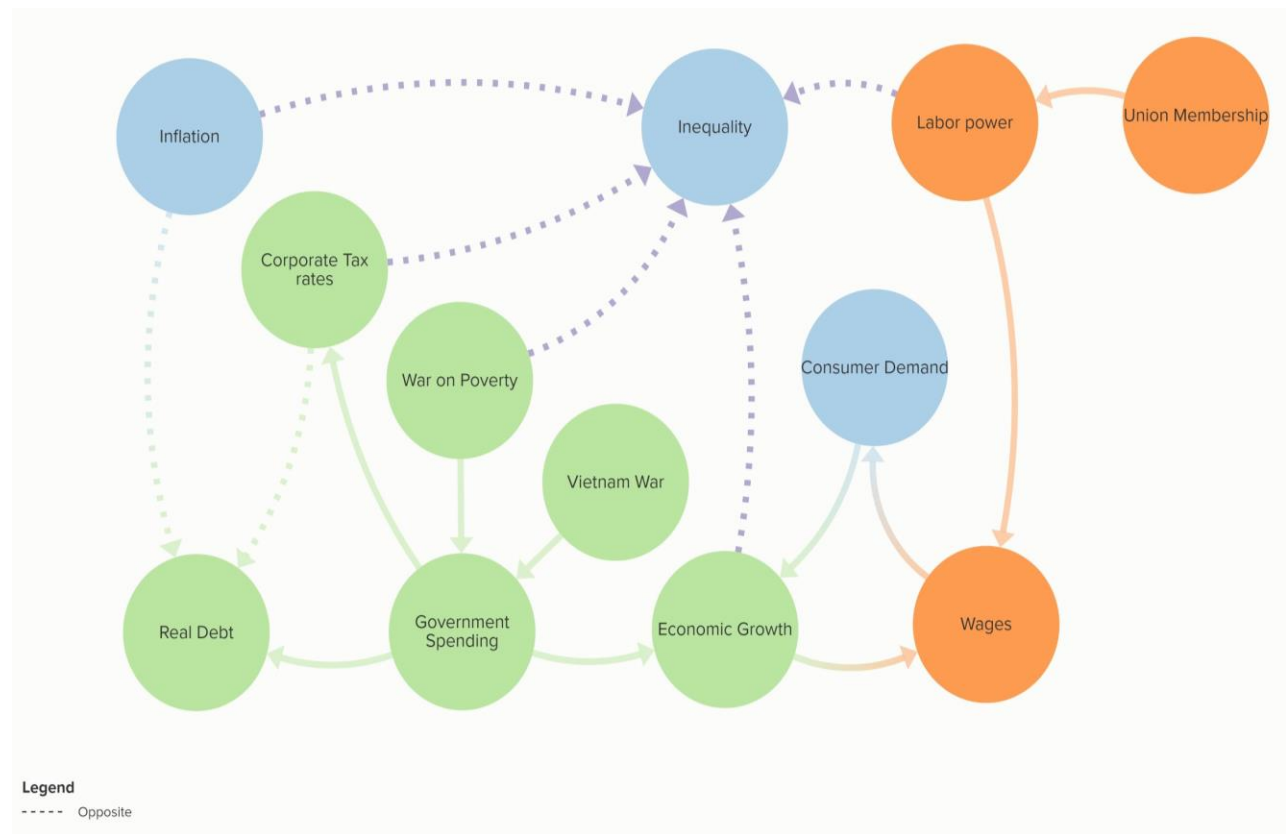


Luddites destroying the machinery that replaced them.

1. FRAMING: WHY THIS ISSUE

Economics was my first degree, and is what led me into the field of Strategic Foresight to begin with. There seems to be an ongoing disconnect between economists and futurists over many issues, particularly whether rapid technological developments will create as many jobs as they replace, or make the current system obsolete. Trying to consolidate these two disciplines can be challenging. Whether they are inevitable or unlikely, I am sensitive to the serious economic consequences of potentialities like the Fourth Industrial Revolution, so I took advantage of the opportunity to examine economics through Systems Thinking. It can be tedious since people tend to view economics differently based on their education, beliefs, and worldview. My interpretation may be completely different from another person, even from a similar educational background. I have surely been influenced by many individuals living and dead, but the first two that come to mind are Thomas Piketty of the Paris School of Economics, and Mark Blyth of Brown University.

2.HISTORY AND CURRENT CONDITIONS- HISTORY (50 YEARS)



To understand how economic systems can change over time we'll start with a very general look at the US economy 50 years ago. For a brief introduction into systems modelling the lines point at the elements that are being affected. If there is a **direct** relationship the line is **solid**, if the association is **inverse** the line is **dotted**.

For example if we start at the "Government Spending" element it was being increased by the war on poverty and Vietnam. If these costs go up, so does government spending. If they go down, so does government spending. That is what makes it a direct relationship. These programs increased economic growth, but also increased the real debt.

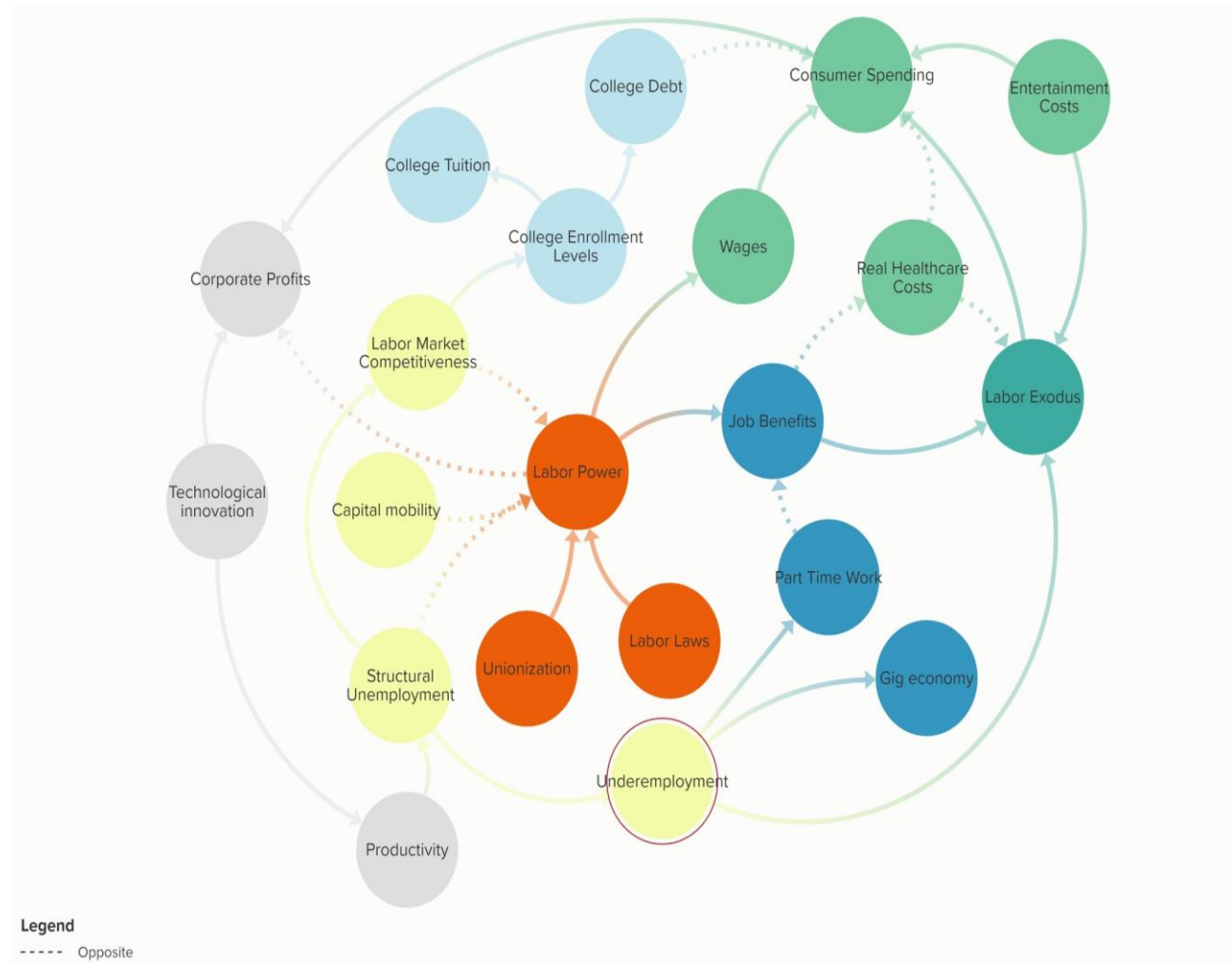
For an inverse association we will look at the higher corporate tax rates of 1968 which had a negative effect on the real debt. [Link](#) If taxes were lowered, the debt would go up. If taxes were raised further debt would go down. This illustrates a negative relationship. (It should go without saying that nuances in these relationships can be endlessly debated based on how exactly policies are implemented, and how viewers see the world.)

Higher rates of inflation also limited the growth of the real debt. There were several compressions of inequality during this period. Higher Inflation & Corporate tax rates limited the upper end. The war on poverty, the increased power of labor, and economic growth lifted the lower end. Economic growth as a compressor might not be intuitive. Following Piketty, inequality rises when the rate of return on private capital outpaces economic growth. [Link](#) In this period, the opposite was the case.

Economic growth also led to increased wages largely due to the leverage labor had thanks to larger union participation. In the decades since, growth has continued while wages largely have not followed. [Link](#)

I feel obligated to point out there were still significant economic issues during this period, including stagflation looming around the corner. [Link](#)

CURRENT CONDITIONS



There are many interacting factors involved in the modern US economy that have changed vastly in 50 years. Different viewers will have different perspectives, but I think what stands out most is the loss of “labor power” that came about via an array of factors. “Labor power” could also be replaced by “Labor advantage” or “Labor leverage.” (Basically, any bargaining power wage earners may have once had.)

First off, the two elements that could theoretically protect Labor power are unionization and labor laws, neither of which are particularly significant factors in the US at the moment. [Link](#) On the other hand, we have an abundance when it comes to elements that detract from labor power. Capital mobility, offshoring, outsourcing, etc. have taken off in the past 50 years. Excess laborers have made the labor market more competitive, and reduced any leverage a wage earner may have had in a more favorable job market. When labor power is down, as it is, wages stay down, as they have. [Link](#)

At the same time, corporate profits go up, because thanks to technology, we are still producing more than we were producing. Wealth is growing, but there is no reason for it to go to wage earners rather than capital owners. In fact, as technology grows, fewer people are needed to produce, the less power labor has, and so on. [Link](#)

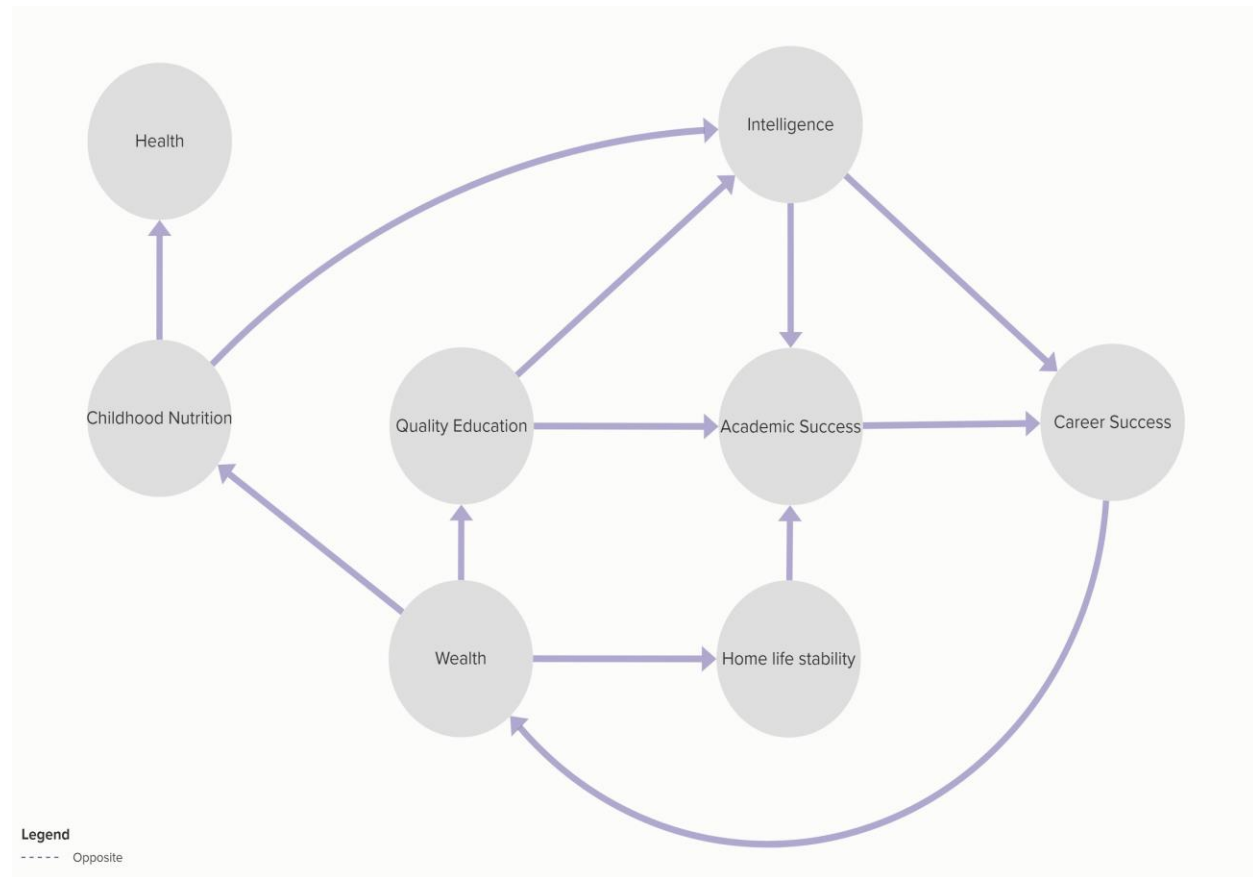
In structural unemployment, whether it comes from not enough jobs, or too many workers due to immigration, population, technology, more women entering the workforce, etc., the end effect is that the labor market becomes much more competitive, and underemployment increases. [Link](#) When the labor market becomes significantly more competitive, people must be more professional and more educated to get jobs. More people must go to college, leading to higher tuition and higher personal debt. Higher debt of course leads to long term declines in consumer spending.

When underemployment increases, more people are in part time work or in the gig economy. This means they likely do not have benefits like in the past, although to be fair they likely would not have them anyway. The power of labor is so weak that companies no longer need to offer benefits to be competitive. [Link](#) When underemployment becomes chronic, we have a labor exodus, as people stop looking for work. This is compounded by the fact that one thing which has gotten cheaper is entertainment. Flat screen TV's and Netflix are tempting ways to pass the time for a population with little to no potential for economic advancement.

Lower wages, a labor exodus, and more money going to healthcare expenditures, all lead to a decline in consumer spending, which leads to a decline in corporate profits, although they still seem to be managing ok for now. [Link](#)

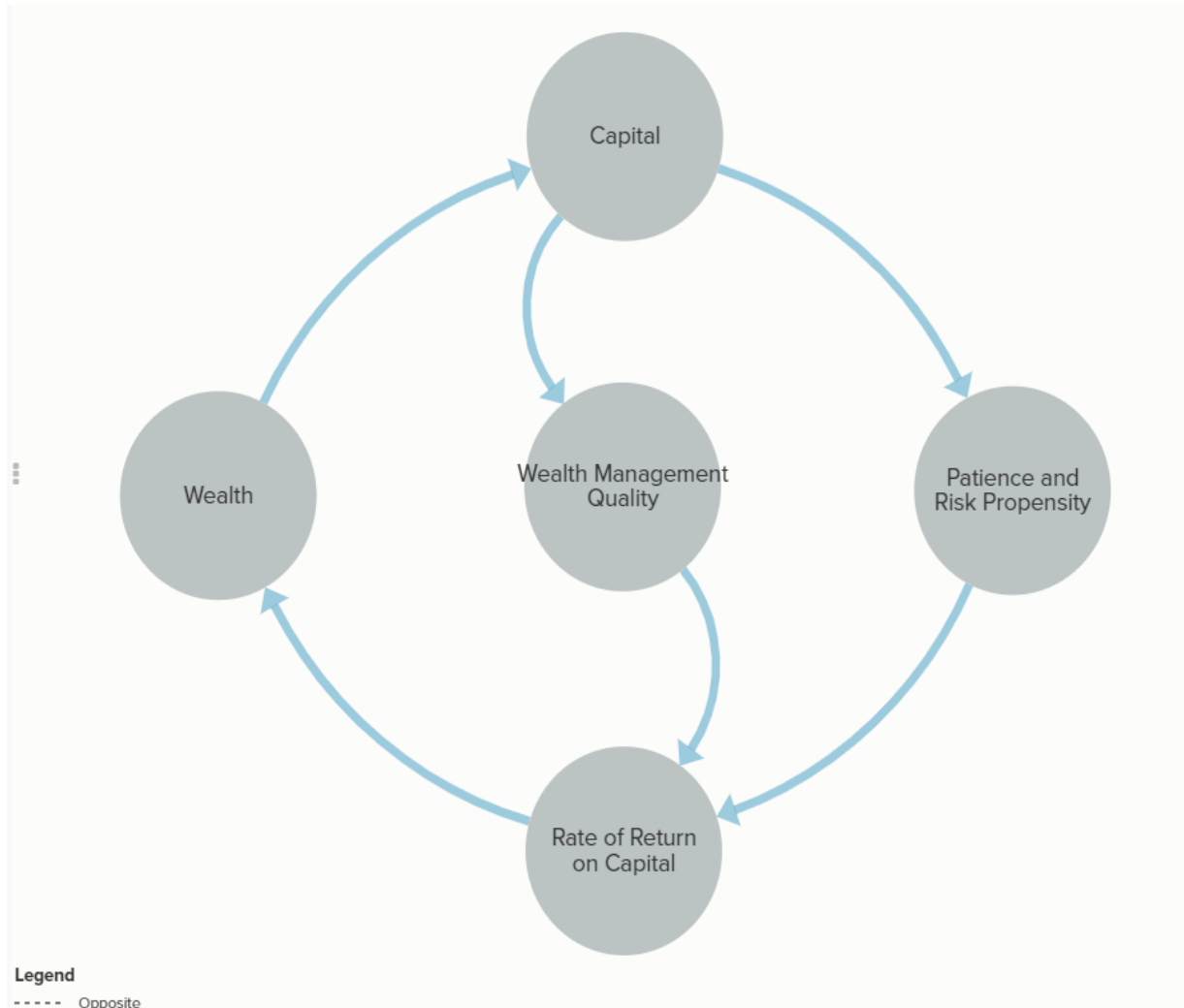
3.STRUCTURE AND DYNAMICS

Amplifying Loops - The virtuous cycle of wealth.



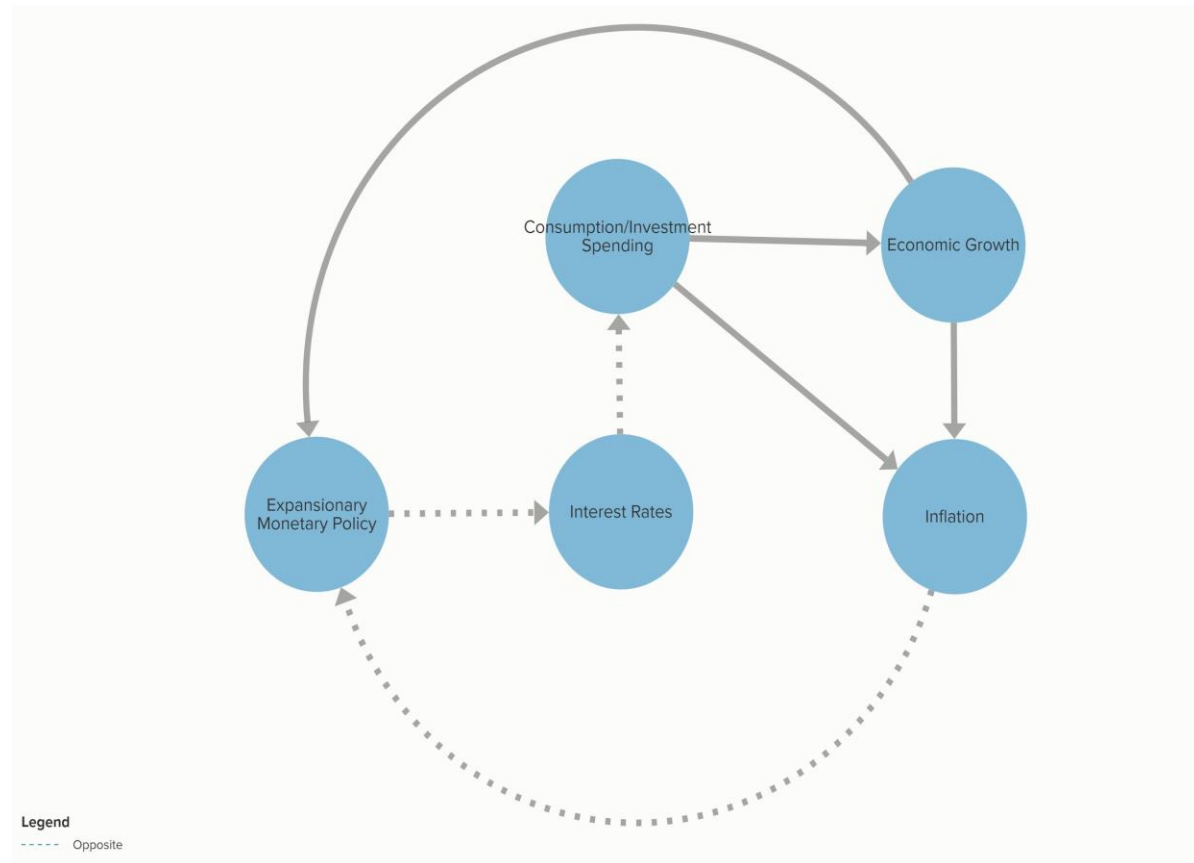
A child born into a wealthy environment will have access to better education (such as preschool, private school and college) and a more stable home life. These elements will contribute to improved academic success, intelligence, and then career success. Improved career success will in turn improve their wealth even further. [Link](#)

Another connection is wealth to nutrition. Better nutrition leads to improved health and intelligence. Intelligence improves academic success, and career success, and once again improves wealth. [Link](#)

Amplifying Loops - Amplifying Returns on Capital

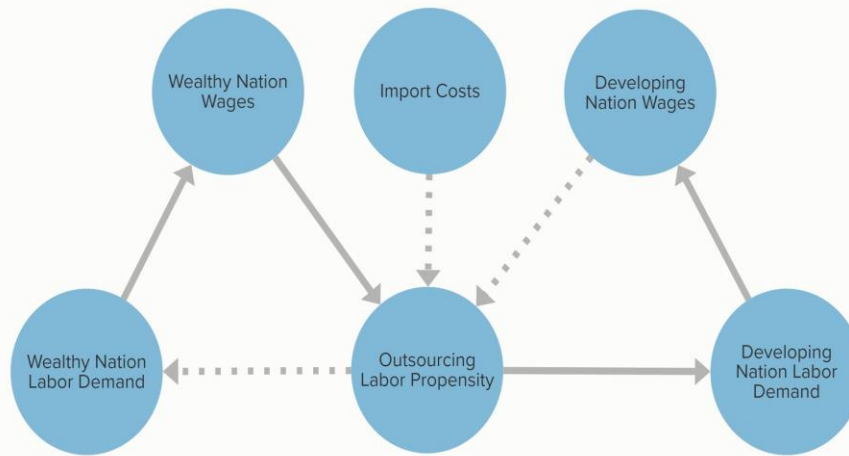
In Piketty's Book, *Capital in the 21st century*, he expounded on the inequality of returns on capital. Higher levels of wealth lead to more available capital, better financial management, and more risk propensity, which leads back to higher wealth. This is an explanation for how worldwide, in the last few decades, the largest fortunes have grown so much faster than the average growth rate of wealth. (Piketty P. 430-431)

Balancing Loops - Monetary Policy



Monetary policy is used to monitor and regulate the growth, inflation, and interest rates of an economy. If growth is considered too low, the central bank will engage in expansionary monetary policy. They will lower interest rates, which leads to higher spending on both consumption and investment. When people spend more the economy grows, but so does inflation. If inflation gets too high the central bank will stop its expansionary monetary policy, which would raise interest rates. When interest rates go up, economic growth, and inflation, go down. If economic growth starts to slow down too much, the central bank will again use expansionary monetary policy to lower interest rates. [Link](#)

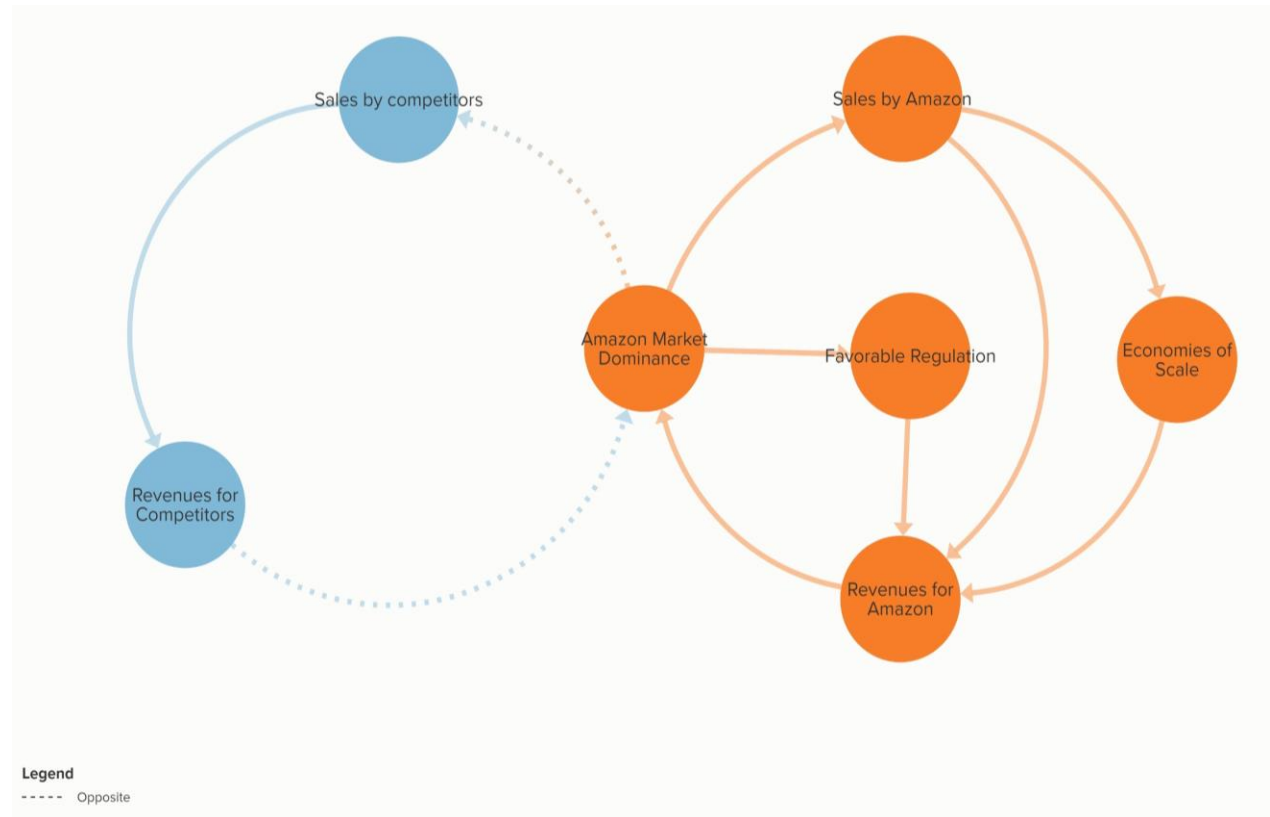
Balancing Loops - Outsourcing



Legend
----- Opposite

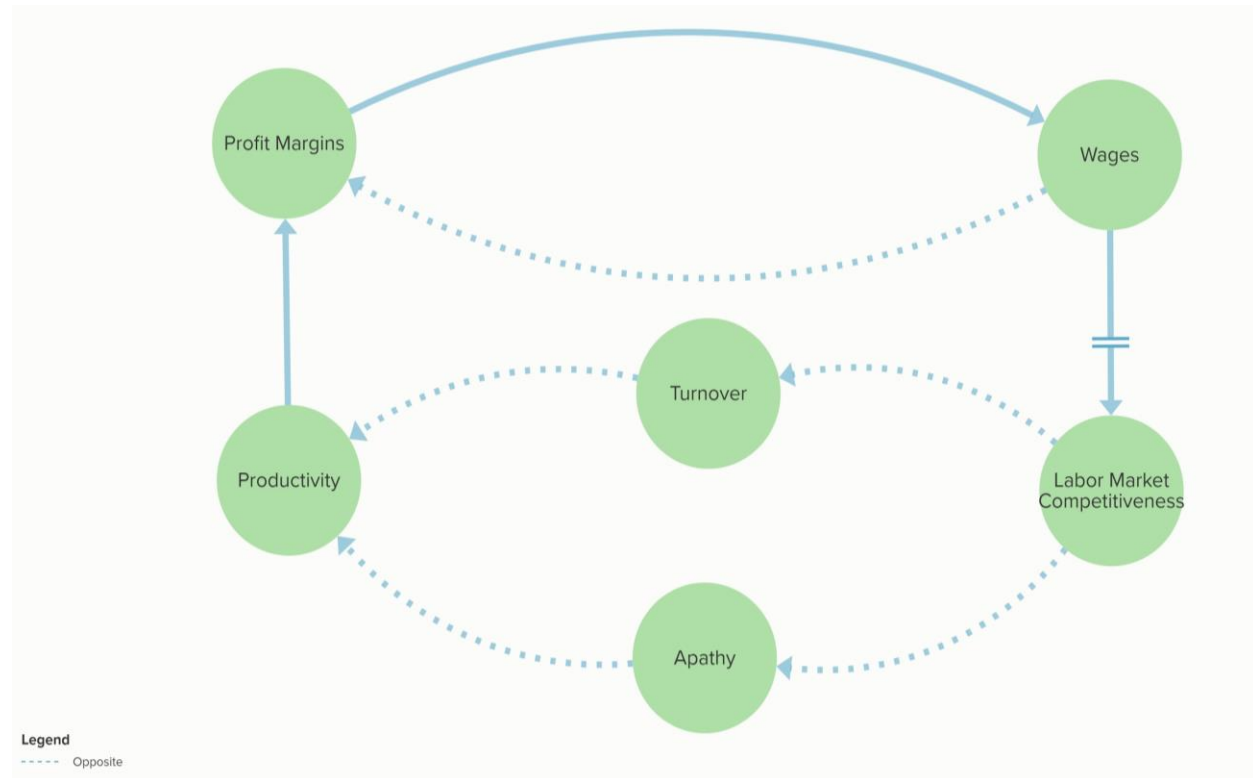
As efficiency improvements and favorable trade deals reduced the costs required to import goods, companies then had a greater propensity to outsource labor. This raised the demand for labor in developing nations. As a result, low skilled wages went up in developing nations. [Link](#) At the same time, demand for low skilled labor went down in wealthy nations, and so did their wages. As wages in wealthy nations go down it becomes a more favorable market for a firm and their propensity to outsource will go down (somewhat).

Archetypes - Amazon Success to the Successful



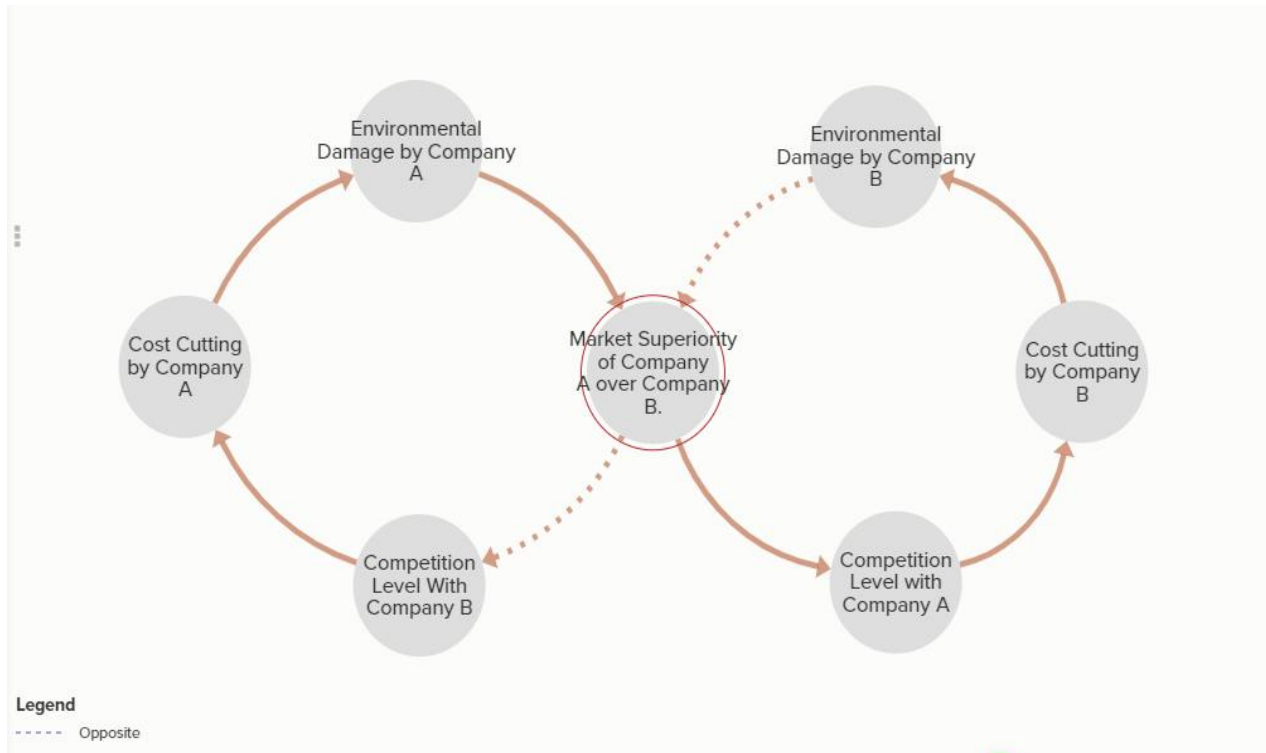
As Amazon becomes more dominant in the market, more and more people buy more items from them. Also, the more dominant they become the more favorable regulation they get, which only further increases their revenues. [Link](#) Increased sales increase their efficiency via economies of scale, and therefore their profitability. Their market dominance grows at the expense of competitors, whose sales and then revenue go down. This decline even further improves Amazon's market dominance. Not shown is the entrance of newly unemployed workers to expand the labor market and potentially lower wages. (If they were ever significantly above minimum wage to begin with.)

Archetypes: Fixes That Fail Wage Cuts



When profit margins are too low a potential response could be to lower wages, which would immediately increase profit margins. Over time though, the loss in labor market competitiveness will also lead to an increase in apathy and worker turnover. The more frequently that workers are inexperienced and require training, the lower productivity goes. As workers are less concerned with losing their job, since they could more easily find the same noncompetitive pay elsewhere, their productivity decreases. As productivity overall decreases profit margins also decrease, reducing or eliminating the purpose of the wage cut. This would only be the case in markets where unemployment is low enough that labor market competitiveness is a significant factor. [Link](#)

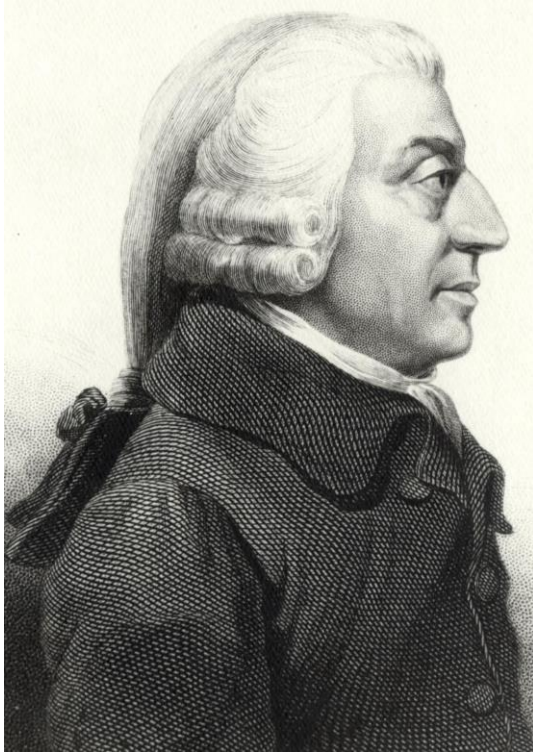
Archetypes: Escalation of Externality



This Escalation map is designed to illustrate that there is not only a propensity to ignore negative externalities of competitive industry, but that there is an imperative. If an enterprise is to survive and flourish it must be the one who shows the least regard for the negative externalities it produces. For this example, I will use environmental destruction, but it could also be worker exploitation, health and safety negligence, or any other generally unethical behavior. [Link](#)

If Company A sees a rise in competition with company B their market superiority goes down, so their competition level goes up. When their competition level goes up they must increase their aggression in cutting costs to remain competitive. With more limited budgets they must reduce any regard they may have had for the environment. Cost cuts go up, environmental damage goes up, and their superiority in the market goes back up. Once Company B sees their place in the market decreasing, they must increase their competition level, cut costs more aggressively and in turn do more environmental damage. This once again reduces the market superiority of company A who again must increase their competitiveness by cutting costs and so on.

4.COMPLEXITY, ADAPTABILITY, EMERGENCE



Actors: The modern economic system consists of many autonomous actors such as Governments, Politicians, Economists, Shareholders, Corporations, Laborers, Consumers.

Rules & Purpose: They operate under the free market, (at least an iteration of it) with differing, but largely similar goals, maximize their own profit and power.

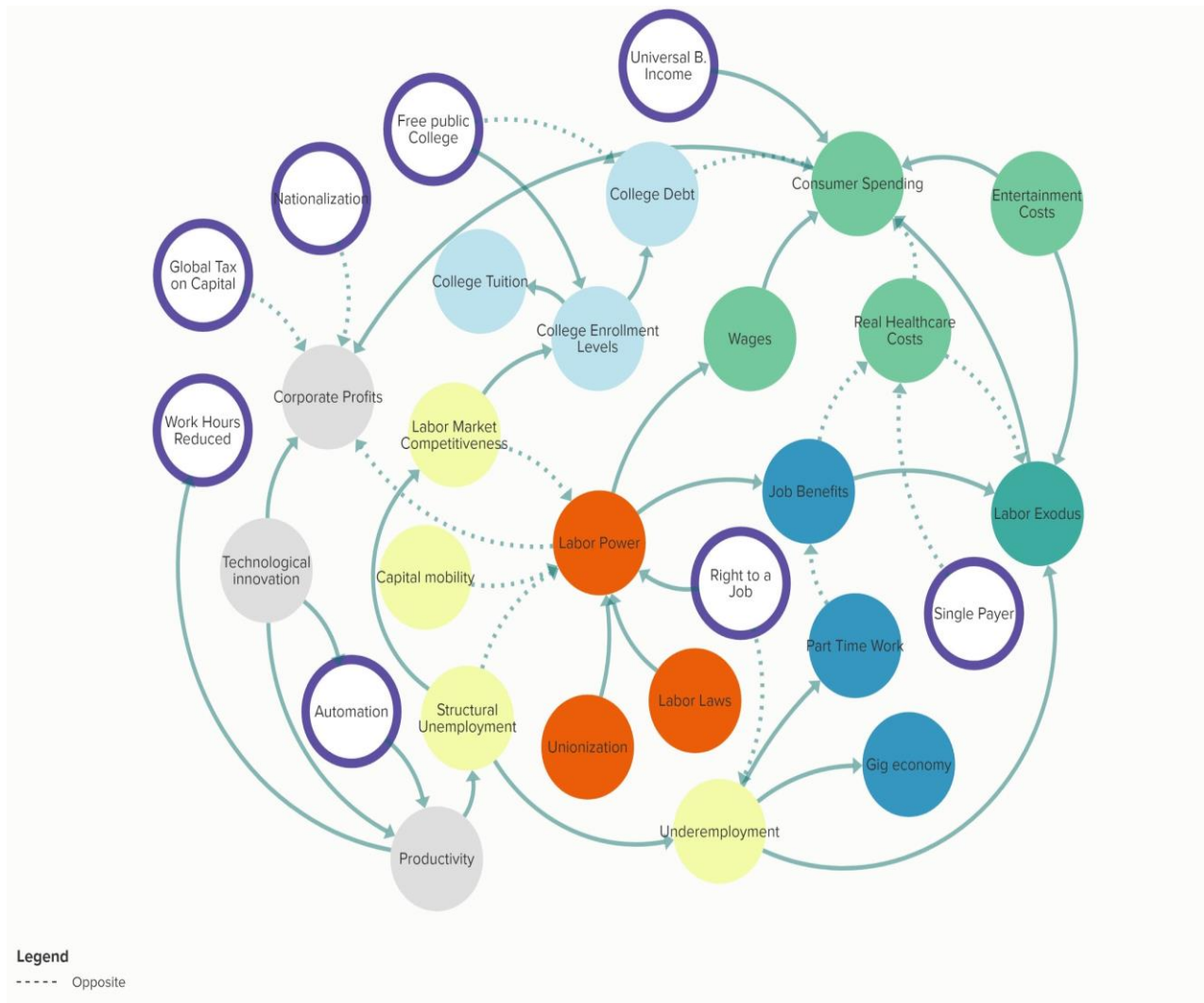
Adam Smith's Vile Maxim. - "All for ourselves and nothing for other people seems, in every age of the world, to have been the vile maxim of the masters of mankind."

Replication & Repair: Structures physical and conceptual, are built and torn down based on their economic value. The most successful systems win out over time, globally similar trends and systems will emerge.

Economic systems can be pushed into turbulence, but they have always been slowly able to recover. Economic systems are constantly reorganizing to remain efficient/competitive.



5. EMERGING CHANGES



There are several changes that could significantly alter the system to varying degrees. They could alter the influence map in different ways depending on how they are implemented, but I will try to stick with the most obvious impacts.

1. Universal Basic Income: It has become a trendy topic that intersects economists, and futurists. Its main impact here would be maintaining or increasing consumer demand.
2. Free Public College: It would make attending university more financially attractive, so enrollment would increase. Personal debt from university would be reduced. Tuition would become functionally cheaper for students, but not necessarily cheaper overall.

3. Nationalization: It would obviously reduce corporate profits as they would be going to the government. It would likely only happen on a large scale, as a response to an existential threat such as climate change. Even then, it is unlikely.
4. Global Tax on Capital: In the off chance that Piketty's idea gains traction, this would also reduce corporate profits.
5. Worker Hours Reduced: if productivity continues to increase, a potential response could be to reduce the expected working hours of the population.
6. Right to a Job: the idea has been injected into US political discourse for the first time in decades. If it became a reality, it would increase the power of labor, and reduce underemployment.
7. Single Payer: This change is likely the most probable on the list for the coming years, and decades. It would reduce personal spending on healthcare and therefore free up some money for consumer spending.
8. Automation: This process is always happening to some extent, but if it happens rapidly on a broad scale, it is the most impactful change on the list. The rapid increase in structural unemployment would likely send the system into chaos.

6.CAS + DISRUPTIVE CHANGE = CHAOS



In the Unity of Production and Science - The Power of the Country! Sovietposters.com

Automation and general convergence of exponential technologies have the most potential to send the current system into chaos. This could happen in a few different ways...

1. Dystopian Domination of the non-propertied: If capital becomes completely dominant over labor, the classes which own no capital will have no means to support themselves. Selling their labor is no longer a viable option. As this coincides with a time of extremely powerful technology, also owned by the ruling class, they would likely have no recourse.
2. Welfare State: Similar drivers lead to different results based on political will. The Government provides basic services along with perhaps a basic income to maintain consumer demand. Some people still work. Some people do not. But everyone has their needs fulfilled.
3. Socialism: As capital is more and more equipped to replace labor, workers are freed from responsibility, rather than deprived of their means to live. Capital becomes owned, managed, and regulated by the community democratically.
4. Technological Abundance: As Peter Diamandis describes it, "A world of haves and superhaves." Exponential converging technologies make everything so cheap that all humans can live a safe and fulfilling life, while the owners of the technology maintain their spot at the top of the hierarchy. It is probably most like the welfare state scenario.

The main takeaway I personally got from this project was that systems modeling of economic systems should be brought into economic education/academia as at least a supplement if not antithesis to the current ceaseless devotion to arbitrary and frequently outdated graphs and formulas. Similar statements have been made by many economists much smarter than me. Since I have already used Piketty I will quote him here.

“To put it bluntly, the discipline of economics has yet to get over its childish passion for mathematics and for purely theoretical and often highly ideological speculation, at the expense of historical research and collaboration with the other social sciences. Economists are all too often preoccupied with petty mathematical problems of interest only to themselves. This obsession with mathematics is an easy way of acquiring the appearance of scientificity without having to answer the far more complex questions posed by the world we live in.”

That is not to say such theoretical mathematics are useless or have no value. It is more that they have been asked to carry a lot of weight with a flimsy foundation. Systems Thinking would do well to buttress it. (Along with a healthy dose of Interdisciplinarity) In fact Professor Alfredo Moscardini and Professor Mohamed Loutfi of the University of Sunderland in the UK wrote [“Systems Thinking and Economics Teaching”](#) in which they acknowledged the need for systems thinking in economics education. Thus far it seems the field has remained resistant or more accurately apathetic to systems thinking. It is for this reason that Futurists who may be more familiar with Systems Thinking should try to fill that void and use it to their advantage. Systems Thinking presents a new way to discuss and display complex economic systems in a way that can be more compelling to a broader audience.