The End of Economic Growth

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Three Possible Futures

We have seen that America’s spending on health care, education, and suburbanization has increased dramatically since the 1960s without bringing any benefit. We have not looked at other examples of waste that are even more obvious, such as the “shop till you drop” culture that makes Americans spend three to four times as many hours shopping as people in Western Europe,60 and the $265 billion annually spent on advertising to persuade Americans to buy things, more than is spent on advertising in the entire rest of the world combined.61

Before the rest of the world tries to imitate American consumerism, we should consider whether we would be better off if growth ended at a lower income level.

The Economy of the Coming Century

There is a chance of moving to a sustainable economy in the coming century, because population growth will end. According to the United Nations’ medium-growth projection, world population will peak in 2075 at about 9.2 billion and then will begin to decline slowly (Figure 15).

The United Nations has repeatedly revised its population projections downward, and it is likely that world population will peak at less than the projected 9.2 billion. Because the world population decline after the peak will be unprecedented, it is impossible to
predict, and so this graph simplifies by assuming that population will level off rather than declining.

To see whether the world can move to a sustainable economy, we must also ask how much per capita Gross World Product will grow in the coming century—that is, we must ask how much each of these people will produce and consume.

![Figure 16: Growth of Per Capita Gross World Product](image)

Projecting current economic growth rates, we find that per capita production and consumption will reach high levels relatively soon (Figure 16). Between 1950 and 2000, per capita Gross World Product grew at a rate of about 2.1 percent a year. If it continues to grow at this historic rate:

- Per capita Gross World Product will be $17,147 in 2040, greater than America’s per capita Gross Domestic Product of $16,420 in 1965.

- Per capita GWP will be $39,778 in 2080, greater than America’s per capita GDP of $36,883 in 2004 (all figures in 2000 dollars).

This does not necessarily mean an end to world poverty, because growth and affluence will be distributed unevenly through the world. The developed nations are way above the average, meaning that the developing nations are below the average. Among the developing nations, Asia is growing rapidly and steadily, Latin America is growing more erratically, and Africa is growing slowly.

Nevertheless, if growth continues, affluence will spread to much of the world by the end of the century.

Wages have already reached middle-class levels in Taiwan and Korea. China’s and India’s economies are both growing at a break-neck pace: though their average wages
are still very low, both these countries have rising wages and a rapidly growing middle class. For example, China’s streets were clogged with bicycles a couple of decades ago, and they are clogged with cars today.

Much of the developing world is at the stage now where Europe was in the nineteenth century, when workers lived in urban slums where conditions were much worse than they had been in rural subsistence economies. Mexican workers in maquiladora factories live in the same sort of misery as the English workers in Dickens’ time.

But wages went up in America and Europe during the twentieth century, because productivity kept growing while slower population growth tightened the labor supply. In the twenty-first century, the same thing could happen to the entire global economy: wages will increase as productivity keeps growing while world population growth slows and peaks. The supply of capital will increase more quickly than the supply of labor, so the share of income that goes to labor will increase.

Wages in Taiwan and South Korea are already so high that they no longer attract labor intensive industries. By the middle of the twenty-first century, wages in China and India could also be high enough that they will also lose their labor intensive industries to countries with lower wages, but at that point, countries with low wages will start to become scarce, since half of the people in the world will live in countries with middle-class wages. By the end of the twenty-first century, wages could go up to middle-class levels throughout the world as industries move to the remaining low-wage nations—if growth continues, but that is a big if.

This projection of world-wide affluence assumes that ecological problems will not disrupt economic growth. If people decide to consume less and work shorter hours when their wages rise, there is clearly less chance of ecological disruption. If people work shorter hours, labor will also become scarce sooner, and wages will go up more quickly. However, businesses will try to use advertising and government policy to stimulate consumer demand world-wide to maintain their profits. Business won this battle in the United States in the 1930s: they will fight it even more fiercely in the coming century, when the world’s future is at stake.

To bring these issues into focus, we will look at three different scenarios for the future of the world economy, where growth ends in widespread economic comfort, growth ends in widespread consumerism, and growth continues indefinitely.

**Scenario 1: Growth Ends in Comfort**

First, imagine that people decide they have enough at the economic level of the United States in the 1960s—the time when American social critics began to say that our economy was so affluent that it was geared to waste. Imagine that individuals generally chose more free time rather than more income, and imagine that people also made the political decisions needed to limit sprawl, excessive automobile use, and other forms of destructive consumption, so per capita GWP stops growing when it reaches the level of 1965 America (slightly less than half of America’s per capita GDP today).

This income level could let everyone in the world live in middle-class comfort. It is true that in the 1960s, 15 to 20 percent of Americans were poor, and many more did
not share in the country’s affluence. But at the same time, the Federal government was building freeways all over the country to stimulate demand, the country was being paved over by suburban sprawl, and the automobile manufacturers were building oversized cars with tail fins to absorb consumer’s excess purchasing power.

The same per capita income would be enough to let everyone live well, if people rejected consumerism and shortened their work hours once they were comfortable, rather than moving to sprawl suburbs and buying two cars. Children could all get a good education. Everyone could have all the useful health care that they needed. Families could all own their own homes in streetcar suburbs (though some people and some cultures prefer denser cities and would not want to suburbanize themselves). In this scenario, people would use canoes and sail boats for recreation rather than jet skis and power boats, cars would be an occasional convenience rather than an everyday necessity, and shopping till you drop would not become the world’s favorite hobby.

Figure 17 represents this scenario graphically. To give everyone in the world basic middle-class comfort, with the per capita GDP that Americans had in 1965, would require a Gross World Product of just over $150 trillion ($16,420 in 2000 dollars times 9.2 billion people). If world economic growth continues at its historic levels, the world will have this GWP in mid-century, before population growth stops completely. Even if reduced economic growth in the developed nations cuts the world’s economic growth rate in half, the world will reach this level before the end of the twenty-first century and then move permanently to a no-growth economy.

"To give everyone in the world basic middle-class comfort, Gross World Product would level off at just over $150 trillion."

In this scenario, the United States would need a period of negative economic growth to get our per capita GDP back down to the 1965 level, less than half of what it is today. Except for the poor, people would begin reducing their work hours. They would do less shopping. They would start moving to neighborhoods where you can walk, and they would change transportation policies and zoning laws so more of these
neighborhoods were built. Of course, negative growth would have to be gradual: it would take many decades to rebuild our cities so they were no longer dominated by the automobile, and a gradual transition is also needed to avoid economic instability and to protect retirement funds.

World growth would slow and end as other countries reached this same per capita GDP. At the end of the twenty-first century, people in the poorest parts of the world might still need two full-time incomes to earn this much; but after another century of wage gains, virtually everyone could earn this much by working relatively short hours.

This is not an austere future. When America’s per capita GDP reached this level, the nation was calling itself the affluent society. The world could aim at a future with the same affluence and with much more free time, making them better off than Americans were in the 1960s.

In this scenario, we would still have to solve many technical problems to make the world economy sustainable, but they would not be insurmountable if there were a strong effort to design non-polluting manufacturing processes, to redesign products so they could be fully recycled, and to shift to renewable sources of energy such as solar power. We would have to increase resource efficiency almost four-fold to produce a Gross World Product of $150 trillion per year sustainably, and there is evidence that this is possible.66

**Scenario 2: Growth Ends in Consumerism**

As a second scenario, imagine that the world imitates the current American consumerist style, so growth does not end until everyone in the world has the income that more affluent Americans have today. Imagine that everyone wants as many useless medical treatments as insured Americans receive today, everyone wants to spend as much on schooling as the most affluent American suburbs do today, everyone wants to drive to the mall and shop till they drop, everyone wants an oversized house in a sprawl suburb and at least two family cars. People are not satisfied until there are more motor vehicles than registered drivers in the world, as there already are in the United States.

To reach this standard of living, growth would level off when the per capita Gross World Product is roughly twice as much as America’s per capita Gross Domestic Product today.

Even in this scenario, America would immediately take the first step toward a no-growth economy. We would have to offer choice of work hours, so Americans who are already prosperous suburbanites could cut back on their hours rather than earning more. Most Americans would want to increase their earnings, but growth would continue to slow in future decades, as more people reached this income level.

To let everyone live in this consumerist style would require a Gross World Product of just over $600 trillion in 2000 dollars, making the per capita GWP about double the current American per capita GDP. At the historic growth rate of per capita GWP, the world will reach this level toward the end of the twenty-first century. If economic

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“To let everyone live in the consumerist style, Gross World Product would level off at just over $600 trillion.”
growth slows as the developed nations stop growing, the world might actually reach this income level some time in the twenty-second century and then move to a no-growth economy.

The world would be less livable in this scenario than in the last one. For example, about 4.5 billion acres of land would have to be suburbanized for people to live in sprawl suburbs, compared with about 900 million acres for people to live in streetcar suburbs. Low-density suburbia would eat up virtually all the open space in densely populated countries. Because of limited space to build roads, most people in the world would be faced with constant traffic congestion. The open space preserved as parkland would be filled with jet skiers, snowmobilers, and off-road vehicles. There would not be many quiet places left in the world.

In this scenario, the world economy would move well beyond the point of counterproductivity. Though this would be a less pleasant world to live in than the first scenario, it could be sustainable ecologically if we increased resource efficiency about fifteen-fold. Technologies are not yet available to do this, and the most ambitious goal that has been suggested is a ten-fold increase in resource efficiency.

If we invested very heavily in research and development of more resource-efficient technologies, in recycling, and in renewable energy, it might be possible to produce a Gross World Product of $600 trillion per year permanently, without resource depletion or disastrous global warming, but it is more likely that ecological problems would cause the world economy to decline while poverty was still widespread.

Scenario 3: Growth Does Not End

Finally, as a third scenario, imagine that we continue to believe the economists who tell us we need growth to avoid unemployment, so the entire world decides it must stimulate demand and promote growth endlessly to create more jobs, as America did after World War II.

There would have to be heroic efforts to promote more consumption. Today, people who earn millions of dollars a year save much of it, but if everyone earned millions, people could not be allowed to save much. The population as a whole has to spend almost all of its income on current consumption, in order to avoid recession and unemployment.

To absorb extra purchasing power after everyone has cars, governments world-wide might promote helicopter use. At first, helicopters would be a luxury: people who owned them could live out in the country and could vacation in the unspoiled wilderness. Once they become more common, helicopters would become a necessity. Factories and offices would locate in the Nevada desert, knowing they could hire employees from California who commute by helicopter. Married couples would take jobs hundreds of miles apart, so they could not live together without commuting by helicopter. New housing would be built where residents could not go shopping or get to work without a helicopter. The wildernesses would fill up with campers in their recreational helicopters. To avoid accidents, the helicopters would have to be guided by centralized computer systems, so all those long helicopter rides would be very boring—but that would provide another marketing opportunity: virtual-reality video games for helicopters, which people could play to pass the time.
But even with the most expensive virtual reality systems, helicopters would only absorb excess purchasing power for a few decades. Once everyone had them, we would have to invent some new expensive habit so growth could continue, even after per capita GWP reached $4 million per year or $11 million per year (third row of Figure 18).

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Figure 18: Per Capita GWP in the Three Scenarios (2000 dollars)

Continued growth means that the Gross World Product keeps doubling. From 1950 to 2000, per capita GWP grew at a rate that gave it a doubling time of about 33 years, which means about an eight-fold increase every century. It is not plausible that this growth rate could continue indefinitely.

It does not make sense in human terms to consume so much. Even there were some new product (such as high-tech recreational helicopters) that everyone in the world wanted to consume, and even if it cost as much as the entire Gross World Product to provide this product to everyone, this product would only sustain growth for one doubling time. After thirty-three years, the world would have to find another even-more-expensive product for everyone to consume.

It is not ecologically sustainable to consume so much. There would be a constant race against the problems caused by growth—endless crash programs to develop technologies that could provide more raw materials, provide more energy, manage ecological breakdown, and manage social breakdown. The faster the growth rate, the more likely that we would lose this race and that there would be economic collapse and die-back—like the collapse and die-back that happened after Easter Island was deforested, but on a world-wide scale.

“Growth must continue, even after per capita GWP is $4 million or $11 million per year.”
To Live Wisely and Agreeably and Well

What will the future be like if we avoid the third scenario and end growth at a reasonable level?

After growth ended, the economy would not be stagnant: there would still be technological change, and existing products and methods would continually be replaced by new ones. But we would adopt new technologies only if they were useful. We will not stimulate demand for more gadgets—whether or not they are useful—just to create more jobs: instead, people would work shorter hours.

There is probably a limit to how much work hours can decline, because there seems to be a limit to how far productivity in services can increase. As the economist William Baumol pointed out in the 1960s, the quality of cars does not depend on how many workers produce them, but the quality of education does depend on the student-teacher ratio. Some services are now increasing productivity because of computerization, but some services will obviously never be fully automated: we will always want people (not robots with artificial intelligence) teaching our children, producing our art and literature, and making our laws.

From Necessity to Freedom

Yet work hours would decline substantially, raising the question of what people would do with their free time.

To begin with, people could use their free time do the things that improve their own well being. Instead of spending more money on medical care, people would spend more time exercising to improve their own health. Instead of spending more money on education, people would spend more time raising their own children. Instead of spending more money on suburban housing and transportation, people would spend more time working in community groups to improve their own neighborhoods.

In addition, people could use their free time to do the work they love, even if it pays little or nothing. Some would have small businesses after hours: they could earn their living by working in the mainstream economy part-time, and they could spend most of their time on handicrafts, computer art, or some other work that they do because they enjoy it, even though it earns them only a few cents an hour. Others would spend most of their time on unpaid work: for example, on study and writing, on local politics, on art, on sports, or on music. Even people whose jobs are satisfying could benefit from more free time: most college professors would be glad to have lighter class loads and more time for research, study, and writing; and lawyers, doctors, engineers, and other professionals could use their free time in similar ways.
People could do work they loved without quitting their day jobs, because their day jobs would not take much time. This sort of voluntary work can provide the feelings of accomplishment and the social contacts that most people get from their jobs today. Yet this is work that people do freely, because they feel it is interesting and important, rather than work that they just do because they need the paycheck, like most jobs today.

As Aristotle said, activities that we do freely are more satisfying than paid work, because they are done as ends in themselves, not as means to an end.

Western civilization emphasized the value of leisure from Aristotle’s time until the eighteenth century, and this was still a central value at the time of the American revolution. The aristocratic Jefferson is known for his classical attitude toward leisure, devoting his free time to philosophy and architecture. The middle-class Franklin, though he is known for working and saving, actually used his savings to retire when he was in his forties, so he would have the free time to devote himself fully to politics and science.

It was only during the nineteenth and twentieth century that we came to consider the production and accumulation of wealth to be ends in themselves, rather than means to the end of living a good life. This attitude may have been useful during the age of economic growth, but when growth ends, we will be able to see that Aristotle was right to say that we work in order to have leisure, that the purpose of work is to support activities that are ends in themselves.

From classical times through the eighteenth century, the west believed in the value of leisure, but it always seemed that only a small number of aristocrats would have the free time needed to live a fully human life, and that most people would always have to toil for long hours just to produce necessities. Now, there is a possibility that most people can move from the realm of necessity to the realm of freedom, spending some of their time on necessary work but having enough free time to develop their talents fully and to live fully human lives.

How Much is Enough?

For the first time, the world economy has reached the point where we have to decide how much is enough. Throughout history, most people lived at a subsistence level: economic growth was obviously a good thing when most people needed more food, housing, basic education, and basic medical care. When we move to an affluent economy, though, we can decide what standard of living we want.

If growth continues, it will eventually reach the point where people have enough. Even Herman Kahn, who was known for defending economic growth against environmentalists, predicted that growth would end because needs were satisfied when the world's per capita GWP was about two and a half times as great as America's per capita GDP in 1975, when he wrote. It is fascinating that, if we project per capita GDP into the future, we find that in only about 10 years, America will reach the income level where the anti-environmentalist Herman Kahn said growth would end because needs were satisfied.69
Kahn never said a word about why the world should aim for two-and-a-half times America’s 1975 income level. He did endless technical studies to try prove that there would be enough energy and resources to support this per capita GWP, but he never did any studies about whether people are better off if they consume so much.

Once we begin to study this question, it becomes clear that, in the United States, we already reached a point where much of what we consume is useless. We have seen that the United States has reached the point where growth does not bring real benefits but does cause real problems. In recent decades:

- Spending on health care has soared without increasing life expectancy; and our worst health problems are caused by mass-produced food that is high in fat and sugar, by smoking, and by lack of exercise.
- Spending on schooling has soared while student achievement has declined; and our worst educational problems are caused by too much entertainment and by parents who work so much that they have no time for their children.
- The amount of land we consume and the distance we drive have soared, but our cities have become less livable; and our worst urban problems are caused by excessive automobile use and by low-density suburban housing.

In each case, growth no longer brings significant benefits, but it does cause significant problems. In each case, historical and international comparisons show that at least half of what we consume is useless.

If we had strict limits on environmentally destructive forms of consumption, growth would still increase our well being as we moved beyond the levels of scenario 1, where people have half of American’s current income: we could stop spending money on freeways, jet skis, sports utility vehicles, unnecessary medical treatments, and unnecessary schooling for our children, and instead spend some of this money on adult education and travel. But endless growth clearly does not make sense in human terms, any more than it makes sense in ecological terms.

In a scarcity economy, it was so important to produce more output that the GDP could be used as a rough measure of economic well being. But it no longer makes sense to use the GDP—or to use a corrected index based on the GDP—or to use a corrected index based on the GDP—to measure economic well being, now that we have reached the point where we can spend more on health care without increasing average life expectancy, spend more on education without children learning more, and spend more on housing and transportation without making our cities more livable. The GDP measures total economic output, but more output no longer means more well being, so we should measure economic well being by using figures on life expectancy, infant mortality, educational achievement, hourly earnings, and the like, rather than figures based on total economic output.

Because progress is no longer improving our lives, some radical environmentalists reject modernization completely and look to primitive or preindustrial societies as models. This sort of thinking obviously is not a basis for practical economic policy, and it is certainly not convincing to people in the developing countries, where growth still is needed. Environmentalists should see that the end of growth is actually a natural result of modernization: growth should end when it reaches the point where economic needs are satisfied.
Possibilities for Our Grandchildren

In his 1930 essay “Economic Possibilities for our Grandchildren,” the great economist John Maynard Keynes had two contradictory attitudes toward free time.

Looking at how technology would affect his grandchildren, one hundred years in the future, Keynes foresaw a society where more leisure would give humanity more freedom.

All through recorded history, Keynes said, there had not been any great economic improvement. There were ups and downs, but there was not any general trend toward improved production and greater prosperity. “From the earliest times of which we have record—back, say, to two thousand years before Christ—down to the beginning of the eighteenth century, there was no very great change in the standard of life of the average man living in the civilized centers of the earth.”

But there has been continuing economic progress during recent centuries, because new technologies have made production more efficient, and because capital accumulating at compound interest has been available to invest in those technologies.

So, Keynes said, “mankind is solving its economic problem.” In the past, “the economic problem, the struggle for subsistence, always has been ... the primary, most pressing problem of the human race—not only of the human race but of the whole biological kingdom from the beginnings of life.” But in the future, “a point may soon be reached, much sooner perhaps than we are all aware of, when these needs are satisfied in the sense that we prefer to devote our further energies to non-economic purposes.”

When that time comes, “man will be faced with his real, his permanent problem—how to use his freedom from pressing economic cares, how to occupy the leisure which science and compound interest will have won for him, to live wisely and agreeably and well.”

But, in Keynes’ mind, this future was so remote that it did not influence current economic policies. Looking at the same increase of leisure as a current issue, Keynes has a very different attitude toward it: he calls it "technological unemployment ... unemployment due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour." 

In this view, more efficient production does not give us leisure and freedom. It gives us the problem of unemployment, which we must solve by finding new uses for labor.

Yet we obviously will never have more leisure as long as we believe that, to fight technological unemployment, we must find new uses for labor just as quickly as we economize the use of labor.

After World War II, this attitude toward unemployment became the conventional wisdom. All the developed nations used the methods that Keynes had recommended to "find new uses for labor." Governments built more roads, built more suburban housing, and used deficit spending to stimulate the economy, just as Keynes had said.
they should to avoid unemployment. They were so successful at “finding new uses for labor” that the work week stopped getting shorter after World War II.

Today, the grandchildren of Keynes’ generation have entered the workforce. In a couple of decades, the hundred years that Keynes said we would have to wait for a future of leisure will have passed. Yet Americans have less leisure today than they did in Keynes’ time.

If we are ever going to have more free time, we need current economic policies that offer us a choice of work hours. We cannot keep following Keynes’ idea that leisure and freedom are economic possibilities for our grandchildren’s generation, but that current policies must create jobs quickly enough that there is not more leisure for our generation.

Keynes’s approach is reminiscent of the school in Alice in Wonderland where the policy was always to give the students jam tomorrow but never to give them jam today. No matter how much time passes, it always remains today, and we never get the leisure and freedom promised in the future.

In retrospect, we obviously would have been better off if we had given Americans a choice of work hours in the 1930s, instead of “finding new uses for labor” in order to fight technological unemployment. We could have continued to reduce work hours gradually during the post-war decades, taking some of the benefits of post-war prosperity in the form of higher earnings and some in the form of more free time, instead of promoting consumerism and suburban sprawl to maintain the 40 hour work week of the 1930s.

**Population, Technology, Consumption**

Ecological sustainability depends on population, on the environmental impact of consumption (which is largely a factor of the technology used), and on the amount that each person consumes.

We can analyze the total environmental impact of the global economy using the classic equation:

\[
\text{Total impact} = \text{population} \times \text{impact per unit of consumption} \times \text{units of consumption per person}
\]

To move toward sustainability, we must deal with all three of these factors.

Population growth has already been the focus of national and international efforts, and fertility rates have declined dramatically during the last few decades. We should continue to work on limiting population, but this is an issue that people already understand and governments are already willing to act on.

Technology that reduces the impact per unit of consumption, has been the focus of plenty of talk but relatively little action. There are obvious things we can do. We should price energy to reflect its environmental costs as well as cost of production, causing a massive shift to solar energy and other sustainable forms of energy. We should also require products to be designed so they are more durable and easily recycled, move away from chemical farming, invest in greater energy efficiency, and

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“**What Gross World Product should we aim at, because it is best in human terms? The debate on global development policy has ignored this key question.”**
so on. These are familiar ideas, and this is an issue that people understand but that most governments are not yet willing to act on.

But consumption, the third key factor in sustainability, has been the focus of relatively little talk and of no government action. Ordinary people are thinking about this issues: there has been a voluntary simplicity movement in America for decades, and the best selling book *Your Money or Your Life* gives people practical advice about to how live simply and save enough to stop working. But these issues have not even been introduced into the debate on economic policy.

Economists are not doing studies to find what standard of living is optimum and when economic growth should end because needs are satiated. Politicians are not advocating choice of work hours as a way of slowing and then ending economic growth.

There could be a sustainable world economy with enough for everyone if the developed nations chose a less consumerist future. The more we do to limit wasteful consumption among the affluent, the better chance we have of creating a future where growth ends because everyone has enough—not because of ecological crisis. Yet the debate on global development policy has ignored the key question: what per capita income should we aim at, because it is best in human terms?

The three scenarios that we looked at are not predictions of the future: they are projections of what would happen if growth continued—and they make it clear that growth cannot continue indefinitely. The most likely prediction for the future is that rising resource prices, global warming, and other ecological problems will prevent most of the world from emerging from poverty: there will be pockets of shaky affluence in the United States, Europe, and parts of Asia, and there will be a long series of crash programs to deal with ecological degradation and to get the world economy back on track.

If we had begun a transition to sustainable production and simpler living in the 1970s, when ecological limits to growth were first widely recognized, we could have moved to a sustainable no-growth economy without doing damage to the global environment. This smooth a transition is no longer possible: global warming has already begun and cannot be stopped, though it can be slowed.

This looming ecological crisis is all the more reason to begin the transition now.

“Consumption, the third key factor in sustainability, has been the focus of relatively little talk and of no government action.”