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THE WORLD OUR GRANDCHILDREN WILL INHERIT:
THE RIGHTS REVOLUTION AND BEYOND

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The World our Grandchildren Will Inherit: The Rights Revolution and Beyond
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ABSTRACT

Following on Keynes's Economic Possibilities for Our Grandchildren, this paper develops conjectures about the world we will leave to our grandchildren. It starts by outlining the 10 most important trends that have defined our economic, social, and political lives over the last 100 years. It then provides a framework for interpreting these trends, emphasizing the role of the expansion of political and civil rights and institutional changes in this process. It then uses this framework for extrapolating these 10 trends into the next 100 years.

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I write as I await the birth of my second son.² If trends about fatherhood continue as they have over the last several decades, the chances are that he will have children in his 40s, and (some of) my grandchildren will be in their 40s or 50s in the year 2112. What sort of world will they inhabit? The track record of forecasts in social sciences does not inspire much confidence in our ability to predict events over the span of 100 years. But prediction about the future is often a vehicle for clarifying the challenges ahead, and because it partly extrapolates from past experience, it also gives us an opportunity to take stock of the trends that have shaped our age. It is in this spirit that I'll take on this task.

The last century has been the age of political rights. Never in our history have so many people taken part in choosing their leaders and having a say in how their societies are governed. To be sure, this unparalleled expansion of civil and political rights remains incomplete. Yet it is profoundly significant, not only due to its transformative impact on the lives of billions, but also because so many other phenomena in recent history are connected to it. The rights revolution is intertwined with diverse trends such as the development of technology; sustained yet uneven economic growth; a general decline in war within recent decades; and a population explosion placing new pressures on our resources and environment.

In this essay I will first outline the 10 most important trends, starting with the rights revolution itself, that have defined our economic, social, and political lives over the last 100 years. Then I will discuss how the rights revolution has helped shape the other nine trends. Certainly the relationships between the rights revolution and these other trends are multifaceted. My aim is not to offer a simple unified explanation for so many global developments, but rather, to present a historically-grounded framework to better understand these changes. In the final section of the essay, I will use this framework to trace out whether we might expect to see a continuation or reversal of these trends during the next 100 years, as a way of thinking about the world our grandchildren will inherit.

I. 10 Trends of the Last 100 Years

1. The rights revolution:

To most citizens in many countries, democratic political participation has become second nature; the scope of this change is impressive when measured since either 1900 or 1950 (see Figure 1).³ Still more recently, we have witnessed in the Arab Spring a vibrant demand for democracy even in places where social scientists and pundits alike had ruled it out. And for the most part, the masses have shown

² He was born on February 9, 2012.

³ See Acemoglu, D, Johnson, S, Robinson, J & Yared, P 2008. 'Income and Democracy', *American Economic Review*, 98(3): 808-42 on data sources and definitions. Both the Freedom House and Polity IV democracy indices are normalized so that zero corresponds to the least democratic and one corresponds to most democratic. Both figures are (unweighted) averages for balanced samples of countries, 164 for Polity IV, and 186 for Freedom House. All colonies are assigned a score of zero prior to independence, and countries that have separated are assigned the score from the united country before separation.

that they can have an intelligent say in politics. To be certain, many public figures have expressed fears that relatively uneducated citizens cannot govern themselves, and that democracy is an unstable system; they advocate that government should be managed by responsible elites. Jose Ortega y Gasset sounded one such alarm early in the 20th century, warning of the dangers of widespread participation in politics in *The Revolt of the Masses*. The American intellectual Walter Lippmann believed that “the common interests very largely elude public opinion entirely, and can be managed only by a specialized class whose personal interests reach beyond the locality.”⁴

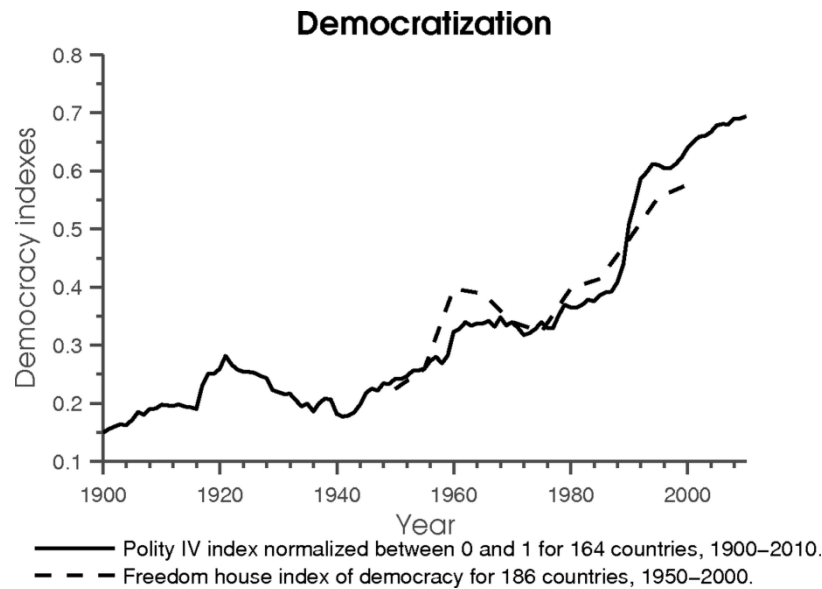


Figure 1

Notwithstanding such objections, political rights for the less educated and less privileged have taken hold, often bringing policies that have redistributed resources or have made public services more widely available, even if this has sometimes been resisted by the elites. Recent research by Thomas Fujiwara provides one example from Brazil, exploiting the effective enfranchisement of the less educated that occurred when an antiquated and difficult voting system was improved, leading to a massive reduction in spoiled ballots by the poor and less educated. Fujiwara shows that this produced the election of state legislatures advocating more widespread redistribution and policies favoring the newly enfranchised, such as better medical care that led to significant improvements in infant health.⁵

The spectacular advancement of rights has not been confined to political rights for the majority. A century ago, the civil rights and freedoms of individuals, women, and religious, ethnic, and sexual minorities were all but non-existent throughout the world — not only in places such as the Ottoman Empire and Russia, but also in the U.S. and Europe. A century ago, after all, women did not have the vote (with rare exceptions) and were discriminated against in many other areas of the law. The situation was worse for sexual minorities; in the 1890s, Oscar Wilde served a two-year prison sentence with hard

⁴ Lippmann, W, 1965, *Public Opinion*, Free Press, page 195.

⁵ Fujiwara, T 2010, ‘Voting technology, political responsiveness, and infant health: evidence from Brazil’, PhD thesis, University of British Columbia, Vancouver.

labor for homosexuality. These rights are much better protected today in developed societies, even if their protection is still very incomplete in other parts of the world.

This journey toward inclusive institutions has been an arduous one. The last 100 years witnessed the rise of fascism and communism, and even some stable democracies have at times implemented authoritarian policies: witness the U.S. internment of Japanese-American citizens during World War II. Aggressive militarism has been widespread, and ethnic and national conflicts are still with us. The rights revolution remains incomplete: The majority of the population today still lives under authoritarian governments, which often pursue policies serving the interests of a narrow elite rather than the people at large.

And yet, on balance the rights revolution has so permeated the world we live in that even authoritarian regimes often moderated the repression of their subjects. Both China and Russia, for example, have in the recent past refrained from openly executing political dissidents, and often allow some dissidents to criticize their regimes — provided that they do not become as prominent and threatening to the regime as Liu Xiaobo. Anti-gay legislation and action or persecution of ethnic minorities, though still commonplace, is often restrained by international reaction.

This unparalleled expansion of civil and political rights, though incomplete, is momentous both because of its impact on the lives of billions, and because the other major trends have been shaped by its very occurrence.

2. The sweep of technology:

The Industrial Revolution brought forth a wave of new machines and improvements of technology in textiles, steam power, transport, metallurgy, and communications. But the pace at which new gadgets, techniques, and products have been introduced during the last century has easily surpassed that of the Industrial Revolution. In consequence, we now have access to technologies that would have been difficult for our great-grandparents to imagine. These include an array of advances in information technology — computer-assisted machinery and robots, the Internet, many new communication technologies — as well as breakthrough drugs and medical technologies, improved indoor plumbing, refrigerators and other household durables, better and less expensive lighting, radio, television, inexpensive air and ground travel, and a huge increase in entertainment and culinary options. The impact of these technologies goes well beyond the reorganization of production; it permeates every aspect of our social lives.

3. Unrelenting growth:

Underpinned by these technological breakthroughs, ours has also been the age of sustained economic growth. While the 19th century also witnessed significant economic growth, its pace and pervasiveness does not compare to the last 100 years. The average citizen of the world has a much higher income than was the case 100 years ago; we are about eight times richer than our great-grandparents who lived at the time. Moreover, some of the most advanced economies during this period, such as the U.S. and the U.K., have grown in a relatively sustained and steady manner, the Great

Depression notwithstanding (as seen in Figure 2, which also depicts the average income per capita in the world economy over the last 200 years in constant purchasing power parity, PPP, 2010 dollars).⁶

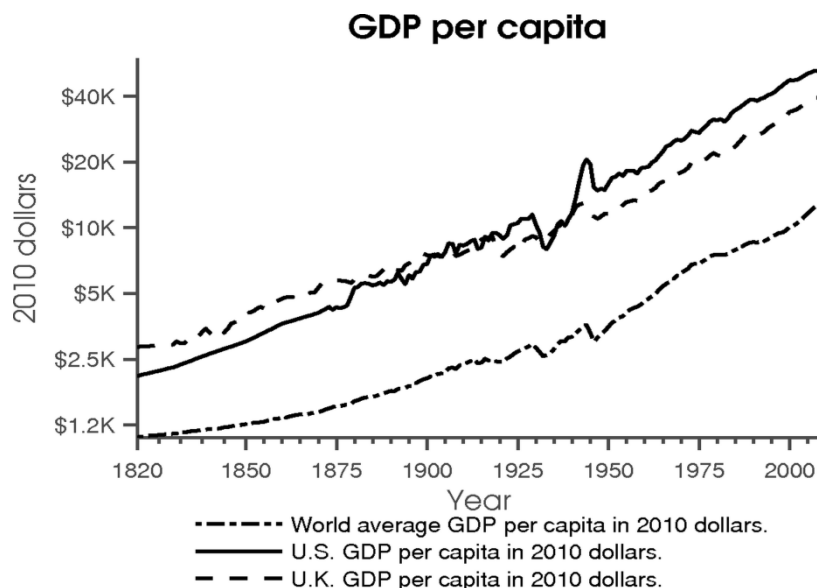


Figure 2

4. Uneven growth:

Equally notable is that this economic growth has not been even among countries. Though the world has become more integrated, the gap between rich and poor nations has widened by most measures. Consider the ratio between the 90th and 10th percentiles, and between the 75th and 25th percentiles, of the country-level income per capita distribution shown in Figure 3. The gap between the very rich (90th percentile) and very poor (10th percentile) countries, as well as that between moderately rich and moderately poor (75th and 25th percentiles), has opened up steadily over this time period. The 90th-10th percentile ratio was less than nine at the beginning of the century and has increased to more than 30 today. If we go back to the middle of the 18th century, before the Industrial Revolution gained full steam and before Adam Smith set out to compose the *Wealth of Nations*, this gap was most likely less than three or four.⁷

⁶ GDP per capita estimates (in PPP) are from Angus Maddison's historical dataset, <http://www.ggdc.nl/maddison/>. World GDP per capita is a population-weighted average of GDP per capita for a balanced panel of 144 countries and uses Maddison's estimates for GDP per capita for different regions for early parts of the sample. The same data are also used in Figure 3

⁷ Acemoglu, D, Johnson, S & Robinson, J 2002, 'Reversal of fortune: geography and institutions in the making of the modern world income distribution', *Quarterly Journal of Economics*, 117(4), 1231-1294.

The picture is a little more nuanced when we instead look at population-weighted numbers. Figure 3 shows that the ratio between the 75th and the 25th percentiles of the population-weighted country-level income distribution has been declining over the last 30 years owing to the recent rapid growth of several populous nations such as Brazil, China, and India. But the ratio between the 90th and 10th percentiles is still steadily increasing throughout the 20th century, going up from less than six to almost 20 today. This picture would certainly have disappointed all but the most pessimistic forecasters opining on the economic possibilities for the vast majority of the world population.

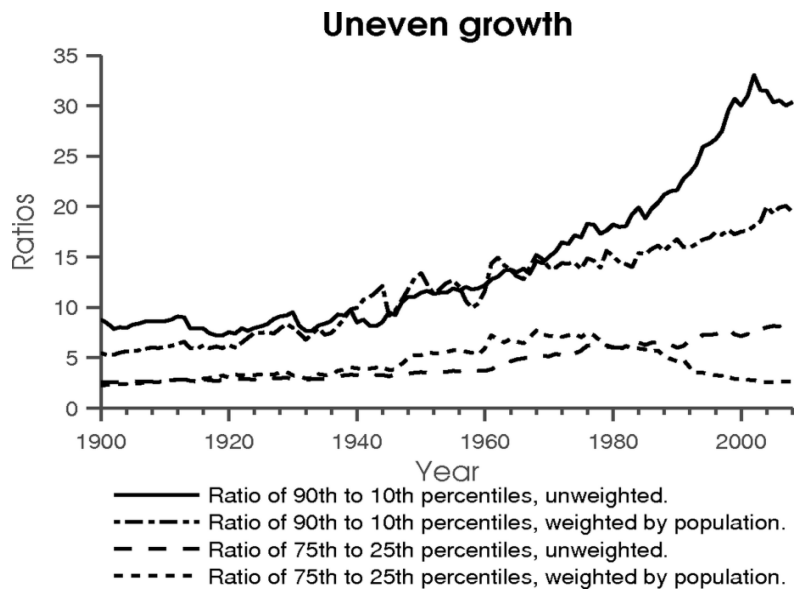


Figure 3

5. The transformation of work and wages:

Technological changes have also transformed the nature of work. In many advanced economies, agriculture was in relative decline already in the 19th century. The agricultural sector has continued to wane, but manufacturing, a key driver of the early stages of growth in many of these economies, has also started a secular decline, being replaced by the service sector. Agricultural employment has started a downward trend in less-developed economies as well.

The disappearance of many of the middle-skill, manual and routine jobs has been an equally far-reaching aspect of the transformation of work in advanced economies.⁸ A complementary process, again unleashed by technological advances and contributing to the same outcomes, has been the globalization

⁸ See Autor, D, Levy, F, and Murnane, R, 2003, 'The Skill Content of Recent Technological Change: An Empirical Exploration' *Quarterly Journal of Economics*, 118(4), 1279--1334, and Acemoglu, D and Autor, D, 2010, 'Skills, Tasks and Technologies: Implications for Employment Earnings' in Ashenfelter, O, Card, D (Eds.), *The Handbook of Labor Economics*, vol. 4b. Elsevier, Amsterdam, 1043-1171.

of technology and production: many tasks previously performed domestically by low- and middle-skill workers are now performed in places such as China where labor is cheaper. Figure 4 gives a glimpse of these trends by showing the decline in production, assembly, and operation and clerical occupations, and the increase in a range of service and managerial occupations in the US, the UK, Germany, France, the Netherlands, and Sweden over the last 20 years.⁹



Figure 4

A major impact of these trends has been distributional: as the demand for low- and middle-skill work has declined, the distribution of earnings in the US has become more unequal, and as the middle-skill jobs have disappeared, it has become polarized. Figure 5 illustrates this by documenting a widening gap between the 90th and 10th percentiles and, even more strikingly, between the 90th and the 50th percentiles of the US earnings distribution. Figure 6 shows the hollowing out of the income distribution by depicting how different percentiles of wages have changed relative to the 90th percentile between 1970 and 2008. Thus we have witnessed not only a disparity in growth among nations, but, in recent decades, an increasing disparity within nations.

⁹ See Acemoglu, D and Autor, D, 2010, 'Skills, Tasks and Technologies: Implications for Employment Earnings' in Ashenfelter, O, Card, D (Eds.), *The Handbook of Labor Economics*, vol. 4b. Elsevier, Amsterdam, 1043-1171 for sources for Figures 4-6. Figure 4 uses data from Eurostat for European countries and the May/ORG CPS for the U.S. The occupation categories are constructed as in Acemoglu, D and Autor, D, 2010. The data include male and female workers between 16 and 39 (excluding military and agricultural workers). The numbers in this figure are the average annual rates of change in each occupation category between 1992 and 2008, except for Sweden which is only available from 1997 on. Figures 5 and 6 are for the weekly earnings of full-time (male and female) workers between the ages of 16 and 64 in the US. Figure 5 uses data from the March Current Population Surveys (CPS). The percentiles are estimated using the CPS weights, and wages are converted to real terms using the personal consumption expenditure deflator. Figure 6 uses the Census and American Community Survey (ACS) sample of full time workers for the years 1970 and 2008, respectively. The percentiles are estimated for weekly real wages using the Census/ACS weights.

Evolution of 10th, 50th and 90th percentiles of the U.S. wage distribution

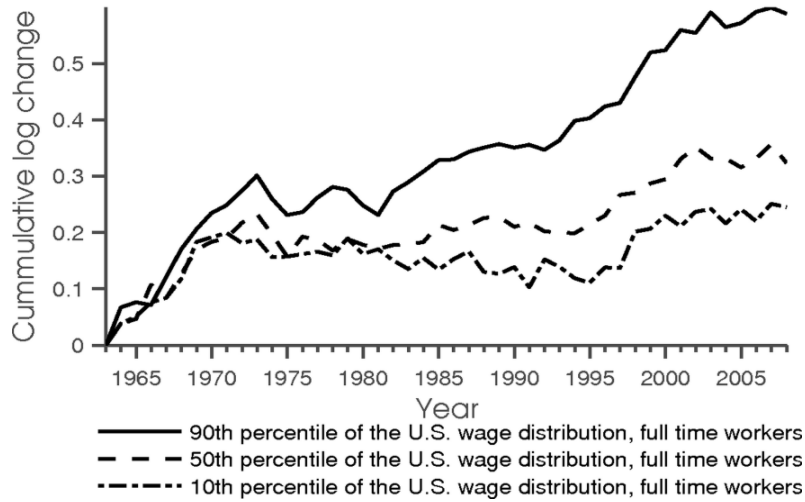


Figure 5

Distribution of wages in the U.S.

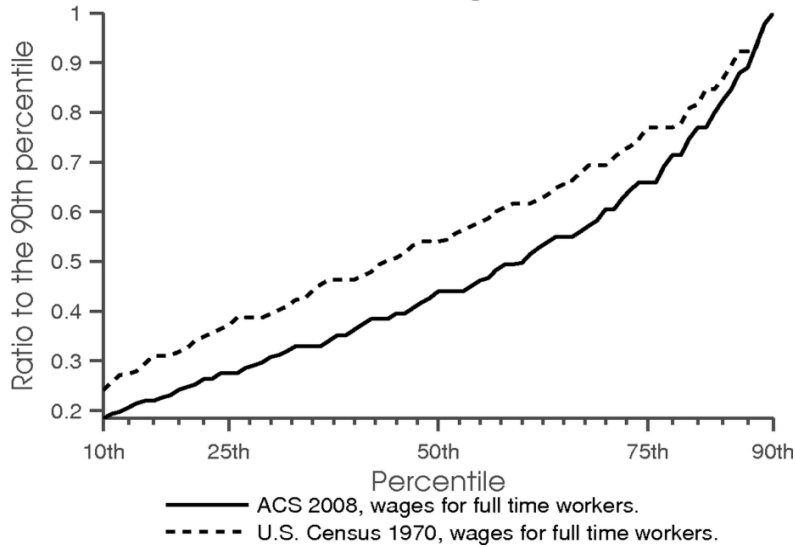


Figure 6

6. The health revolution:

Though the wealth of nations has become more unequal, the picture is very different for the health of nations. There has been a striking improvement in health over the last 100 years, in the world as a whole, and in all geographic regions. Figure 6 illustrates this by plotting the evolution of life expectancy at birth both globally, and separately for Europe and some of its offshoots (Australia, Canada, New

Zealand and the US); Asia and Latin America; and sub-Saharan Africa.¹⁰ It also shows a striking narrowing in the differences between life expectancy in the rich world and in Asia and Latin America. Even if improvements in sub-Saharan Africa have been more limited, and have recently slowed down because of AIDS and the return of tuberculosis, major health innovations and their diffusion throughout the world have meant that most nations today enjoy health conditions unparalleled anywhere in the world at the beginning of the 20th century.

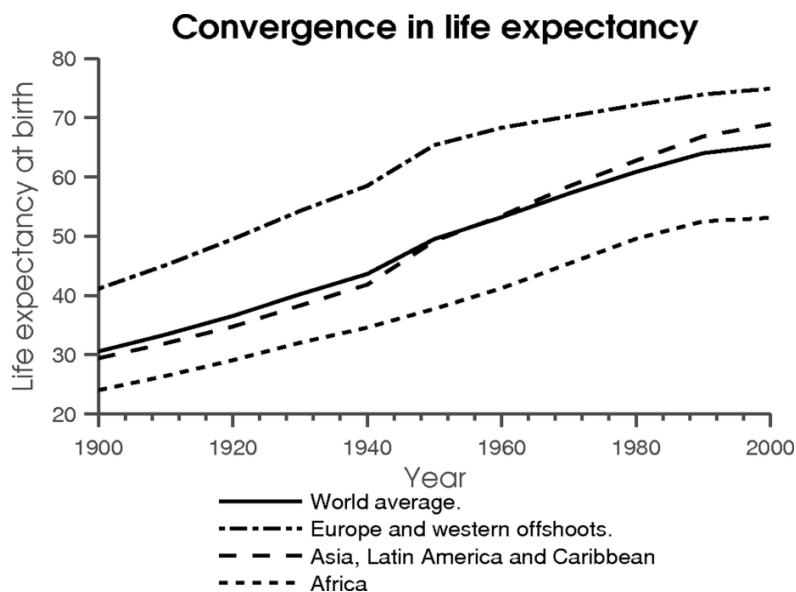


Figure 7

7. Technology without borders:

New communication technologies and changes in trade policies have also created a more integrated world. Granted, international trade as a fraction of national income was also high in the early 20th century, but both the scale of international trade and the globalization of technology and production distinguish the recent developments in this area as shown in Figure 8.¹¹ Advances in communication technologies and possibilities for outsourcing and offshoring tasks now enable firms to more comprehensively arbitrage low wages around the world. Besides its impact on wage inequality in advanced economies, this process has also enabled much more rapid growth in economies such as China, which have been able to leverage their abundant low-wage labor, without having to go through the same investments and similar technological and institutional stages that advanced economies

¹⁰ See Acemoglu, D & Johnson, S 2007, 'Disease and development: the effect of life expectancy on economic growth', *Journal of Political Economy*, vol. 115 (6): 925-985 for data sources. The numbers in this figure are unweighted averages with missing data in-between interpolated using a constant growth rate.

¹¹ The figure shows the value of exports plus imports to GDP at the world level. Data for 1870-1939 are from Estevadeordal, A, Frantz, B & Taylor, A 2003, 'The rise and fall of world trade, 1870-1939', *The Quarterly Journal of Economics*, vol. 118(2): 359-407. Data for 1945 onwards are from the IMF International Financial Statistics (IFS) <http://elibrary-data.imf.org/>. The value of exports plus imports is converted to constant dollars using the deflators provided by the IMF, and world GDP from Madisson is used to calculate the trade to GDP ratio.

underwent in the 19th and early 20th centuries. This, as we will see, also has important implications for the institutional and technological trajectories of these emerging economic powers.



Figure 8

8. Century of war, century of peace:

The 20th century started off badly and got worse in one very important regard: major wars and the waste of millions of innocent lives. The two most deadly conflicts of human history were waged within the first half of the 20th century. Perhaps surprisingly, the subsequent 60 years, though not free of deadly civil and international wars, have been the most peaceful throughout our recorded history. Figure 9 illustrates this by showing both the total number of deaths from international wars per 100,000 and the 21 year moving average of these numbers, which makes the trends — the highs due to the two world wars and the lows over the last 60 years — easier to see. Figure 10 shows the raw numbers and the moving average for deaths from civil wars. Though there is a spike following the end of colonial rule in much of the world, the trend in the last half century has been towards fewer and less deadly civil wars, despite the deadly conflicts in Rwanda and the Balkans.¹² Figure 11, which focuses on the developed world, shows that violence within countries, as measured in terms of homicides, follows a different trajectory. In the 1960s there was a sharp increase in homicides in the US, Canada, Australia, New Zealand, and almost every European nation. But this was followed by an equally sharp downward trend from 1990 onwards.¹³ Overall, the numbers taken together suggest that, though many parts of

¹² The figures are constructed using the “best estimates” from the PRIO-UPSALA dataset from Lacina, B and Gleditsch, N 2005, 'Monitoring Trends in Global Combat: A New Dataset of Battle Deaths', *European Journal of Population* vol. 21(2–3): 145–166. International battle deaths are those recorded in conflicts between two or more recognized states. Civil war deaths are those recorded in conflicts that are fought within state borders between a government and non-government forces (civil war) or two non-government forces.

¹³ Steven Pinker in his new magnum opus, *The better angels of our nature: why violence has declined*, Viking, 2001, also emphasizes these trends.

the world are still mired in violence, and many civil wars are still raging, there is cause to think that we are seeing a trend toward less violence in most spheres of our lives today.¹⁴

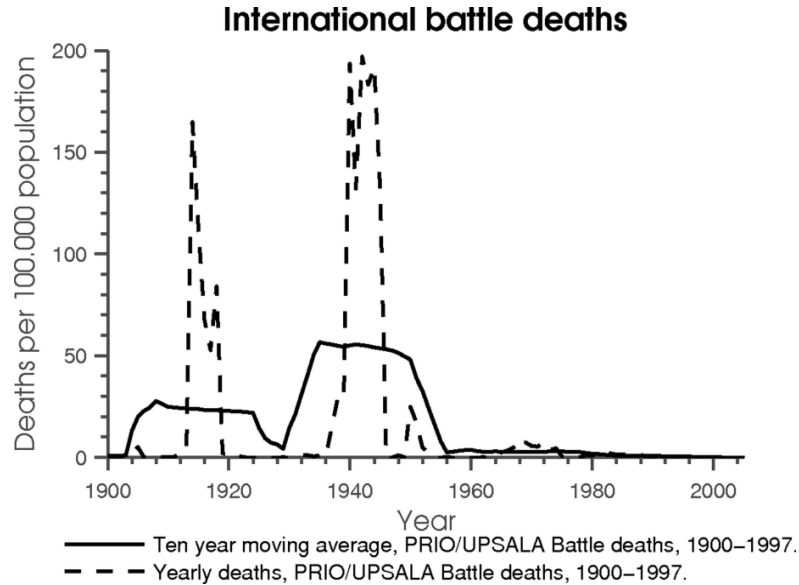


Figure 9

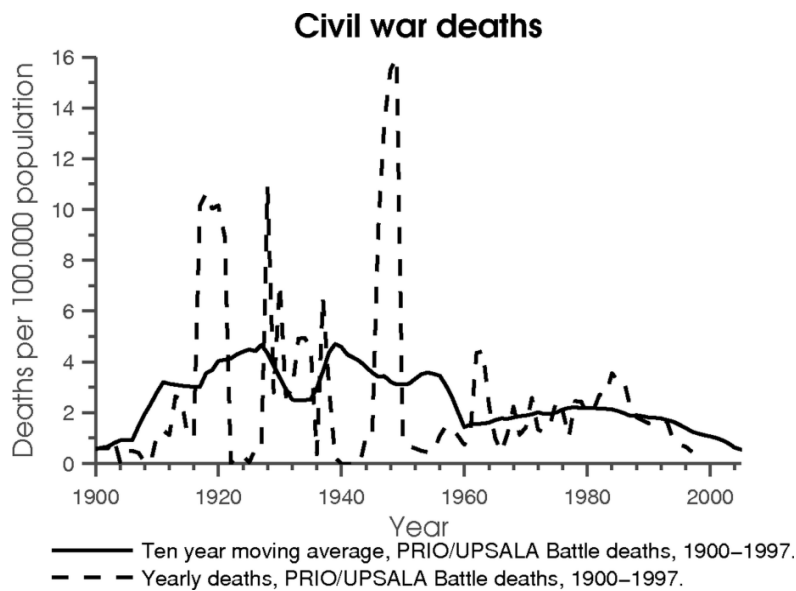


Figure 10

¹⁴ Murder rates are constructed using the WHO dataset on causes of death, <http://www.who.int/healthinfo/statistics/mortality/en/index.html>. The WHO reports homicide rates (excluding war casualties) from country reports for a set of 16 Western European countries, the U.S., Canada, New Zealand and Australia. Missing data for 8 observations are interpolated using a constant growth rate, and the regional trend in homicide rates is used to construct estimates for 39 observations (out of a total of 1120 observations).

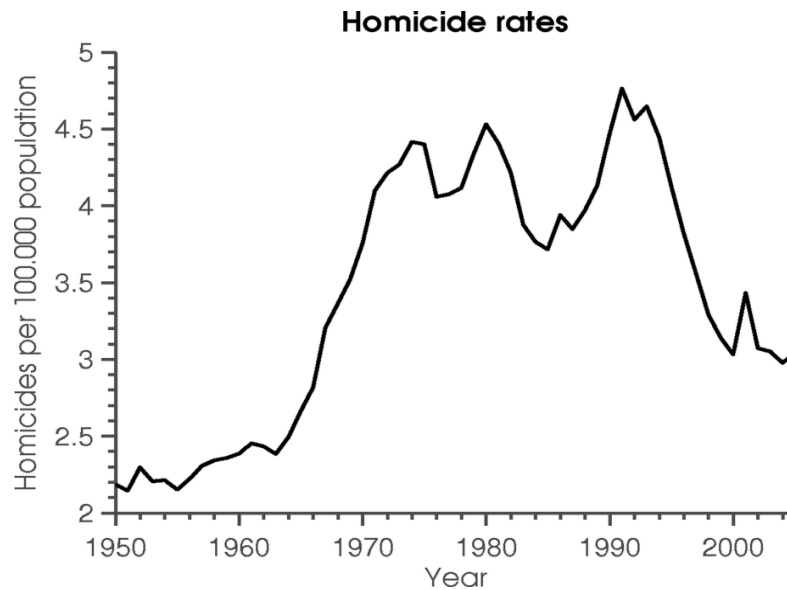


Figure 11

9. Counter-Enlightenment in politics:

Few would have predicted the rights revolution. But those who might have, like Denis Diderot or Baron D’Holbach, would have considered it a corollary of the spread of the universalist ideals of the Enlightenment, a triumph of rational thought and empirical assessment. However, these last 100 years have also witnessed strong and often violent counter-Enlightenment movements playing a defining role in politics. The first half of the 20th century was dominated by the rise of two anti-democratic political movements, fascism and communism, which unleashed unprecedented violence on the citizens of the countries they engulfed. It took World War II to vanquish fascism’s most notorious form, Nazism, but fascistic regimes in Greece, Portugal, Spain, and Latin America lingered until the 1970s. Most communist states disintegrated after the rights-based popular uprisings of 1989, although some remain.

The last four decades, however, witnessed another counter-Enlightenment movement: the increasing prevalence of religion in politics. This trend cuts across religions and regions: Fundamentalist Christians have become a renewed force to be reckoned with in U.S. politics during the last half century and ultra-Orthodox Judaism now plays a more important role in Israeli and Middle Eastern politics. But this development is most dramatically illustrated by the resurgence of political Islam in the Middle East, North Africa, and South Asia. Following the more secular regimes that had sprung up in those regions during the first 60 years or so of the 20th century, political parties oriented around religion have acquired more power in many countries during recent decades throughout the Muslim world. This has prompted many to forecast an upcoming “clash of civilizations,” a view inevitably strengthened by former U.S. president George W. Bush’s declarations that the country was fighting a “war on terror” emanating from the Middle East.

10. The population explosion, resources and the environment:

There are many more of us on planet Earth today than 100 years ago. Figure 12 shows the world's population has increased from 1.5 billion in 1900 to 6.9 billion in 2010.¹⁵ Most of this increase has been in the less prosperous parts of the world. The population of Western Europe, North America, Australia and New Zealand increased only by a factor of 1.7 during the same period. The growing population and rising income per capita have placed increasing demands on our environment. Many scholars have publicly worried that we will outgrow our planet's ability to support us. The pessimistic and optimistic views on this were characterized by the famous wager between environmentalist Paul Ehrlich — who had predicted a demographic catastrophe and widespread resources scarcities — and economist Julian Simon, about the prices of a bundle of scarce commodities. Ehrlich picked chromium, copper, nickel, tin, and tungsten as five commodities that would experience increases in their inflation-adjusted prices between 1980 and 1990. The wager ended with a victory for the optimistic view when the prices of all five commodities fell. But that victory may have been premature. Since then resource prices (including those in Ehrlich's bundle, illustrated in Figure 13) have been increasing.¹⁶ Resources aside, the more fundamental impact we have on our environment comes from our prodigious fossil fuel consumption and the increasing levels of carbon dioxide in the atmosphere — which can continue apace even if some resources, including oil, are scarce.

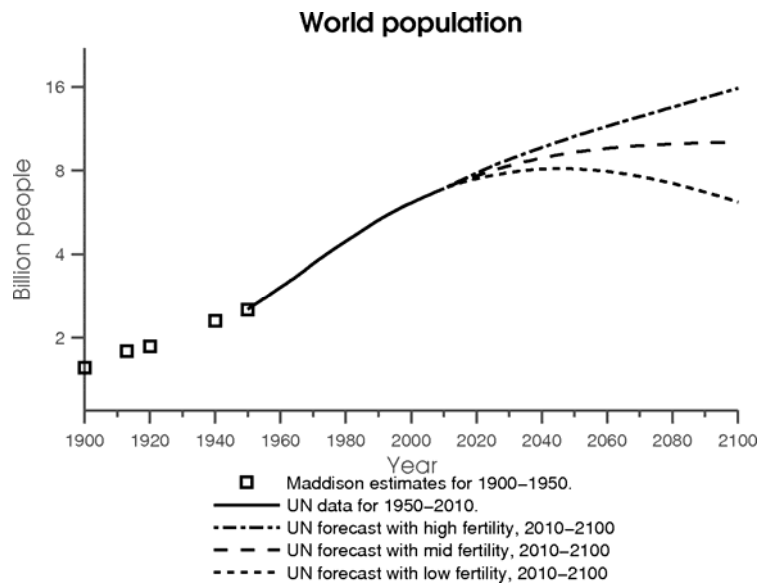


Figure 12

¹⁵ Historical population numbers are from Maddison (see footnote 6), and UN population projections from <http://www.who.int/healthinfo/statistics/mortality/en/index.html>.

¹⁶Commodity prices for Figure 13 are from the US geological survey, <http://www.who.int/healthinfo/statistics/mortality/en/index.html>. All prices are in constant dollars and are normalized to 100 in 1980.

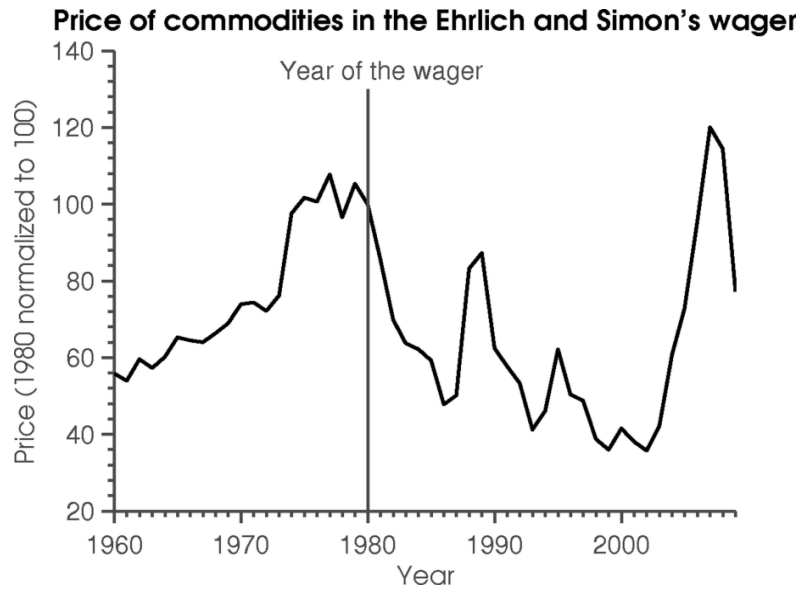


Figure 13

II. An Interpretive Framework

These trends do not exist independently of one another. Understanding how they interrelate is an important step in any attempt to assess how they will continue. The framework I will use to interpret these trends borrows heavily from my work with James A. Robinson, but also augments it in a number of important respects.¹⁷

At the center of my interpretation is the idea that technological change is at the root of economic growth — but that political institutions shape the nature, pace, and spread of technological change. From ancient Rome to the Industrial Revolution and the dramatic economic transformations of the last century, history is littered with examples showing how the development, spread, and use of technology depend on institutions.

In this, I depart from the conventional wisdom in much of social science, which maintains a causal link running from technologies to institutions — and not the other way around, as I am arguing. A popular variant of this conventional wisdom is modernization theory, which posits an inexorable link from prosperity to democracy and political rights. Yet there is no more support for modernization theory in the data than there is for any other form of technological determinism. Globally, countries that have grown more rapidly since World War II, or since the beginning of the 20th century, are no more likely to

¹⁷ See Acemoglu, D & Robinson, J 2012, *Why nations fail: the origins of power, prosperity and poverty*, Crown Publishing, New York.

become more democratic than those growing more slowly, for example.¹⁸ I will instead argue that institutional developments, caused by and causing the rights revolution, are the main drivers of the technological and economic changes we have experienced over the last century.

Technological progress takes place and spreads most naturally under a specific type of economic institution, which we have called *inclusive*: institutions that provide incentives and opportunities for innovation and economic activity for a broad cross-section of society. These incentives are based on secure property rights for innovators, businesses, and workers, while opportunities are undergirded by a level playing field, in the form of a lack of entry barriers into businesses and occupations, and basic public services and infrastructure that enable a large portion of the population to participate in economic activity. Inclusive economic institutions are supported by inclusive political institutions, which are defined by two characteristics: first, a pluralistic, broad-based distribution of political power, so that no single individual or group can exercise power and rule without constraints and in an arbitrary fashion; and second, sufficient state centralization, so that there is a sort of monopoly of violence in the hands of the state — rather than warlords, strongmen, or bandits — upon which order and security over the territories making up a nation can be grounded.

Standing in direct contrast to inclusive institutions are *extractive institutions*. Extractive economic institutions are characterized by insecure property rights for the majority, coercion, and lack of freedom directed at extracting resources from the majority for the benefit of a narrow elite; a playing field tilted to favor the elite often thanks to entry barriers into businesses and occupations; and a general lack of opportunities and public services for most. These economic institutions are kept in place by extractive political institutions, concentrating power in the hands of narrow interests or groups without any meaningful checks or constraints on the exercise of this power. In some cases, extractive political institutions emerge from a lack of state centralization; the lawlessness and insecurity endemic in places such as Somalia allow extractive practices to exist even in the absence of a well-defined national elite.

Technological change, and hence growth, is much more likely to take place under inclusive institutions because they provide opportunities and incentives for a larger segment of the population. In fact, extractive institutions often explicitly block technological innovation because it is regarded as destabilizing for the regime in charge, or because it runs against the interests of the narrow elite controlling power. Though they do not foster an environment conducive to economic growth, extractive institutions have been the norm throughout history because they benefit rulers and elites who enrich themselves and reap the benefits of monopolizing political power, even at the cost of impoverishing and oppressing the rest of society. These people will also steadfastly oppose many political reforms because, like many technological changes, such reforms will often erode their power.

Though the political and economic power of the elite can explain the emergence and persistence of extractive institutions, it is not the only significant factor ensuring their durability. Extractive institutions, just like other forms of organizations, have a social basis. They create a whole hierarchy of social organizations, with their own internalized norms. For extractive institutions, these norms often are

¹⁸ Acemoglu, D, Johnson, S, Robinson, J & Yared, P 2008. 'Income and Democracy', *American Economic Review*, 98(3): 808–42.

based on various forms of authoritarian ideas and rigid hierarchies — not only in national politics, but within villages, neighborhoods, families, and firms. So even within communities or families that bear the brunt of their state's poverty and repression, extractive institutions will be supported by these norms; individuals will oppose change towards more inclusive institutions not only because their positions within the social hierarchy are threatened, but also because they have been socialized within these institutions and internalized their authoritarian values.

But even if their internal logic militates against change, the world under extractive institutions is not a static one. Precisely because extractive institutions involve the enrichment of a small group at the expense of the rest, the rest will sometimes rise up. This inherent conflict in society sometimes rips apart the fabric of extractive institutions, allowing more inclusive ones to be stitched together. This we have witnessed with such landmark events as the Glorious Revolution of 1688-89 in England and the French Revolution of 1789, when absolutist monarchies were toppled by social movements vying to share power. In England, this led to the end of Stuart rule and the emergence of a constitutional monarchy, ultimately ushering in an era of inclusive political institutions. In France, the revolution opened the way to the republic — even if the consolidation of this new form of government took another 90 years. We are witnessing similar social movements with similar grievances and demands rise up against extractive regimes in the Middle East and North Africa in the context of the Arab Spring.

It is in this light that the first trend, the rights revolution, should be assessed. Though moves away from extractive towards inclusive institutions had taken place for centuries, ours has been the period in which such moves gathered speed and force. It is important that this revolution wasn't just one of change in political regimes and constitutions on parchment paper. Many extractive institutions have made empty gestures toward voting rights and political representation. But it is only where inclusive institutions have taken hold most strongly that a broad set of civil and political rights for most groups — including equality before the law, freedom of expression, and property rights — has been implemented, and there has been a broad emancipation of individuals from the authoritarian social norms of communities and families that have reinforced the extractive order.

In fact, inclusive institutions are unlikely to be durable if they are superimposed on the social hierarchy and the socialization created by extractive institutions. This is the reason why a democracy that does not fully respect individual liberties will never be a lasting, inclusive regime. And clearly not all revolutions, or revolutionary movements, inevitably lead to more inclusive institutions. Some merely lead to changes in government without altering the nature of the state, and others, such as the Bolshevik Revolution of 1917, replace one tyranny with another, more murderous one. The crucial institutional transformations link together changes in the form of government with an extension of rights running throughout society.

That the second trend — the sweep of technology — follows from the rights revolution is a centerpiece of my interpretative framework. Indeed, the technological breakthroughs we have witnessed over the last century would not have been possible in a world dominated by extractive institutions. The incentives, freedoms, opportunities, and the level playing field provided by the inclusive institutions taking hold in many parts of the world were the foundations of these technological changes

— in the same way that the initial, more-inclusive institutions that followed the Glorious Revolution in England were a *sine qua non* of the Industrial Revolution. The rights revolution may have also contributed to these technological breakthroughs in another way: greater individual freedoms in all likelihood have facilitated and encouraged a greater degree of boldness and risk-taking in innovation and business. A 20-year-old founding a company that would become one of the largest in the world in seven years seems unthinkable in a patriarchal society with rigid hierarchies, but, steeped as we are in the rights revolution, today we take it for granted.

The next four trends —unrelenting growth, uneven growth, the transformation of work, and the health revolution — all emanate, more or less directly, from these technological developments and other key aspects of the rights revolution. Economic growth followed directly from the technological breakthroughs of our age. That this growth has been uneven is largely a consequence of the fact that inclusive institutions spread unevenly both in the 19th and 20th centuries. Nations that adopted relatively inclusive institutions prospered by investing in and adopting the best available technologies, or by creating their own technological breakthroughs, while those with extractive institutions provided few incentives for their citizens to attempt such ventures, and often actively blocked industrialization and the use of modern technologies they suspected would be destabilizing to their regimes.¹⁹

The fifth and sixth trends, the transformation of work and the health revolution, also followed from the same forces. Work changed directly due to the forms of technological progress witnessed in the last century. The health revolution, fueled by better drugs and vaccines, is also one of the most noteworthy fruits of our greater technological ingenuity. It is also a uniquely illustrative consequence of several immediate forces unleashed by the rights revolution. The largest relative changes in health and life expectancy, as Figure 7 shows, occurred in developing countries in Asia and Latin America. Many of these nations were still ruled by extractive regimes lacking the inclination or capacity to deliver health care, drugs or vaccines to their populations. Instead, the impetus for better health care came from richer countries and their international groups, such as the World Health Organization. Thanks to the application of the rights revolution being extended across a series of social issues, it became accepted that wealthy countries should also help those suffering from ill health around the world.

The seventh trend, the spread of technology without borders, is another consequence of the rights revolution. But to understand its full import we need to take a small digression. Though inclusive institutions are the mainspring of technological change, growth is still possible under extractive institutions. All else equal, those in command of extractive institutions would like to achieve as much economic growth as possible because they would be its beneficiaries. But a problem arises when growth necessitates new technologies that will strip the elite's rents or destabilize their power. So economic growth can proceed when it can rely on businesses controlled by the state, the elite, or their allies. There are two scenarios that make this sort of growth under extractive institutions possible. The first is when the comparative advantage of a society is in a well-defined sector that can function fairly productively even if it is under the control of a small group of people in society. An exemplar is the

¹⁹ Acemoglu, D & Robinson, J 2012, *Why nations fail: the origins of power, prosperity and poverty*, Crown Publishing, New York, Chapter 9.

Caribbean colonies, such as Barbados, Cuba, and Haiti, between the 16th and 18th centuries, which generated rapid growth despite harshly extractive institutions based on slavery and sugar plantations controlled by a small planter class.

The second scenario of growth under extractive institutions is driven by a process of catch-up and technology transfer from a more advanced set of countries.²⁰ The rapid growth of the Soviet Union between the 1930s and the early 1970s was underpinned by this process, set in motion in part by the forceful, ruthless transfer of resources out of agriculture into industry. In both of these scenarios, though it can take place rapidly and for an extended period of time, growth under extractive institutions is ultimately limited. The plantation colonies stagnated and regressed when the world demand for sugar declined; the Soviet Union stagnated when the limits of industrialization based on forced reallocation were reached. None of these societies generated much technological progress otherwise.

The expansion of China's economy over the last three decades is another example of growth produced by extractive institutions, but with a major difference. The onset of technology without borders has meant that the extent and pace of growth under extractive institutions can be greater today than it was in the 19th century, when Germany and Russia went through a process of catch-up. Though the two countries reached higher growth rates than the leading economies of the time, the U.S. and the U.K., their expansions ended quickly, and had been only made possible by deep-rooted changes in the structure of society — changes that ultimately destabilized and upended the regimes in those nations. By contrast, China has been able to achieve rapid catch-up growth for over three decades, with much more limited threats to its extractive institutions, partly because the nature of technology has changed. In Germany and Russia at the end of the 19th century (or in Japan and South Korea during the second half of the 20th century) catch-up growth involved developing industries, building a domestic market, and undergoing a process of structural, social, and institutional changes — including rapid urbanization and the social and political demands coming with industrialization. But unlike China, their growth wasn't built on simply importing technology to produce goods for the world market. In contrast, today, instead of having to develop an entire industry, an emerging market economy can just house some of an industry's tasks, such as assembly and operation. This has enabled China to grow rapidly by leveraging its cheap and abundant labor force, while also mollifying the internal demands for political changes that earlier societies undergoing catch-up growth had to contend with.

Here we therefore encounter a paradoxical consequence of the technological breakthroughs originating from inclusive institutions: they may aid the continuation of extractive institutions elsewhere in the world. The globalization of production that technology without borders has created may have fueled rapid Chinese growth, but in so doing it may have lessened domestic pressure for institutional changes. In fact, this paradox might be deeper. One phenomenon related to Chinese growth is the fifth trend, the transformation of work and wages, which has helped produce the inequality gap that has opened up within advanced economies.

²⁰ Acemoglu, D, Aghion, P & Zilibotti, F 2006, 'Distance to frontier, selection, and economic growth', *Journal of the European Economic Association*, MIT Press, vol. 4(1), pages 37-74, 03.

Extractive institutions need not last forever. Neither do inclusive institutions. They are constantly threatened by groups that want to expand their political power at the expense of the rest, exploit their power to gain economic privileges, and then use their economic privileges as leverage to gain more political power. When such a process goes on unchecked, it can bring down inclusive institutions. The sharp increases in inequality in the U.S., which partly flow from the same technological and globalization developments that are fueling Chinese growth, may be posing a twin challenge here. First, the rise in inequality has created a class of very wealthy citizens who can use their wealth to gain more political power — partly to defend their wealth and partly to further their economic, political, and ideological agendas. Second (as also shown in Figures 5 and 6), it has thinned the middle classes, which have often strongly supported inclusive institutions. When thinking about technological without borders, then, we should be mindful of its potentially unexpected consequences — economically and politically — in both inclusive and extractive institutions around the world.

The outlines of the framework I have offered so far also make it clear why part of the eighth trend — the decline of war and violence — is a consequence of the rights revolution, for multiple reasons. First, these freedoms and rights are naturally in conflict with wars and violent militaristic adventures. Second, as argued by Stephen Van Evera and Jack Snyder, many wars have their origins in domestic political conflicts, which are much more likely to occur under extractive institutions now being weakened by the rights revolution.²¹ Third, the rights revolution also provides the philosophical foundation of the changes in international organizations (such as the United Nations since World War II) and the norms that have been acting, albeit imperfectly, as a restraint on war.

But there is more to it. As I discussed above, a lasting transition from extractive to inclusive institutions also necessitates a fundamental change in the social basis of these institutions, in particular a move away from the authoritarian and hierarchical structure of families and communities. I believe that it is this transformation, underway in many parts of the world, which is in large part responsible for the decline of war and violence. The conservative commentator Charles Murray traces the roots of inner-city violence in the U.S. during the 1970s and 1980s to the collapse of the traditional authority of family and friends over youngsters. But the more remarkable trend is the secular decline in violence throughout the world that has gone hand-in-hand with the decline of the authoritarian community and family structures.²² It is also reasonable to conjecture — though this is highly speculative — that the transformation of work, by reducing the importance of agriculture and other manual tasks, may also accelerate the decline of the social structures and norms supporting extractive institutions, because rigidly hierarchical community structures and authoritarian, patriarchal families built partly on the threat of violence are more likely to prevail when work is based on physical labor.

Then what explains the explosion of war in the first half of the 20th century and the counter-Enlightenment trends of both the first and the second halves? Do these not stand in stark contrast to the rights revolution? The honest answer is that I don't know. But the framework I have outlined gives

²¹ Van Evera, S 1999, *Causes of war*, Cornell University Press, and Snyder, J 1993, *The myths of empire: domestic politics and international ambition*, Cornell University Press.

²² Murray, C 2012, *Coming apart, the state of white America, 1960-2010*, Crown Publishing.

some clues. The rights revolution, by going against the fabric of societies largely developed under extractive institutions, may have also sown the seeds of a strong political backlash. This, combined with intense distributional conflicts that have been ongoing in the wake of the collapse of these extractive regimes, may have created the opportunity for these counter-Enlightenment movements to take hold. This perspective becomes more plausible when we consider that communism, fascism, and religious extremism in politics have all emerged in the midst of conflict about the distribution of resources and income in society, and mobilized those discontented and alienated by the changes around them. I discuss these issues in a little more detail below with regard to the rise of political Islam.

Finally, the tenth trend — the explosion of population and the greater strains we are putting on our environment — is another paradoxical consequence of the world-wide development of inclusive institutions and the technological changes that flowed from them. These innovations have enabled much more rapid growth in output around the world. As we have seen, they have also generated much better medical technologies that have prevented the premature deaths of millions. Many women who would have died young now survive to child-bearing age, and in many societies this has translated into a population explosion. This much greater population does not, by itself, pose a major problem for our planet so long as other economic and social challenges are met. But together with the rise in income per capita, it has also led to a massive increase in our fossil fuel emissions, which now threatens the stability of our climate.

III. The Century Ahead

The past may be an imperfect guide to the future. But we are now armed with a list of developments that have defined our epoch, and an understanding of their entanglement with the rights revolution and growth of inclusive institutions. Given this framework, I can at least discuss the future of these trends: Will rights expand and economic growth continue? What are the possible limitations on each? And, for that matter, can our institutions cope with the pressures that growth will place on our resources? These developments are among the things that will shape the planet we bequeath to our grandchildren.

1. The rights revolution continued?

We can be cautiously optimistic that the rights revolution will continue and spread, even if slowly and imperfectly. However, not only is the rights revolution incomplete, but our current prosperity is no guarantee of its maintenance and expansion. There are important roadblocks in the way of further expansion of political and civil rights, in the U.S. and abroad.

For one thing, democratic and inclusive institutions, and by implication civil and political rights, are under attack in the U.S., one of the most prosperous and democratic countries of our times. These threats are coming from two distinct quarters. The polarization of U.S. incomes, as discussed above, has created a class of very wealthy Americans who are increasingly influencing politics. Money — both as a

source of campaign contributions and as a part of lobbying activities — has become even more essential in politics. This poses a challenge for American democracy, and if American democracy falters, it will harm the durability of political and civil rights globally. The second threat is the erosion of individual and minority liberties emanating from the so-called “war on terror,” started under President George W. Bush and continued vigorously under President Barack Obama, which could further corrode American democracy.

Additionally, Chinese growth, particularly at a time of economic problems in the U.S. and Europe, creates the illusion of an alternative, authoritarian path to riches. In this view, democracy is a burden and a hindrance, and enlightened authoritarianism can better serve the people. It should be no surprise that this path is enthralling to aspiring autocrats in Asia and Africa. There is even some enthusiasm for it in the U.S. and Europe. Faulty though this reading of the causes and nature of Chinese growth may be, it does not preclude a turn towards authoritarianism in some of these countries.

These threats notwithstanding, the odds are in favor of the rights revolution to continue, albeit at a relatively slow pace, and for reasons very different from those advanced by the modernization theory. The optimistic case that the rights revolution can overcome these roadblocks is based on several factors. First, inclusive institutions, though by no means irreversible, have a resilience of their own, and have overcome comparable challenges before; in the U.S., such institutions limited the power of the Gilded Age’s robber barons, who were as wealthy, and even more ruthless, than their counterparts today. In Western Europe, inclusive institutions have followed a somewhat different trajectory, and even if they are facing challenges related to the future of the European Union and the Euro, the diversity of inclusive institutions across advanced economies is a strong guarantee against their wholesale takeover by some narrow band of moneyed interests. Second, the spread of the Internet and social media has added another pillar of support for inclusive institutions. We have recently witnessed how Wikipedia, Google, Reddit, and several other prominent sites have stopped anti-piracy laws that would have seriously curtailed free speech on the Internet. Third, the rights revolution has been perpetuating itself by weakening authoritarian community and family structures, and hence making it harder to return to a world in which individual and minority rights and liberties can be easily encroached. Fourth, as I suggested above, the transformation of work may also be weakening these authoritarian social structures.

Finally, the framework I have outlined also suggests that double-digit Chinese growth rates, even if they benefit from the globalization of technology and production, are ultimately transitory. Unless China fundamentally reforms its political institutions in an inclusive direction, its economy will run out of steam, probably within the next two or three decades as the country reaches income per capita levels around 30 to 40 percent of that of the U.S. This would be bad news for the welfare of the citizens of the world’s most populous country — and worse news if, rather than encouraging institutional reform, the slowdown of growth in China brought out the Communist Party’s authoritarian and repressive streak. But it also implies that the lure of the authoritarian growth model is likely to fade.

Nevertheless, even if the rights revolution is not reversed, its advance will be slow because of the endurance of extractive institutions that still surround us. Moreover, many of the societies under

extractive institutions today are different from China in that they still lack political centralization. To create a more broad-based participation in politics, many of these societies will have to first build state institutions, and then prevent these institutions from being captured by some narrow interests. The hard cases of Afghanistan, Haiti and Somalia, among others, highlight how difficult this is.

Overall, the rights revolution will have a crucial effect on the trajectories of the other major trends. But this does not imply that there will be an automatic expansion of rights being the next century. One of the major differences between the framework I have tried to articulate, and modernization theory, is that there is nothing inevitable about the continuation of the rights revolution. It will take the actions of millions of individuals around the world to defend and advance this revolution and the inclusive institutions built around it.

2. *The future of technology:*

Much can be debated about the future of particular technologies, from robots potentially replacing factory workers, to new drugs and the possibility of automated cars. But in general, one part of this picture is clear: there is little evidence that we are running out of innovations. Not only are there millions of ideas that can be recombined into new processes and products, but every innovation poses new problems and opens the way for yet more innovations; consider how smart phones, tablets, and social media have created new industries centered on developing applications for these platforms. Nor is there much evidence supporting the idea that we have now satisfied so many of our basic needs that there is less room for technology to improve our lives.²³ Few in the 1970s would have foreseen our current need for mobile communication, the Internet, and social networking, all of which stem from technological breakthroughs.

Another factor boding well for the future of technology is the ability of our society to direct technological change to sectors, products, and factors of production that will most benefit from improvements.²⁴ This has long been the case. Recent work by Walker Hanlon illustrates one such example of directed technological change from the 19th century: Civil War-era disruption of U.S. cotton supplies to the British industry led to rapid improvements in textile processes using Indian cotton.²⁵ A contemporary example is the response of the U.S. pharmaceutical industry to changes in the market size for different types of drugs driven by the baby boom and the subsequent baby bust. The evidence suggests that there have been significantly more new drugs for diseases whose market expanded.²⁶

²³ The idea that much of 20th century growth was based on “low-hanging fruit,” for example, because they were some major needs to be satisfied is proposed by several economists. See, in particular, Gordon, R, 2010, ‘Revisiting US productivity growth over the past century with a view of the future’ NBER Working Paper No. 15834, and Cowen, T 2011, *The great stagnation: how America ate all the low-hanging food of modern history, got sick, and will (eventually) feel better*, Dutton Adult, New York.

²⁴ Acemoglu, D 2002, ‘Directed technical change’, *The Review of Economic Studies*, Vol. 69, No. 4, pp. 781-809.

²⁵ Hanlon, W 2011, ‘Necessity is the mother of innovation: input supplies and directed technical change’, PhD thesis, Columbia University, New York.

²⁶ Acemoglu, D & Linn, J 2004 ‘Market size in innovation: theory and evidence from the pharmaceutical industry’ *Quarterly Journal of Economics*, Vol. 119, No. 3, pp. 1049-1090.

The main threat to our technological vibrancy comes not from an imminent drying up of new ideas but from a wholesale shift away from inclusive institutions. Short of this, innovations and technological ingenuity will continue, and even if those threats to our inclusive institutions should not be underestimated, we are not in imminent danger of seeing the whole edifice that has developed over the last century collapse in front of our very eyes.

3. Will growth relent?

Economic growth is not a law of nature. It can slow down or even halt. But there are several reasons to think that we are not near the end of growth potential. The first is our ongoing ability to produce technological innovations, the main engine of economic growth, and the second is the rapid catch-up growth potential not only in China but throughout the developing world.

This is not to suggest that there are no dangers to watch out for. Advanced economies, in particular the U.S. and Western Europe, are struggling with their own fiscal and economic problems, and though these problems are mostly short-term and much more superficial than they first appear, the possibility of policy mistakes creating more profound problems cannot be ruled out. There is also a limit to how much we can count on developing nations to spearhead world growth. The growth of these nations relies on demand from advanced economies and the continued globalization of technology and production, thus making it dependent on the economic health of the U.S. and Western Europe; and some of this growth will likely slow down as the easiest catch-up opportunities are exhausted.

But most probably, absent a major global drift away from inclusive institutions, our grandchildren will also be writing about how unrelenting growth has been in the 21st century.

4. How uneven will growth be?

It would be utopian to hope that economic growth in the next century will create a convergence between rich and poor nations. But there are reasons to expect that growth will not be as uneven as it was in the 20th century. First, rights and inclusive institutions are likely to keep spreading. Second, the globalization of technology and production is likely to continue, creating greater demand for cheap labor all around the world, increasing economic activity in many poor countries. Third, while some of those countries will still be ruled by extractive regimes, we may also expect some changes among these extractive institutions, in particular as many civil war-torn areas in sub-Saharan Africa and Asia start a process of state centralization and state building. In most cases, this process will be under the auspices of authoritarian governments, which, though often quite predatory, still create an environment where there is some law and order. This will then allow more effective exploitation of natural resources for which the world demand has been soaring, and can attract foreign investment to take advantage of cheap local labor. To be sure, this type of growth under extractive institutions will probably create new and sometimes quite jarring inequities within these nations.

5. The transformation of work continued:

The structural transformation of work will continue in many nations. Technology and machines will perform more of the manual labor and routine tasks that people do today. Employment in agriculture will become less important, and services will expand throughout sub-Saharan Africa, Asia, and Latin America. In advanced economies, the erosion of various middle-skill occupations is also likely to continue. But neither of these two trends will inexorably lead to greater income inequality globally. The transition from agriculture to manufacturing and services can often act as an equalizing force, lifting millions from poverty — even if the conditions in urban areas and in non-agricultural sectors awaiting most migrants are still harsh and their opportunities limited.

The transformation of work associated with technological changes has contributed to worsening income inequality in the U.S. Future advances in cheap robotics may sharply reduce current demand for low- and middle-skill labor. That being said, increasing inequality is not an inevitable consequence of technological change. Other advanced nations subject to the same technological trends, including Germany, France, the Netherlands and Sweden, have not experienced similar surges in income inequality (see Figure 14). Tellingly, there has been a huge rise in top-end inequality — the share of total national income going to the richest 1 percent of the population — in the U.S. and the U.K., which is largely unmatched in these other countries (see Figure 15).²⁷ This suggests that U.S. inequality has risen partly because of the deceleration in the supply of high-education workers, and partly because of institutional and policy changes favoring the wealthiest citizens. The U.S. may be able to combat the rise in inequality with policy and institutional choices resembling those of their more-equal European counterparts, including redistribution policies directly tackling inequality, a more progressive tax code, and greater investments in high-quality pre-college education aimed at creating new types of middle-class jobs — though not the manual, middle-skill jobs our parents' generation could obtain.

²⁷ Figure 14 uses data on household disposable income from the Luxembourg Income Study, see Smeeding, T 2002, 'Globalization, Inequality, and the Rich Countries of the G-20: Evidence from the Luxembourg Income Study (LIS)', Syracuse University. Disposable income is defined as total household income from all sources minus taxes plus transfers. Figure 15 uses data from Atkinson, A, Piketty, T and Saez E, 2011, 'Top incomes in long-run history' *Journal of Economic Literature*, 49, 3-71 (<http://g-mond.parisschoolofeconomics.eu/topincomes/>). The top 1% shares include capital gains for the US, Sweden, and Germany but not in the UK, the Netherlands, and France. The UK data are at the tax unit level prior to 1999 and at the person level thereafter.

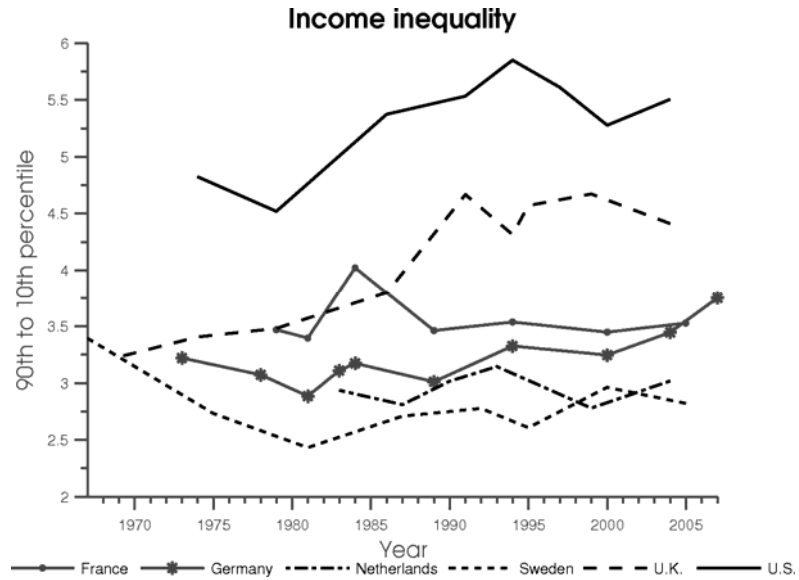


Figure 14

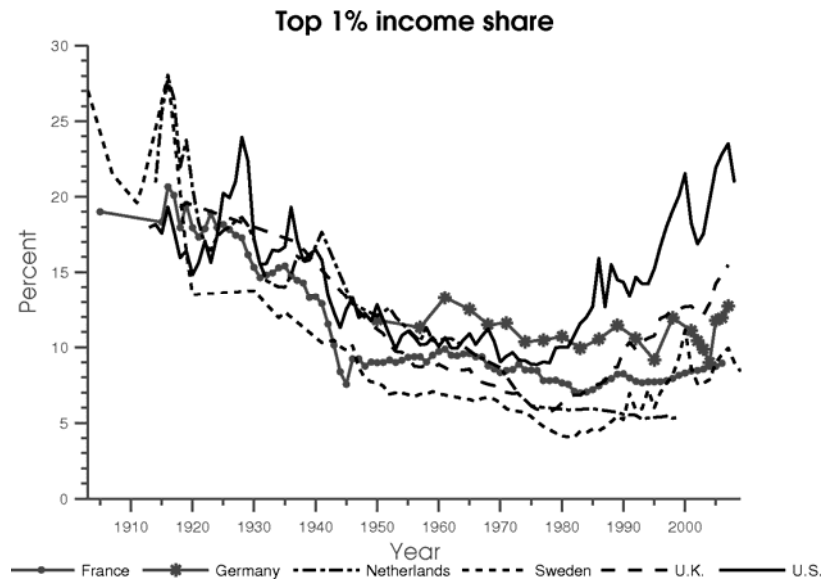


Figure 15

Furthermore, technological change has not reduced the demand for all medium and low-skill labor; Figure 4 above shows that it has increased the demand for, and employment in, a variety of service occupations involving health-care technology, food preparation, and personal care. We may expect many of these occupations to command higher wages in the next several decades because the underlying technological are likely to trends continue; because the demand for these services and the workers performing them is likely to further expand as a result of the rise in incomes; and because, seeing these trends, workers are likely to invest in useful skills related to such occupations, and thus increase their earnings. The directed nature of technology may also play an important role here. The path of technological change is pliable, and will respond to profit incentives and policy. If employment in service occupations expands, we may also expect technological developments directed at improving

productivity in these tasks, which may also contribute to the emergence of a new middle class. Still, the way gains from growth are shared within a nation is determined not only by the path of technology, but by that nation's institutions and political choices.

6. The health revolution continued:

The health revolution is highly likely to continue. Not only will our children and grandchildren in advanced nations live healthier and longer lives than us, their cousins in the poorer parts of the world will also be much healthier than their parents and grandparents. This is again mostly because of better technology, in the form of new drugs and vaccines, spreading more rapidly across the world, but will also be helped by greater awareness of effective infrastructure investments in public health. Of course, the delivery of public health services will almost surely be slower than we might wish. All-too-avoidable famines in places such as East Africa will still occur. But barring major wars, the global convergence in health outcomes will continue. What this implies for economic growth is more debatable. Groups like the World Health Organization and economists such as Jeffrey Sachs believe there will be a huge growth dividend from improvements in health. But the striking improvements in health since the 1950s do not seem to have yielded such dividends.²⁸ Most likely, the health revolution will continue to improve lives and welfare, but will not by itself a major source of economic growth.

The biggest threat to the health revolution comes from the status of the rights revolution. Health-care delivery cannot be improved indefinitely without corresponding institutional improvements in many parts of sub-Saharan Africa and Asia. Moreover, the advanced nations must sustain the commitment to human rights that saw them make the investments and the foreign aid necessary to improve health around the world in the first place.

7. The future of globalization:

Though fueled by the technological breakthroughs in communication and transport, globalization has also advanced due to the policy decisions of nations. As Figure 8 shows, an earlier trend toward globalization ended with World War I. A contemporary curtailment of globalization remains possible, though less likely because of the world's even-greater integration today; simply changing trade policies would be less easy. It is more realistic to think that globalization will be seen in even more areas of life, such as the offshoring of medical diagnoses.

Nevertheless, the pace of globalization of technology is likely to slow for two reasons. First, the main impetus for it, low wages in labor-abundant countries such as China, India, and Indonesia, has already started changing as a result of the very process of globalization exploiting these differences. Second, if Chinese growth does come to a screeching halt, the current international division of labor may start faltering.

²⁸ Acemoglu, D, and Johnson, S 2007, 'Disease and development: the effect of life expectancy on economic growth', *Journal of Political Economy*, Vol. 115, No. 6, pp. 925-985.

8. The peaceful century?

If the 20th century was one of both war and peace, will the 21st century be one of peace alone? There are reasons to think so, with qualifications. On the positive side, we have seen that both international and civil wars have been declining over the last 60 years. The root causes of these trends, the rights revolution and its ramifications including changes in attitudes and norms, and the development of international institutions protecting world peace, are likely to continue. For example, as the rights revolution spreads to other parts of the world, the hope is that there will be fewer wars resulting from domestic political strife. Perhaps as importantly, the values and social norms consistent with the rights revolution should make violence of all sorts less common.

Our prospects for peace will depend not just on the aspirations of institutions, but their capacities. Further state centralization would likely reduce the various types of violence and murder in places such as Somalia, the Congo, Afghanistan, and many parts of Pakistan — despite these states' sometimes brutal treatment of their own citizens.

Meanwhile, international organizations such as the United Nations that have helped reduce war during the last 60 years have been designed for specific problems, such as providing a forum for Cold War disagreement between the U.S. and the Soviet Union — which was not only politically but economically isolated from Western economic powers. The challenges ahead, such as potential conflict between China and its neighbors, could be very different in part because China's integration into the global economy and its lucrative markets will make it much more difficult for Europe, the U.S., and Japan to take unified positions. It remains an open question whether international institutions can cope with a new set of conflicts.

9. From counter-Enlightenment to Enlightenment?

Some counter-Enlightenment political movements are now distant memories. But the renewal of religion as a political force in many regions is a clear reality. Is this something that will also decline as tolerance and rational thought replace extremism? There is no easy answer to this question, in part because our understanding of the causes of religion's political resurgence is still quite incomplete. My best assessment, for now, is that the increasing political role Islam has been playing in the Middle East, North Africa, and parts of South Asia is the result of four intersecting trends.

First, as noted, this trend is in part a reaction of individuals brought up within authoritarian and traditional communities and families to threatening changes around them. An illustrative example comes from Sayyid Qutb, the writer who has been one of the inspirations of many different shades of political Islam, including Al Qaeda. Qutb's radicalization during his studies in the U.S. was partly a response to what he saw as excessive materialism, sexual promiscuity, and a modernity lacking spirituality engulfing America — trends he saw in his home nation of Egypt as well.

Second, Islam has been used by many rulers in the region as a method of controlling their populations and quelling discontent, inevitably increasing its role in society. This is not only apparent in theocratic dictatorships such as Saudi Arabia, but has also been a common practice by non-religious

autocrats ranging from Gamal Abdel Nasser in Egypt to Saddam Hussein in Iraq and Hafez and Bashar al-Assad in Syria.

Third, these efforts at using religion for social control notwithstanding, the support for political Islam often comes from the less well-to-do and the disenfranchised — in part because recent economic and social changes in many nations in the region have taken place under extractive institutions, leaving large segments of society behind, and in part because Islam has often been the only discourse permitted for those outside the ruling elite. The evidence from the attitudes of moderate Islamist political parties, such as the Justice and Development Party in Turkey, the Muslim Brotherhood in Egypt, or Ennahda in Tunisia suggests that, whatever their own flaws, they also speak more for this segment of the population than the regimes they are challenging. This is highlighted by recent research by Erik Meyersson on the implications of the Islamist party narrowly winning power in some Turkish municipalities in 1994.²⁹ He found that where narrow victories shifted local control to members of this Islamist party, girls were significantly more — not less — likely to go to school, probably because conservative parents felt more secure about sending their daughters to school, and perhaps also because this party cared more about the schooling of the less well-to-do than did the elite secular parties that had dominated Turkish politics until then.

The fourth and final factor potentially contributing to the increasing role of Islam is a widespread feeling in many of these countries that the West has been imperialistic and has played an instrumental role in the relative underdevelopment of the region. We should then expect that the rights revolution will be particularly slow in taking root in many of these countries because all four trends still shape domestic politics and attitudes in the region, and because many versions of political Islam are opposed to several aspects of the rights revolution, including certain freedoms for individuals, women, and religious and sexual minorities.

Nevertheless, I believe that the rights revolution is likely to spread to this part of the world too, because of the political and social dynamics the region is experiencing. The most important factor is that, as demonstrated by the Arab Spring, the extractive regimes running many of the region's countries are less entrenched than they appeared just a couple of years ago; people now possess the self-sustaining sense that political change is coming to the region, even if there will be many false starts and much continued conflict about it in the next several decades. We should then expect that many of the regimes in the region will be more representative, replacing dictatorships and monarchies. Though there is no guarantee that these new regimes will be more respectful of individual rights than the ones they replace, there are two reasons for optimism. First, as these extractive regimes collapse, the use of religion for social control may abate. Second and more importantly, relatively moderate and popular versions of the religious political movements, such as the Ennahda, are bringing new political and civil rights to a significant fraction of the population. Ultimately, this may pave the way for greater rights for everybody. It would be naïve to expect a wholesale embrace of Enlightenment in much of the region any time soon. But we may see a *de facto* expansion of political and civil rights to individuals, women, and

²⁹Meyersson, E 2011, 'Islamic rule and the emancipation of the poor and pious', Working paper, London School of Economics, London.

minorities, even as the rhetoric within much of the society still remains influenced by religious movements hostile to the expansion of these rights.

In focusing on the role of religion in politics, I do not mean to rule out the possibility that there may be other, new counter-Enlightenment forces emerging in the next century. A candidate is the resurgence of modern variants of fascism, or other forms of militarism, in China or the U.S. or both. Perhaps, somewhat in line with Sinclair Lewis's warnings in his 1935 novel *It Can't Happen Here*, the increasing role of religion in U.S. politics, the war on terror, and future conflicts with China make this more likely. There might also be an anti-modernist movement opposed to technology and economic progress, perhaps partly motivated by the damage that technological change and economic growth have done to the environment — and thus paradoxically partly spawned by the rights revolution that makes people more concerned about the rights and welfare of others. Though possible, I think these threats are largely far-fetched.

10. Population, resources and the environment in the 21st century:

The U.N. forecasts about world population, under low, medium, and high fertility scenarios, (see Figure 12 above) produce two important conclusions. First, the global population will continue to grow for quite a while. Second, it is likely to reach a plateau at some point in the next century. The world can easily accommodate this expanded population, and there is little reason to fear any acute resource scarcities or population-related disturbances. Even if Julian Simon would have lost his wager at today's prices, he was largely right that technology can be quite adept at dealing with scarcities reflected in prices — for example, by channeling innovations to overcome bottlenecks, as examples of directed technological change discussed above illustrate.

The most vital question concerns climate change and our fossil fuel consumption, partly because the damage that our fossil fuel emissions create is a textbook case of the tragedy of the commons: without carbon taxes and other regulations, the damage each of us creates on the environment is not priced, and we will collectively continue to emit fossil fuels even as this habit threatens our planet. Figure 16 shows the evolution of carbon emissions and concentration carbon in the atmosphere.³⁰ Not only have we been increasing our carbon emissions since the turn of the 20th century, but given rapid industrialization in China and other emerging economies, there appears no feasible way of changing course any time soon. Instead, we have pinned our hopes on two other precarious developments, one technological, the other political.

³⁰ World emissions and concentration levels are taken from the Carbon Dioxide Information Analysis Center (CDIAC); see http://cdiac.ornl.gov/trends/emis/overview_2008.html, and <http://cdiac.ornl.gov/trends/co2/>. Emissions are plotted in equivalent CO₂ billion metric tons. CO₂ concentration levels in the atmosphere are from two sources: Data for 1900-1959 comes from measurements in ice cores in Law Dome, Antarctica. Data for 1960-2010 comes from in situ air samples taken collected at Mauna Loa, Hawaii, USA.

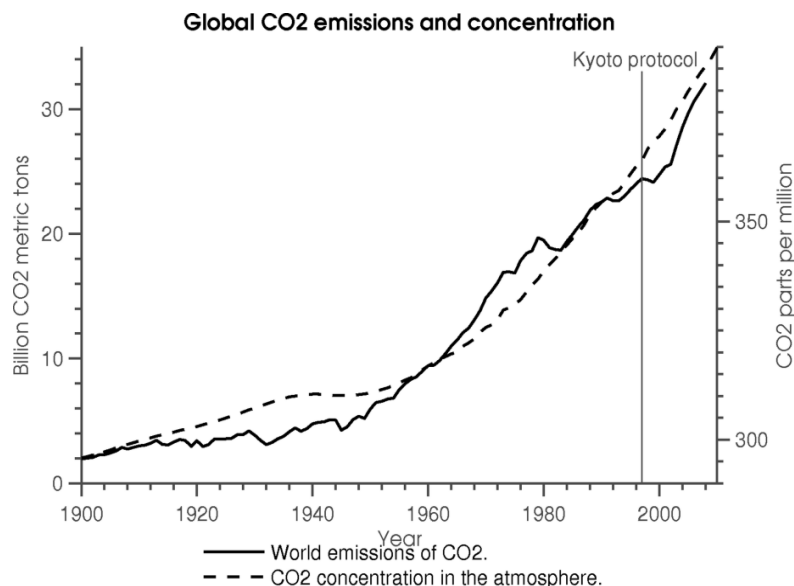


Figure 16

On the technological front, we need breakthroughs in alternative energy, and the energy grid, in order to find low-carbon ways of producing and delivering energy. Many also hope that geo-engineering solutions will reduce the impact of already-emitted carbon and cut emissions through processes such as carbon capture. But these are stopgap measures. Ultimately, the only way to slow down the atmospheric concentration of carbon is to transition to cleaner energy. This is a tall order, but perhaps not as much as it might first appear — thanks again to the often-directed nature of technological changes. In particular, to be viable, clean energy doesn't need to be fully cost-effective in the medium term. With the right policies, the large-scale switch to alternative energy can take place when these are up to 50 percent more expensive than fossil-fuel based energy. Once they have a sufficient market share and are expected to expand, there will also be greater incentives for technology to be endogenously directed towards these technologies and away from the older, dirtier technologies.³¹ These innovations, together with the natural learning-by-doing that will take place with the new cleaner techniques, can take us towards our target.

Though on the whole this scenario is highly optimistic, within it lies a major danger: the prospect that geo-engineering and technological advances in clean technology might work as a pretext for not taking action in reducing carbon emissions and switching to cleaner energy sources more quickly: Why make costly sacrifices today if technology will miraculously solve all our problems in the future? If so, our belief in our own technological mastery might ultimately create much more damage than good.

On the political front, only an international agreement can ensure the transition to alternative energy sources — even if this means higher costs in the short term for participating countries. Even though our record in this area is mixed at best, there is again a silver lining: the rights revolution, if it

³¹ Acemoglu, D, Aghion, P, Bursztin, L & Hemous, D 2012, 'The environment and directed technical change', forthcoming, *American Economic Review*.

does indeed continue to spread, would also tend to make people care more about the welfare of those who will suffer because of climate change. We are already seeing this in the willingness of a subset of the population in the developed world to make sacrifices, albeit small ones, to reduce their own carbon emissions or contribute in other ways to the preservation of the environment. If this trend continues and there is enough demand from electorates for an international accord to fight climate change, politicians will have to fall in line.

At the end, as with the other trends that have made and should continue to make our world a better place, the healthy future of our planet will also depend on the continuation and strengthening of the rights revolution.