

Moore's Law for Everything

by Sam Altman (Mar 18, 2021)

My work at OpenAI reminds me every day about the magnitude of the socioeconomic change that is coming sooner than most people believe. Software that can think and learn will do more and more of the work that people now do. Even more power will shift from labor to capital. If public policy doesn't adapt accordingly, most people will end up worse off than they are today.

We need to design a system that embraces this technological future and taxes the assets that will make up most of the value in that world—companies and land—in order to fairly distribute some of the coming wealth. Doing so can make the society of the future much less divisive and enable everyone to participate in its gains.

In the next five years, computer programs that can think will read legal documents and give medical advice. In the next decade, they will do assembly-line work and maybe even become companions. And in the decades after that, they will do almost everything, including making new scientific discoveries that will expand our concept of “everything.”

This technological revolution is unstoppable. And a recursive loop of innovation, as these smart machines themselves help us make smarter machines, will accelerate the revolution's pace. Three crucial consequences follow:

1. This revolution will create phenomenal wealth. The price of many kinds of labor (which drives the costs of goods and services) will fall toward zero once sufficiently powerful AI “joins the workforce.”
2. The world will change so rapidly and drastically that an equally drastic change in policy will be needed to distribute this wealth and enable more people to pursue the life they want.
3. If we get both of these right, we can improve the standard of living for people more than we ever have before.

Because we are at the beginning of this tectonic shift, we have a rare opportunity to pivot toward the future. That pivot can't simply address current social and political problems; it must be designed for the radically different society of the near future. Policy plans that don't account for this imminent transformation will fail for the same reason that the organizing principles of pre-agrarian or feudal societies would fail today.

What follows is a description of what's coming and a plan for how to navigate this new landscape.

Part 1

The AI Revolution

On a zoomed-out time scale, technological progress follows an exponential curve. Compare how the world looked 15 years ago (no smartphones, really), 150 years ago (no combustion engine, no home electricity), 1,500 years ago (no industrial machines), and 15,000 years ago (no agriculture).

The coming change will center around the most impressive of our capabilities: the phenomenal ability to think, create, understand, and reason. To the three great technological revolutions—the agricultural, the industrial, and the computational—we will add a fourth: the AI revolution. This revolution will generate enough wealth for everyone to have what they need, if we as a society manage it responsibly.

The technological progress we make in the next 100 years will be far larger than all we've made since we first controlled fire and invented the wheel. We have already built AI systems that can learn and do useful things. They are still primitive, but the trend lines are clear.

Part 2

Moore's Law for Everything

Broadly speaking, there are two paths to affording a good life: an individual acquires more money (which makes that person wealthier), or prices fall (which makes everyone wealthier). Wealth is buying power: how much we can get with the resources we have.

The best way to increase societal wealth is to decrease the cost of goods, from food to video games. Technology will rapidly drive that decline in many categories. Consider the example of semiconductors and Moore's Law: for decades, chips became twice as powerful for the same price about every two years.

In the last couple of decades, costs in the US for TVs, computers, and entertainment have dropped. But other costs have risen significantly, most notably those for housing, healthcare, and higher education. Redistribution of wealth alone won't work if these costs continue to soar.

AI will lower the cost of goods and services, because labor is the driving cost at many levels of the supply chain. If robots can build a house on land you already own from natural resources mined and refined onsite, using solar power, the cost of building that house is close to the cost to rent the robots. And if those robots are made by other robots, the cost to rent them will be much less than it was when humans made them.

Similarly, we can imagine AI doctors that can diagnose health problems better than any human, and AI teachers that can diagnose and explain exactly what a student doesn't understand.

“Moore’s Law for everything” should be the rallying cry of a generation whose members can’t afford what they want. It sounds utopian, but it’s something technology can deliver (and in some cases already has). Imagine a world where, for decades, everything—housing, education, food, clothing, etc.—became half as expensive every two years.

We will discover new jobs—we always do after a technological revolution—and because of the abundance on the other side, we will have incredible freedom to be creative about what they are.

Part 3

Capitalism for Everyone

A stable economic system requires two components: growth and inclusivity. Economic growth matters because most people want their lives to improve every year. In a zero-sum world, one with no or very little growth, democracy can become antagonistic as people seek to vote money away from each other. What follows from that antagonism is distrust and polarization. In a high-growth world the dogfights can be far fewer, because it’s much easier for everyone to win.

Economic inclusivity means everyone having a reasonable opportunity to get the resources they need to live the life they want. Economic inclusivity matters because it’s fair, produces a stable society, and can create the largest slices of pie for the most people. As a side benefit, it produces more growth.

Capitalism is a powerful engine of economic growth because it rewards people for investing in assets that generate value over time, which is an effective incentive system for creating and distributing technological gains. But the price of progress in capitalism is inequality.

Some inequality is ok—in fact, it’s critical, as shown by all systems that have tried to be perfectly equal—but a society that does not offer sufficient equality of opportunity for everyone to advance is not a society that will last.

The traditional way to address inequality has been by progressively taxing income. For a variety of reasons, that hasn’t worked very well. It will work much, much worse in the future. While people will still have jobs, many of those jobs won’t be ones that create a lot of economic value in the way we think of value today. As AI produces most of the world’s basic goods and services, people will be freed up to spend more time with people they care about, care for people, appreciate art and nature, or work toward social good.

We should therefore focus on taxing capital rather than labor, and we should use these taxes as an opportunity to directly distribute ownership and wealth to citizens. In other words, the best way to improve capitalism is to enable everyone to benefit from it directly as an equity owner. This is not a new idea, but it will be newly feasible as AI grows more powerful, because there will be dramatically more wealth to go around. The two dominant sources of wealth will be 1) companies, particularly ones that make use of AI, and 2) land, which has a fixed supply.

There are many ways to implement these two taxes, and many thoughts about what to do with them. Over a long period of time, perhaps most other taxes could be eliminated. What follows is an idea in the spirit of a conversation starter.

We could do something called the American Equity Fund. The American Equity Fund would be capitalized by taxing companies above a certain valuation 2.5% of their market value each year, payable in shares transferred to the fund, and by taxing 2.5% of the value of all privately-held land, payable in dollars.

All citizens over 18 would get an annual distribution, in dollars and company shares, into their accounts. People would be entrusted to use the money however they needed or wanted—for better education, healthcare, housing, starting a company, whatever. Rising costs in government-funded industries would face real pressure as more people choose their own services in a competitive marketplace.

As long as the country keeps doing better, every citizen would get more money from the Fund every year (on average; there will still be economic cycles). Every citizen would therefore increasingly partake of the freedoms, powers, autonomies, and opportunities that come with economic self-determination. Poverty would be greatly reduced and many more people would have a shot at the life they want.

A tax payable in company shares will align incentives between companies, investors, and citizens, whereas a tax on profits does not—incentives are superpowers, and this is a critical difference. Corporate profits can be disguised or deferred or offshored, and are often disconnected from share price. But everyone who owns a share in Amazon wants the share price to rise. As people's individual assets rise in tandem with the country's, they have a literal stake in seeing their country do well.

Henry George, an American political economist, proposed the idea of a land-value tax in the late 1800s. The concept is widely supported by economists. The value of land appreciates because of the work society does around it: the network effects of the companies operating around a piece of land, the public transportation that makes it accessible, and the nearby restaurants, coffee shops, and access to nature that makes it desirable. Because the landowner didn't do all that work, it's fair for that value to be shared with the larger society that did.

If everyone owns a slice of American value creation, everyone will want America to do better: collective equity in innovation and in the success of the country will align our incentives. The new social contract will be a floor for everyone in exchange for a ceiling for no one, and a shared belief that technology can and must deliver a virtuous circle of societal wealth. (We will continue to need strong leadership from our government to make sure that the desire for stock prices to go up remains balanced with protecting the environment, human rights, etc.)

In a world where everyone benefits from capitalism as an owner, the collective focus will be on making the world “more good” instead of “less bad.” These approaches are more different than they seem, and society does much better when it focuses on the former. Simply put, more good means optimizing for making the pie as large as possible, and less bad means dividing the pie up as fairly as possible. Both can increase people's standard of living once, but continuous growth only happens when the pie grows.

Implementation and Troubleshooting

The amount of wealth available to capitalize the American Equity Fund would be significant. There is about \$50 trillion worth of value, as measured by market capitalization, in US companies alone. Assume that, as it has on average over the past century, this will at least double over the next decade.

There is also about \$30 trillion worth of privately-held land in the US (not counting improvements on top of the land). Assume that this value will roughly double, too, over the next decade—this is somewhat faster than the historical rate, but as the world really starts to understand the shifts AI will cause, the value of land, as one of the few truly finite assets, should increase at a faster rate.

Of course, if we increase the tax burden on holding land, its value will diminish relative to other investment assets, which is a good thing for society because it makes a fundamental resource more accessible and encourages investment instead of speculation. The value of companies will diminish in the short-term, too, though they will continue to perform quite well over time.

It's a reasonable assumption that such a tax causes a drop in value of land and corporate assets of 15% (which only will take a few years to recover!).

Under the above set of assumptions (current values, future growth, and the reduction in value from the new tax), a decade from now each of the 250 million adults in America would get about \$13,500 every year. That dividend could be much higher if AI accelerates growth, but even if it's not, \$13,500 will have much greater purchasing power than it does now because technology will have greatly reduced the cost of goods and services. And that effective purchasing power will go up dramatically every year.

It would be easiest for companies to pay the tax each year by issuing new shares representing 2.5% of their value. There would obviously be an incentive for companies to escape the American Equity Fund tax by off-shoring themselves, but a simple test involving a percentage of revenue derived from America could address this concern. A larger problem with this idea is the incentive for companies to return value to shareholders instead of reinvesting it in growth.

If we tax only public companies, there would also be an incentive for companies to stay private. For private companies that have annual revenue in excess of \$1 billion, we could let their tax in equity accrue for a certain (limited) number of years until they go public. If they remain private for a long time, we could let them settle the tax in cash.

We'd need to design the system to prevent people from consistently voting themselves more money. A constitutional amendment delineating the allowable ranges of the tax would be a strong safeguard. It is important that the tax not be so large that it stifles growth—for example, the tax on companies must be much smaller than their average growth rate.

We'd also need a robust system for quantifying the actual value of land. One way would be with a corps of powerful federal assessors. Another would be to let local governments do the assessing, as they now do to determine property taxes. They would continue to receive local taxes using the same assessed value. However, if a certain percentage of sales in a jurisdiction in any given year falls too far above or below the local government's estimate of the property's values, then all the other properties in their jurisdiction would be reassessed up or down.

The theoretically optimal system would be to tax the value of the land only, and not the improvements built on top of it. In practice, this value may turn out to be too difficult to assess, so we may need to tax the value of the land and the improvements on it (at a lower rate, as the combined value would be higher).

Finally, we couldn't let people borrow against, sell, or otherwise pledge their future Fund distributions, or we won't really solve the problem of fairly distributing wealth over time. The government can simply make such transactions unenforceable.

Part 5

Shifting to the New System

A great future isn't complicated: we need technology to create more wealth, and policy to fairly distribute it. Everything necessary will be cheap, and everyone will have enough money to be able to afford it. As this system will be enormously popular, policymakers who embrace it early will be rewarded: they will themselves become enormously popular.

In the Great Depression, Franklin Roosevelt was able to enact a huge social safety net that no one would have thought possible five years earlier. We are in a similar moment now. So a movement that is both pro-business and pro-people will unite a remarkably broad constituency.

A politically feasible way to launch the American Equity Fund, and one that would reduce the transitional shock, would be with legislation that transitions us gradually to the 2.5% rates. The full 2.5% rate would only take hold once GDP increases by 50% from the time the law is passed. Starting with small distributions soon will be both motivating and helpful in getting people comfortable with a new future. Achieving 50% GDP growth sounds like it would take a long time (it took 13 years for the economy to grow 50% to its 2019 level). But once AI starts to arrive, growth will be extremely rapid. Down the line, we will probably be able to reduce a lot of other taxes as we tax these two fundamental asset classes.

The changes coming are unstoppable. If we embrace them and plan for them, we can use them to create a much fairer, happier, and more prosperous society. The future can be almost unimaginably great.

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