

The global fertility collapse

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FEBRUARY 15, 2023

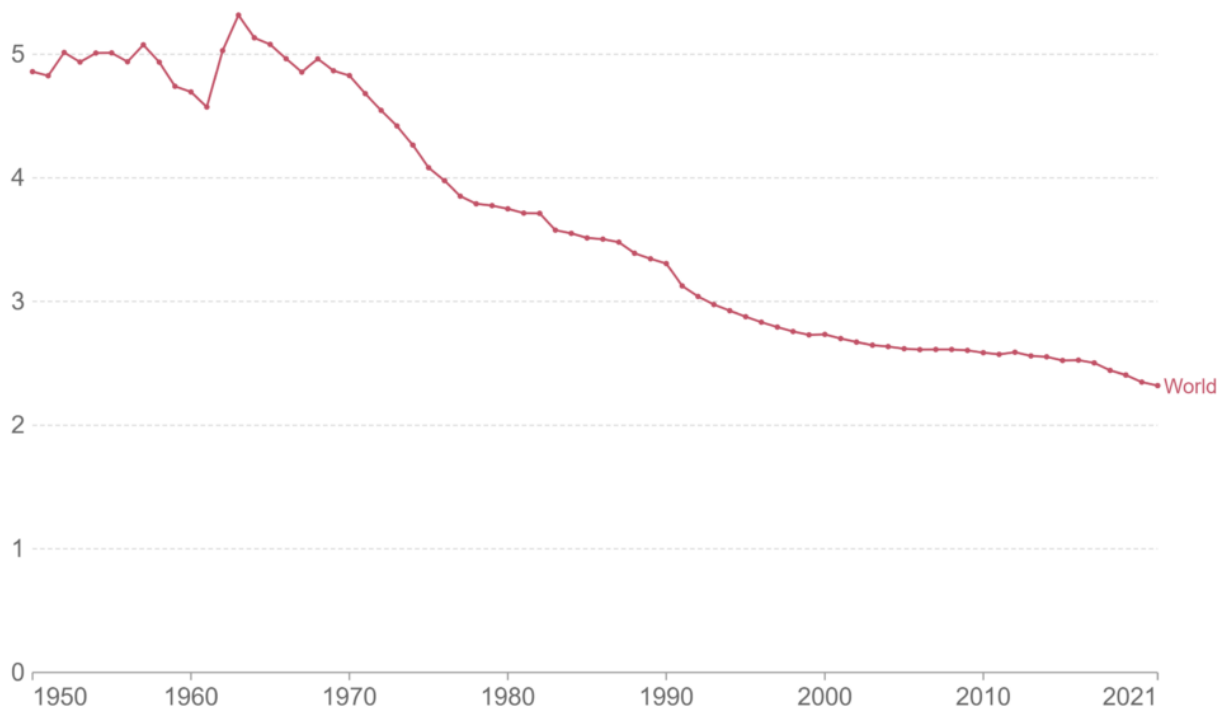
*"The Permanent Problem" is an ongoing series of essay about the challenges of capitalist mass affluence as well as the solutions to them. You can **access the full collection here**, or subscribe to **brinklindsey.substack.com** to get them straight to your inbox.*

When I was a kid, fear of overpopulation was all the rage. Paul Ehrlich's doomsaying *The Population Bomb* sold millions – I remember encountering it regularly during my endless boyhood bookstore browsing, just down the shelf from *The Late Great Planet Earth* and *Chariots of the Gods?* Vegetable-averse kids like myself were often scolded at the dinner table to remember the starving children in India. And popular culture assiduously mined the topic for material, never more memorably than in the final installment of Charlton Heston's trilogy of **anti-Promethean disaster flicks**, *Soylent Green* (**spoiler alert**).

Ehrlich's book came out in 1968, just as the assumptions underlying his nightmare prophecy of mass famines around the world were unraveling. The **Green Revolution**, which began with technology transfer initiatives in Mexico during the 1940s and 50s, spread to India and elsewhere around the world during the 1960s, leading in rapid fashion to dramatic increases in crop yields. As a result, the foretold famines never materialized.

Meanwhile, the global fertility rate peaked in 1965 at over 5 children per woman. Since then, it has been in relentless decline – now all the way down to 2.3. While the Green Revolution was the product of innovation and thus the resulting productivity spike was legitimately unexpected, the drop in birthrates merely recapitulated at the global level a dynamic that had begun in rich countries a century earlier. Between 1870 and 1920, fertility rates fell by 30 to 50 percent in western Europe and the United States. Along with a corresponding, and generally earlier, drop-off in mortality rates, this phenomenon is known as the "demographic transition" – the sea change from a high birth-rate, high death-rate society to one with low birth and death rates.

Fertility rate: children per woman



Source: United Nations - Population Division (2022)

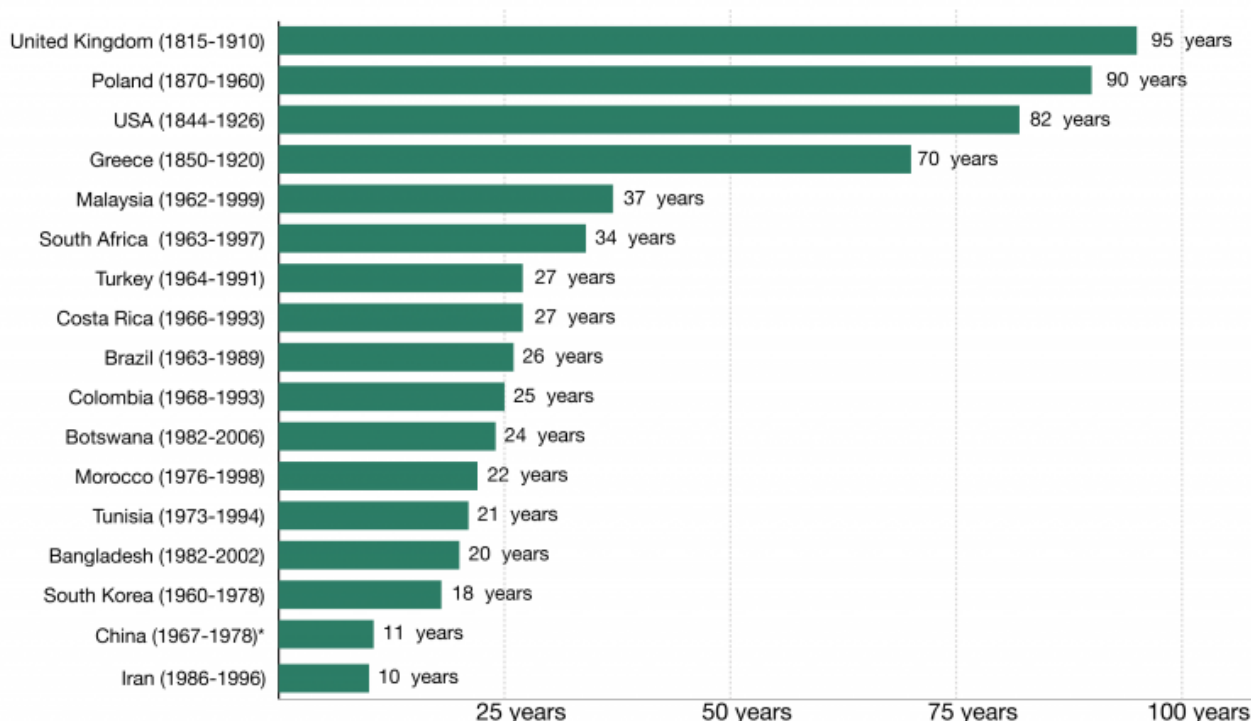
OurWorldInData.org/fertility-rate • CC BY

Note: The total fertility rate is the number of children that would be born to a woman if she were to live to the end of her child-bearing years and give birth to children at the current age-specific fertility rates.

It's no coincidence that the precipitous drop-off in North Atlantic birthrates kicked off around 1870 – the same year that Brad DeLong selected as the starting point for his history of humanity's “**stumbling toward utopia.**” The demographic transition was just one spectacular byproduct of the larger transition from mass poverty to mass affluence made possible by capitalist mass production. The rising demand for literate workers, along with the rising probability that children would survive till adulthood, incentivized greater parental investment of resources in each child; urbanization increased the cost of raising kids, while expanding economic opportunities for women increased the opportunity cost of having extra ones. These and related factors combined to transform kids from productive assets into increasingly costly splurges – and parental demand for children fell accordingly. And as the novel social conditions produced by industrialization spread from the North Atlantic to the rest of the world, the demographic transition went global – and at a much faster pace than before (see chart below), as catch-up opportunities extended to demographics as well as growth. Consequently, world population, which passed the 8 billion mark last year, is now expected to level off at around **10-11 billion people.**



How long did it take for fertility to fall from more than 6 children per woman to fewer than 3 children per woman?



* The one-child-policy in China was introduced after the decline of the total fertility rate below 3. It was introduced between 1978 and 1980.
 Data source: The data on the total fertility rate is taken from the Gapminder fertility dataset (version 6) and the World Bank World Development Indicators.
 The interactive data visualization is available at OurWorldinData.org. There you find the raw data and more visualizations on this topic. Licensed under CC-BY-SA by the author Max Roser.

The defusing of the population bomb was a triumph of capitalist wealth creation – but it came with a catch. Birth rates fell enough to avert Malthusian catastrophe, but then they kept right on falling. In the 1970s, sub-replacement fertility rates – that is, rates below the roughly 2.1 children per woman needed to maintain a stable population – began cropping up in rich democracies. But low fertility didn’t confine itself to rich countries; it kept spreading. As of now, roughly half the world’s population resides in countries with sub-replacement fertility. Here are the current **fertility rates** of some representative countries:

United States	1.6
Brazil	1.7
Chile	1.6
Germany	1.5

France	1.8
United Kingdom	1.6
Sweden	1.7
Italy	1.2
Russia	1.5
Ukraine	1.2
Australia	1.6
Japan	1.3
China	1.7
Thailand	1.5
South Korea	0.8

And consider the trend in some big countries with fertility rates still above replacement levels: India: 2.3 today, down from 4.0 in 1990; Indonesia, 2.3 today, down from 3.1 in 1990; Argentina, 2.3 today, down from 3.0 in 1990; Mexico, 2.1 today, down from 3.5 in 1990. Africa is the only continent where high fertility remains the rule, but it is dropping there as well: The average fertility rate is now 4.2, down from 6.0 in 1990.

With all due awareness of the fact that fertility rates could well rebound, it is important to recognize what the current widespread “birth dearth,” if it is not reversed, portends over the longer term. Look at South Korea, a country known for its rapid economic rise, industrial prowess, and now its blockbuster cultural exports – but which also has the dubious distinction of possessing the lowest fertility rate in the world. If current trends persist, South Korea’s population – currently just under 52 million – is **projected** to drop below 38 million by 2060; by 2100, its population will have dropped below 16 million, less than a third of what it is today.

It can take an extended stretch of sub-replacement fertility before a country’s overall population starts to decline. Because there has been population growth between the births of the older population and those of the first low-fertility cohorts, births even at the reduced rate will still outnumber deaths for a span of years. And if a country experiences net-positive immigration, it can keep population growth going considerably longer. On the other hand, countries from which emigration is net-positive will encounter population decline more quickly.

Population decline has already begun in some places. Japan’s population peaked in 2008 at just over 128 million, falling by almost 3 million since then. South Korea’s population peaked in 2020 and has dipped the past two years. If **China’s** population hasn’t peaked already, it’s likely to happen in the next couple of years. All of these countries have historically experienced limited immigration (although the pace in Japan has **picked up recently**), and so they enjoy less insulation from the demographic consequences of low fertility.

It is in **eastern Europe**, though, where population loss has been most widespread and dramatic – due to a combination of low fertility and a wave of emigration since the collapse of communism as people sought greater opportunities to the west. Between 1992 and 2016, the countries of this region lost about 18 million people, or about 6 percent of their total population. Latvia has already lost nearly 30 percent of its people; Lithuania’s and Bulgaria’s populations have fallen by nearly 25 percent. The astonishing emptying of the region is projected to continue apace: Latvia is on track to shed nearly a quarter of its remaining population over the next three decades; Bulgaria, whose population has already fallen from just below 9 million in the 1980s to under 7 million today, is shrinking by 50,000 people a year.

The U.S. fertility rate dipped below 2.0 in the early 1970s, then recovered to basically replacement level between 1990 and 2010 before sliding downward again. At the same time, though, the United States was undergoing a wave of mass immigration, with the foreign-born portion of the population rising from 4.7 percent in 1970 to 13.6 percent today. But just as birthrates have slumped over the past decade or so, the combination of the Trump administration and COVID-19 has caused annual immigration totals to fall **precipitously**. As a result, U.S. population growth during the decade 2010-2020 was the slowest since the Depression-era 1930s.

Although the U.S. population overall continues to inch upwards, population decline is **already a grim reality** in much of the country. Between 2007 and 2017, about half of U.S. counties, home to roughly 50 million Americans, saw their populations shrink. In an astonishing 80 percent of U.S. counties, with a combined population of nearly 150 million, the number of prime-age workers (ages 25-45) fell during that same period.

As that last figure reveals, low fertility affects not only the size of the population, but its composition as well. While low birthrates can lead eventually to population loss, their more immediate impact is to commence the gradual and ongoing aging of the population. The U.S. median age is now 38.8 years, up from 30.0 in 1980. Back in 1980, people 65 and over constituted 11 percent of the population; now it's up to 16 percent. In the EU, people 65 and over now equal 29 percent of the working-age population (20 to 64) – almost double the ratio back in 1965. By 2050, half or more of EU residents will be 50 or older. In Japan, where the median age is now 48.4, people 65 or older make up 29 percent of the whole population. (By way of comparison, the youngest country in the world right now is Niger, with a median age of only 14.9 years.)

So how does the global demographic U-turn affect the outlook for addressing the permanent problem? What is the impact of the slowdown in population growth, and the prospect of outright population decline, on our chances for learning to “live wisely and agreeably and well”? Attentive readers will recall that, before taking December off to suffer COVID-19 and celebrate Christmas, I was doing a series of essays on the many and varied causes of declining economic and social dynamism – and that I wasn't done yet. So it shouldn't be a surprise that, as I see it, the worldwide collapse in fertility poses a serious threat to the continued vitality of the capitalist system.

Awareness of the problem remains far from widespread. I reckon more people today are still worried about the nonexistent danger of runaway population increase than share my concern about demographic stagnation and decline. To the extent people are even aware of the dramatic worldwide fall in fertility, they are more likely to see it as a lucky break that has saved us from the population bomb than as the Charybdis to overpopulation's Scylla. And to be fair, it's easy to put a plausible, positive gloss on current trends. The prospects for raising living standards in poorer countries seem like they should improve with the relaxation of population pressures; likewise, the problems of climate change and environmental degradation more broadly would appear to be more manageable in the absence of ongoing population growth.

After all, we know that the richest countries in the world all have low fertility (well, with the singular exception of Israel), while the poorest countries still exhibit high fertility. Accordingly, it's clear that low fertility is associated with economic success – so what's the problem? The problem is too much of a good thing: the relationship between fertility decline and economic growth appears to be shaped like an inverted U, with falling births per woman aiding economic dynamism to a point, but then undermining it thereafter.

At the beginning of the demographic transition, a high-birthrate, high-death-rate society is very young, with a median age of 15 or so. That means that most of its people are children, below the modern working age; its "dependency ratio," or the ratio of people too young or old to work to the working-age population, is accordingly quite high. As death rates fall, the population starts to bulge; but then, as birthrates start falling as well, that bulge begins to age. As the bulge is centered on the prime working years, the transitioning society reaps a "demographic dividend": the payoff in added economic productivity that accompanies rapid growth in the labor force and a declining dependency ratio.

But as the demographic transition is completed, the society reaches the top of that inverted U and begins a downward slide. Now, as the bulge population starts retiring, the dependency ratio begins climbing again. Labor force growth slows, which means that labor productivity will need to rise if growth rates are to remain stable. But the aging process is simultaneously degrading the productivity of the work force: In a modern economy, worker productivity generally peaks in a person's 40s, so well before retirement, workers' productivity begins winding downward.

Accordingly, the association between falling fertility and rising economic growth is a one-off and temporary affair, lasting only decades. By contrast, this underlying relationship held steady from the dawn of the human species until the advent of modern economic growth: **the larger a society's population, the wealthier it tended to be**; and the wealthier a society was, the faster its population grew. Compare the state of development in Eurasia in 1491 to that in the pre-Columbian Americas; compare the Americas to Australia before Europeans arrived; compare Australia to Tasmania.

Back when it was possible for human populations to be isolated from each other for thousands of years, larger societies could produce more useful ideas that translated into larger, more intricate, and more productive divisions of labor.

At the root of this dynamic was the nonrivalrousness of ideas. Because new, useful knowledge can be consumed by some without in any way reducing its availability to others, it follows that a larger society can produce more new, useful knowledge that all of its members can share. But during the agrarian era, technological progress did not occur fast enough to change people's dominant reproductive strategy – namely, to have as many children as they could afford to raise. Accordingly, such progress as did occur generally translated into a rising population rather than rising living standards.

With the arrival of industrialization, the connection between rising living standards and rising fertility was finally broken. The economic incentives to have more children (to help out on the farm, to take care of you in your old age, to “hoard” children against the distinct possibility that some of them will die) steadily diminished, while the incentives to have fewer children (urbanization makes raising kids more expensive, expanding economic opportunities for women increase the opportunity cost of having more kids, rising returns to education favor investing more parental resources in fewer children) steadily sharpened. (You should check out the new book by **Oded Galor** for more details.)

Much has changed, then, but one thing hasn't: Ideas remain nonrivalrous, which means that more people still should result in more new, useful ideas. Which means, in turn, that – *ceteris paribus* – slower population growth should translate into a slower pace of innovation. Not everything is held equal, though: Slowing workforce growth and accompanying labor shortages increase the incentives for **labor-saving automation** and can thereby lead to accelerated productivity growth.

While we need to keep in mind this countervailing factor, the evidence to date shows that it has been outweighed by all the ways that an aging society acts as a drag on growth. The U.S. **labor force participation** rate peaked in 2000 at 67.3 percent; by February 2020, on the eve of the pandemic, it had fallen to 63.4 percent – the same as back in 1978 – and most of that decline was due to aging. With labor hours per capita falling during the 21st century, a labor productivity boom was needed to forestall falling growth. It hasn't materialized – and a growing body of research points the blame at falling population growth and aging.

Several recent studies conclude that aging is the major factor behind this century's ongoing decline in business dynamism – i.e., new business formation and the churn of workers between employers and occupations. This drop-off in “creative destruction” is bad news for productivity growth, which in turn is bad news for maintaining GDP growth in the face of aging. A **2019 study**, looking at regions throughout the OECD, found that regions aging 10 percentage points faster than the country's average rate experienced productivity growth that was 1.5 percentage points lower than the national average. A **2016 paper**, updated in 2022, concluded that a 10 percent increase in the share of the U.S. population 60 years and older reduced per capita GDP by 5.5 percent. Accordingly, the authors found that aging was responsible for lowering the growth of per capita GDP by 0.3 percentage points a year from 1980 to 2010. I could go on, but you get the point.

And what we're going through now may just be a taste of worse to come. I mentioned earlier that the prevailing opinion among demographers is that world population will ultimately stabilize at 10-11 billion people. But given the rapid global spread of sub-replacement fertility, how confident should we be that fertility rates will eventually stabilize and even rebound? A 2020 paper in **The Lancet** looks ahead to 2100 and sees a shrinking global population: According to the study's projections, world population will peak at 9.7 billion in 2064 and then fall to 8.8 billion by the end of the century. In that world, the populations of Japan, Thailand, and Spain will have dropped more than 50 percent from peak levels; China's population will have been nearly cut in half. The U.S. population will be roughly where it is today, having been buoyed by immigration.

So what are the prospects for global capitalism on a shrinking planet? Stanford economist **Charles Jones**, always worth reading on future prospects for growth, has examined the question and come to this blunt and dispiriting conclusion: “When population growth is negative, both endogenous and semi-endogenous growth models produce what we call the

Empty Planet result: knowledge and living standards stagnate for a population that gradually vanishes.”

Advocates of “degrowth” look forward to such a scenario with eager anticipation: They imagine that stepping off the GDP treadmill and reducing humanity’s environmental footprint will, at long last, enable us to “live wisely and agreeably and well.” On the plus side, a diminished human presence would surely bring some environmental benefits: forests can grow back, habitats can be reclaimed, and species now at the brink of extinction can get the breathing room they need to recover. **Wildlife is already returning** to the abandoned villages that now dot Japan and Europe.

On the whole, though, technological stagnation is terrible news for environmental conservation and reclamation. Arresting technological development at the level of heavy reliance on fossil fuels and factory farming is **analogous to a rock climber** pausing halfway up a cliff face: This is not a viable stopping point. If we don’t keep pushing upward until we get to clean energy and humane, sustainable food production, some catastrophe surely awaits.

Meanwhile, the hope that a shrinking population and economic stagnation will be a boon for overall human well-being flies in the face of contemporary evidence. For one thing, maintaining the social protections provided by contemporary welfare states will be an increasingly tall order. As the old-age dependency ratio ratchets ever upwards, the tax burden imposed on the shrinking working-age population will eventually grow unbearable.

Beyond that, look at the quality of life in the growing number of shrinking cities and towns today. Once population decline proceeds far enough, an unstoppable death spiral results: Declining tax revenues mean declining services, making the location even less appealing and thus spurring additional out-migration. **Employment declines** faster than population: In America’s most rapidly shrinking counties, 29 percent of prime-age men were jobless between 2013 and 2017, compared to 17 percent in the fastest growing counties. The overall mood is bleak and depressing: boarded-up downtowns, closed schools, empty playgrounds, an increasingly geriatric population playing out the string without the consolation of a rising generation to keep the world spinning. Aging, with its physical deterioration and inevitable losses of friends and loved ones, is a bitter enough pill; try choking it down with the bile that rises from watching your community and way of life die with you. Unsurprisingly, “**deaths of despair**” from suicide, drugs, and alcohol are positively

associated with rural location and vacant housing units in the area – both of which are associated in turn with population loss.

It should be equally unsurprising that those parts of the advanced democracies now in the grip of demographic decline have become hotbeds of authoritarian populism. According to analysis by **Mark Muro** of the Brookings Institution, roughly half of U.S. counties lost population during the 2010s; President Trump won a majority of the vote in some 90 percent of them. Along similar lines, a fascinating recent paper titled “**Golfing with Trump**” compared election results in 2012, 2016, and 2020 to identify those areas that swung in Trump’s favor relative to Mitt Romney’s performance in 2012. They found that those decisive areas were once tight-knit communities with high social capital that had experienced protracted periods of population and employment decline. And they note that this connection between depopulation and populism does not appear to be unique to the United States:

There are important parallels with the experience of other countries which suggest that our results may be more generalisable. For example, the *Gilets Jaunes* movement came from the declining peripheries of rural France; the rise of the Lega across many parts of Italy has been ignited by the long-term stagnation of the tight-knit communities of the formerly highly successful industrial districts in Northern and Central Italy; the Alternative for Germany (AfD) party in Germany comes, in part, from the declining industrial and small-town communities of Eastern Germany.

One should also mention Eastern Europe, where authoritarian populism has risen to power in Hungary and is on the march in Poland. Like their fellow partisans in the United States and western Europe, populists in those countries have exploited fears of out-of-control immigration – even though immigration in the east is all but nonexistent. Those countries have, however, been experiencing high levels of emigration, which along with falling birth rates have produced dramatic and continuing population declines. As **Ivan Krastev** and **Stephen Holmes** note in their book on the rise of illiberalism *The Light that Failed*:

[Hungarian prime minister Victor} Orbán gives the game away when he says, “Migration for us is surrender... we want Hungarian children.” His pro-procreation policy is a better indicator of the government’s

real worries than anti-immigration talk in the absence of immigrants. Exciting the public's fears of a non-existent migrant "invasion" which can be successfully blocked by militarized borders may be one way the region's populist politicians exploit their electorate's fears of national extinction by a slow process of depopulation that has taken place over the last decades and against which hardened borders and discrimination against foreign-born inhabitants are obviously no defence.

So can the fertility collapse be turned around? A number of countries, including Hungary as mentioned above, have tried their hand at pro-natalist policies – bounties for babies, subsidies for childrearing more generally – and some have succeeded in nudging birth rates upward. But nowhere have such policies succeeded decisively – that is, in lifting a country that has sunk into sub-replacement fertility back onto the path of sustainable population growth. Given the rapid global spread of sub-replacement fertility – a phenomenon that has cut across religious, linguistic, and ethnic lines as well as political regime types and all but the lowest levels of economic development – we must suppose that this trend is being driven by deep structural factors. Fiddling with economic incentives at the margin may help, but is unlikely to be enough. Fertility may rebound on its own, but the scale of policy interventions would need to escalate dramatically to be capable of turning things around.

This brings me to the end the end of my survey of the causes that underlie **capitalism's crisis of dynamism**. To recap:

- Innovation and growth get harder over time as low-hanging fruit is progressively exhausted.
- Greater wealth naturally breeds caution and conservatism, as people with a lot to lose naturally prioritize hanging on to what they've got over chasing new gains.
- A strong cultural aversion to technologies that empower large-scale interventions in the physical world – what I call the anti-Promethean backlash – arose with the emergence of the environmental movement during the 1960s and acts today as a major barrier to technological progress.

- The arrival of mass affluence and the post-industrial economy has changed our society's fundamental orientation from solving problems in the physical world to solving problems of social relations and psychic health, in the process degrading our ability to engage in the former.
- The lack of any systemic competition since the fall of communism has made conditions less favorable for institutional innovation.
- The global collapse in fertility means that population growth – the fundamental driver of technological progress throughout human history – is grinding to a halt.

In my next essay, I'll wrestle with the unsettling question that this review implicitly poses: Is capitalist dynamism doomed?