A composite view on inequality and wellbeing

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19 May, 2020

Introduction

By the end of the 2010s, the global economy produced far more than at any time in the past. However, it is not equally evident that the world's citizens are better off today than they were one or even two centuries years ago. Has everyone reaped the benefits of increased productivity?

While income and productivity are hugely important measures of progress, for nations as well as individuals, there is a widely felt need to to go "beyond GDP" to understand wellbeing. To this end, statistical agencies and academic researchers are expanding data collection and analyses to include wellbeing. Since wellbeing is inherently multidimensional, this implies tracking a wide range of indicators to obtain a complete picture of development (Stiglitz, Sen, and Fitoussi 2009; Boarini and D'Ercole 2013).

Economic and social historians are no exception to this trend. They had already gathered much data about development and wellbeing in the long run. Thanks to the efforts to create historical national accounts, country-level series on income and productivity are widely available (Maddison 2001). These series are continuously being improved and are now going back further in time (Bolt and Zanden 2014). Equally important, however, is that historical statistics have always included other wellbeing measures such as real wages, heights, or mortality (Steckel and Floud 1997; Feinstein 1998; Bengtsson and Poppel 2011). Efforts to further collect, harmonise, and analyse such data are resulting in an ever-clearer picture of long-run development in wellbeing. The previous *How was life* volume presented the state of the art in this field (Van

Zanden et al. 2014). Besides GDP per capita, it provided insights in the long-term development of wages, education, health (life expectancy nad heights), safety, political freedoms, the environment, and gender inequality.

While the long-run developments in well-being are clearer than ever, one of the key challenges remaining is to move beyond country averages, and begin focusing on within-country inequality and the distribution of wellbeing outcomes. For one, this is necessary because these averages will always miss part, or sometimes even most, of the distribution of wellbeing. The actual wellbeing of many individuals might be missed by a country average. Moreover, inequality is once again being seen as an obstacle to achieving societal progress in general (OECD 2015). However, this line of research focuses on the potential adverse effects of income inequality, while inequality in other dimensions, such as wealth, health, or education could be equally salient.

This volume therefore has a twofold contribution compared to the previous *How was life* report. The first is to expand the range of wellbeing indicators for which we have long-term series. These indicators are working hours, poverty, and improved per capita GDP series. The second contribution is to go beyond the within-country inequality covered in the previous volume. There, income inequality and gender inequality were covered, but inequality in other dimensions was not. Here, data on within-country inequality in wellbeing indicators in three additional dimensions is provided: education, length of life, and wealth.

The goal of this chapter is to provide an integrated view on this new wellbeing data. One point of focus will be the addition of new indicators to the HWL1 dataset that have sufficient coverage: working hours and poverty. Above all, however, this chapter will analyse the development of inequality of wellbeing in the world economy. After introducing the data and concepts, this chapter proceeds to analyse trends in within-country inequality, and then develops a set of composite indicators to summarise progress in the full dataset of wellbeing indicators.

Description of concepts used

For the underlying data, the concepts used are described in detail in the relevant chapters of this volume. The data used from the previous volume are described in Van Zanden et al. (2014). Here the most important

caveats about the newly added data are briefly summarised.

First, in length of life inequality and educational inequality there is a right truncation in the distribution because at some point obtaining more education or longevity becomes very difficult. Income and wealth inequality do not appear to be constrained by such limits. This means that as the average level of life expectancy or education increases, their inequality mechanistically decreases. Chapters **XXX** and **YYY** investigate this issue in more detail. The option to correct for this effect by subtracting the expected value of inequality at a given level was explored, but ultimately rejected. In the end, individuals are more likely to experience actual differences in years of education or length of life, rather than differences corrected for differences in other countries. It should however be remembered that the inequality trend in these indicators might be driven by countries' relative position to the maximum achievable levels.

The poverty indicator used here is absolute poverty, using a cost of basic needs approach. It measures what share of the population cannot afford a basic consumption bundle. In this approach, the series deviates from the World Bank's "dollar-a-day" method which uses an average of national poverty lines as its poverty threshold (Chen and Ravallion 2010; Ravallion, Datt, and Walle 1991). From a long-term perspective, however, the differences between the two indicators are minor (Ravallion, n.d.).

Unless stated otherwise, the regional and global series of inequality indicators in this chapter are population-weighted averages of country-level Gini coefficients. Consequently, the resulting figures cannot be interpreted as a proper Gini for the world or a world region, that is, a Gini coefficient calculated over all individuals in that area. While the population-weighted averages can give an impression of regional developments in inequality, this limitation should be kept in mind.

More generally, all regional and global trends here are presented as population-weighted averages based on all countries for which data is available. To prevent increasing data availability over time from driving the trends in the series, the data for countries with missing data are imputed by (log-linear) interpolation and extrapolation.[1] Regional and

[1] Of the indicators presented here, per capita GDP and wealth are log-linearly interpolated; all other indicators are imputed with linear interpolation. The composite indicator has its own imputation procedure which is explained in Rijpma (2016).

global averages are only reported if at least 40% of the population in a region or the world is covered by non-imputed data.

To summarise the developments in the many wellbeing indicators gathered, this chapter makes use of composite indicators like the one that was used in the previous *How was life* volume. This indicator is updated with the new indicators of the present volume. The other novelty is that two separate composite indicators are created: one for the indicators on the level of wellbeing countries, and one for the inequality of wellbeing in countries.

Composite indicators can be controversial. The hart of the issue is that the indicators being aggregated are conceptually different, and are measured using different units. Combining them into one number requires forcing the variables to a common scale, choosing an aggregation function, and choosing weights. The tradeoffs in wellbeing indicators implied by this procedure amounts to statements on the relative importance of each indicator for overall wellbeing (Ravallion 2012a, 2012b). Since people can of course hold different opinions on the relative importance of each dimension of wellbeing, it is very difficult to devise a completely satisfactory solution to this issue.

That said, composite indicators are not without benefits either. Above all, they are very useful tools to summarise the large number of indicators gathered for a volume such as this. It is likely that readers will summaries of the masses of data they see, either on their own account, or by means of the introduction, conclusion, or executive summary highlighting certain indicators and trends at the expense of others. The contribution of composite indicators as presented in this chapter is to do this in a systematic, disciplined, and transparent way.

In this chapter the approach to composite indicators of the previous *HWL* volume is used. There, a latent variable model was used to create the composite indicator (Rijpma 2014, 2016). This is a statistical procedure that tries to extract one or more common factors from the variable entering the model. It does this by finding the shared information between the indicators in a way that distinguishes between countries as best as possible. To this end it assigns higher weights to indicators that are highly correlated, and vice-versa.

The main disadvantage to this approach is that such a statistical procedure is not guaranteed to provide correct, or even satisfying tradeoffs.

Especially if it is believed that each indicator captures a unique part of wellbeing, a latent variable model can give problematic results, because such variables might have a low correlation. There are of course also advantages to the approach. For one, the functional form of aggregation through the latent variable-approach comes down to a linear aggregation with minimal transformations. The indicators here are only standardised to have mean of zero and a standard deviation of one to facilitate computation. This keeps the tradeoffs simple and transparent (Ravallion 2012a; Chakravarty 2003). The specific model used here can moreover deal with missing data, which is an important issue for composite indicators because they need full data to be present for a given year and country to be calculated. This is of course difficult to achieve with historical data without an imputation procedure. Finally, a statistical approach can also provide estimates of uncertainty, including that caused by the imputation of missing data, and is able to do so at the regional level for which much of the data is reported. Details can be found in Rijpma (2016) and Rijpma (2014), in turn based on Jackman (2009) and Høyland, Moene, and Willumsen (2012).

Historical sources and data quality

A detailed discussion of the source material and data quality can be found in the other chapters of the current and the previous volume (Van Zanden et al. 2014). Here only a number of general statements are made.

Overall, data quality improves as we move closer to the present. For the period after World War II, the data behind most indicators are gathered either by statistical agencies, or by researchers using similar methods to statistical agencies. Prior to WWII, estimates are frequently also based on research necessarily using imperfect data. In the earliest decades, the first half of the nineteenth century in particular, the quality of the data is lower as data becomes more scarce, and guesstimates become inevitable.

The quality of data behind the new indicators that will be analysed in this chapter are worth summarising briefly. For working hours data falls in the highest quality-category from the 1930s onwards. When data is available for earlier periods in Western Europe and the Western Offshoots, the data is also typically also of fairly high quality (research

using same methods as statistical agencies). Coverage outside these regions before the 1930s is however limited. Poverty data is of high or fairly high quality since the 1950s. Data for the nineteenth century is typically worse, with guesstimates becoming commonplace, often based on estimates of per capita GDP and income inequality. It is also important to note that price data in socialist countries can be unreliable because they could be set by the government and goods were not always available to be bought at those prices. Because of this, guesstimates remain necessary in these countries until well into the twentieth century.

Regarding the new inequality measures, whenever length of life inequality data is available, data is good quality. However, coverage is limited outside the advanced economies of Western Europe and its offshoots before the 1950s. The data underlying the educational inequality estimates is of fairly high quality from the 1950s onwards. Data is scarcer for the first half of the twentieth century, and guesstimates are not uncommon in the nineteenth century. Data on wealth inequality, finally, is very scarce outside Western Europe and the Western Offshoots. Even as late as the 1990s, estimates are available for less than 10% of the countries in the Clio-Infra datasets. For this reason, this final indicator was left out of the inequality analyses of this chapter because the comparisons with other indicators would be unbalanced.

Main highlights

Figure 1 shows the world population-weighted average over time for six new indicators added in this volume, the improved historical GDP per capita series, as well as last volume's income inequality series. The developments in these indicators confirm one of the overall conclusions of the previous *How was life* volume: that of improvements in wellbeing in the world over the past 200 years. For one, the new GDP per capita series utilizing better PPPs still shows immense progress in productive capabilities over the past 200 years. While this progress is not distributed evenly over the globe, overall the capabilities to improve the lives of the world's citizens has grown considerably.

Globally, poverty can be seen to have been decreasing over the entire period. Progress was particularly fast in the 1950s, 1970s, 1990s, and 2000s, when on average, poverty declined by five percentage points

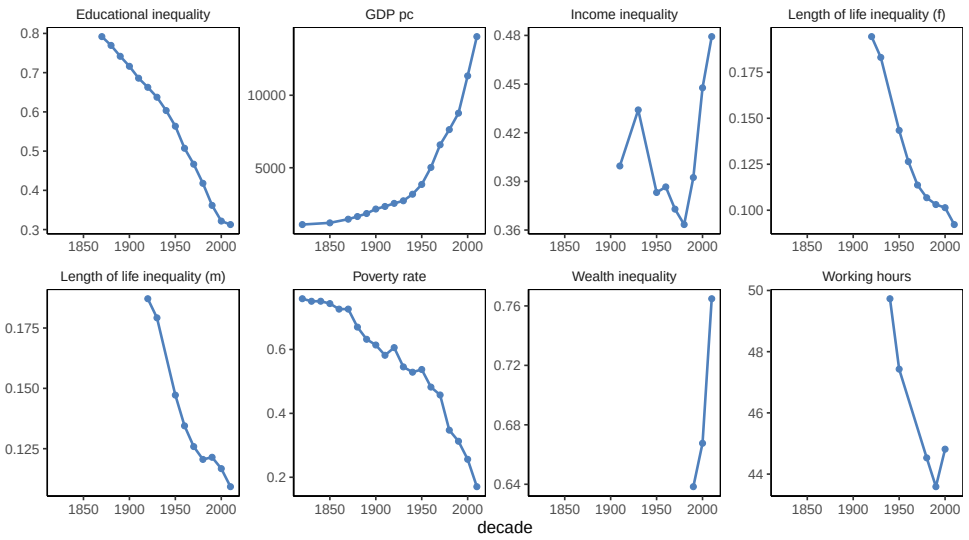

Figure 1: World population-weighted averages of selected wellbeing indicators, 1820–2010.

or more over a 10-year period. Recently, the decline is concentrated in Asia and Sub-Saharan Africa; prior to that the declines were concentrated the other regions.

Working hours declined throughout the period as well. Coverage outside Western Europe and the Western Offshoots before 1950 is limited, but from that moment onwards working hours declined across the globe. In a forty-year period they declined from 50 hours to less than 44 per week in the 1990s. For countries where data is available from an earlier date, it can be seen that working hours were higher still, with weekly working hours commonly as high as 60 in the nineteenth century. The decline was set in motion in the second half of the nineteenth century, with the largest progress made in the first half of the twentieth century. Very recently, working hours have been increasing again.

The inequality indicators display a more diverse pattern. On average, income inequality decreased from the early twentieth century up until the 1980s, after which it started increasing again. A similar pattern might hold for wealth inequality. The coverage for wealth inequality only allows us to make statements for the 1990s and later, where it was clearly increasing. However, a slow decline in wealth inequality before this period can be observed for the countries for which data is available.

Length of life inequality decreased throughout the period for which we have sufficient data, for both men and women. Only in the 1990s can

a relative slowdown be observed, mostly for men. This decrease was mostly concentrated in Eastern Europe and the former Soviet Union, where inequality even increased for men. Educational inequality too has been decreasing for most of the period covered by our data, with a slowdown only becoming visible in the 2010s. These changes in inequality suggested by these plots will be investigated in more depth in section
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Correlation with GDP per capita

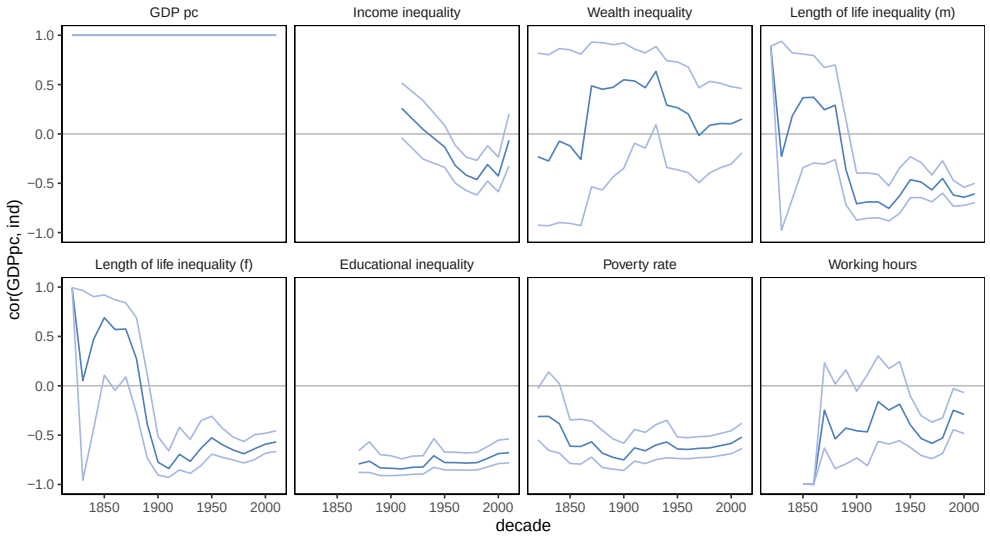

Figure 2: Correlation of selected wellbeing indicators with GDP per capita, by decade

To understand these trends as well as the composite indicator discussed below, it is useful to discuss the correlation of the indicators with per capita GDP (figure 2). Compared to original core set of indicators of the previous volume, the correlations with per capita GDP are somewhat weaker. Whereas correlation coefficients of 0.5 or higher were consistently found for indicators such as real wages, average years of education, or life expectancy (the levels, not inequalities), such large coefficients are less frequent now.

Poverty does have a fairly strong negative correlation. However, given the expected strong relation between economic growth and poverty reduction (Dollar and Kraay 2002), the correlations coefficients of 0.5–0.7 might even be considered somewhat weak.

A consistent, negative correlation of working hours with per capita GDP

is found. It is however not very strong and measured with some uncertainty. It is only clearly negative from the 1960s onwards and has become weaker in recent decades, probably due to increases in working hours in a number of high-income regions.

Looking at the inequality indicators, the correlation of income inequality with per capita GDP has changed considerably over the course of the twentieth century. In the early twentieth century the correlation was positive, meaning that high-income countries also had high income inequality. This relation had reversed after the Second World War, so that the advanced economies also tended to be more equal. Today the correlation is close to zero.

Length of life inequality and educational inequality show negative correlation, suggesting that countries with a high GDP per capita had lower inequality in health and education. In the nineteenth century however, the correlation with length of life inequality is measured with substantial uncertainty. It is probably safest to say in that period that length of life inequality did not display a strong relation with per capita GDP in that period. The correlation of educational inequality with per capita GDP is consistently negative. For both these inequality indicators it is worth remembering that the levels of average years of education and life expectancy themselves were strongly correlated with per capita GDP in the same period (Zijdeman and Ribeiro de Silva 2014; Leeuwen and Leeuwen-Li 2014).

Figure 3 shows the overall relation of the three inequality indicators with GDP per capita. Overall, all inequality measures display a negative correlation with GDP per capita. Strong negative relations can be observed for educational inequality and length of life inequality. Income inequality and wealth inequality, however, shows a more complex pattern, with a positive relation at low levels of GDP per capita, and a negative one at higher levels.

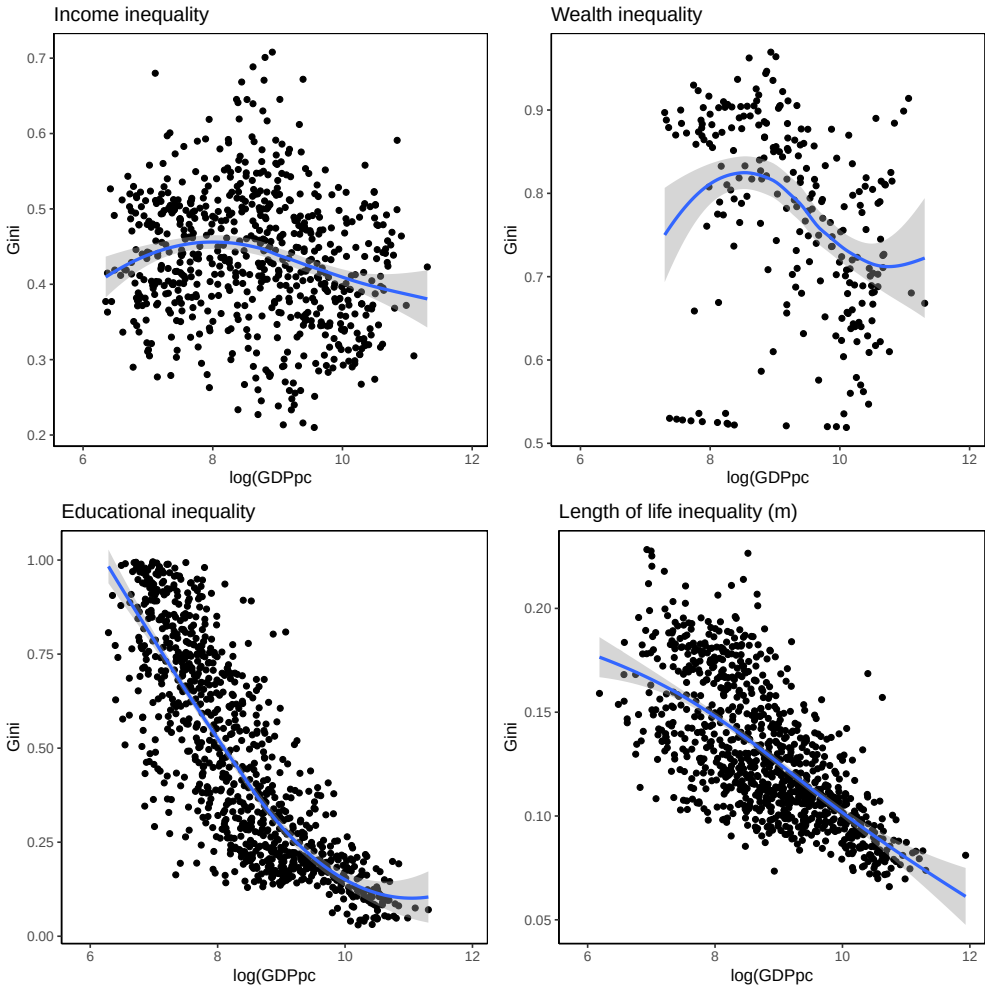

Figure 3: GDP per capita and Gini coefficient for income, length of life, and education, 1870–2010. Curves indicates loess fit and 95% confidence intervals

Trends in inequality

In the discussion of the main global trends in inequality in wellbeing above, there were hints that the twentieth century may have been characterised by a U-shape in inequality in a number of dimensions. From a high point at the start of the twentieth century, income inequality declined to reach a low in the 1970s–1980s, after which it started rising again, This U-shaped pattern as well as the matches the findings of recent research on income and wealth inequality (Piketty 2014; Scheidel 2017). While educational inequality and length of life inequality declined more consistently, there too a slowdown could be observed in later decades.

Figure 4 looks at the average change in the Gini coefficient in income inequality by region to pinpoint the moment income inequality started declining. Looking at Western Europe and the Western Offshoots, the change in inequality was still positive in the 1920s, meaning that the 1920–1929 period was on average still characterised by increasing inequality. From the 1930s to the 1970s in Western Europe and until the 1960s in the Western Offshoots, inequality declined. Therefore, according to the data presented here, the decline in income inequality in the advanced economies did not happen immediately after the First World War, but only began in earnest during the 1930s. The rise of inequality as early as the 1960s in the Western Offshoots is likewise somewhat surprising because it seems to pre-date the breakdown of the Keynesian consensus and the rise of neoliberal policies that would otherwise be an obvious explanation for the recent rise in inequality. More precise data than the decennial estimates presented here should however be used to determine this more precisely.

Moving to other regions, it is striking that the decline in inequality in the 1930s and 1940s can be found in most regions with the exception of South and South-East Asia. In the Middle East and North Africa (MENA) the decline was very small. The rising inequality of recent decades can also be found outside the “West” – in Asia and particularly in Eastern Europe and the former Soviet Union. Some regions are definitely not part of this trend (Sub-Saharan Africa, the Middle East and North Africa, Latin America and the Caribbean).

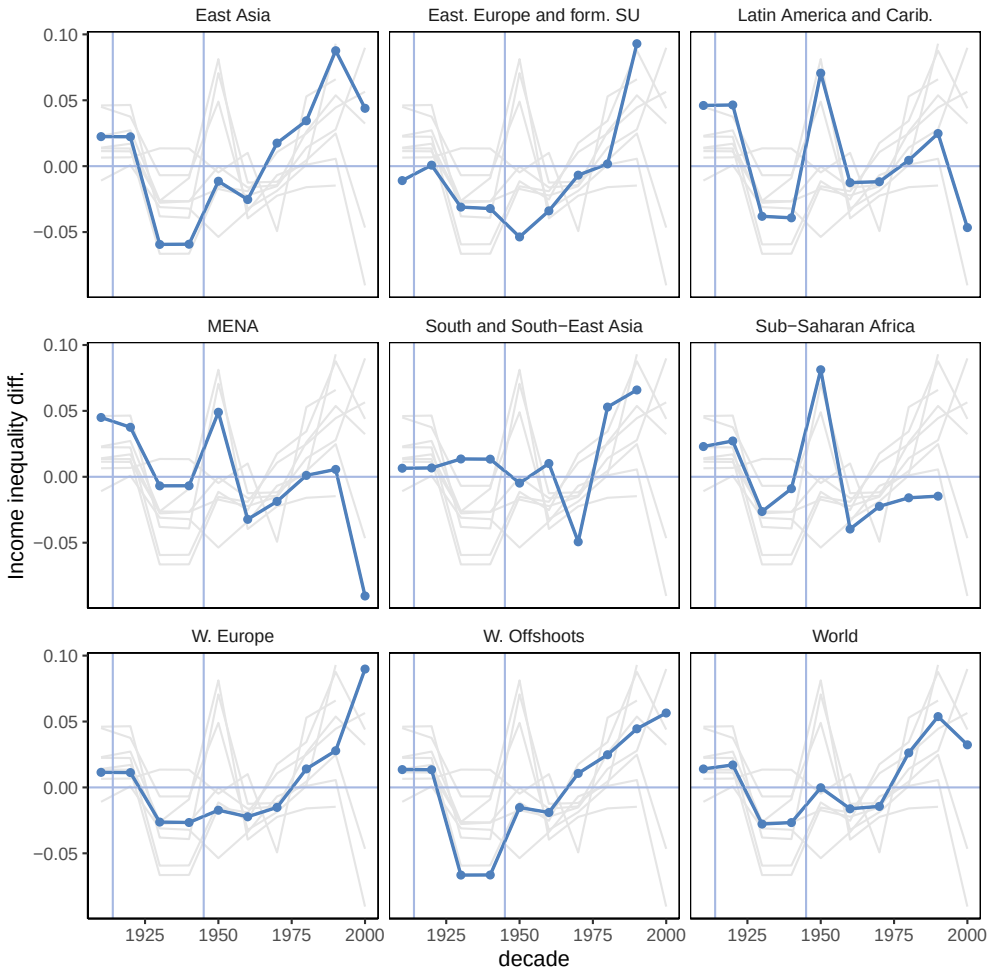

Figure 4: Regional average change in Gini coefficient for income inequality. Reference lines at 1914 and 1945.

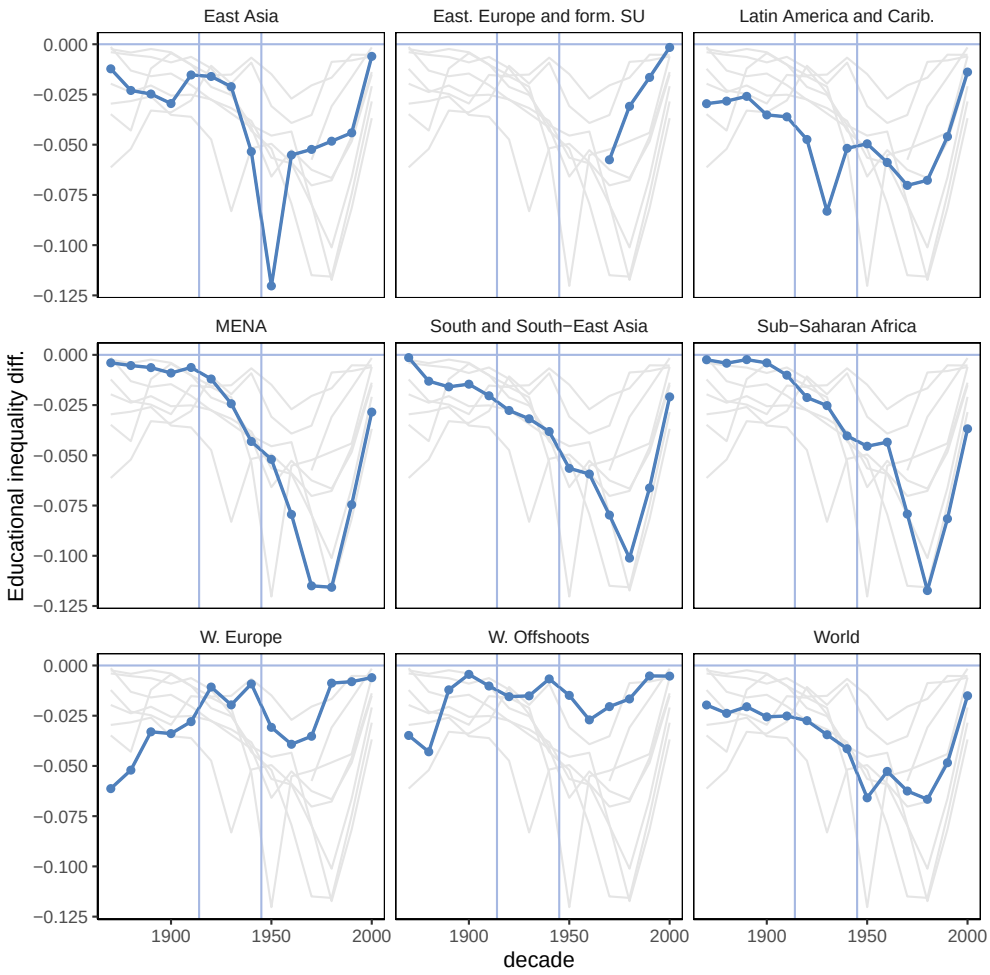

Figure 5: Regional average change in Gini coefficient for educational inequality, 1870–2010. Reference lines at 1914 and 1945.

If we look at changes in educational inequality (figure 5, a different picture emerges. Inequality in this dimension was declining throughout the period. The decline was the strongest in the 1950–1980s, but has recently slowed down to a point of near-stagnation. The decline in educational inequality was less pronounced in Western Europe and Western Offshoots than elsewhere, though here it should be kept in mind that educational inequality was already fairly low in these regions in the 1870s. However, the decline in educational inequality is found in all regions throughout the period. The U-shaped pattern found for income inequality cannot be generalised to relative educational inequality.

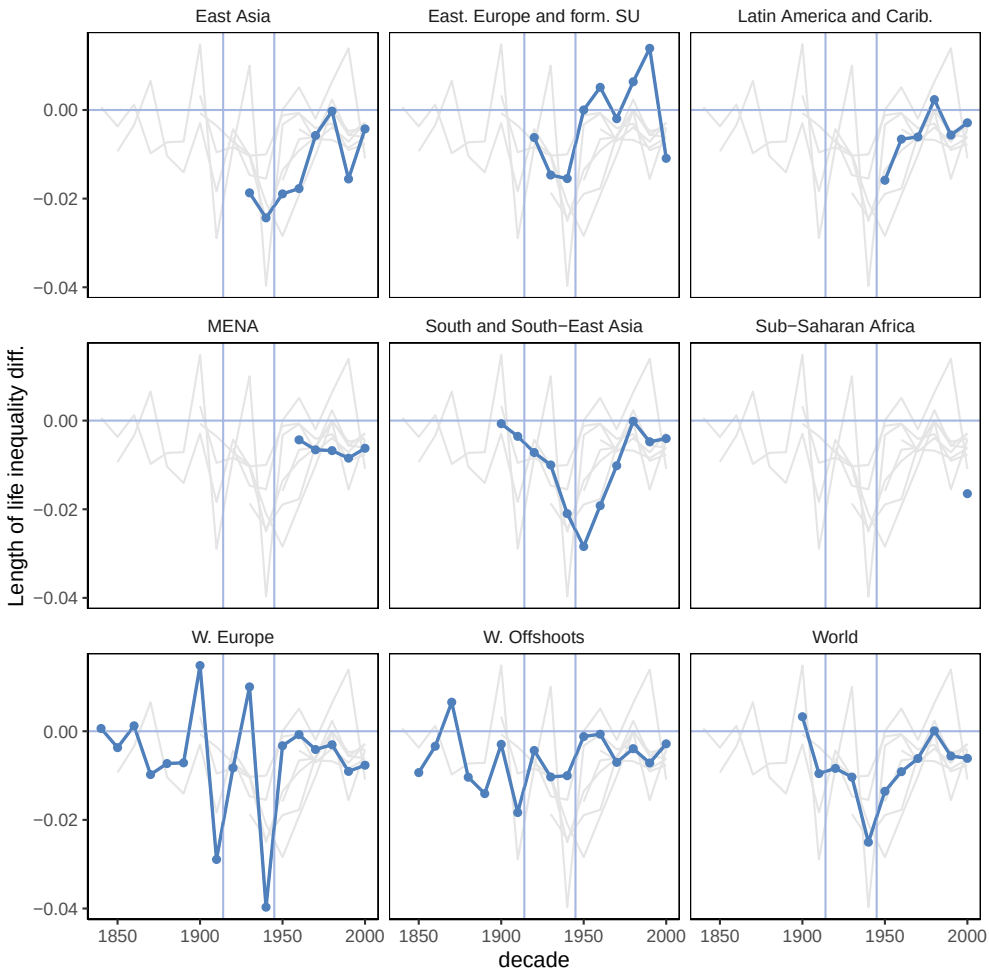

Figure 6: Regional average change in Gini coefficient for length of life inequality, 1870–2010. Reference lines at 1914 and 1945.

Finally, we look at regional averages of changes in length of life inequality (figure 6). Data coverage is an issue here, with few countries outside Western Europe and the Western Offshoots providing enough data to allow for the calculation of regional averages of differences over a long period. What stands out though is that in most of the world's regions, the trend is towards more equality. The decrease in inequality was widespread and concentrated around the middle of the twentieth century. The slowdown of the closing decades of the twentieth century was also fairly widespread, but particularly pronounced in Eastern Europe and the former Soviet Union where length of life inequality even increased.

To understand these patterns better, figure 7 looks at individual countries. For this, the focus is on the 25 "Clio-Infra countries" – countries with good historical data that together cover a large share of the pop-

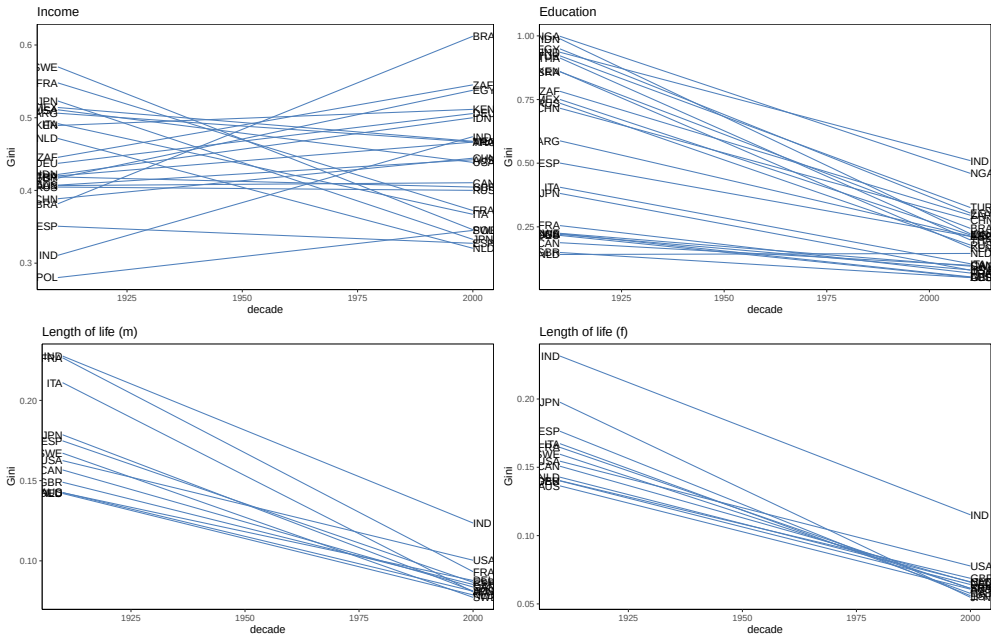

Figure 7: Income, length of life, and educational Gini in 1900 and 1990/2000 for selected countries.

ulation from various regions of the world.[2] Inequality is compared between 1910 and 1990, two years for which data coverage is relatively good for all three inequality indicators. What stands out is the cross-like pattern for income inequality, meaning that countries that were ranked relatively high on inequality in 1910 were ranked relatively low in 1990, and vice-versa. Countries such as Sweden, France, Japan, Italy, and the Netherlands moved from being highly unequal countries in terms of income to being relatively equal countries in 1990. Countries like South Africa, Brazil, and India show the opposite development. These patterns however are not replicated for other dimensions of inequality. At most, there is a degree of convergence, as very unequal countries in 1910 make more progress than the most equal countries of 1900. This can especially be seen for educational inequality. What this means for inequality considered form a multidimensional perspective, is that countries that grew more equal in terms of income inequality were likely to have become more equal in other dimensions. Countries that grew more unequal in terms of income over the twentieth century probably compensated for this to some extent in other dimensions.

In figure 8 these developments are scrutinised further by considering

[2] 75% is covered on average, with higher percentages further back in time. Sub-Saharan Africa and the Middle East and North Africa regions have lower coverage.

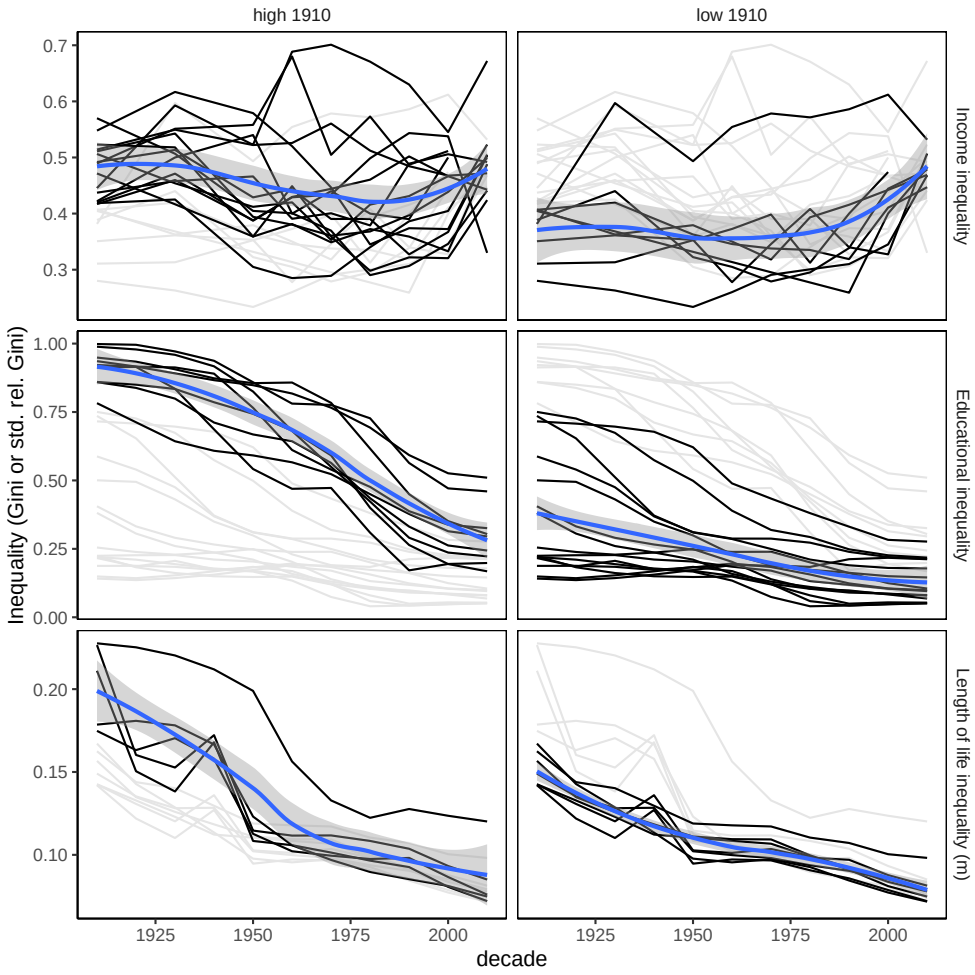

Figure 8: Gini coefficient for inequality in income, length of life, and education, 1870–2010, by level of inequality in 1910.

the entire inequality trajectory for this set of countries. By furthermore splitting the sample by the level of inequality in 1910, these plots directly show whether high inequality countries developed differently from low inequality countries. High-inequality countries are defined here as those above median inequality in 1910. Moreover, in this comparison, the data for the 2000s and 2010s can also be included as well if it is available (in figure 7 one of the years 1990, 2000, or 2010 was taken as end year because it increased the number of countries covered by inequality data). It can be seen that both high and low income inequality countries converged to a low level of income inequality in the 1960s and 1970s, after which increases were common to many countries. Educational inequality too shows a pattern of convergence, though it continues until the present. Though there is less data to work with, developments in length of life inequality are similar.

An updated composite indicator

As a final way of analysing the trends in the wellbeing indicators covered by the two *HWL* volumes, we look at a composite indicator. Two distinct indicators are used: one covering the country averages (levels) from the two volumes. The indicators taken from the previous volume are real wages, heights, life expectancy, average years of education, income inequality, biodiversity, democracy, and homicide rates. The old GDP per capita series are replaced by the new ones based on more recent PPP estimates. Data on working hours and poverty are added from the present volume.

The second composite indicator consists of the inequality indicators: income inequality from the previous volume; and length of life inequality, educational inequality, and gender equality from the present volume. Unfortunately, due to low coverage before the 1990s, wealth inequality data could not be included.

The first thing to look at are weights of the composite indicator implied by the latent variable model. Tables 1 and 2 show this for the two composite indicators. Most variables contribute as expected, the one exception being biodiversity (Rijpma 2014 for a discussion). The contribution of poverty and working hours is similar in magnitude to the core variables of the previous volume, expect average years of education and life expectancy which stand out as having the highest contribution.

Table 1: Factor loadings for latent variable model

X	mean	q05	q50	q95
GDPpc	0.74	0.71	0.74	0.77
Lab. real wage	0.75	0.71	0.75	0.80
Height	0.76	0.72	0.76	0.80
Life exp.	0.99	0.96	0.99	1.02
Av. years edu.	0.95	0.94	0.95	0.97
Polity	0.73	0.70	0.73	0.77
Biodiversity	-0.35	-0.38	-0.35	-0.33
Homicide rate	-0.13	-0.20	-0.13	-0.06
Working hours	-0.77	-0.83	-0.77	-0.70
Poverty rate	-0.77	-0.79	-0.77	-0.74

Table 2: Factor loadings for latent variable model (inequality indicators only)

X	mean	q05	q50	q95
Inequality	0.17	0.12	0.17	0.23
Length of life ineq.	0.73	0.67	0.73	0.79
Educ. ineq	0.87	0.84	0.87	0.90
Gender Equality	-0.69	-0.72	-0.69	-0.65

The inequality measures all enter in the expected direction (for the gender equality data a higher score implies less equality, so it is expected to have the opposite sign). This means that high values in the composite indicator correspond to higher inequality. The model assigns a somewhat lower weight to income inequality than to the other inequality indicators.

Before continuing to discuss the developments shown by this composite indicator, it is useful to make a quick comparison of the composite indicator of the country averages to the old composite indicator (Rijpma 2014). The overall message here is that the two indicators are very similar. For one, the old factor loadings are largely unchanged. Moreover, figure 11 clearly shows that the regional developments are typically very close, differences being visible only in the early period, but still well within the wide confidence intervals for this period (figure 9). Larger differences exist at the country level, but are typically still minor.

A number of explanations can be given for this similarity. First of all, coverage in the new indicators is usually lower than in the old set of indicators, and the model does not favour variables with a high degree of missingness. They would mostly add to the uncertainty of the estimates. Furthermore, each new variable added to a composite indicator by definition has a lower impact than the previous variables. In other words, since we started with nine variables, adding two more variables was never likely to make very large changes to the composite indicator unless they got a very large weight.

Above all though, the indicators used in the previous volume were also the most important and accessible ones. Because of this, the latent variable model based on the more limited set of indicators is already capable of capturing the shared information from the old set of variables, and the new variables added here mostly confirm this pattern.

Given the above, the story told in previous volume still holds when looking at the composite indicator of the country averages. While there sometimes is considerable uncertainty in the regional estimates, overall it can be stated the world has seen great progress, with all regions showing considerable increases in the composite wellbeing indicator over the 200-year period. Progress is also greater and more equally distributed than that shown by GDP per capita. In terms of the composite indicator, there are no regions or countries that are worse off

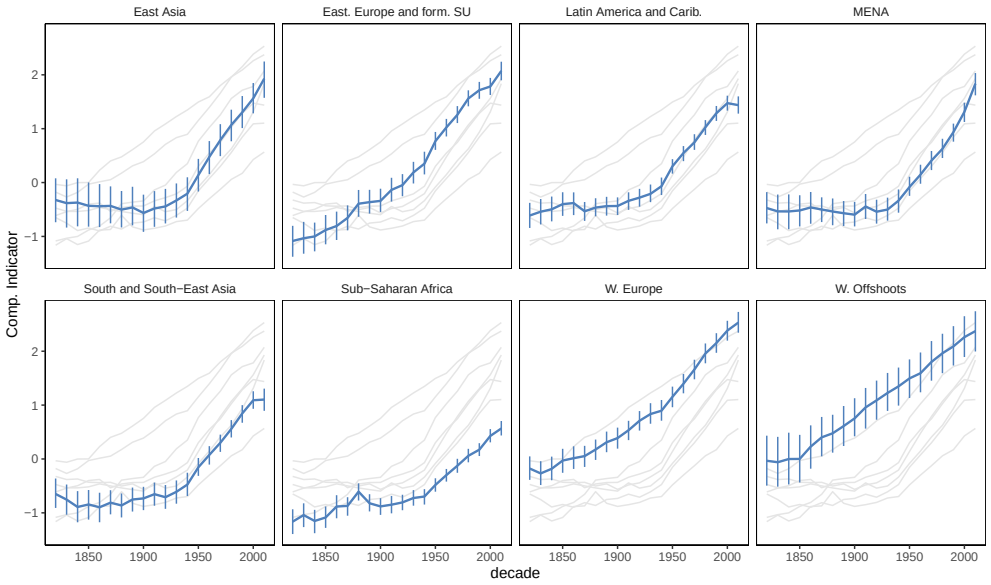

Figure 9: Composite indicator of wellbeing indicator by region, 1820–2010. Vertical bars indicate 90% confidence intervals.

today than the best-performing countries were in 1820, as can be seen in the case of GDP per capita.

However, the fact that gains were strong and widespread, does not mean that there were no uneven gains. Western Europe and the Western Offshoots performed better than the other regions throughout the period. By the middle of the nineteenth century they already had the highest scores on the composite indicator. Both regions kept their lead over other regions throughout the period. That said, clear cases of convergence can also be found, as East Asia, Eastern Europe and the former Soviet Union, the Middle East and North Africa, and Latin America and the Caribbean caught up with the two leading regions. This process began roughly in the middle of the twentieth century. Finally, while there is substantial progress, South and South-East Asia and, above all, Sub-Saharan Africa have not been converging with the leading regions.

Figure 10 shows the regional development of the composite indicator of inequality of wellbeing indicators. The composite indicator is measured with a reasonable degree of certainty, though for some regions, East Asia and Western Offshoots in particular, it is hard to make comparisons over time and with other regions with substantial certainty.

The overall trend is, again one of improvement, with inequality lessening in all world regions. No substantial regional trends towards more

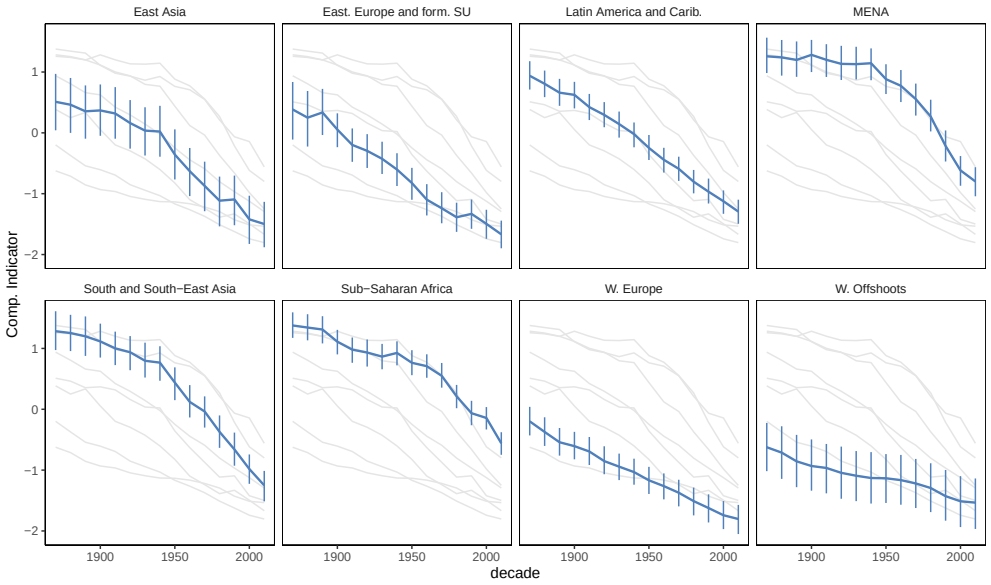

Figure 10: Composite indicator of wellbeing inequality by region, 1820–2010. Vertical bars indicate 90% confidence intervals.

inequality can be observed when looking at multiple inequality indicators at once. Western Europe and the Western Offshoots perform best throughout the period. It is noticeable that in terms of inequality, Western Europe overtakes the Western Offshoots around 1950, something which never happened in the levels composite indicator. The composite indicator of multiple inequality indicators shows this reversal to have been a long-term development.

The inequality composite indicator also displays regional convergence. Differences between regions in 2000 were substantially smaller than they were around 1900. Eastern Europe and the former Soviet Union in particular have become far less unequal. While Sub-Saharan Africa and the Middle East and North Africa do converge on the best-performing regions, they do remain the two worst-performing regions in terms of the inequality composite indicator throughout the period. For the Middle East and North Africa this is a striking development as the region has made much more progress in terms of incomes as well as the other composite indicator. Its poor performance in terms of length of life inequality, gender equality, and to a lesser extent income inequality are behind this pattern.

Conclusions and priorities for further research

Generally, the *How was life* volumes have told a story of progress. Looking at the many long-term wellbeing indicators made available by economic and social historians generally shows that life has been improving throughout the world, on a range of indicators. The new and updated indicators added in this volume have by and large confirmed this picture. Poverty and working hours were all improving, and the improved per capita GDP figures have not overturned the general patterns presented in the previous volume.

While large parts of the past two centuries, and the second half of the twentieth century in particular, confirm to this story of improvement, there are important caveats. One is that progress on a few of indicators has stalled in recent decades, the rise in working hours being one of the new example presented here. Moreover, these gains are not distributed evenly over the world, with some regions, above all Western Europe and the Western Offshoots, attaining higher wellbeing levels throughout the 1820–2020 period.

The addition of within-country inequality indicators to the picture of wellbeing sketched in this volume strengthens the above observations. While within-country income inequality decreased since the 1930s in many world regions, there has been a recent resurgence in inequality. However, the other inequality indicators considered in this volume display a global trend towards more equality.

Suggestions for future research focus mostly on the inequality dimension. For one, more and better data on inequality in dimensions other than income is clearly needed, especially for countries outside Western Europe and the Western Offshoots. Currently, long-run series of inequality other than income inequality have worse coverage, especially length of life inequality.

Another issue deserving attention is how to measure inequality when there are soft limits to a distribution, as was the case for length of life and years of education. These limits mean that progress in the overall level of an indicator almost automatically reduces inequality in the same indicator as more and more people approach the limits of education or longevity. A solution to measuring inequality in these circumstances would be a useful tool to analyse long-term trends in such indicators.

To summarise trends in inequality in wellbeing in a composite indicator, this chapter has also taken a highly practical approach. This means that the inequality indicators were combined in a linear combination, which is not an entirely satisfactory apparoch. Working with a more limited set of variables, and considering more aggregation functions, would open up avenues here (e.g. Jones and Klenow 2016; UNDP 2010; Atkinson 1983).

Finally, one important reason for looking at inequality is that we are concerned that country-level averages and correlations tell an incomplete story of wellbeing. Wellbeing in the end is experienced by individuals. To address this, it is important to pursue historical micro-level wellbeing data, preferably in multiple dimensions for each individual. This will, however, require substantial data collection efforts and new methods to deal with it.

Appendix

HWL1 and HWL2 composite indicators

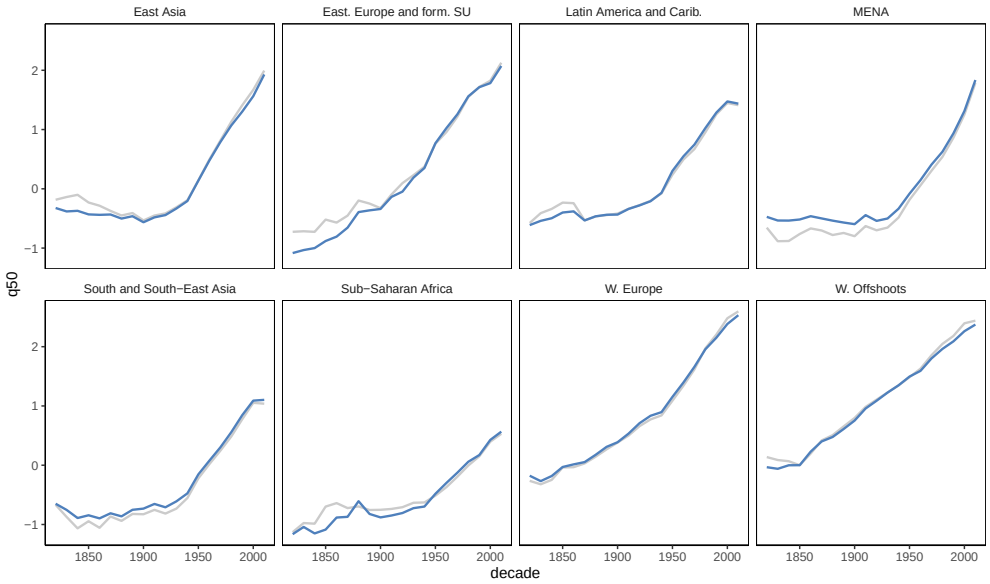

Figure 11: Regional comparison of the expanded composite indicator with the older version (Rijpma 2014), 1820–2010.

Composite indicator scores for 25 Clio-Infra countries

Table 3: Composite indicator (levels) scores for selected countries, 1820–2000.

iso3	1820	1870	1910	1950	1970	2000
ARG	-0.37	-0.46	-0.02	0.76	1.12	1.65
AUS	-0.35	0.26	1.26	1.81	2.18	2.89
BRA	-0.77	-0.67	-0.65	0.12	0.41	1.49
CAN	-0.12	0.47	1.06	1.80	2.28	2.74
CHN	-0.45	-0.54	-0.52	-0.27	0.37	1.21
DEU	-0.49	0.19	0.75	1.49	2.14	2.70
EGY	-0.43	-0.60	-0.54	-0.10	0.08	1.08
ESP	-0.18	-0.29	0.19	0.75	1.31	2.24
FRA	-0.40	0.01	0.69	1.37	1.91	2.57
GBR	-0.27	0.09	0.75	1.47	2.02	2.87
IDN	-0.79	-0.94	-0.88	-0.53	0.01	1.18
IND	-0.59	-0.78	-0.84	-0.29	0.03	0.77
ITA	-0.31	-0.54	0.00	0.93	1.51	2.43
JPN	-0.61	-0.58	-0.32	0.65	1.69	2.48
KEN	NA	NA	NA	-0.46	0.03	0.57
MEX	-0.85	-0.70	-0.65	0.02	0.64	1.52
NGA	NA	NA	NA	-0.70	-0.35	0.27
NLD	-0.27	0.13	0.65	1.40	1.93	2.51
POL	-0.78	-0.33	0.24	0.51	1.09	1.84
RUS	NA	NA	NA	NA	1.39	1.67
SUN	NA	NA	-0.13	0.67	NA	NA
SWE	-0.45	0.07	0.69	1.46	2.10	2.52
THA	-0.76	-0.87	-0.73	-0.17	0.33	1.37
TUR	-0.67	-0.65	-0.55	-0.22	0.34	1.22
USA	0.31	0.65	1.09	1.95	2.41	2.95
ZAF	-1.06	-0.66	-0.43	0.11	0.52	0.97

Table 4: Composite indicator (levels) scores and 90 percent confidence intervals for selected countries, 1820–2000.

iso3	1820	1870	1910	1950	1970	2000
ARG	-0.4±0.5	-0.5±0.3	-0.0±0.3	0.8±0.3	1.1±0.3	1.6±0.3
AUS	-0.4±0.6	0.3±0.3	1.3±0.4	1.8±0.3	2.2±0.3	2.9±0.3
BRA	-0.8±0.6	-0.7±0.4	-0.7±0.3	0.1±0.3	0.4±0.3	1.5±0.3
CAN	-0.1±0.6	0.5±0.3	1.1±0.3	1.8±0.3	2.3±0.3	2.7±0.3
CHN	-0.5±0.6	-0.5±0.4	-0.5±0.4	-0.3±0.3	0.4±0.3	1.2±0.3
DEU	-0.5±0.5	0.2±0.3	0.7±0.3	1.5±0.3	2.1±0.3	2.7±0.3
EGY	-0.4±0.6	-0.6±0.4	-0.5±0.3	-0.1±0.3	0.1±0.3	1.1±0.3
ESP	-0.2±0.5	-0.3±0.3	0.2±0.3	0.7±0.3	1.3±0.3	2.2±0.3
FRA	-0.4±0.5	0.0±0.3	0.7±0.3	1.4±0.3	1.9±0.3	2.6±0.3
GBR	-0.3±0.3	0.1±0.3	0.8±0.3	1.5±0.3	2.0±0.3	2.9±0.3
IDN	-0.8±0.5	-0.9±0.4	-0.9±0.4	-0.5±0.3	0.0±0.3	1.2±0.3
IND	-0.6±0.6	-0.8±0.3	-0.8±0.3	-0.3±0.3	0.0±0.3	0.8±0.3
ITA	-0.3±0.5	-0.5±0.3	-0.0±0.3	0.9±0.3	1.5±0.3	2.4±0.3
JPN	-0.6±0.6	-0.6±0.3	-0.3±0.3	0.7±0.3	1.7±0.3	2.5±0.3
KEN				-0.5±0.3	0.0±0.3	0.6±0.3
MEX	-0.9±0.6	-0.7±0.4	-0.6±0.3	0.0±0.3	0.6±0.3	1.5±0.3
NGA				-0.7±0.3	-0.4±0.3	0.3±0.3
NLD	-0.3±0.4	0.1±0.3	0.7±0.3	1.4±0.3	1.9±0.3	2.5±0.3
POL	-0.8±0.6	-0.3±0.5	0.2±0.5	0.5±0.3	1.1±0.3	1.8±0.3
RUS					1.4±0.3	1.7±0.3
SUN			-0.1±0.7	0.7±0.4		
SWE	-0.4±0.5	0.1±0.3	0.7±0.3	1.5±0.3	2.1±0.3	2.5±0.3
THA	-0.8±0.6	-0.9±0.4	-0.7±0.4	-0.2±0.3	0.3±0.3	1.4±0.3
TUR	-0.7±0.5	-0.7±0.3	-0.6±0.3	-0.2±0.3	0.3±0.3	1.2±0.3
USA	0.3±0.6	0.6±0.4	1.1±0.3	1.9±0.3	2.4±0.3	2.9±0.3
ZAF	-1.1±0.5	-0.7±0.4	-0.4±0.4	0.1±0.3	0.5±0.3	1.0±0.3

Table 5: Composite indicator (inequality) scores for selected countries, 1820–2000.

iso3	1820	1870	1910	1950	1970	2000
ARG	-0.05	0.66	0.14	-0.76	-0.97	-1.41
AUS	-0.01	-0.38	-1.16	-1.46	-1.55	-1.96
BRA	0.00	1.21	0.94	0.26	-0.15	-1.15
CAN	-0.08	-1.19	-1.26	-1.40	-1.41	-1.80
CHN	-0.05	0.70	0.52	0.07	-0.69	-1.25
DEU	0.72	-0.77	-1.12	-1.44	-1.73	-2.03
EGY	0.10	1.45	1.43	0.99	0.74	-0.72
ESP	0.66	0.47	-0.23	-1.00	-1.36	-1.58
FRA	0.92	-0.33	-0.82	-1.19	-1.54	-1.88
GBR	0.81	-0.72	-1.29	-1.42	-1.64	-2.00
IDN	-0.11	1.50	1.41	0.87	-0.06	-1.20
IND	-0.16	1.46	1.38	0.99	0.53	-0.30
ITA	0.76	0.64	-0.44	-1.19	-1.29	-1.74
JPN	0.01	0.74	-0.34	-1.13	-1.49	-1.81
KEN	NA	NA	NA	0.64	0.19	-0.98
MEX	-0.06	1.13	0.69	-0.18	-0.77	-1.26
NGA	NA	NA	NA	1.02	0.71	-0.28
NLD	0.76	-0.93	-1.28	-1.40	-1.43	-1.81
POL	-0.16	0.34	-0.48	-0.17	-0.96	-1.34
RUS	NA	NA	NA	NA	-1.24	-1.47
SUN	NA	NA	-0.15	-1.09	NA	NA
SWE	0.89	-0.58	-1.03	-1.36	-1.54	-2.02
THA	-0.15	1.39	1.18	-0.02	-0.35	-1.30
TUR	0.07	1.42	1.34	0.73	-0.03	-0.80
USA	0.00	-0.80	-1.12	-1.38	-1.54	-1.81
ZAF	0.13	1.01	0.81	0.21	0.01	-0.83

Table 6: Composite indicator (inequality) scores and 90 percent confidence intervals for selected countries, 1820–2000.

iso3	1820	1870	1910	1950	1970	2000
ARG	-0.1±1.1	0.7±0.4	0.1±0.4	-0.8±0.4	-1.0±0.4	-1.4±0.4
AUS	-0.0±1.2	-0.4±0.4	-1.2±0.4	-1.5±0.4	-1.5±0.4	-2.0±0.4
BRA	0.0±1.1	1.2±0.4	0.9±0.4	0.3±0.4	-0.2±0.4	-1.2±0.4
CAN	-0.1±1.2	-1.2±0.4	-1.3±0.4	-1.4±0.4	-1.4±0.4	-1.8±0.4
CHN	-0.1±1.2	0.7±0.4	0.5±0.4	0.1±0.4	-0.7±0.4	-1.3±0.4
DEU	0.7±1.0	-0.8±0.4	-1.1±0.4	-1.4±0.4	-1.7±0.4	-2.0±0.4
EGY	0.1±1.2	1.4±0.4	1.4±0.4	1.0±0.4	0.7±0.4	-0.7±0.4
ESP	0.7±1.0	0.5±0.4	-0.2±0.4	-1.0±0.4	-1.4±0.4	-1.6±0.4
FRA	0.9±0.9	-0.3±0.4	-0.8±0.4	-1.2±0.4	-1.5±0.4	-1.9±0.4
GBR	0.8±1.1	-0.7±0.4	-1.3±0.4	-1.4±0.4	-1.6±0.4	-2.0±0.4
IDN	-0.1±1.2	1.5±0.4	1.4±0.4	0.9±0.4	-0.1±0.4	-1.2±0.4
IND	-0.2±1.2	1.5±0.4	1.4±0.4	1.0±0.4	0.5±0.4	-0.3±0.4
ITA	0.8±1.1	0.6±0.4	-0.4±0.4	-1.2±0.4	-1.3±0.4	-1.7±0.4
JPN	0.0±1.1	0.7±0.4	-0.3±0.4	-1.1±0.4	-1.5±0.4	-1.8±0.4
KEN				0.6±0.4	0.2±0.4	-1.0±0.4
MEX	-0.1±1.2	1.1±0.4	0.7±0.4	-0.2±0.4	-0.8±0.4	-1.3±0.4
NGA				1.0±0.4	0.7±0.4	-0.3±0.4
NLD	0.8±1.0	-0.9±0.4	-1.3±0.4	-1.4±0.4	-1.4±0.4	-1.8±0.4
POL	-0.2±1.2	0.3±0.9	-0.5±0.8	-0.2±0.4	-1.0±0.4	-1.3±0.4
RUS					-1.2±0.4	-1.5±0.4
SUN			-0.2±0.8	-1.1±0.7		
SWE	0.9±0.9	-0.6±0.4	-1.0±0.4	-1.4±0.4	-1.5±0.4	-2.0±0.4
THA	-0.2±1.2	1.4±0.4	1.2±0.4	-0.0±0.4	-0.4±0.4	-1.3±0.4
TUR	0.1±1.2	1.4±0.4	1.3±0.4	0.7±0.4	-0.0±0.4	-0.8±0.4
USA	0.0±1.1	-0.8±0.4	-1.1±0.4	-1.4±0.4	-1.5±0.4	-1.8±0.4
ZAF	0.1±1.1	1.0±0.4	0.8±0.4	0.2±0.4	0.0±0.4	-0.8±0.4

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