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## INEQUALITY BEYOND GDP: A LONG VIEW

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This paper addresses international inequality in multidimensional well-being during the last one-and-a-half centuries. Inequality fell in health and education since the late 1920s, due to the globalization of mass schooling and the diffusion of the health transition, but only dropped in population-weighted terms from 1970 onward for political and civil liberties, as the emergence of authoritarian regimes increased its dispersion since the end of World War I. In terms of *augmented* human development inequality declined since 1900. These results are at odds with per capita income inequality that rose over time and only shrank from 1990 onward. The gap between the *OECD* and the *Rest of the world* accounted only partially for inequality in well-being since the dispersion within developing regions became its main driver from the mid-20th century onward. Countries in the middle and lower deciles of the world distribution achieved the largest relative gain over the past century.

**JEL Codes:** F60, I00, N30

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### 1. INTRODUCTION

In the last one-and-a-half centuries, substantial gains in well-being have been achieved across the board. This can be observed for its main dimensions: health, education, political voice, civil liberties, personal security, and material well-being (Maddison, 2008; Morrisson and Murtin, 2009; Deaton, 2013; Pinker, 2018; Prados de la Escosura, 2021). However, in the study of international well-being and its distribution the focus remains on income. In this paper I address multidimensional well-being and raise some questions. How have the gains from well-being dimensions been distributed? Is well-being inequality higher in the world today than it was in the late 19th century? How does the inequality of different well-being dimensions

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compare? What drives inequality? Which parts of the distribution achieved larger gains over time in relative and absolute terms?

This paper approaches multidimensional well-being from a *capabilities* perspective.<sup>1</sup> The *capabilities* approach makes well-being dependent on a combination of *functionings* or achievements freely chosen by individuals (Sen, 1984). Thus, the distribution of well-being across countries will be assessed on a broad basis that includes health, access to knowledge, and civil and political liberties, proxied by Kakwani indices of life expectancy at birth and schooling, and an index of liberal democracy, respectively, as well as the distribution of material well-being, proxied by per capita income. Well-being dimensions may reveal diverging trends, warranting the resort to a composite measure. Therefore, I will also address differences across countries in terms of *augmented* human development, which encompasses enjoying a healthy life, acquiring knowledge, and achieving a decent standard of living in a context of freedom of choice (Prados de la Escosura, 2021).

This paper contributes to the literature on international well-being distribution in several ways. First, it offers long-run trends in relative inequality for schooling, life expectancy, political and civil liberties, and *augmented* human development, that are contrasted with those for per capita income.<sup>2</sup> Second, it addresses the drivers of inequality across well-being dimensions on the basis of the mean log deviation that is decomposable by population groups. Finally, it shows the distribution of relative and absolute gains in well-being dimensions by ventiles using growth incidence curves. The period considered spans from 1870 to 2015, encompassing two phases of globalization (pre-1913 and post-1950) and one of globalization backlash (1914–1950), on the basis of a sample ranging between 115 and 162 countries that represents most of world's population.

The paper's main results challenge the conventional view of well-being distribution across countries and over time that derives from GDP per head. While the international dispersion of per capita income increased until the late 20th century and only fell since 1990, inequality in health and education fell steadily since the late 1920s and, in terms of political and civil liberties, although unweighted inequality experienced a long-run decline since 1890, population-weighted inequality grew over time only dropping from 1970 onward. Inequality in *augmented* human development declined since 1900. The gap between the *OECD* and the *Rest of the world* accounted only partially for inequality in well-being since the dispersion within developing regions became its main driver from the mid-20th century onward. A look at the long-run distribution of well-being reveals relative gains for those countries in the middle and lower deciles over the past century. The globalization of primary and secondary schooling and the health transition mainly accounted for the reduction in population-weighted inequality in terms of well-being, while the

<sup>1</sup>Alternative approaches include the welfare economics approach, which values various dimensions of quality of life in monetary terms (Nordhaus and Tobin, 1972; Becker *et al.*, 2005; Jones and Klenow, 2016; Gallardo Albarrán, 2017), and subjective well-being (SWB), which places life satisfaction at its center (Easterlin, 1974; Kahneman and Deaton, 2010; Veenhoven and Vengust, 2013; Clark, 2018).

<sup>2</sup>Relative inequality depends on the ratio of countries' values to the mean, and absolute inequality measures the absolute distance between countries' values. The focus here will be on relative inequality, and relative inequality and inequality will be used as synonym terms.

rise of authoritarian political regimes partly offset it, and civil and political liberties only helped reduce well-being inequality from the late 20th century.

The paper is organized as follows. Section 2 provides an overview of the empirical literature on multidimensional international inequality in the long run. Section 3 presents new indices of life expectancy, schooling, and political and civil liberties, as well as of *augmented* human development. Section 4 offers long-run trends in inequality. Section 5 portrays relative and absolute gains across the distribution for each well-being indicator on the basis of growth incidence curves. Section 6 accounts for discrepancies in inequality trends between well-being dimensions. Section 7 concludes.

## 2. WELL-BEING INEQUALITY IN THE LONG RUN

Long-run inequality has received little quantitative attention until the last decades due to data constraints. Bourguignon and Morrisson (2002), on the basis of 33 “trans-national” units, concluded that world inequality was much higher in 1992 than in 1820. This resulted from a rise in inequality between the early 19th century and mid-20th century that tended to stabilize during the second half of the century. The main element behind long-run world income inequality was the disparity across countries. Nonetheless, within-country income distribution dominated world inequality during the 19th century, while in the 20th century cross-country income distribution prevailed. Refined estimates by Van Zanden *et al.* (2014) tend to confirm Bourguignon and Morrisson’s findings. Driven by between-country inequality, the dispersion of global income distribution increased over the long run, mostly up to 1950, stabilizing thereafter, and experiencing a moderate rise from 1980 onward. When, alternatively, absolute inequality is considered, Goda and Torres García (2017) find a sustained rise since 1850 (with only a decline in the 2000s), in which within-country inequality represented the driving force before 1929 and after 1985, while between-country inequality prevailed over 1929–1950.

However, per capita income is just one dimension of well-being. Inequality in access to education and health has also attracted social scientists’ interest. Morrisson and Murtin (2013) provided a long-run view of global education inequality on the basis of average years of schooling, finding a long-term reduction, mostly attributable to the diffusion of literacy. The long-run evolution of life expectancy inequality has been addressed by Bourguignon and Morrisson (2002), who, on the basis of cross-country data for life expectancy at birth at benchmark years, found a sustained increase in inequality between 1820 and 1910, that stabilized up to 1929, and, then, declined sharply down to 1970, remaining unaltered until 1990. An update of the estimates shows a further decline in the 1990s (Morrisson and Murtin, 2005). Thus, the levels of inequality in the late 20th and early 19th centuries were similar. In the case of civil and political rights, however, although its spread and setbacks across countries have attracted much attention, no quantitative assessments of its international distribution seem to exist.

Whether to look at different dimensions of well-being individually or to resort to multidimensional indices poses a dilemma. On the one hand, the interpretation of individual indices is straightforward. On the other hand, if individual indices show

conflicting tendencies, drawing general conclusions on its evolution becomes impossible (Decancq *et al.*, 2009). This has led to constructing composite indicators. In the only long-run perspective on human development, Morrisson and Murtin (2005) observed that the evolution of inequality had an inverted U-shape with a turning point in 1930.

The main conclusion that derives from the literature is that (non-income) well-being inequality experienced a long-term rise that peaked by the early-20th century and, then, gave way to a sustained decline. This is at odds with the evolution of international income distribution, in which dispersion rose over time to decline only in the early 2000s. Can this depiction of the trends in well-being inequality be confirmed using a more rigorous conceptual approach and on the basis of a more comprehensive database?

### 3. ASSESSING WELL-BEING

How to measure progress in non-economic dimensions of well-being beyond GDP constitutes a far from negligible matter. Original values of social variables (life expectancy, height, or literacy) are usually employed (Bourguignon and Morrisson, 2002; Lindert, 2004; Becker *et al.*, 2005; Acemoglu and Johnson, 2007; Hatton and Brey, 2010; Morrisson and Murtin, 2013). However, unlike GDP, non-income well-being indicators, such as life expectancy, height, infant mortality, literacy rates, or years of schooling, have asymptotic limits that reflect biological or physical maxima. This means that the use of original values for comparisons over space and time introduces biases, because the range of variation is very narrow, forcing smaller gains (both absolute and relative) as their levels get higher (Sen, 1981; Dasgupta, 1990; Cornia and Menchini, 2006). This objection is particularly relevant when an attempt is made at measuring the distribution of such variable across countries and over time, since the use of original values tends to bias the results toward convergence.

A transformation would be, then, required to measure changes within upper and lower bounds. A possibility is a linear transformation, which reduces the size of the denominator and, thus, widens the index's range. Indices for each dimension ( $I_x$ ) are computed as,

$$(1) \quad I_x = (x - Mo)/(M - Mo),$$

where  $x$  is the observed value of a given dimension of welfare, and  $Mo$  and  $M$  represent the minimum and maximum values (goalposts), respectively. The index varies within 0 and 1.

However, using linearly transformed values does not solve the problem as absolute changes of identical size result in smaller measured improvement for the country with the higher initial level (Sen, 1981; Kakwani, 1993).<sup>3</sup> Consider, for example, two improvements in life expectancy at birth, one from 30 to 40 years and another

<sup>3</sup>As Decancq *et al.* (2009, 17) put it, the problem of spurious convergence remains, nonetheless, with a concave transformation as "it dampens the effect of increasing values at the higher end of the distribution."

from 70 to 80 years. These increases are identical in absolute terms, but the second is smaller in proportion to the initial starting level. For example, using expression (1) and with 85 and 20 years as goalposts—as does the United Nations Development Programme’s [UNDP] (2014) Index of Human Development—the index would double in the former case and increase only by 20 percent in the latter.

The shortcomings of a linear transformation of original values become more evident when quality is taken into account. Healthy life expectancy increases with life expectancy at birth as morbidity experiences a relative compression (Murray *et al.*, 2017) and, therefore, as life expectancy raises, disability for each age-cohort falls and the quality of life rises across the board (Mathers *et al.*, 2001; Salomon *et al.*, 2012). Similarly, the quality of education, measured in terms of cognitive skills, grows as the quantity of education increases (Altinok *et al.*, 2018).

Unfortunately no historical data on health-adjusted life expectancy and quality-adjusted education measures for the broad country sample considered here are available before 1990.<sup>4</sup> However, Kakwani’s (1993) proposal of transforming social dimensions with a nonlinear function, in which achievements of the same absolute size have a larger impact as the starting point is higher, may provide a short-cut method to derive proxies for healthy life expectancy and cognitive skills on the basis of crude figures for life expectation at birth and years of schooling. Life expectancy at birth is defined as “the average number of years that a new-born could expect to live, if he or she were subject to the age-specific mortality rates of a given period.”<sup>5</sup> Years of schooling represent the average years of total schooling (primary, secondary, and tertiary) for population aged 25 and over.

Kakwani (1993) constructed a normalized index from an achievement function in which an increase in the standard of living of a country at a higher level implies a greater achievement than would have been the case had it occurred at a lower level,

$$(2) \quad f(x, Mo, M) = (\log(M - Mo) - \log(M - x)) / \log(M - Mo)$$

where  $x$  is an indicator of a country’s standard of living,  $M$  and  $Mo$  are the maximum and minimum values, respectively, and  $\log$  stands for the natural logarithm. The achievement function proposed by Kakwani (1993) is a convex function of  $x$ , and it is equal to 0, if  $x = Mo$ , and equal to 1, if  $x = M$ , with a range between 0 and 1. In the case of life expectancy, maximum and minimum values accepted are 85 and 20 years, respectively, and 0 and 15 years are the goalposts in the case of years of schooling (UNDP, 2014). A “floor” of 25 years has been assumed for life expectancy at birth and 0.01 years in the case of years of schooling.<sup>6</sup>

Freedom and agency are crucial elements of well-being in a capabilities approach (Ivanov and Peleah, 2010). The best and most comprehensive indicator

<sup>4</sup>In fact, whether the association between mortality and morbidity existed between 1870 and 1990 remains an unknown (Riley, 1990; Howse, 2006; Bleakley, 2007, 2010).

<sup>5</sup>[http://www.un.org/esa/sustdev/natlinfo/indicators/methodology\\_sheets/health/life\\_expectancy.pdf](http://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/health/life_expectancy.pdf)

<sup>6</sup>Arbitrary “floor” values have been adopted to allow the inclusion of countries for which no data exist in earlier periods and, at the same time, to avoid zero values in the transformed variables.

available is, perhaps, offered by *Varieties of Democracy*, the *Liberal Democracy Index*, which combines political liberties (electoral democracy, including free competition, extensive participation, and rulers' responsiveness to citizens) and civil liberties (protection of individual and minority rights and limits on government including the rule of law, an independent judiciary, and effective checks and balances).<sup>7</sup>

As well-being dimensions may exhibit diverging trends in their level and distribution, well-being inequality is also addressed using a composite index, the *Augmented Human Development Index* (AHDI), which represents an alternative to the UNDP's conventional HDI (Prados de la Escosura, 2021). As the conventional HDI, the AHDI includes as proxies for a healthy life (life expectancy at birth), access to knowledge (years of schooling), and material well-being and other aspects of well-being (discounted per capita income, in logs). The difference with the HDI is that non-income variables are transformed nonlinearly using expression (2), rather than linearly, so increases of the same absolute size represent greater achievements the higher the level at which they take place. Moreover, the aggregate index is augmented by incorporating civil and political liberties, proxied here by the index of liberal democracy which, as it measures quality in addition to quantity (unlike the other bounded variables considered here), is derived linearly (expression [1]).

The AHDI has been obtained as a multiplicative combination of the transformed values of each dimension. Since all dimensions are considered indispensable, they are assigned equal weights (UNDP, 2014). Upper and lower bounds and maximum and minimum levels for life expectancy and years of schooling are those mentioned above. In the case of per capita income, the upper and lower bounds are expressed in Geary-Khamis [G-K] 1990 dollars, \$47,000 and \$100, respectively. A "floor" of \$300 has been accepted as a basic level of physiological subsistence (Milanovic *et al.*, 2011). The income dimension has been derived using also expression (1) but with per capita GDP previously transformed into natural logs. The reason why per capita income enters the index at a declining rate is that it is aimed to represent command over resources to live a full, meaningful life so, in terms of capabilities, income returns diminish as its level raises.<sup>8</sup> If we denote the nonlinearly transformed values of life expectancy and schooling as  $E$  and  $S$ , respectively, political and civil liberties, as  $L$ , and the adjusted per capita income as  $Y$ , the historical index of human development is derived as,

$$(3) \quad AHDI = (E \times S \times L \times Y)^{1/4}$$

#### 4. TRENDS IN WELL-BEING INEQUALITY

Inequality is measured here with Henri Theil's (1967) population weighted index, also known as Theil L or Mean Logarithmic Deviation (MLD), which has

<sup>7</sup>*Varieties of Democracy (V-Dem)* database encompasses 201 countries over 1789–2017 (Coppedge *et al.*, 2018).

<sup>8</sup>For a theoretical justification of the introduction of diminishing returns to income, see Zambrano (2014, 2017).

sensitivity to transfers in the lower part of the distribution. Two types of inequality estimates are presented here, inequality between country averages in which all countries are given the same weight, regardless their size, that is, Milanovic's (2005) Inequality 1; and inequality between country averages but weighted by countries' size, so a large country counts more than a small one, namely, Milanovic's Inequality 2. The unweighted measure of inequality (Inequality 1) allows for the fact that policies are implemented at country level and impact on its citizens' well-being. Besides, weighted measures (Inequality 2) are very sensitive to the performance of highly populated countries. However, Inequality 2, although it implicitly assumes perfectly equal within-country distribution, does get us closer to a measure of world distribution by assigning a higher value to more populated countries (Milanovic, 2005, pp. 7–8). Unfortunately, no data on within-country distribution of social dimensions of well-being are available for such a large sample and time span.

Does population-weighted international inequality (Inequality 2) provide a good proxy for global inequality, that is, inequality among world inhabitants (Inequality 3)? This would be the case if between-country inequality, rather than within-country inequality, drives global inequality. Evidence on global inequality estimates both for per capita income and education supports this hypothesis (Bourguignon and Morrisson, 2002; Morrisson and Murtin, 2013; Van Zanden *et al.*, 2014; Lakner and Milanovic, 2016). The assumption here is, then, that inter-country dispersion provides a lower bound measure of global inequality.

Different country samples have been used in the alternative inequality estimates, for which the longer the time span, the narrower the spatial coverage. Thus, over the entire time span, 1870–2015, 115 countries are considered, its number rising up to 121, 146, 161, and 162 countries for the samples starting in 1913, 1950, 1980, and 1990, respectively.<sup>9</sup> The country samples represent above 90 percent of the world population. The results of these samples are highly coincidental, so there has been no need to splice them.

Let us now look at the international distribution of well-being dimensions over time and compare it with that of per capita income.

How is access to knowledge, proxied by the Kakwani index of schooling, distributed internationally?<sup>10</sup> High initial levels of inequality are observed for both unweighted and population-weighted measures in the late 19th and early 20th centuries (Table 1, Panel A, cols. 1–2), prior to the diffusion of mass primary education (Benavot and Riddle, 1988; Lindert, 2004). Inequality fell steadily since 1900. The level of inequality was, nonetheless, still high in the third quarter of the 20th century.

Trends in schooling inequality obtained with the Kakwani transformation match those derived on the basis of the original values by Morrisson and Murtin (2013), but the latter's level of inequality is systematically lower because bounded variables, when transformed linearly, exhibit a spurious tendency toward convergence.

<sup>9</sup>See the Online Appendix, Table A-1, for the list of countries included in each sample. Data, sources, and procedures for well-being dimensions at country level are provided at [https://frdelpino.es/investigacion/en/category/01\\_social-sciences/02\\_world-economy/03\\_human-development-world-economy/](https://frdelpino.es/investigacion/en/category/01_social-sciences/02_world-economy/03_human-development-world-economy/).

<sup>10</sup>See the description of the Kakwani index in Section 3 of the paper expression (2).

TABLE 1  
INTERNATIONAL INEQUALITY IN SCHOOLING AND LIFE EXPECTANCY (POPULATION-WEIGHTED MLD)  
(KAKWANI INDICES)

Panel A. schooling						
	Unweighted TOTAL	Population weighted TOTAL	Population weighted Between-group	Population weighted Within-group	Population weighted <i>The Rest</i>	Population weighted <i>OECD</i>
1870	1.25	0.88	0.38	0.50	0.57	0.20
1880	1.28	0.85	0.42	0.43	0.50	0.15
1890	1.29	0.84	0.45	0.39	0.46	0.12
1900	1.27	0.77	0.44	0.33	0.39	0.09
1913	1.08	0.65	0.38	0.26	0.32	0.07
1925	1.03	0.69	0.40	0.29	0.35	0.07
1929	0.95	0.60	0.33	0.27	0.33	0.07
1938	0.85	0.54	0.26	0.28	0.34	0.06
1950	0.69	0.52	0.23	0.29	0.35	0.06
1960	0.59	0.45	0.17	0.28	0.32	0.06
1970	0.49	0.38	0.14	0.24	0.27	0.05
1980	0.36	0.31	0.11	0.20	0.23	0.05
1990	0.28	0.27	0.11	0.16	0.17	0.04
2000	0.23	0.21	0.09	0.12	0.14	0.03
2010	0.20	0.20	0.08	0.12	0.13	0.03
2015	0.19	0.15	0.06	0.10	0.10	0.03

Panel B. life expectancy						
	Unweighted TOTAL	Population weighted TOTAL	Population weighted Between-group	Population weighted Within-group	Population weighted <i>The Rest</i>	Population weighted <i>OECD</i>
1870	0.21	0.22	0.15	0.07	0.08	0.04
1880	0.23	0.24	0.15	0.08	0.09	0.04
1890	0.26	0.30	0.20	0.10	0.12	0.03
1900	0.28	0.35	0.21	0.14	0.16	0.02
1913	0.27	0.39	0.22	0.16	0.20	0.02
1925	0.30	0.41	0.21	0.20	0.24	0.02
1929	0.26	0.24	0.15	0.09	0.11	0.01
1938	0.21	0.20	0.13	0.07	0.09	0.01
1950	0.16	0.16	0.07	0.10	0.12	0.01
1960	0.15	0.20	0.07	0.13	0.16	0.00
1970	0.12	0.08	0.02	0.06	0.07	0.00
1980	0.10	0.07	0.02	0.05	0.05	0.00
1990	0.09	0.06	0.02	0.04	0.05	0.00
2000	0.11	0.07	0.02	0.05	0.06	0.00
2010	0.11	0.08	0.02	0.06	0.06	0.00
2015	0.09	0.06	0.02	0.05	0.05	0.01

*Notes:* “Total” inequality amounts to the sum of “Between-group” and “Within-group” columns. The last two columns correspond to inequality within The Rest and the OECD, respectively.

*Sources:* See the text. Computed from data provided in [https://frdelpino.es/investigacion/en/category/01\\_social-sciences/02\\_world-economy/03\\_human-development-world-economy/](https://frdelpino.es/investigacion/en/category/01_social-sciences/02_world-economy/03_human-development-world-economy/)



Main phases can be observed in the evolution of life expectancy inequality: a rise from 1870 to 1925, followed by a sustained fall until the early 1980s, that bounced partially back between 1990 and 2010, recovering, then, a declining trend. When we compare Inequality 1 and Inequality 2, we find that, for population-weighted inequality, the rise up to the mid-1920s and the long-run contraction to 1980 were sharper, unlike the post-2010 rebound. It is also noticeable a sharp and punctual reversal in 1960 that captures the impact of China's mortality increase during the Great Leap Forward famine (Meng *et al.*, 2015). This hints at the importance of large countries as illustrated by the upsurge of Inequality 2 in 1960, not observable in Inequality 1 (Table 1, Panel B, cols. 1–2).

Inequality trends in life expectancy are comparable to those obtained by Bourguignon and Morrisson (2002), but as they computed inequality 2 on the basis of the original values of life expectancy at birth, the level of inequality is underestimated and does not capture the post-1990 reversal.

Unweighted and population-weighted inequality in political and civil liberties exhibits different trends. In the case of Inequality 1, after increasing in the late 19th century, a long-run decline took place since 1900, punctuated by reversals in the Interwar years and, more intensively, in the 1970s and early 1980s. If we turn now to Inequality 2, between 1870 and 1970, a rising trend is observed, followed by fall between 1970 and 2010 and a mild reversal in the 2010s (Table 2, Panel A, cols. 1–2).

Since the different well-being dimensions discussed exhibit contradictory trends, a look at the international distribution of a composite measure such as the AHDI seems warranted (Prados de la Escosura, 2021). Unweighted inequality in terms of augmented human development increased up to 1890 and followed, then, a steady long-run decline but for a reversal in the aftermath of World War I and stagnation in the early 1970s. If we now turn to population-weighted inequality, we find a declining trend that was reversed in the aftermath of the World Wars (Table 2, Panel B, cols. 1–2).

But how do international inequality trends in well-being compare to those in GDP per head for the same country sample? If we first delve into unweighted measure, a long-run increase in per capita income inequality took place up to 2000. The sharp increase in inequality between the end of the Great Depression and 1950 reflects the uneven impact of World War II across countries. A contraction occurred after 2000. In the case of population-weighted inequality, a sustained rise up to early 1970s took place, only punctuated by a severe contraction during the Great Depression. Inequality declined since the late 20th century. Thus, distinctive pattern of international distribution emerge for multidimensional well-being and GDP per head (Table 2, Panel C, cols. 1–2).

What drove inequality? Was it the gap between advanced or *OECD* countries<sup>11</sup> and the Rest of the world, or the dispersion within each of these two groups? MLD allows us to carry out this breakdown of aggregate inequality 2.

<sup>11</sup> Advanced countries comprise here those belonging to the OECD prior to its enlargement in 1994 (*OECD*, for short, or the *West*, as this group of countries is indistinctively labeled throughout the paper). In this paper, countries under the label *OECD*, or the *West*, coincide largely with the membership of the Organisation for Economic Co-operation and Development (OECD) up to 1994 (see the list of *OECD* countries in the Online Appendix, Table A1, bold font).

TABLE 2  
INTERNATIONAL INEQUALITY IN CIVIL AND POLITICAL LIBERTIES, AHD, AND PER CAPITA GDP  
(POPULATION-WEIGHTED MLD)

Panel A. civil and political liberties						
	Unweighted TOTAL	Population weighted TOTAL	Population weighted Between-group	Population weighted Within-group	Population weighted <i>The Rest</i>	Population weighted <i>OECD</i>
1870	0.79	0.47	0.22	0.25	0.29	0.06
1880	0.82	0.54	0.31	0.24	0.28	0.06
1890	0.85	0.58	0.31	0.27	0.33	0.06
1900	0.62	0.58	0.31	0.28	0.33	0.06
1913	0.52	0.33	0.22	0.11	0.13	0.05
1925	0.57	0.55	0.25	0.29	0.32	0.21
1929	0.57	0.56	0.28	0.28	0.29	0.25
1938	0.56	0.54	0.19	0.35	0.29	0.60
1950	0.50	0.68	0.23	0.45	0.53	0.11
1960	0.46	0.71	0.12	0.58	0.69	0.11
1970	0.56	0.80	0.14	0.65	0.76	0.12
1980	0.63	0.66	0.16	0.50	0.57	0.04
1990	0.43	0.54	0.09	0.45	0.51	0.00
2000	0.34	0.42	0.05	0.37	0.42	0.02
2010	0.29	0.35	0.05	0.30	0.34	0.02
2015	0.28	0.41	0.05	0.36	0.40	0.02
Panel B. augmented human development						
	Unweighted TOTAL	Population weighted TOTAL	Population weighted Between-group	Population weighted Within-group	Population weighted <i>The Rest</i>	Population weighted <i>OECD</i>
1870	0.41	0.27	0.19	0.08	0.08	0.05
1880	0.44	0.30	0.22	0.07	0.08	0.04
1890	0.46	0.33	0.24	0.08	0.10	0.03
1900	0.42	0.34	0.25	0.09	0.11	0.03
1913	0.39	0.29	0.21	0.09	0.10	0.02
1925	0.40	0.34	0.22	0.12	0.14	0.05
1929	0.37	0.28	0.19	0.10	0.11	0.05
1938	0.32	0.22	0.14	0.09	0.09	0.08
1950	0.26	0.25	0.16	0.09	0.11	0.03
1960	0.23	0.24	0.12	0.11	0.13	0.02
1970	0.21	0.19	0.10	0.08	0.09	0.02
1980	0.17	0.15	0.09	0.06	0.07	0.01
1990	0.15	0.14	0.06	0.07	0.08	0.00
2000	0.13	0.11	0.05	0.06	0.07	0.00
2010	0.11	0.09	0.04	0.05	0.06	0.00
2015	0.11	0.09	0.04	0.05	0.06	0.00

(continued)

TABLE 2  
(CONTINUED)  
Panel C. Real per capita GDP

	Unweighted TOTAL	Population weighted TOTAL	Population weighted Between-group	Population weighted Within-group	Population weighted <i>The Rest</i>	Population weighted <i>OECD</i>
1870	0.22	0.18	0.15	0.03	0.03	0.05
1880	0.24	0.22	0.18	0.04	0.04	0.05
1890	0.26	0.25	0.19	0.06	0.06	0.05
1900	0.28	0.30	0.22	0.08	0.09	0.05
1913	0.30	0.36	0.25	0.11	0.13	0.05
1925	0.31	0.39	0.27	0.12	0.13	0.06
1929	0.34	0.41	0.28	0.14	0.16	0.05
1938	0.34	0.42	0.24	0.18	0.21	0.06
1950	0.54	0.57	0.31	0.26	0.30	0.11
1960	0.52	0.57	0.29	0.27	0.32	0.06
1970	0.52	0.62	0.28	0.34	0.40	0.03
1980	0.49	0.62	0.25	0.38	0.43	0.02
1990	0.51	0.62	0.28	0.34	0.39	0.02
2000	0.59	0.57	0.28	0.29	0.32	0.02
2010	0.54	0.42	0.18	0.24	0.27	0.02
2015	0.52	0.39	0.15	0.24	0.26	0.03

*Notes:* “Total” inequality amounts to the sum of “Between-group” and “Within-group” columns. The last two columns correspond to inequality within the Rest and the OECD, respectively.

*Sources:* See the text. Computed from data provided in [https://frdelpino.es/investigacion/en/category/01\\_social-sciences/02\\_world-economy/03\\_human-development-world-economy/](https://frdelpino.es/investigacion/en/category/01_social-sciences/02_world-economy/03_human-development-world-economy/)

In the case of schooling, the level of inequality depended to a larger extent on the gap between the *OECD* and the *Rest* up to 1930, and the dispersion within each group dominated hereafter (Table 1, Panel A, cols. 3–4). However, inequality trends were driven by the dispersion within the *OECD* and the *Rest* and, more specifically, by latter’s (Table 1, Panel A, cols. 5–6).

Similarly, in terms of life expectancy the gap between the *OECD* and the *Rest* made the largest contribution to total inequality up to World War II, and within-group inequality became its main contributor from 1950 onward (Table 1, Panel B, cols. 3–4). However, the dispersion within the *OECD* and the *Rest* drove inequality rising trends up to the 1920s and after 1990 (mostly the dispersion within the Rest) (Table 1, Panel B, cols. 5–6), while the reduction in the gap between the *West* and the *Rest* steered the inequality decline between the late 1920s and 1970.

When we turn to political and civil liberties, the gap between the *OECD* and the Rest accounts for most inequality until World War I, and the dispersion within groups, in particular, within the Rest, explains inequality levels from 1930 onward (Table 2, Panel A, cols. 3–4). Nonetheless, within-groups dispersion mainly drives inequality trends.

In terms of augmented human development, the *OECD-Rest* gap made the largest contribution to the level and trend of international inequality up to the 1980s, when within-group inequality took over (Table 2, Panel B, cols. 3–4).

Lastly, the gap between the *OECD* and the *Rest* was the main contributor to the aggregate level of inequality in terms of GDP per head until 1950 and, then, within-group dispersion took over (Table 2, Panel C, cols. 3–4). The dispersion within the two groups, *OECD* and the *Rest*, mainly the latter's, accounts for inequality trends over 1930–2000 (Table 2, Panel C, cols. 5–6).

Thus, the role played by the OECD-Rest gap driving the level of inequality up to roughly the early 20th century appears as a common feature of both multidimensional well-being and per capita GDP, but no coincidence exists about the driver of inequality trends.

## 5. THE DISTRIBUTION OF WELL-BEING GAINS

So much for the aggregate evolution of inequality, but how much did well-being vary across the distribution over time? The annual cumulative growth rate by country deciles, from bottom to top, namely, the Growth Incidence Curve (GIC), provides a nuanced picture of the distribution of gains for each well-being dimension over 1870–2015. It is worth noting that these are anonymous GICs as countries in a given ventile in year  $X$  do not correspond to the countries in the same decile in year  $Y$  as long as there is some mobility in the distribution (Lakner and Milanovic, 2016, pp. 16, 22). However, this shortcoming does not invalidate the comparative exercise as it still provides the relative and absolute gains for each ventile of the distribution.

In the case of schooling it can be observed (Figure 1a) that, in the long run, the lower deciles (percentiles 10th–25th) experienced the main relative gains (the continuous line, left axis), while those above percentile 85th received the smallest gains. The more than proportional improvement over time in low schooling countries is consistent with the reduction in relative inequality discussed above. However, a glance at the absolute gain achieved by each decile (the dotted line, right axis) offers the mirror image. Deciles in the middle of the distribution obtained larger absolute gains than those at the bottom, but still smaller than the top deciles. In other words, the gap or distance between high and low schooling countries widened over time. In particular, absolute gains were significantly larger for countries in the top 5 percent. Between 1870 and 2015, low-level countries in terms of schooling (those in the 10th–25th percentiles) grew above 3 percent per year, while those in the top 5 percent did it at 1 percent; however, the absolute level gain of the bottom countries was 0.2, while the top 10 percent secured 0.6.

A look at the growth incidence curves for the main phases in the evolution of well-being reveals which parts of the distribution experienced larger relative gains in schooling (measured as annual cumulative growth rates over each of the five periods distinguished) (Figure A-1 in the Appendix S1). Thus, the lower part of the distribution, more specifically, countries below percentile 25th, achieved the largest relative gains during 1870–1913, a feature consistent with a contraction from a high initial level of inequality. The early 20th century (1913–1950) reinforced this tendency. The Golden Age (1950–1970) represented major gains for the lower part of the distribution, especially the lower middle deciles and percentile 5th. In the post-oil shock decades (1970–1990), the main gains went to the lower and middle deciles. Lastly, during 1990–2015, the main gains were attributed to the lower part of the

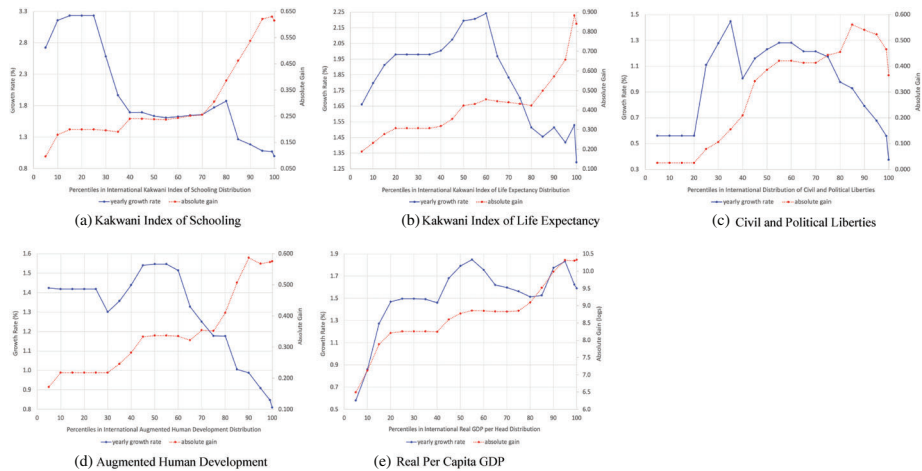


Figure 1. Absolute and Relative Growth Incidence Curves, 1870–2015.

Source: See the text.

distribution (percentiles 10th–25th). In a nutshell, relative gains were larger at the bottom and, then, at the middle class, a result that matches the long-run contraction in schooling inequality across countries.

The progress of life expectancy across the distribution shows (Figure 1b) that, over 1870–2015, the middle class (percentiles 45th–60th) experienced the main relative gains, followed by the lower-middle deciles, and the smallest gains accrued to those above percentile 80th. However, in absolute terms, the largest gain went to countries in the top 20 percent, especially those in the top 1 percent. The upper middle deciles were next, and those below the 40th percentile received the smallest gains. As in the case of schooling, the distance broadened between high- and low-level countries. Thus, in the long run, middle countries (those in percentiles 45th–60th) grew above 2 percent per year and those in the top two deciles below 1.5 percent; but the absolute level gain for the bottom countries was below 0.3 and above 0.8 for the top 1 percent.

A closer look at the GICs of the main phases indicates that the upper half of the distribution achieved the main relative gains during 1870–1913, a feature consistent with the persistence of high inequality (Figure A-2 in the Appendix S1). The early 20th century upturned the tendency with the main gains accruing to the lower part of the distribution and, next, to upper middle deciles. The Golden Age (1950–1970) represented a major upward push to the middle class (percentiles 35th–55th) gains. After the Golden Age, relative gains were milder and more smoothly distributed. In the period 1970–1990 the largest gains went to the lower part of the distribution and, since 1990, gains were rather evenly distributed with the top 5 percent improving comparatively. To sum up, relative large gains took place at the bottom and the middle of the distribution between the 1920s and 1970.

In the case of political and civil liberties, relative gains over the long run were concentrated in the broad middle part of the distribution (percentiles 25th–75th)

at the expense of those countries at the bottom and the top of the distribution (Figure 1c). In absolute terms, however, the largest gains went to upper part of the distribution, especially accruing to the top two deciles. Thus, absolute differences widened across the distribution.

If we turn now to the GICs for the main phases, we observe that countries in the lower middle deciles achieved the largest relative gains during the first globalization 1870–1913 (Figure A-3 in the Appendix S1). This trend was inverted in the early 20th century, and the upper half of the distribution, in particular, the upper middle deciles, obtained the largest improvement. The gains of the upper middle class were reinforced during the Golden Age (1950–1970). However, in the following two decades, the middle and lower sections of the distribution achieved larger gains, and the post-1990 era witnessed a major leap forward for the lower middle deciles. Therefore, a process of catching up appears to have occurred in the lower half of the distribution since 1970.

How did countries behave across the distribution over the long run in terms of augmented human development? The main relative gains accrued to the lower half of the distribution, especially to the middle deciles (45th–60th) (the continuous line) (Figure 1d). However, the absolute gains (the dotted line) were directly related to the initial country levels, with those in the top 10 percent getting the largest ones. Thus, while the more than proportional improvement in the middle deciles, that grew at double the pace than those in the top decile, is consistent with the reduction in relative *AHD* inequality, the distance between high and low *AHD* countries widened over this period, and the top 10 percent absolute level gain was near 0.6 against less than 0.2 for the bottom decile.

A glance at the GICs for different periods reveals that middle-upper part of the distribution (percentiles 60th–80th) achieved the main relative gains during 1870–1913, a feature that matches the rising aggregate inequality (Figure A-4 in the Appendix S1). The early 20th century witnessed the success of the “middle class” (percentiles 40th–55th). Although the largest relative gains went to the lower part of the distribution (percentiles 10th–25th), the middle “class” was also reinforced during the Golden Age (1950–1970). In the post-Golden Age decades more than proportional improvements for the lower deciles were paralleled by gains in the upper-middle deciles. Differences across the distribution smoothed since 1990, although the middle deciles were the main achievers. Thus, the inverse association between relative gains and initial *AHD* levels observed for all phases, but the first one (1870–1913), is consistent with the sustained decline in aggregate relative inequality since the 1920s.

How do gains were distributed across the distribution for GDP per head? As for life expectancy and liberal democracy, the bottom two deciles also achieved the lowest relative gains. But the main difference is that, in addition to the middle (percentiles 45th–65th), the top of the distribution (percentiles 90th–95th) experienced the main relative gains (the continuous line) (Figure 1e). The distribution was similar in relative and absolute terms (dotted line) but for the fact that, in the latter, the largest gains went to the top 10 percent decile.

If the GICs for the main phases are considered, one finds that the upper part of the distribution achieved the main relative gains during 1870–1913 (Figure A-5 in the Appendix S1). The early 20th century reinforced this tendency, but gains were

larger for the top 10 percent. After a relatively smoothed distribution of relative gains, substantial differences across deciles emerged from 1950 onward. During the Golden Age the bottom and the upper middle deciles were the main achievers. In the years 1970–1990, the largest relative gains were achieved by the lower part of the distribution and, next, by the top 15 percent. Lastly, over 1990–2015, major gains accrued to the middle and, then, the lower middle deciles.

A substantial difference between multidimensional well-being and per capita GDP growth incidence curves is that, in the former, relative gains over the 150 years considered went to the middle and lower deciles of the distribution, and to the middle and top deciles in the latter. Discrepancies also emerge for the main phases considered; specifically, the skewed distribution of per capita income gains toward the upper part of the distribution during 1914–1970, although it matches that of civil and political liberties, is at odds with schooling and life expectancy, as well as with augmented human development, in which the middle and lower deciles experienced the largest gains.

## 6. ACCOUNTING FOR INEQUALITY DIFFERENCES IN WELL-BEING DIMENSIONS

But why did the international distribution in terms of well-being and per capita income differ? It is often assumed that improvements in life expectancy, schooling, and civil and political rights are associated, either as a cause or as a consequence, to raising average incomes. If this is so, how can their inequality trends be so different? A glance at the evolution of well-being dimensions may help us understand why.

### 6.1. *Schooling*

Mass primary education was initiated in Europe during the 1870s. Schooling moved from private and decentralized (local or religious) to compulsory and centralized as a result of public intervention, although the speed and breadth of the process varied substantially across countries during the late 19th and early 20th centuries (Ansell and Lindvall, 2013).

But why did such a change happen? Meyer *et al.* (1992, pp. 129, 132) claimed that mass education was at the core of the nation-state model and represented a project of the elites involving socialization of individuals, extension of citizenship, and a secular vision of progress. Schooling was, thus, an instrument to spread the values of the elite to the rest of the population (Alesina *et al.*, 2020a).

Centralization and secularization, carried out in both democracies and dictatorships, played a major role in the expansion of mass primary education (Ansell and Lindvall, 2013, p. 506). The tension between central and local governments, secular and religious authorities conditioned the pace at which mass primary education spread.

The diffusion of mass education to the rest of the world would have resulted from “the spread of the Western system, with its joined principles of national citizenship and state authority” (Meyer *et al.*, 1992, p. 146). After World War II the newly independent countries in Asia and Africa would adopt the education policies earlier implemented in the metropolis. The Cold War and international cooperation contributed to accelerating the spread of mass primary and secondary schooling.

A number of non-excluding elements account for the spread of schooling: industrialization (that required skills), war (helped by indoctrination and mass provision of public goods to motivate conscripted armies), and redistribution (Gellner, 1983; Darden and Mylonas, 2015; Manzano, 2017; Aghion *et al.*, 2019; Alesina *et al.*, 2020b).

Homogenizing population to forge a national identity through a common national language and mass public instruction, often imposed on the population and helped by compulsory military conscription, appears as a distinctive driving force behind mass schooling (Alesina *et al.*, 2020a). In immigration and newly independent countries schooling was crucial in nation-building. Bandiera *et al.* (2018: 66) show that U.S. schooling laws were designed “to instil civic values to the culturally diverse migrants” during the Age of Mass Migration (1850–1914). Similarly in Argentina public primary schooling in Spanish was a tool for nation-building during the massive Italian immigration (Botana and Gallo, 1997).

Democratization has been considered responsible for the spread of education. Lindert (2004), for example, established a connection between the expansion of primary mass schooling and democratization on the basis of some Western countries’ experience. Paglayan (2021) qualifies this argument by pointing out that democratization only promotes the expansion of primary schooling when a majority of the population lacked access to primary schooling before democracy emerged, an infrequent historical situation. Most state education systems were established ahead of it to homogenize population. In fact, elites perceived democratization as a threat to their power (Alesina *et al.*, 2020a). The discrepancies observed in the international distribution of schooling and liberal democracy over the long run, declining steadily in the case of schooling and rising in the case of liberal democracy until the late 20th century, contradict the hypothesis of a connection between the spread of democratization and schooling.

Other external developments affected the spread of mass education. Klasing and Milionis (2020) claim that the epidemiological transition, by improving relative female life expectancy, due to the better response of the female immune system to vaccination against infectious diseases, contributed to rising female education and reducing the education gender gap. Thus, it can be hypothesized that, as longer and healthier lives prompt individuals to invest on their education (Hansen, 2013), women’s higher education attainment may have contributed not only to raising the average level of schooling but also to lowering the dispersion of schooling levels across countries. The fact that Inequality 2 for both schooling and life expectancy, moved together between the 1920s and the 1970s, the phase of international diffusion of the epidemiological transition, supports the conjecture. Furthermore, the second health transition, with increases in life expectancy as a result of major improvements in the treatment of cardiovascular and respiratory diseases, had also the consequence of increasing enrolment in higher education (Hansen and Strulik, 2017).

## 6.2. *Life Expectancy*

What drives life expectancy’s international distribution? The epidemiological transition helps explain the observed tendencies in the international distribution of life expectancy distribution. The epidemiological or health transition



represents a long phase in which persistent gains in lower mortality and higher survival are achieved as infectious disease gives way to chronic disease as the main cause of death (Omran, 1971, 1998; Riley, 2001). The epidemiological transition is associated to the diffusion of the germ theory of disease since the 1880s (Preston, 1975) that led to the introduction of new vaccines from the 1890s. Moreover, medical technological progress introduced new drugs to cure infectious diseases—sulpha drugs since the late 1930s (Easterlin, 1999) and antibiotics since the 1950s—,contributing to spread the health transition (Easterlin, 1999; Jayachandran *et al.*, 2010; Lindgren, 2016). However, a less-noticed result of the epidemiological transition consisted of improvements in public health—often at low cost, because low incomes prevented the purchase of the new drugs—and the diffusion of preventive methods of disease transmission and knowledge dissemination through school education contributed to reducing infant mortality and maternal death, two major determinants of the increase in life expectancy at birth in developing regions (Riley, 2001).

Thus, unlike the widespread view that associates the health transition to the diffusion of new drugs and, therefore, dates its beginning after the 1940s (Acemoglu and Johnson, 2007; Klasing and Milionis, 2020), the diffusion of the epidemiological transition in world regions without the purchasing power to access the new drugs started much earlier with the prevention of infectious disease. Widespread gains in longevity during the globalization backlash (1914–1950), a time of economic distress, are, hence, linked to the germ theory of disease.

The substantial achievements in longevity during the epidemiological transition were not shared equally across countries. Lack of economic means and basic scientific knowledge prevented a fast and wide diffusion of new medical technology and health practice across countries. Thus, in the late 19th and early 20th centuries, the increase in life expectancy inequality can be associated to the fact that the first health transition was unevenly distributed and initially restricted to advanced Western countries.

The gradual international diffusion of the health transition favored the reduction in life expectancy inequality between the late 1920s and 1980. The inequality contraction was particularly intense during the 1930s and 1940s, when life expectancy improved in countries of low per capita income levels as a consequence of the epidemiological transition, just at a time of stagnant or declining average incomes and growing income disparities across countries resulting from the Great Depression and World War II (Mandle, 1970; Reher, 2003; Riley, 2005).

The reversal in life expectancy inequality, with an increase after 1990, may be associated, not just to the impact of HIV-AIDS in sub-Saharan Africa, or to the demise of socialism in Eastern Europe, but also to a second health transition that, so far, has been restricted to the *West*. In this new transition, mortality and morbidity fall among the elderly as a result of new medical knowledge that has permitted a better treatment of respiratory and cardiovascular disease and vision problems (particularly, cataract surgery) (Cutler *et al.*, 2006; Eggleston and Fuchs, 2012; Chernew *et al.*, 2016). The rise in longevity has also been helped by better nutrition in early years of life. The result is people living not just longer life but longer healthy life years (Murray and Lopez, 1997; Mathers *et al.*, 2001; Salomon *et al.*, 2012).

To sum up, episodes of rising international inequality in life expectancy in the late 19th and early 20th centuries and, then, in the late 20th and early 21st centuries, coincide with the early stages of two health transitions and result from the uneven diffusion of new medical knowledge and technology and health practices.

### 6.3. *Political and Civil Liberties*

Finally, what drives the spread of civil and political rights? Over the past 60 years, Lipset's theory of political modernization, namely, that economic development brings democracy with it, has been at the center of debate about democratic transitions and democracy stability.<sup>12</sup> For example, Acemoglu *et al.* (2008, 2009) accept the income-democratization correlation but reject a causal effect of income on democracy. And Boix (2011) proposes a conditional version of Lipset's theory in which the association between democratization and GDP per head exhibits diminishing returns to income. Moreover, the relationship shifts outward over time.

Different explanations have been proposed for the introduction and spread of democracy in a country. Collier (1999) stresses the role played by the elite in the first democratization wave up to the early 20th century. Acemoglu and Robinson (2006, p. 27) consider, instead, that the threat of a revolution in a context of high inequality stimulates democratization, which implies "a commitment to future pro-majority policies by the elites." Boix (2003), claims, however, that only in a context of declining inequality and economic diversification the elite would accept democratization, as the redistribution threat diminishes. The spread of democracy is also associated to international conflict and war exposure (Knutsen *et al.*, 2019). For example, a trade-off has been suggested between the extension of suffrage and mass conscription (Ticchi and Vindigni, 2008).

Mukand and Rodrik (2020) trace a sequence in which the three dimensions of liberal democracy: property, political, and civil rights interplay. From autocracy, under which only property rights were respected, to liberal democracy, in which the three types of rights are recognised usually in a context of mild inequality and social homogeneity. In addition, there are intermediate stages: liberal autocracy, in which property and civil rights but not electoral rights were acknowledged, and illiberal democracy, in which civil rights are absent. The evolution of this sequence has differed over space and time and accounts for the level of liberal democracy and its distribution over the last one-and-a-half-centuries.

The time dimension of democratization defines another stream of the literature that approaches the spread of liberal democracy as a global process that transcends national boundaries and is subjected to geopolitical events. The world trends observed in liberal democracy, with three expansion phases: up to the early 1920s, during the aftermath of World War II and until the early 1960s, and from the late 1980s onward, and their reversals, resemble closely the evolution of the share of democratic countries in the world (Boix, 2011, p. 810) and broadly conform to Huntington's (1991) waves of democratization. The swift diffusion of democracy in the early 1920s, late 1940s and early 1950s, and the 1990s, and their setbacks,

<sup>12</sup>(Lipset, 1959, p. 80) sustained that "the factors subsumed under economic development [industrialization, urbanization, wealth, and education] carry with it the political correlate of democracy."

closely matches major international events.<sup>13</sup> Such coincidence lends support to the decisive role of the great powers in shaping the international order and interfering with countries' internal politics (Boix, 2011; Narizny, 2012). Yet the diffusion of ideas (liberalism, equality, human rights) also played a significant part in the spread of democratization from the early 19th century (Collier, 1999; Mukand and Rodrik, 2020).

## 7. CONCLUDING REMARKS

Although it is often assumed that improvements in life expectancy, schooling, and civil and political rights are associated, either as a cause or as a consequence of rising average incomes, they evolve differently, as did their inequality trends.

The paper's main results challenge the view of well-being distribution across countries and over time that derives from GDP per capita. While the international dispersion of per capita income increased until the late 20th century and only fell as of 1990, inequality in schooling and life expectancy concentrated its decline between the late 1920s and the early 1980s, but increased overtime in the case of political and civil rights to decline only after 1970. Augmented human development, a comprehensive measure of well-being, experienced a long-term decline since the early 20th century.

Inequality across well-being dimensions was driven by the gap between the *OECD* and the *Rest* until early 20th century when the dispersion within each group, the *Rest* in particular, increasingly drove it. Countries in the middle and lower deciles achieved the largest relative gain over the past century.

The spread of mass education, largely a result of governmental intervention, accounted for the long-term decline in schooling inequality. Episodes of rising international inequality in life expectancy in the late 19th and early 20th centuries, and then, in the late 20th and early 21st centuries, coincided with the initial stages of two health transitions and result from the uneven diffusion of new medical knowledge and technology and health practices. Meanwhile, the inequality decline was concentrated between the late 1920s and the early 1980s, when the epidemiological transition spread across the board. In terms of political and civil liberties, population-weighted inequality grew over time especially between the end of World War I and the collapse of the Soviet Union, when authoritarian and totalitarian ideologies emerged in parallel to the expansion of liberal democracy, only dropping from the 1970s onward, as authoritarian regimes (socialists and non-socialists) lost ground and liberal democracy spread as of the late 1980s.

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<sup>13</sup>Namely, the breakdown of Austria-Hungary and Russia's empires, the rise of fascism and Nazism in the Interwar and its defeat in World War II, the subsequent demise of colonial empires and the Cold War, and the collapse of the Soviet Union.

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article at the publisher's web site:

### Appendix S1. Supporting Information.