The Moral Foundations of Progress

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Stubborn Attachments opens with a concise case for growth:

- 1. Exponential: Economic growth is recursively-self improving
- 2. Atemporality: A person's value is not dictated by when they happen to exist
- 3. Pluralist Moral Realism: Goodness exists, but cannot be distilled to a single value
- 4. Enabler: Growth proxies well for many important values

Accordingly, it concludes that "the overriding importance of sustained economic growth is more than philosophically tenable. Indeed, it may be philosophically imperative."

This comes with several caveats:

- **1. Rights:** Only a near-absolute commitment to human rights can be sufficient to constrain growth. We ought to make this commitment.
- **2. Sustainability:** Given exponential growth, the bulk of all moral values could exist in the future, but only if a future exists for humanity.
- **3. Uncertainty:** It is difficult to predict the far future, so absolute rights and economic growth are the only values worth fighting for.

This last statement makes *Attachments* a kind of totalizing morality. It is in the vein of Wittgenstein's final "Whereof one cannot speak, thereof one must be silent." This does not make *Attachments* a hermetic text. To the contrary, as we'll soon see, maximizing the rate of sustainable economic growth necessitates a broad range of interests.

At its core, *Attachments* is a provocative text. It does not come to definitive conclusions, but rather raises a host of potential objections, both empirical and philosophical.

The rest of this article walks through several of the most compelling objections, noting where future work is needed, and which assumptions we ought to take as foundational. I begin by questioning how well economic growth, even broadly defined, actually enables plural ethical values, and whether we can expect this relationship to continue into the future and far-future. I also invigate a fundamental issue on the nature of "moral progress", decoupling the meanings "values individuals hold" from "values that society collectively

promotes". Second, I examine the relationship between growth and existential risk, attempting to determine more precisely what the growth/sustainability trade off looks like, and how the two values interact if we are concerned about the distant future.

In conclusion, I note several open questions for researchers in this area, and concrete suggestions for building an intellectual community capable of addressing them.

1. Wealth Enables Plural Values

Throughout the book, Tyler relies on the claim that since wealth has historically been a driver of plural moral values, we can maximize the former in order to pursue the latter:

The history of economic growth indicates that, with some qualifications, growth alleviates misery, improves happiness and opportunity, and lengthens lives. Wealthier societies have better living standards, better medicines, and offer greater personal autonomy, greater fulfillment, and more sources of fun.

....The bottom line is this: the more rapidly growing economy will, at some point, bring about much higher levels of human well-being—and other plural values—on a consistent basis.

The Enabler case for growth relies on this view that economic growth lifts many boats, and furthers plural values.

"Plural" should not be taken to mean "all". If someone were to claim "glory in battle" as a value, they might be dismayed to find that it correlates negatively with economic growth. Though *Attachments* never aims to provide an exhaustive list, it offers "a variety of relevant values, including human well-being, justice, fairness, beauty, the artistic peaks of human achievement, the quality of mercy, and the many different and, indeed, sometimes contrasting kinds of happiness".

Given a reasonable sounding set of plural values, Cowen claims that economic growth will benefit all of them. From there, the Exponential argument effectively argues that many plural values are not self-sustaining. Mercy does not necessarily beget more mercy, not beauty more beauty. Certainly, they do not do so in an exponentially increasing fashion.

We're encouraged to picture a process of "trickle-down" value. Say investments in economic growth return 100x over the next century, whereas investments in beauty only return 2x. Even if your only value is beauty, *Attachments* argues it is thus preferable to invest in

economic growth, so long as there is even a small positive correlation between the two values.

There are a variety of paths for responding to this view, we'll take each in turn.

1. Has wealth actually led to happiness?

One tempting response is to directly question the empirics. <u>Some researchers</u> have debated whether or not it is even true that economic growth has been good for common moral values including <u>poverty alleviation</u> and <u>human happiness</u>.

While it is hard to quantifiably measure values like beauty and mercy, along the axes we can measure, I am convinced the empirical case is strong. It is easy to take what we have today for granted, point out that <u>genocides</u>, <u>wars and pandemics</u> have continued, bask in a glorified depiction of past societies, and conclude that things have not improved. But along the most simple axes, the <u>portion of humans living in extreme poverty has decreased</u>, and even more plainly, we are simply able to support many more lives worth living.

On the topic of wealth and happiness, there are two key results. Richard Easterlin's <u>1974</u> "paradox" showed that while "within countries there is a noticeable positive association between income and happiness... whether any such positive association exists among countries is uncertain" and "for the United States since 1946, higher income was not systematically accompanied by greater happiness."

On a more individual level, Kahneman and Deaton's <u>2010 paper</u> famously reported "Emotional well-being also rises with log income, but there is no further progress beyond an annual income of ~\$75,000", producing this chart showing a leveling off of "positive affect":



These two results would seem to damn the moral case for progress, except that both findings are incomplete. As disputed in *Attachments* itself, both results should be considered in light of more recent evidence.

At the country level, a <u>subsequent result</u> from Stevenson and Wolfers found that "the core of the Easterlin paradox lies in Easterlin's failure to isolate statistically significant relationships between average levels of happiness and economic growth through time." They go on to conclude:

the relationship between subjective well-being and income within countries (that is, contrasting the happiness of rich and poor members within a country) is similar to that seen between countries, which in turn is similar to the time-series relationship (comparing the happiness of countries at different points in time as they get richer or poorer)

As for individual happiness, note that the Khaneman/Deaton paper also charts the relationship between income and a measure called the <u>Cantril Ladder</u> which asks respondents to imagine the best possible life as a 10, the worst possible life as a 0, and then rank their current lives on that scale. Along this metric, happiness continues to rise even as respondents surpass the famous \$75,000 level. As the authors explain "We speculate that the Cantril ladder of life is a purer measure of life evaluation than the life satisfaction question, which has an emotional aspect".

Even still, note that \$75,000 is around <u>median household income</u> for the US, which is among the wealthier countries in the world. From <u>Our World in Data</u>, there were still 650 million people living in extreme poverty as of 2018. That corresponds to less than \$1.90/day. Clearly, we are far from reaching a civilizational plateau.

Note also the Cantril Ladder depends upon the capacity to imagine a better possible life. At the moment, it is difficult to conceive of a world in which diseases are eradicated, although such a world would make us much happier. Conversely, we can imagine someone from the distant past reporting "I've lost two children to disease, lost my wife to childbirth, lost half my friends to war, but the harvest is good and we have a good chance of surviving the

winter months, so maybe a 7/10". We should not take this as strong evidence that their life is nearly as good as possible.¹

For a more comprehensive academic survey, see the endnotes from Chapter 2 of Stubborn Attachments. For a pop-historical account, see Steven Pinker's *Enlightenment Now*². For an anecdotal and emotionally charged view, see Appendix B taken from Robert Caro's interviews with women in Texas's Hill Country who experienced first-hand the impact of electrification.

2. Will the wealth/value correlation continue?

What about more mundane arguments? We might appeal to the concept of <u>commodity</u> <u>fetishism</u> in which a person "ascribes an independent, objective value and reality to a thing that has no inherent value". That's a Marxist line, but it's a concern shared by capitalists as well. From <u>Peter Thiel</u>:

You have no idea what to do with money, so money simply becomes an end in itself. Which always seems a little bit perverse... seems like kind of a crazy thing to do. But I think that's actually what happens a great deal... In effect, it's a hermetically closed loop. At the end of the day, no one's doing anything real with the money, it's completely abstracted.

More fundamentally, is it possible that we've reached a point of extreme diminishing returns? Perhaps wealth enabled human happiness in the past, but will not in the future. Our technological advancements used to entail new antibiotics, <u>reductions in child</u> <u>mortality</u>, and the capacity for self-determination. It is hard to compete with advances of that size, no matter how good our movies and kitchen appliances become.

The obvious counter objection is that many people still live in poverty today. They still have high rates of child-mortality, and still do not have access to antibiotics. So in that very basic sense, we can expect economic growth to be good, at least to the point where all humans are above some poverty line.

¹ More speculatively, the researchers at the <u>Qualia Research Institute</u> would likely insist that we experience merely a tiny fraction of possible bliss. Thanks to Andrew Zuckerman for informing me of the term "super-happiness", originated by <u>David Pearce</u>.

² Consider <u>Cowen's own critique</u> of Pinker as well as Pinker's <u>misleading statements about Al</u>. However, the overall thesis is still probably correct.

There are two avenues to explore here. The first is that consumption past a certain level simply does not affect human happiness, as borne out in both individual and cross-national outcomes. The second view is that economic growth no longer benefits "ordinary" people due to wage-decoupling and perverse capitalist incentives.

On decoupling, I <u>previously referenced this chart</u> demonstrating mostly flat male income since around 1970, despite massive GDP growth.



This is of historical interest, but it shouldn't be taken to imply that "ordinary" or "median" Americans have not gotten wealthier. Contrast with this chart of female income which has risen steadily:



This doesn't totally make up for the stagnation in male incomes, but progress is still progress whether it comes from economic growth or improving social attitudes. A <u>more</u> <u>comprehensive survey</u> from Scott Alexander very tentatively concludes that around half of this effect is due to rising inequality, with the other half caused by measurement artefacts. For his part, Cowen has written informally about <u>wage stagnation</u>, including at greater length in a <u>recent opinion piece</u>. To briefly summarize his views: it's a hard problem, but not due to any fundamental dynamics, and there are steps we can take to remedy it.

Additionally, there are plausible axiologies in which <u>we should not be neutral about</u> <u>creating more happy lives</u>. On a Total Utilitarian view, it is preferable to live in a future with many more people, assuming that their lives are on average net positive experiences. In this scenario, possible psychological limits are irrelevant to determining the potential moral gains from economic growth.

3. This is all post-hoc selection bias: centuries of growth have preserved only the values which growth is capable of harboring, and we've already lost sight of many worthwhile values.

Turning to the final point, let's consider the proxy effect as a mere artefact of selection bias. One might look at the abolition of slavery, improving rights of women, progress against the persecution of sexual and religious minorities, and conclude that economic growth has correlated positively with all sorts of worthwhile values. It is worth asking however, which values have been left behind.

In a concept termed <u>The Narrowing Circle</u>, Gwern Branwen argues against the "moral arc of history" as a self-justifying concept in which only the values promoted by progress remain held up as genuine ethical goods. In this view, the idea of moral progress "thus assumes its conclusion". As a counterpoint, Gwern notes ways in which, from a historical perspective, current morality has been perverted. Rather than expand monotonically, we have actually come to exclude animals, criminals, ancestors and divine beings.

If this list sounds ridiculous, that's precisely the point. Humans used to take their ancestors seriously as objects of moral concern. In contrast, today's humans "dishonor our ancestors by neglecting their graves, by not offering any sacrifices or even performing any rituals, by forgetting their names (can you name your great-grandparents?), by selling off the family estate when we think the market has hit the peak, and so on." The fact that none of this strikes us as morally transgressive is a result of the progress we've made in ethics, but that also makes such "progress" justified only by circular reasoning.

Religiosity is another arena ripe for possible moral decline. Atheism was once tantamount to heresy, today it's commonplace. Even among those who remain nominally religious, sincere belief coupled with commitment to religious practices has waned. From a <u>Pew</u> <u>Research survey</u>, we find a sharp decline in Christian faith in just the last decade, a drop in church attendance, and rise in those who identify as "religiously unaffiliated".³



Today's religious freedom comes with numerous benefits, including the decline of holy wars, religious persecution, sexual freedoms and so forth. But how do these material

³ Pew does note that among Christians, church attendance has remained constant since 2009, but we have to consider this in the context of Christianity declining from 77% to 65% of the population. In other words, the cohort of Americans identifying as "Christian" has been distilled to the most hardcore adherents, and yet church attendance hasn't growth.

goods compare to the spiritual costs? It depends on your moral framework, and it's not a coincidence that ours is self-justifying.

On animal welfare, we can more rigorously examine empirical data. From \underline{Vox} , we see a rapid rise in species extinctions in the last few hundred years.



Additionally, there is now an unprecedented number of animals subjected to factory farming. I'm not aware of a high quality historical data set, though <u>Wikipedia states</u>⁴: Intensive animal farming is a relatively recent development in the history of agriculture, and the result of scientific discoveries and technological advances. Innovations from the late 19th century generally parallel developments in mass production in other industries in the latter part of the Industrial Revolution.

....Agricultural production across the world doubled four times between 1820 and 1975 (1820 to 1920; 1920 to 1950; 1950 to 1965; and 1965 to 1975) to feed a global population of one billion human beings in 1800 and 6.5 billion in 2002.

In tandem with our worsening treatment of animals at large, we've also shied away from treating any animals exceptionally well. In the past, many animals were literally worshiped,

⁴ Similarly, in his talk at Stanford, Tyler Cowen says "One area where I think you find it very hard to see moral growth: how people treat animals. Wealthier societies have much more factory farming, simply because they can. There's no factory farming in ancient Athens because they just don't have the technology."

per Gwern once more: "If you could ask snakes, one of the most common sacred animals, what they made of the world over the last millennia, would they regard themselves as better or worse off"?

Pets may stand out as an exception, and seem to be treated well, except that domesticated dogs suffer from years of dysgenic breeding leading to chronic illness. We might also wonder if their lives are truly worth living. As Dormin writes in an <u>extended attack</u> on dog ownership, Border Collies are intelligent creatures, desperate for purpose. Trapped in a artificial environment, a pet's "inborn inclinations become maladaptive neuroses which torture their narrow lives."

In summary: economic growth has maximized certain values, and left others to rot. In hindsight, it looks like we've made monotonic progress, but only due to survivorship bias. The only values we have left are the ones growth has promoted.

Taking a small step back to improve my terminological rigour, note that I'm being a bit duplicitous in my use of "promoted". There are two relevant senses. In the first, it means that a value is more widely held, or held more strongly. In the second sense, "promoted" means that the object of value itself is at a higher level. For example, it may be true that our civilization considers animal consciousness a matter of ethical concern to a greater degree than previous civilizations, while simultaneously torturing animals in unprecedented numbers. In this case, we might say that the value has been widely promoted, although the object of value has declined.

Though there is some relationship between the values that individuals hold, and the values that society more broadly maximizes, it's not obvious that these operate in tandem. More succinctly: it's possible for a society to collectively pursue aims which no individual personally values. At various points in history, many people have felt that their society was in a period of moral decay. Even today, American conservatives may feel that abortion represents a moral step backwards. American libertarians may worry about the increasing number of regulations and <u>advent of penal labor</u>. American liberals may worry about continued environmental degradation.

Given the distinct meanings of "promoted", it's thus unclear that Gwern's hypothesis functions as a condemnation of moral progress. Perhaps our values have shifted, but this has not necessarily been a self-justifying progress. That leaves the question: if individual values don't determine what society maximizes, what does? Marx would have credited (or blamed) the <u>economic system</u>, as does <u>Scott</u> <u>Alexander</u>. Nadia Eghbal strips humans of autonomy, instead viewing us as <u>hosts for</u> <u>mimetic parasites</u>. In this view, even if you have the personal capacity to make choices, ideologies determine how those choices will play out. We can imagine analogous determinisms for a number of fields. Which is correct? Is the whole meta-theory viable?

4. The Longtermist Objection

What about the future? Paul Christiano writes:

It seems clear that economic, technological, and social progress are limited, and that material progress on these dimensions must stop long before human society has run its course... While further progress today increases our current quality of life, it will not increase the quality of life of our distant descendants--they will live in a world that is "saturated," where progress has run its course and has only very modest further effects.⁵

If economic growth only continues for the next million years, does the *Attachments* argument still hold? Perhaps we would have to replace the Exponential argument with "Economic growth is recursively-self improving for the next 1000 years", but it doesn't really matter. That still results in a boggling, but not physically implausible amount of wealth.^{6 7}

US GDP growth is around 2%, so 0.02%. Lifetime of the sun is around 5 billion years, so 50 million years. That gets us to 10^{430008} , which is indeed massive. I'm not sure why our galaxy is taken as the relevant frame on a 50 million year time scale. There are something like 200 billion galaxies, which helps out the growth case a bit. But still, Paul's point stands.

⁶ In 2013, <u>total energy supply</u> was around 1.6×10¹⁷ Wh. By comparison, <u>the sun produces</u> 3.8×10²⁶ W per second, which is 3.3 * 10³⁰ Wh per year. There are around 10¹¹ stars in our galaxy, and around 10¹¹ galaxies in the observable universe. So at a very rough first approximation, we could be something like 10³⁵ times more wealthy than we are currently. At 3% growth, we would plateau after 2726 years.

⁷ The math might work out, but it's still difficult to imagine. On that point, see <u>Scott Alexander</u>: ...*imagine being a futurist in ancient Greece presented with world GDP doubling time. Take the trend seriously, and in two thousand years, the future would be fifty thousand times richer. Every*

⁵ Cristiano goes on to write:

That is, the relationship between progress at time T and progress at time T+1 will break down eventually. For example, if exponential growth continued at 1% of its current rate for 1% of the remaining lifetime of our sun, Robin Hanson points out each atom in our galaxy would need to be about 10140 times as valuable as modern society. Indeed, unless our current understanding of the laws of physics, progress will eventually necessarily slow to an extremely modest rate by any meaningful measure.

However, it still matters if we hit a point of "saturation" where further growth no longer matters. Consider the following sequences describing wealth over time:

a) 5, 10, 15, 20, 30, 35, 40, 45, 50...

b) 1, 2, 3, 5, 8, 13, 21, 34, 55...

At first glance, (b) appears dramatically superior. Although each value is lower until the end, it grows more quickly, and will quickly surpass (a). From there, the gap will only diverge further. But what if we hit a point of saturation? It might instead look like:

a) 5, 10, 15, 20, 30... 90, 95, 100, 100, 100...

b) 1, 2, 3, 5, 8... 89, 100, 100, 100, 100, 100...

In this view, b remains superior in terms of total value, but only by a small amount. Were the universe to continue at saturated value for another million time steps, the percentage difference between (a) and (b) would shrink almost to 0. With different initial conditions, we can make the comparison arbitrarily disfavorable to growth.⁸

In his talk on the <u>moral imperative of economic growth</u>, Tyler provides some helpful framing to the longtermist objection. As he posits, "advanced civilization" likely only has another 700 years, and it's on that time scale that prioritizing growth makes sense. On a very long time scale, risk prevention takes precedence, and on a very short time scale consumption and redistribution take precedence, but on that moderate 700-year scale, growth takes precedence over other considerations.

Putting aside the question of whether this forecast is reasonable, it still fails as a compelling counter argument. Naively, say there are three possible timescales for humanity, and we assign equal (33.3%) credence to each of them:

- 1. Short: Humanity dies out within 100 years or fewer
- 2. Medium: Humanity dies out within 1,000 years or fewer

man would live better than the Shah of Persia! There would have to be so many people in the world you would need to tile entire countries with cityscape, or build structures higher than the hills just to house all of them. Just to sustain itself, the world would need transportation networks orders of magnitude faster than the fastest horse. But common sense was wrong and the trendline was right.

⁸ Of course, we can also make the comparison arbitrarily favorable to growth! As usual, the particular parameters matter quite a bit.

3. Long: Humanity dies out within 1,000,000 years or more

In this case, the overwhelming moral importance still lies in the far-future (1,000,000+ years). So long as you accept the basic Atemporal argument of *Attachments*, the mere possibility of a far-future dominates the expected value calculus. You could tweak the probabilities to assign 99% credence to the medium-term view and only 1% to the long-term view, and the math will still work out.⁹

Growth will still matter in that it accelerates our arrival at the "saturation" point, but as estimated by Nick Bostrom in <u>Astronomical Waste</u>, the cost of this delay is miniscule compared to the cost of outright extinction.

So existential-risk remains of tremendous importance, but where does that leave progress? Much more on this later.

5. Conclusion

Where does this all leave us? We should retain, along the lines of *Attachments*, a great respect for the self-sustaining quality of economic growth. It has historically been proxied well for many important plural values. A reformer living 300 years ago whose primary concern was for human health or poverty alleviation may have been better served attempting to improve the economic growth rate than working on those causes directly.

Having accepted this central point, it seems plausible that those secondary values are lucky to have been served, and not all reasonable ethical values have been so privileged. An 18th century reformer concerned primarily with religiosity should have attempted to pursue that value directly, or perhaps even fought against the engine of economic growth.¹⁰

Additionally, it's possible that those values were only carried forth by economic growth because people fought for them directly, rather than by proxy. Given the harsh history of persecution faced by sexual and ethnic minorities fighting for equality, it is difficult to

⁹ Thanks to <u>Philip Trammell</u> for contributing this point.

¹⁰ It's possible that growth still gives you greater optionality. You can lose religiosity, focus on population growth for a couple hundred years, then convert everyone back to Christianity and end up with far more Christians than you ever could have had otherwise. Having said that, it seems likely that Zoroaster's worshipers peaked a couple thousand years ago, and will not see a resurgence. Thanks to <u>Leopold Aschenbrenner</u> for making this point.

argue, even in retrospect, that their newfound liberties have arisen automatically as a byproduct of growth, even given a correlation between wealth and liberal social attitudes.

For example, the UAE has a GDP per capita of \$41.5k (\$70.5k PPP, compared to \$68K US), but still <u>outlaws homosexuality</u> with "imprisonment of up to 10 years on consensual sodomy" in Dubai.¹¹ It is unfortunately not difficult to imagine an alternate universe where the UAE is more powerful, looks bad at the sweep of human history and declares "In <u>ancient Greece homosexuality was prevalent and widely accepted</u>, today it has effectively be banned. See how effectively economic growth promotes plural moral values!"

Finally, I've <u>noted previously</u> that things can always become arbitrarily bad. The <u>historical</u> <u>trend towards fewer wartime deaths</u> ought to be tempered by an understanding that <u>Everything is Awesome and We're All Going to Die</u>. The optimistic stance is that <u>nuclear</u> <u>warhead stockpeaks peaked</u> at 69,368 in 1986, and declined to 17,995 by 2021. And yet, 17,995 is still more nuclear warheads than any point in history before 1960. It is possible to <u>pick up nickels in front of a steamroller</u> and feel that you're making progress every day until catastrophe strikes. This brings us to our second section.

2. There is No Growth/Sustainability Trade-off

Summed up in a single motto, *Stubborn Attachments* advocates for "sustainable growth plus rights".

But which to prioritize first? The case for growth depends on the moral importance of the future, but none of that matters if there isn't a future to care for.

If we stagnate now, we may be able to restart growth in the future. In comparison, an existential catastrophe is by definition unrecoverable. Given the choice, we ought to focus on stability.¹²

Even if there are benefits to growth, we might be able to pursue them in isolation. Perhaps economic growth improves our capacity for <u>asteroid impact avoidance</u>. If that's a matter of

¹¹ Technically sodomy is <u>punishable by death</u>, though this is <u>generally not practiced</u>.

¹² <u>Nick Bostrom caveats this view</u> by pointing out that delayed growth still has immense moral costs, but they are not nearly on the scale of outright extinction.

concern, we might still prefer developing an aerospace industry without parallel advances in all fields.

Or perhaps social progress has made us wiser? Proto-democratic systems have existed since <u>pre-Babylonian Mesopotamia</u>, but we only recently (around 1992) reached a threshold where <u>the majority of the world's population lives under full democracy</u>. Even so, there doesn't seem to be a fundamental reason we can't target <u>epistemic progress</u> without the accompanying risks from other kinds of growth.

Is there then any hope for growth as a priority? I explore two pathways: growth as a necessary component of democracy, and civilizational safety as a luxury good more likely to be pursued by wealthy individuals.

1. Growth as a Political Panacea

<u>Sam Altman views</u> growth as a requisite for functional democracy. As he summarizes: "Without economic growth, democracy doesn't work because voters occupy a zero-sum system." In his Conversation with Tyler, <u>Sam further stresses the importance of</u>: "getting back to sustainable economic growth, getting back to a world where most people's lives get better every year and that we feel the shared spirit of success"

This makes sense in theory. Without growth, you're just fighting for a bigger share of the same pie. In a zero-sum game, democracy becomes a tyranny of the majority.

There is some historical backing for this view. In *The Collapse of Complex Societies*, Joseph Tainter attributes the collapse of Rome precisely to stagnation:

These studies postulate deficiencies in Roman social structure and economy, such as: (a) economic stagnation and lack of lower- or middle-class incentives; (b) the formation of large estates using slave or serf labor; (c) lack of regional economic integration; (d) overtaxation and the cost of government; (e) a weak financial system limited by minimal credit arrangements and by the supply of precious metals; and (f) the end of geographical expansion. The Empire, in short, was unable to bring forth the changes necessary for its continued existence. [emphasis mine]¹³

¹³ Tainter later clarifies "The collapse of the Roman Empire in the West cannot be attributed solely to an upsurge in barbarian incursions, to economic stagnation, or to civil wars, nor to such vague processes as decline of civic responsibility, conversion to Christianity, or poor leadership. Several of these factors were indeed involved in the collapse process, but to understand that process it is necessary to go back in time to the formation of the entity that ultimately fell."

This is a promising avenue for justifying growth, but is open to a broad theoretical attack. Namely, what Tainter describes has less to do with growth as a virtue, and more to do with an addition to expansion. Civilization is, in this view, no more than a complex ponzi scheme in which yesterday's costs must be paid for by an endless expansion. But as Christiano noted earlier, the universe is finite, We're thus left with <u>Greta Thunberg's critique</u> of the "fairy tales of eternal economic growth".¹⁴

But remember, in Cowen's view, we're only concerned about the next 700 years. On that time scale, a ponzi scheme may be sustainable. And unlike pure ponzi schemes, civilization does actually have to produce something beyond abstract financial returns that only exist on paper. We've seen massive growth, for example, in population and sustainable energy production:



¹⁴ Oswald Spengler, who also wrote on the <u>collapse of civilization</u>, believed that the paradox of eternal expansion was more than a myth, it was the central myth that allowed Western civilization to flourish. In his view, Western culture was essentially *Faustian* in nature, meaning that it is characterized by "the concept of infinitely wide and profound space, the yearning towards distance and infinity".

Alternatively, from <u>Vonnegut</u>: "Americans... are forever searching for love in forms it never takes, in places it can never be. It must have something to do with the vanished frontier."

Girard is typically credited with identifying mimetic desire as the source of competition and thus "<u>limitless violence</u>" and "a violence that knows no bounds." David Graeber <u>identifies an earlier</u> <u>source</u>: "as Augustine already anticipated, infinite desires in a finite world means endless competition"

Also consider Graber's alternate view on the fundamental tension between capitalism and eternity: "Presented with the prospect of its own eternity, capitalism—or anyway, financial capitalism—simply explodes. Because if there's no end to it, there's absolutely no reason not to generate credit—that is, future money—infinitely."

Those are real human lives which would not otherwise exist, and it seems likely that they are a "bubble" which will suddenly pop. We can better understand civilization's self-reliant growth through Alex Danco's notion of "<u>controlled bubbles</u>"

this isn't an ordinary bubble: there are rules. There are virtually no outright scams, there's a strong <u>social contract</u>, and a complex system of overlapping incentives between founders, investors and operators that keep a healthy simmer but prevent any boiling over. Silicon Valley is a bubble with a <u>superego</u>.

Or as described by **Byrne Hobart and Tobias Huber**:

Financial bubbles are, in one sense, the most benign expression of mimesis. Money changes hands, but the world does tend to improve, either through over-investment in technology (in equity bubbles) or through a more detailed mapping of the status quo (in credit bubbles).¹⁵

As described by Byrne, and in Danco's other writing on the <u>Alchemy of Venture</u>, controlled bubbles are really about solving coordination problems. How does this map onto Sam's theory of democracy? Decently well. As Sam continues:

Growth may be the root cause of American exceptionalism—things consistently got better every decade largely because we were growing. People from other countries wanted to live here, we led the world in technological innovation, social mobility was high because everyone was getting richer, and we had the resources to get involved around the world.

To summarize where we're at rhetorically: growth may be an enabler of political stability, which may be important for civilizational resilience. This has ponzi scheme dynamics at a surface level, but that may not be a fatal objection.

¹⁵ Hobart and Huber go on to write:

Both the Manhattan Project and the Apollo Program were enormous technical risks requiring a single-digit percentage of GDP to be invested in an uncertain outcome. One result of these bubbles was coordination—building a tenth of the Apollo Program would have been a foolish investment for a private or public actor, but given a government commitment to completing the entire project, it made sense for individual participants to build out smaller components. The Apollo Program required advances in rocketry, communications, computation, and simulation; the project wouldn't have been viable if any of these had failed, but the existence of the project provided the initial shove necessary to get the technological ball rolling. To take an extreme example, when Voyager was launched, it had the ability to encode extremely succinct messages. The technology to decode them did not exist, but the team believed (correctly) that this technology would be developed in time

A more detailed interpretation of the virtuous cycle Sam imagines is thus:

- The US is a hub of technological innovation
- This leads to economic growth, which feels like social mobility¹⁶
- These factors attract the world's best scientific talent¹⁷
- That talent then leads to sustained technological dominance
- Allowing us to "get involved in the rest of the world" and ensure continued stability¹⁸

The strength and necessity of these links remains speculative, but it is a promising avenue for the defense of growth. In this model, growth really is essential not only for the functioning of democracy, but for civilizational resilience itself.

2. The Risk Kuznets Curve

Modeling the effect of economic growth on existential risk, Leopold Aschenbrenner points to the possibility of an inverted U-curve:



Figure 4: The hazard rate along the transition path. Time 600 corresponds to today and the value at this date is highlighted in the graph. A period represents a year.

¹⁷ During WWII, this would have included Leo Szilard, Enrico Fermi, Edward Teller, Wernher von Braun, Kurt Gödel, Albert Einstein, Hermann Weyl, John von Neumann, and many more.

¹⁸ There are two much darker interpretations of the cycle. First, "Get involved in the rest of the world" could mean defeating the Nazis in WWII, but it also entails <u>human rights violations by the CIA</u> and an imperfect record euphemistically titled <u>United States involvement in regime change</u>. Second, "attracting talent" might refer to the recruitment of scientists, but it also refers to America's long history of importing cheap labor through slavery, indentured servitude, and the continued exploitation of an undocumented underclass. From the outside, the former also looks like a <u>brain</u> drain, or possibly even an <u>IQ shredder</u>, which means there are underappreciated negative externalities.

¹⁶ Per <u>Wikipedia</u>, actual social mobility is "a change in social status relative to one's current social location within a given society." So technically this is not accomplished by universal enrichment. But with more precise terms, the original point stands.

In this view, increased economic growth "accelerates" our path along that curve, increasing risk in the short-run, but decreasing overall risk (equivalent to the area under the curve).



It's critical to understand the particular mechanism at play. As Leopold explains: In a sense, the period of faster growth accelerates the movement along the existential risk Kuznets curve. As a result, the overall area under the hazard rate curve is lower—and recall that this is all that matters for the long-run probability of civilization's survival.

This finding has its basis in Jones's earlier paper *Life and Growth* which examined the relationship between investments in safety and consumption. As he explains in greater detail:

The marginal utility associated with more consumption on a given day runs into sharp diminishing returns, and ensuring additional days of life on which to consume is a natural, welfare-enhancing response. When the value of life rises faster than consumption, economic growth leads to a disproportionate concern for safety.

Since its publication, several objections have been levied against Leopold's result. First, it is suggested that we ought to engage in <u>differential technological development</u> and more narrowly pursue the types of progress that lead directly to safety. Though growth loses its singular importance in this view, it remains entirely permissible. This objection is thus reduced to a question of tractability. We know that growth rates have varied immensely across history and continue to vary immensely across countries. It's reasonable to infer that much faster growth may be possible, and that this at least merits investigation.

The second key objection is that Leopold's result depends critically on the relevant timescale. On a 1000 year time scale, overall risk is lower under accelerated growth. But it

takes ~300 years for moment-in-time risk to fall, and another ~200 years for cumulative risk¹⁹.

In contrast, <u>proponents of a certain worldview</u> posit that there is a 50% chance²⁰ of transformative AI occurring within the next 50 years. On that timescale, faster growth is a liability. Furthermore, if the risk of extinction from transformative AI is <u>as high as some</u> <u>researchers estimate</u>, this ought to take precedence over all other concerns.

Even granting these forecasts, the objection won't prove fatal to the importance of growth. As a result of lower risk from non-Al causes of existential risk, <u>Nick Beckstead's model</u> yields the surprising result that "the effect of faster progress on artificial intelligence on the risk of human extinction is very unclear."²¹

To build intuition for this result, take an exaggerated model in which the risk of alien invasion over the next 100 years is 50%, but the risk from unaligned AI over the same time period is only 1%. Assuming that the advent of AI will allow us to fend off this alien threat, it's easy to see how accelerating progress would lead to lower overall risk, even if it increases the dangers from AI. Whether or not this holds true depends on the model parameters. If the risk of alien invasion is 0.1%, and the risk of AI is 10%, the argument for acceleration is much less compelling.

In real life, we have a decent sense of that relative risk. <u>Toby Ord</u> places the odds of existential risk from any cause in the 100 years at ~1 in 6, and the risk of AI in particular at ~1 in 10. There may be some complex conditional probabilities, but at first glance, AI risk seems to be around half of all possible existential risk.

¹⁹ These numbers are eyeballed from the graph, and depend on model parameters. The point is merely that the preferability of growth depends on your timescale.

²⁰ Note that these arguments hold even if you believe the near-term probability of achieving transformative AI is closer to 5%. There is also an open question of the long-term probability of achieving transformative AI, conditional on not achieving it in the next 100 years. At that point, we will very likely have the computing power equivalent to a human brain, so continued failure may point to a deeper misunderstanding of the feasibility and desirability of human-level AI.

²¹ Beckstead is a member of the aforementioned "proponents of a certain worldview", meaning effective altruists concerned about risks from advanced AI. Having said that, he notes that this is a simplified model, and goes on to describe its limitations. Though this post represents the views of the Open Philanthropy Project as an entity and acknowledges feedback from several notable researchers, I am not sure how close it is to the consensus opinion of the broader community.

But that still isn't enough to give us a clear decision. The remaining key parameter is the cost, in terms of safety, of accelerating AI development. Taking this as uncertain, Beckstead provides a table of results depending on your assumptions:

		Number of years development of advanced AI is sped up		
		1	5	10
Ratio of cisk from advanced AI to all other cisks	0.1	11.76%	58.82%	117.65%
	0.3	3.92%	19.61%	39.22%
	1	1.18%	5.88%	11.76%
	3	0.39%	1.96%	3.92%
	10	0.12%	0.59%	1.18%

Given that the ratio is likely close to 1²², we find that it is worth speeding up AI development by 5 years if this increases the associated risks by less than 6%. I'm currently not aware of any estimates of this parameter.

A third objection <u>noted by Carl Shulman</u> holds that Leopold's assumptions are too far detached from a useful model of reality. As he writes:

My main issue with the paper is that it treats existential risk policy as the result of a global collective utility-maximizing decision based on people's tradeoffs between consumption and danger. But that is assuming away approximately all of the problem.

If we extend that framework to determine how much society would spend on detonating nuclear bombs in war, the amount would be zero and there would be no nuclear arsenals.... the level of consumption is not key: spending on war and dangerous tech that risks global catastrophe can be motivated by the fear of competitive disadvantage/local catastrophe (e.g. being conquered) no matter how high consumption levels are.

²² Meaning that AI is about as risky as everything else combined.

Carl objects that the level of investment in safety is not the result of a collective decision making process. As such, it doesn't matter if an increased value of life makes it rational for the civilization to invest in safety rather than consumption. Each individual person would still rather be a free rider and get the best of both.

A more detailed view could separate concern for safety into three levels:

- 1. Full buy-in: Everyone acts collectively to prevent existential risk
- 2. Partial buy-in: Every living person benefits from shiting investments to safety, but you still have to figure out public good provisioning.
- 3. No buy-in: Future people would benefit from shifting investments to safety, but each living person would rather invest in increased consumption.

Leopold's model demonstrates that at sufficient levels of growth, we accelerate the shift from level 3 to level 2. Carl correctly points out that this is still not level 1, but that's far from a fatal objection.

2.b. Existential Risk, Age and Longevity

We can better understand the level 2/3 dichotomy through analogy to climate change. Currently, very young people ought to be personally concerned about climate change, whereas very old people should only care for altruistic reasons. This seems to <u>play out</u>



Admittedly, young people simply tend to be more progressing on many issues. But the point here is primarily illustrative: it's easy to support a cause that impacts you personally, even if you are not personally responsible.

There are a <u>number of solutions</u> to the problem of public goods provisioning, democratic governments being chief among them. This is still not an easy problem, but it's dramatically easier than convincing people to act in the interests of future people who do not yet exist.

Consider a bill which would cost \$1 trillion but reduce the odds of existential risk of the next 100 years from 15% to 14%. If you truly assume massive future potential for humanity with no time discounting, this has tremendous expected value. And yet, it's not clear it could pass today. Whether or not we collectively agree on such matters depends largely on the shift from level 3 to level 2 thinking that Leopold's paper describes.

Finally, let's consider the impact of longevity. The longer each living person can expect to live, the more bought in they are to increasing civilizational resilience, even if only for selfish reasons. At a naive first estimate, doubling someone's longevity roughly doubles their willingness to pay for existential risk prevention.²³

There's a similar argument to be made, which is that life-extension aside, we should simply be trying to decrease the age of our leaders. In 2020 the presidential election between Joe Biden (78) and Donald Trump (74) led John Mulaney to <u>dub the whole thing</u> an "elderly man contest... there's two elderly men, and you're supposed to choose your favorite of the two elderly men... and then we might have the same elderly man or we might have a new elderly man."





²³ The real estimate is not quite as optimistic. We not only discount the future when it comes to altruism, but also when it comes to our own lives. There are also some <u>open questions</u> as to how cost-effective we can expect life extension research to be, though the bottom line is: it's plausibly extremely cost-effective.

And among CEOs of top companies:



You might argue that this is a win for longevity. It shows that increasingly old people are remaining at the "top of their game". But in the same 14 year period where the average CEO age increased 12 years from ~46 to ~58, <u>life expectancy in the US</u> only increased 1.1 years from 77.7 to <u>78.8</u>.

This might all sound somewhat tongue-in-cheek, but if you take Leopold's model seriously, you should be very concerned about aging in government and industry.

Conclusion: Making Progress (Studies)

If I've written appropriately, you should not walk away feeling that any of these matters are settled. Rather, I hope to invoke a sense of intellectual curiosity, feeling of opportunity, and desire to rigorously examine my numerous unjustified assertions. In doing so, I only ask that you consider which assertions are substantial. That's to say, critical to the core issue at hand: whether or not economic growth is a moral imperative.

Rather than a laundry list of open questions, I aim to encourage a focused research agenda along three lines:

 Is economic growth tractable? It's intimidating to think about federal policy change, but it's possible this field is massively neglected and thus full of fertile ground. Thanks to the Effective Altruism movement, we have a good sense of the dollar to QALY conversion rate, but I'm still not sure what the dollar to Al Risk Reduction rate looks like, and am even less certain about how to "purchase" accelerated growth. Or perhaps this is a fundamentally flawed framework if growth "pays for itself" and is thus "free" in some important sense.

- 2. Is moral progress possible? What's the relationship between the values individuals hold, and the values that society collectively maximizes? Considering the variety of historical values, it's tempting to reduce everything to a utilitarian framework, and simply consider how much suffering has been alleviated through adherence to various instrumental values. But maybe that perspective is precisely my problem. If we cast aside plural moral values now, will we ever have a chance to recover them? Perhaps <u>Sacred Principles are an Exhaustible Resource</u>, and all the money in the world won't make up for a dystopian future where humans see themselves merely as producers and consumers of material goods. Unless this is resolved, we can expect the growth imperative to face substantial resistance. Bykvist, Ord, and MacAskill call for investment in pure moral progress, but it's not clear that this is even possible in isolation.
- **3.** How does growth impact risk? I've covered several questions on the existential-risk frontier, but much more remains. We need a better estimate of the costs of accelerating AI progress, as well as a better understanding of the possibility and consequences American decline. We should also consider how growth enables increasingly horrific downside risk. Is anything worth accepting the possibility of future genocides of unprecedented scale? What about the risk of <u>hellish whole brain emulation</u>? Taking Leopold's result seriously, several issues emerge along the estimation and influence of critical model parameters.

I can't address these questions alone. In fact, we can't even address them collectively. The Progress Studies community remains immature, and incapable of pursuing a serious research agenda. At the moment, it is <u>not yet an established discipline</u>, which incurs <u>serious</u> <u>costs</u> ranging from a lack of epistemic norms, to the absence of standard operationalizations of key concepts, and an absence of foundational assumptions. So there is a meta-question to be raised along institutional design.

I launch this concern seriously. It's not merely that we don't have the capacity. It's that even if I hunker down for a year to write research papers, they would be meaningless in the absence of intellectual institutions. A result can only be made valid in the context of an epistemic framework.²⁴

This all presents a compelling opportunity. Given its nascent state and the lack of serious full-time Progress Studies researchers, we-meaning anyone reading this document, meaning you-each have good odds of being able to substantially shape the course of this field.²⁵

How should we approach field-building? <u>One approach</u> is straightforward: publish good research, then label it Progress Studies, and simply assert that it is part of a new intellectual tradition. In contrast, my work here thus entails the beginning of an even more straightforward approach:

- 1. Robustly argue for foundational assumptions
- 2. Define operationalizations of key concepts
- 3. Set and enforce epistemic norms

That's to say, don't worry too much about "field building" or what happens at the meta-level. Simply embark on a quest to rigorously answer important questions, and invite others to join in the adventure.

What happens next? **First**, The foundational questions here are far from settled, and open research questions are already beginning to emerge from this initial investigation. Future work ought to entail a more comprehensive, albeit prospective, research agenda that we can begin to execute against.

Second, The key concepts are also lacking, and some of this will require more sophisticated economic reasoning than I'm currently able to provide. It's long been clear that while TFP and GDP are unreliable measures, simply pointing out their failures is insufficient. Jason

²⁴ A <u>hardcore objectivist</u> might argue that at the very least, mathematical results have intrinsic validity. That's true, but only as meaningless tautologies. I can generate an infinite number of mathematically valid results (1 + 1 = 2, etc). But what constitutes a "finding" or "theorem" is a matter of identifying useful abstractions in the context of an active research culture. Just as there is no <u>private language</u>, there is no independent research.

²⁵ It is remarkable to look back on early writing in the rationalist/effective-altruist sphere and see how many of the people involved are now highly-prominent figures. Did they become prominent because they had long standing expertise? Or did early interest in EA select for smart and hard working people? If you one-box <u>Newcomb's paradox</u>, you should get involved in Progress Studies today.

Crawford suggests a <u>dashboard for progress</u>, and refining these measures will entail a substantial scope of further work.

Third, I no longer believe that setting epistemic norms has to be a lengthy or complex process. I have already begun drafting an initial set of standards, and will actively seek to foster agreement from leading actors in the Progress Studies space. These will initially trend towards being too weak rather than too strong, aiming to set a minimal baseline for civility.

If you would like to get involved in any capacity (research, funding, operations), you can find my contact details <u>here</u>. I look forward to hearing from you.

Appendix A: Minor Objections to Stubborn Attachments

Against the Overtaking Criterion

In an appendix to *Attachments*, Tyler endorses:

The Overtaking Criterion: A sequence $g^{\infty} = (b1, b2, ...)$ is preferred to $h^{\infty} = (a1, a2, ...)$ if one sequence, at some point in time, remains systematically higher than the other.

....it simply means that we prefer one sequence of values to another if one sequence, at some point in time, remains systematically higher than the other.

....the overtaking criterion will prefer (c) to (d) for: (c) 3, 3, 7, 8, 9, 10, 11, 12, 13, 14... (d) 4, 4, 6, 7, 8, 9, 10, 11, 12, 13..."

....We can also add Pareto principles to the overtaking criterion so that if one sequence has some unambiguously higher values along the way, it is better even if it does not overtake the other for all later periods of time, but rather remains equal to it.

This is a nice formalization of the growth principle, but I don't think it holds up to scrutiny. Consider the sequences:

e) 100, 3, 4, 5, 6, 7, 8... 97, 98, 100, 100, 100 f) 3, 4, 5, 6, 7, 8, 9... 98, 99, 100, 100, 100

Ignoring the very first term, (f) is systematically higher, until they remain equal to each other. By this logic, (f) should be preferred by *OC*. And yet, if we cancel like terms, we get that these sequences are equivalent to:

e') 100 f') 99

It is difficult to justify preferring (f') to (e'). Note that we can make the inequality arbitrarily bad, while still obeying *OC*.

Tyler does cite Chichilnisky's <u>paper on avoiding sustainable development</u> in which a welfare function is "insensitive to the utility levels of any finite number of generations, or equivalently it is only sensitive to the utility levels of the 'tails' of utility streams." He notes "We could entertain such an alternative if in fact we did face an infinite time horizon and a "dictatorship of the future" problem."

Still, it remains unclear from his description how *OC* is preferable to a simple <u>Total</u> <u>Utilitarian</u> accounting.

Against redistribution to the rich

In Chapter 5, Tyler toys with the idea of redistribution to the rich. In a stunning inversion, he writes:

...the rich earn higher returns on their accumulated wealth, as has been argued by the French economist Thomas Piketty... let's assume, for the sake of argument, that the wealthy earn eight percent on their holdings, annually and on average, while the poor earn one percent. If one-fifth of the gains to the wealthy trickle down to the poor over time, then the poor are better off if the wealthy command more resources. They will receive one-fifth of the eight percent, or 1.6 percent, rather than the one percent they would earn on their own.

He does not literally endorse this theory, but suggests that it at least implies "short-term redistribution to today's poor is no longer the default option".

This all sounds fine, under you consider the long-run consequences of our existing system. Assuming "for the sake of argument" that the wealthy earn 8% while the poor earn 1%, it won't be long at all until the wealthy hold the vast majority of all capital anyway. As we have already <u>heard countless times</u>, this dynamic is, in actually, already beginning to play out:



Now let's take the extant situation as a starting point and continue holding Tyler's model assumptions. Starting with 77.1% of the wealth and experiencing 8% growth, the top decile will hold 3616.1% of today's wealth in 50 years. By comparison, the remaining bottom nine deciles who currently hold 22.9% of the wealth will grow at 1% and hold a mere 37.7% of today's wealth in 50 years. Renormalized, that means we'll see a future where the top decile owns 99% of all wealth.

I don't mean to be an inequality alarmist, nor do I think this situation will literally play out. My point is that taking Tyler's model, we do not arrive at the conclusion that redistribution to the rich is moral or even necessary. It appears to already be happening, to about as extreme an extent as is possible, though the existing dynamics he describes.

Further, it's not so clear to me that his model assumptions are at all reasonable. Granting that the wealthy are better asset managers than the poor, it doesn't actually hold that they can expect to earn much better returns. Instead, the poor, or anyone else with a Fidelity account, can simply invest in the S&P and <u>still beat out hedge funds</u>.

I'm sort of kidding, but here's the meat of the argument: non-rich people can, and very often do, earn returns on part with the rich, without having to engage in redistribution. Sometimes that takes the form of a financial advisor, but more often, they're just investing in a Vanguard fund and receiving "advice" in the form of a pre-existing portfolio. We might also consider the <u>Norway pension fund</u> as an example of socialist redistribution without loss of efficacy. The fund is managed by <u>Nicolai Tangen</u> who previously ran AKO Capital. It is perfectly fine to have "the rich" manage your money, then go on to engage in a norwegian-style socialist model of redistribution to the poor.

I have no opinion on whether or not this is preferable in practice. That depends critically on countless other matters not discussed here. But as a matter of theory, I don't find the higher returns earned on capital to be a compelling thought experiment for shifting the burden of proof onto redistribution to the poor.

Replacement cost is much higher than assumed

In chapter 5, Tyler muses on the replacement cost of a human life, concluding that we ought to invest more in the young and less in the old:

So let's say a human life is worth \$4 million, as estimated by standard economic willingness to pay to reduce risk measures, but we can create another human life for about \$10,000, say by subsidizing births or by saving another human life in a more economical manner elsewhere. Birth subsidies are probably going to be cheaper than spending \$4 million to save a life. So how much should we spend to save or preserve that first human life? Should we spend \$4 million? Or is this human life worth only \$10,000—in other words, its replacement cost?

He goes on to conclude that while not definitive, replacement costs should "exert downward pressure on our value of life estimates."

I agree with this logic, but I am not so sure the replacement cost of human life is as low as \$10,000.

For starters, "replacing" an adult human life also entails the costs of raising, educating and training them. Acknowledging that this whole conversation is somewhat silly, let's do our best to make back-of-the-napkin estimates. At <u>first glance</u>, the cost to parents is around \$250,000, but that is merely the financial cost, and doesn't count the time commitment. <u>Our World in Data</u> shows that it varies a lot by country, but generally US parents at around 3 hours per day, combined. Over 18 years, that's 19,710 hours, which is \$337k at the <u>US median wage</u> of around \$18/hour.²⁶

²⁶ There are several caveats here. University-educated parents spend more time with their kids and earn more money, so the estimate is likely higher. On the other hand, the responsibility for raising kids might fall on the parent with lower earnings potentially. But also consider that we should

Turning to the other side of the equation, is it really so cheap to create more lives? Joe Biden's <u>proposed tax credit</u> would pay \$57,600 for each child. That's not \$57,600 per counterfactual child who would not have otherwise existed, it's just \$57,600 for every child. So if this increases fertility by 10%, we're effectively paying \$633,600 for every additional life. I'm not sure what the empirical values are, <u>some papers</u> find that programs are much more effective than this estimate.

Then there are emotional costs associated with losing a loved one, but there are presumably also emotional benefits to gaining a loved one.

So there is significant uncertainty here, and I am not exactly sure what it all works out to. But it is not clear to me that Tyler's original logic is robust, or that the value of life should experience great downward pressure from the economics of replacement cost.

On Agricultural Productivity

Discussing redistribution, Tyler writes:

So rather than redistributing most wealth, we can do better for the world by investing in high-return activities like supporting immigration and producing new technologies with global reach, such as cell phones and new methods for boosting agricultural productivity.

This is tricky. One one hand, agricultural innovations really do have tremendous impacts. The recent <u>Bt Eggplant</u> results in increased yield, reduced pesticide costs, and reduced pesticide poisoning among farmers. That's great!

Here is the harsh critique I would write if I was a Marxist: The United States wastes 30% of it's food at the "retail and consumer levels", as a civilization, we already grow enough food to feed 10 billion people, and yet there is still hunger and malnutrition. The problem is not lacking agricultural productivity, it's precisely a failure of redistribution. And yet someone, Tyler calls for less redistribution, in order to fund agricultural productivity, which only solves problems caused by a lack of redistribution to begin with!

incorporate compound interest on the \$337k, as well as lost career growth and so on. And of course, parents are likely substituting away from leisure time rather than work time, so it might not be appropriate to consider any of this in terms of "lost" wages rather than as "lost" time watching Netflix. Considering all of this a wash, I will stick with the initial estimate.

Okay, but that is not my argument. After all, it's not as if US food waste can simply be transported overseas at no cost.

But still, this line of reasoning seems worth engaging with more deeply. Even if we ignore present moral costs and only consider future economic growth, it seems socially inefficient to allow <u>650 million people to live in extreme poverty</u>. Surely people who are not sick or malnourished can contribute more to the global economy?

Ultimately, this is a matter of empirical tractability. E.g. Does a dollar invested in agricultural productivity help more than a dollar invested in bed nets? <u>GiveWell's analyses</u> do include measures of increased income and productivity, though I am less sure how good we are at estimating the quantitative impact of investments in innovation. The <u>Charter Cities Institute</u> has made the short-term utilitarian case for charter cities. In their view, it depends tremendously on which modeling assumptions you choose.

Appendix B: A short testimony on the human impact of economic growth

[In 1900,] slightly less than one quarter (twenty-four percent) of all U.S households had running water... twelve percent had gas or electric lighting. In the mid-nineteenth century, a typical worker might have put in somewhere between 2,800 and 3,300 hours of work a year; that estimate is now closer to 1,400 to 2,000 hours a year.

- Stubborn Attachments

I realized I was hearing, just in the general course of long conversations, about something else: what the lives of the women of the Hill Country had been like before, in the 1930s and '40s, the young congressman Lyndon Johnson brought electricity to that impoverished, remote, isolated part of America-how the lives of these women had, before "the lights" came, been lives of unending toil. Lives of bringing up water, bucket by bucket, from deep wells, since there were no electric pumps; of carrying it on the wooden yokes-yokes like those the cattle wore-that these women wore so they could carry two buckets at a time; of doing the wash by hand, since without electricity there were no washing machines, of lifting heavy bundle after bundle of wet clothes from washing vat to rinsing vat to starching vat and then to rinsing wat again; of spending an entire day doing loads of wash, and the next day, since there were no electric irons, doing the ironing, with heavy wedges of iron that had to be continually reheated on a blazing hot wood stove, so that the ironing was also a day-long job, a day of standing close to the stove even in the blazing head of a HIII Country summer. I was hearing about all the other chores that had to be done by hand because there was no electricity, of all the tasks that made these women old and bent ("bent being the Hill Country world for "stooped") before their time. It gradually sank in on me that I was hearing a story of a magnificent kind of courage, the courage of the women of the Chill Country, and, by extension, of the women of the whole American frontier.

....At the beginning, these women, who lives lives of the deepest loneliness-their homes sometimes at the end of dirt roads on which, you realize, you have driven thirty miles without passing another house; who were so unaccustomed to talking to strangers, particularly about personal matters_weren't giving me the details I need. Ina solved that. We had three fig trees on our property. Ina taught herself to make fig preserves, and when she started to bring a jar with her as a gift, suddenly these women were her friends, and were showing her-and then, when she brought me back with her, showing me-things I will never forget.

Some of those interviews contained moments of revelation-of shock, really. A woman with whom my earlier conversation had been stilled and unrevealing, this time suddenly blurting out, "You're a city boy. You don't know how heavy a bucket of water is, do you?" Walking over to her garage, she brought out an old water bucket to which a long length of frayed rope was attached and walked partway down a slope to a well that was covered with wooden boards. Pushing them aside, she handed me the bucket and told me to drop it. It dropped quite a way. When it seemed full, she told me to pull it up, and I felt how heavy it was, and thought of how many bucket she-mostly she alone, her husband working in the fields or with the cattle all day, her children working beside him as soon as they were old enough, no money on Hill Country farms or ranches to even think of paying a hired man-had to pull up every day. I found a 1940 Agriculture Department study of how much water each person living on a farm used in a day: forty gallons. The average Hill Country family was five people. Two hundred gallons in a day, much of it hauled up by a single person.

..."Oh, did I tell you about the soap? We didn't have enough money for store-bought soap, so we used lye soap that we made ourselves. There was a saying around here: 'Lye soap peels the skin off your hands like a glove.' " And of course, as Ina became friends with them, they told her intimate details that they would never have told me: about the perineal tears, caused by childbirth without proper medical care, which seemed to be common in the Hill Country. (And indeed were: I was looking up federal statistics and studies from New Deal days all the time now, and one study by team of gynecologists had found that out of 275 Hill Country women, 158 had perineal tears, many of them third-degree "tears so bad that it is difficult to see how they stand on their feet.") And yet, Ina would tell me, her eye brimming, how these women had told her they had no choice but to stand on their feet and do the chores; with their husbands working "from dark to dark" (that was a phrase Ina and I learned during those three years) there was no one else to do them. I recall many moments of revelation like that; and I saw, I hope to write more about them someday. When INa said to me one evening with real anger in her voice, "I don't ever want to see another John Wayne movie again," I knew exactly what she meant. So many of the women in Western movies were simply the background figures standing at stoves or pleading with their husbands not to go out to a gunfight. You hear a lot about gunfights in Westerns; you don't hear so much about hauling up the water after a perineal tear. But both acts are equally part of the story, the history, of the courage it took to settle American's frontier. I understood that now, and I remember how badly, when I sat down with my legal pads and my typewriter, I wanted to make others understand it, too.

....Over and over-in my memory, many, many times-at the end of my talk or during the book-signing that followed, women would approach me. Over and over again I would lean down from the platform or up from the book I was inscribing to hear some version of "I'm so glad you wrote that chapter. My mother used to try to tell me how hard her life had been, but I never really understood. Now I try to tell my daughter how hard her grandmother's life was, and she'll understand because I can give her your book."

Then, after a few years, what I was hearing was "My grandmother used to try to tell me..." Now there is no one left to tell the daughters and the granddaughters. The women who lived that life, a life before electricity–millions and millions of them–of course are almost all dead, and they can't tell their story to their descendants. Robert A. Caro, Working