

Global Inequality

The Implications of Thomas Piketty's *Capital in the 21st Century*

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Abstract

In the 2000s, global inequality fell for the first time since the Industrial Revolution, driven by a decline in the dispersion of average incomes across countries. Between 1988 and 2008, a period of rapidly increasing global integration, income growth was largest for the global top 1 percent and for country-deciles in Asia, often in the upper halves of the national distributions, while the poorer deciles in rich countries lagged behind. Although within-country inequality

increased in population-weighted terms, for the average developing country the rise in inequality slowed down in the second half of the 2000s. However, like any analysis based on household surveys, these results could miss important increases in inequality if they are concentrated at the top. These data constraints remain especially serious in developing countries where only very limited information on the top tail exists, especially regarding capital incomes.

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Global Inequality:
The Implications of Thomas Piketty's *Capital in the 21st Century*

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Introduction

This essay aims to complement Thomas Piketty's analysis in *Capital in the 21st Century* (C21) by offering a twofold global perspective on inequality. First, I review the trends in global inequality, defined as the inequality among all persons in the world regardless of their country of residence. Piketty's analysis, like most perspectives on inequality, concentrates on inequality among individuals *within* a country. Adopting a global (or cosmopolitan) perspective on inequality sheds light on another aspect of the world we live in. While no world government exists, international organizations play an increasing role, and the cosmopolitan view is the only one consistent with their mandates. Globalization has coincided with rapid growth in some of the poorest countries on the one hand, and increasing inequality in many of these same countries on the other hand. Global inequality captures the overall effect of these forces on persons irrespective of where they might be living. Second, I summarize the developments in within-country inequality in the developing world. This flows naturally from an analysis of the global distribution, which can be broken up into differences between and within countries. An analysis of global inequality needs to separate the recognition of inequality from the capacity to reduce it, which largely remains at the country-level (Anand and Segal, 2015).

C21 documents a stark rise in inequality within developed economies in North America and Western Europe. Emerging economies do not feature prominently in the empirical work nor do they have an explicit role in the model. Milanovic (2014) argues that in Piketty's model, developed countries today are what developing economies will look like in the future. For example, China today is a wealth-young economy, similar to the US in the 19th century, but given China's fast demographic transition, it may be quite similar to today's France in fifty years. So the transition path is very much the same, just at a much faster pace. Furthermore, Milanovic notes that emerging economies also affect C21's inequality $r > g$. On the one hand, given their lower capital stock, emerging markets continue to offer higher returns, pushing up r , which Piketty recognizes as one of the mechanisms behind the apparent stability in r . On the other hand, their higher growth rates push up g thus delaying the point at which $r > g$ materializes.

Although Piketty's model deals almost exclusively with developed Western nations, this has not stopped the book from achieving a global appeal. C21 has been widely translated, including into Chinese, Japanese and Korean, and reported in the local press (Brasor, 2015; Denney, 2014). More generally, the concern with inequality goes beyond the developed countries. For example, in a survey of 15 developing countries, 77% of policy makers recognize that the current level of inequality threatens long-term development, while only 7% see inequality as conducive to long-term development (UNDP, 2014). Similarly, in a survey of more than 500 policy makers in Asia, 70% suggest that the concern with income inequality increased in the last 10 years, while just over half disagreed that higher income inequality is acceptable as long as poverty is falling (Kanbur and Zhuang, 2012).

A word of caution is needed right from the beginning. Expanding the analysis to a global level faces formidable data constraints. Due to the unavailability of administrative data for developing

countries, the analysis in this essay will use household surveys. It is well known that household surveys do a poor job at capturing top incomes and there is no reason why this issue should be any less severe in developing countries. Furthermore, as I will discuss in more detail below, household surveys in poor countries tend to use consumption expenditures – not incomes – which understates living standards at the top and thus understates levels (and possibly also trends) of inequality. Finally, those emerging economies which use income surveys typically do not capture capital incomes, and information on wealth – the very topic of C21 – is practically non-existent. Paraphrasing Atkinson and Bourguignon (2015), it is important to be very clear about what the data can and cannot say, while at the same time not rejecting all evidence on the grounds of imperfect measurement.

The available evidence suggests that the Gini index of the global distribution of income has fallen for the first time since the Industrial Revolution, a development that is likely to continue. This decline was driven by falling inequality between countries, i.e. average incomes converged across countries. This is likely to continue, leading to further declines in global inequality. But this reduction was counteracted by an increase in (population-weighted) within-country inequality, such that the average person lived in a country where inequality was increasing. Looking at only developing countries, average national inequality increased during the 1980s and the 1990s while it declined in the 2000s. This recent fall was driven by Latin America, while China appears to have plateaued. The changes in global and within-country inequality coincided with rapid globalization since the late 1980s, enabled by technological change. It seems that globalization has had important distributional effects (within countries and globally), and between skilled and unskilled labor, as well as between capital and labor.

This essay is structured in six main sections. I begin with describing the global distribution and trends in global inequality, drawing mostly on Lakner and Milanovic (2016). Section II moves from global inequality to inequality within-countries, especially within developing countries. In Section III, I discuss the role of globalization and technology in explaining some of these patterns. Policy implications are presented in Section IV. In Section V, I offer some predictions on the likely future direction of global inequality. Section VI concludes and outlines an agenda for future research on inequality in developing countries.

I. The global distribution and trends in global inequality

The analysis of the global distribution presented in this essay is based on joint research with Branko Milanovic (Lakner and Milanovic, 2016). We are interested in measuring the inequality of disposable income among all people in the world. Income is measured at the household level and every household member is assigned an equal share. Incomes are compared across countries using purchasing power parity (PPP) exchange rates to account for differences in price levels. Our data are based on household surveys that have only become widely available in the developing world during the late 1980s. Therefore, our analysis begins in 1988, a much shorter time span than C21 is considering. Given our data sources we need to make two further approximations: First, because

some data come in grouped form (notably China), we use ten decile groups for every country-year.¹ That is, every individual is assigned the average income of her decile (in the within-country distribution). Second, because income is difficult to measure in an economy where own-consumption is widespread, developing countries tend to use consumption expenditure instead of income (Deaton and Zaidi, 2002).² While this is a serious issue, as Anand and Segal (2015) write, “one simply has to live with the noncomparability [because] [t]here is no reliable way to infer an income distribution from an expenditure distribution”.

An important caveat, however, is that we are likely to underestimate top incomes for a number of distinct reasons. First, we use household surveys, which do a poor job at capturing the richest households (e.g. Atkinson et al., 2011; Alvaredo and Londoño Vélez, 2013). Second, even if the survey manages to interview the richest households, their income may be understated. In particular, household surveys in developing countries often fail to capture entrepreneurial and capital incomes, which remain the main sources of incomes of the rich in developing countries according to the few available data sources (Alvaredo and Gasparini, 2015). Third, consumption surveys – which are used in most developing countries outside Latin America – understate true living standards at the top because the rich save a higher proportion of their income than the poor. Actual consumption expenditures at the top may also be underestimated because expenditure surveys capture spending on durables poorly (Aguiar and Bils, 2015).

This suggests that household surveys are likely to underestimate the *level* of inequality. However, if top incomes increase faster than the rest, the surveys would also underestimate the *trend* in inequality. There is some suggestive evidence pointing in that direction. First, while the evidence from administrative data remains very limited, in some of the available countries top income shares are rising contrary to household-survey-based inequality measures (e.g. Colombia, Malaysia) (Alvaredo and Gasparini, 2015).³ Second, much has been written about the declining labor shares in many countries around the world (Karabarbounis and Neiman, 2014). For example, in China at the same time as the labor share was falling, household savings recorded in national accounts were growing faster than GDP.⁴ This suggests that the inequality in incomes grew faster than the inequality in consumption expenditures, which we use to estimate inequality in China. Third, a number of alternative data sources also point toward rising top incomes. In many developing regions of the world, billionaire wealth (according to the “rich list” published by Forbes magazine) increased faster than national income (Lakner and Ruggeri Laderchi, 2016). For example, between 2012 and 2015, a period of only three years, the number of billionaires in China doubled from 251

¹ As a result, our results would tend to underestimate within-country and thus global inequality. However, Anand and Segal (2015) argue that the differences are very small. We find that moving from percentile to decile groups in a slightly different global distribution reduces the global Gini index by approximately 0.5 percentage points.

² The difference between income and expenditure are net savings.

³ I am abstracting here from the fact that the Gini index is most sensitive to changes around the middle, so an increase in top incomes need not show up as a significant increase in the Gini index. See Alvaredo (2011) on the relationship between top income shares and the Gini index.

⁴ Household savings as a percentage of GDP increased from 17.5 in 2000 to 23.4 in 2008 (Ma and Yi, 2010).

to 513 (Hurun Report, 2015). Finally, account holdings leaked from a number of tax havens show considerable wealth in developing countries (ICIJ, 2016).

According to our analysis, global inequality as measured by the Gini index has declined very slightly between 1988 and 2008. As the solid line in Figure 1 shows, the global Gini index fell from 72.2% in 1988 to 70.5% in 2008, a fall of almost 2 percentage points which was particularly strong since 2003. Not surprisingly, global inequality is much higher than what is found within individual countries. For example, in 2008 the Gini index of South Africa, one of the most unequal countries, was 63%. The results are robust to using the same countries throughout, as shown by the dashed line in Figure 1.⁵ But given the numerous margins of errors involved in these calculations, both sampling and non-sampling (e.g. PPP exchange rates) (Anand and Segal, 2015), it would be premature to claim that global inequality declined robustly. Furthermore, once we attempt to impute top incomes (Figure 1, dotted line), global inequality has remained almost unchanged over these 20 years, although the decline in the last five years remains.⁶

Taken together this suggests that at the very least, there is no evidence pointing toward *increasing* inequality at the global level. Newer data for 2011 finds that the downward trend is accelerating (Milanovic, 2016, p. 120). Although different methods and inequality measures disagree over the timing and size of the decline, the fall since the mid-2000s is robust across a number of sources.⁷ Viewed over the long run, this is a remarkable development. Bourguignon and Morrisson (2002) find that global inequality rose steadily between 1820 and the 1990s, by some 15 percentage points. Therefore, as Bourguignon (2015) and Milanovic (2016) point out, global inequality has stabilized or even declined for the first time since the Industrial Revolution.

The decline in inequality has been driven by falling inequality between countries. Figure 2 decomposes global inequality into differences within and between countries. The total height of the bars shows total global inequality as measured by the GE(0) (or mean log deviation, Theil-L) inequality index.⁸ The striped bars depict that part of total inequality that is due to differences within every country. The solid bars capture the contribution of differences in mean incomes across

⁵ The baseline results use the largest possible sample of countries in every year. A closely connected issue, which cannot be addressed, is the unavailability of surveys for some countries. This problem is most acute in the Middle East and the African continent. The affected countries account for around 5% of global GDP and 10% of global population.

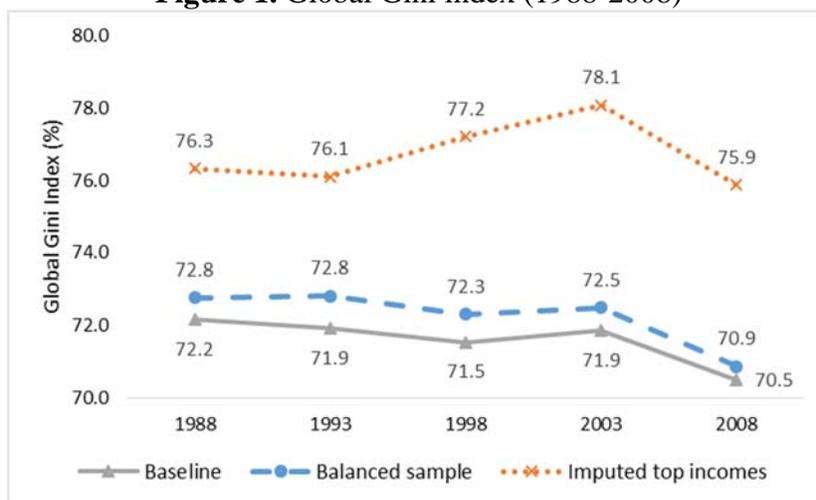
⁶ Anand and Segal (2015) use a different approach to account for missing top incomes, which results in an upward adjustment to the level of the global Gini index that is approximately half of the difference presented in Figure 1. They assume that the household survey fails to capture the top 1%. They then append the top 1% income share either directly from tax record data or predict it from a cross-country regression that uses the survey-based top 10% share and the survey mean income. While their procedure also increases a country's mean, this effect is smaller than the national-accounts-based adjustment in Lakner and Milanovic (2016) (shown in Figure 1). Regarding the time trend, Anand and Segal also find a fall in the most recent period (between 2002 and 2005 in their data), although the level remains marginally higher in 2005 than in 1988 (72.7% and 72.6%, respectively).

⁷ According to the review by Anand and Segal (2015), methodologies differ primarily in their (1) use of GDP per capita or average incomes from household surveys, (2) adjustments for differences between income and consumption surveys, and (3) PPP exchange rates. Bourguignon (2016), who rescales survey incomes to GDP per capita, finds a faster decline than what is presented in Figure 1, beginning in the early 1990s.

⁸ I use an alternative measure of inequality because the Gini index cannot be decomposed in this manner.

countries. It is clear that the gap in mean incomes between countries has fallen, while within-country inequality has increased to a more limited extent, although this conclusion no longer holds once you look within regions.⁹ At the global level, the decline in the between-component was clearly driven by the rapid growth in average incomes in China. For example, the contribution of countries other than China, India and the US to between-country inequality almost doubled.¹⁰ The decomposition also shows that the majority of the world's population lived in a country where inequality was increasing, which of course does not imply that inequality was going up everywhere, as I will discuss in the next section.

Figure 1. Global Gini index (1988-2008)



Source: Lakner and Milanovic (2016).

Notes: Solid line shows baseline results. Dashed line uses the same set of countries throughout. Dotted line imputes for missing top incomes using the household surveys-national accounts gap and a Pareto distribution, as explained in more detail in Lakner and Milanovic (2016).

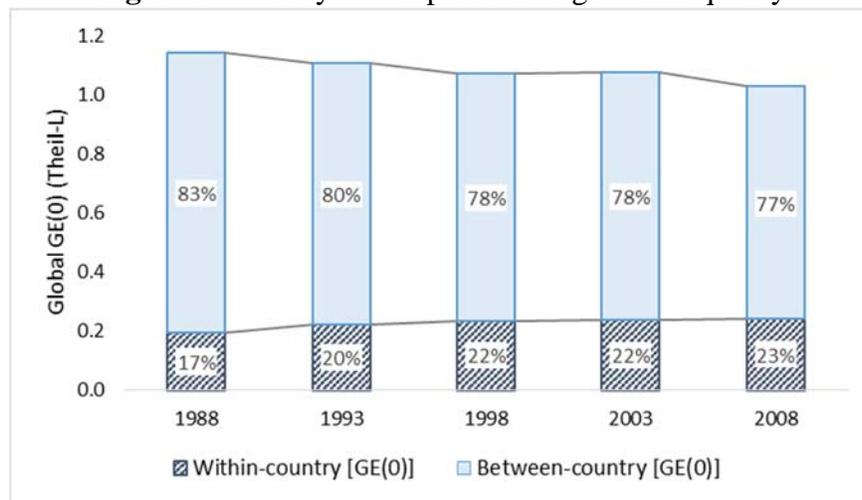
Between-country inequality can also explain the trend in global inequality in the long-run. In the 19th century, global inequality was primarily due to differences within countries (Bourguignon and Morrisson, 2002). During the Industrial Revolution today's developed countries were pulling away from the global mean thus increasing between-country inequality, and in turn global inequality. Over the past couple of decades the gaps among countries have fallen for the first time (Milanovic, 2016). At the same time, increasing within-country inequality has counteracted some of the fall in the between-country component. As Bourguignon (2015) and Milanovic (2016) discuss, these two

⁹ In both Sub-Saharan Africa and East Asia, regional inequality increased. But while in Africa this increase was driven by increasing between-country inequality, rising within-country inequality was responsible in East Asia (Jirasavetakul and Lakner, 2016).

¹⁰ Of course, the two aspects are not independent. The between-contribution is computed as the difference between the country mean and the global mean, which China's rapid growth would have also tended to increase. A poor country that is growing slower than the global mean would tend to increase between-country inequality, as long as its mean is below the global mean.

developments could lead to a replacement of between-country differences with within-country differences, or an “internalization” of global inequality within countries, which would look more like the situation in the 19th century. However, it is important to point out that between-country differences still account for most of global inequality (see Figure 2), so such a development would still take some time.

Figure 2. Country-decomposition of global inequality



Source: Lakner and Milanovic (2016).

Note: The height of the bars is the level of inequality (measured by Theil-L index). Within-country inequality captures inequality within countries, while between-country inequality consists of differences in average income across countries. The numbers in the bar chart refer to the contributions of between- and within-country differences to total inequality.

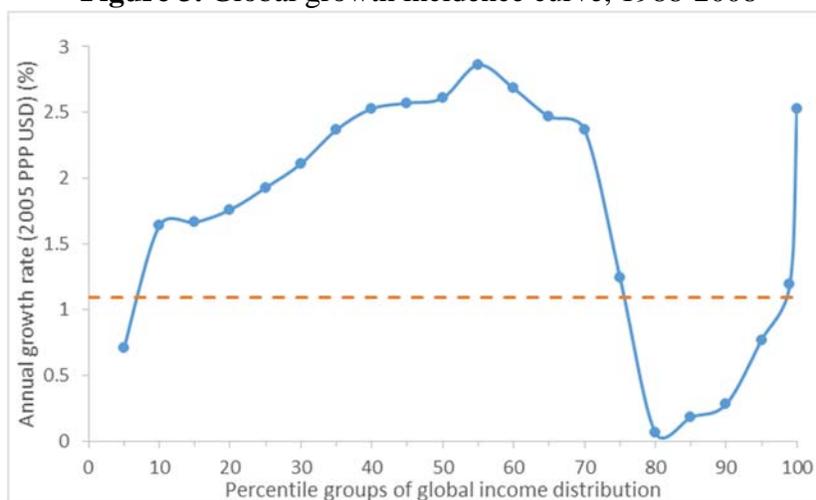
Instead of looking at the overall level of inequality, we might also be interested in how different parts of the global distribution have fared over time. Figure 3 shows the global growth incidence curve, which shows the growth rate of different percentile groups along the distribution.¹¹ This figure captures three developments in the global distribution (Milanovic, 2016): First, the rapid growth in China, especially in the upper parts of its distribution, creating the peak around the global median. Second, the stagnation of incomes in the bottom parts of the rich countries, around the 85th global percentile. Third, the rapid growth of the very rich, giving rise to the second peak at the top of the global distribution. This seems to resemble the narrative on the distributional effects of globalization and technological change, whereby lower-paid workers in rich countries are being

¹¹ The pattern remains very similar with data after the global financial crisis (Milanovic, 2016). The pattern is also very similar when using a *non-anonymous* growth incidence curve (not shown). In Figure 3, which is an *anonymous* growth incidence curve, the composition of the global percentiles with different country-groups may change over time. In other words, we do not track the evolution of a particular country-group (e.g. the bottom 10% in the US) over time, while this is implicit in the interpretation. However, as it turns out the two graphs are very similar (see Lakner and Milanovic, 2016).

squeezed, the (urban) Chinese benefit from export-led growth and the very top in rich countries have seen their income shares rise. This will be discussed in more detail in section III.

From the evidence presented thus far, the conclusion has been that global inequality on the whole has stopped increasing and might even have fallen while the gains were highest around the global median and the very top of the distribution. But it is important to bear in mind that this assessment has been based on comparing relative gains. The Gini index remains unchanged when all incomes grow at the same rate, i.e. Figure 3 is a flat line. But this implies very different absolute gains precisely because the underlying global distribution is so unequal. Although the growth rates of the global median and the top 1% are roughly similar, the former added \$400 (2005 PPP) over this 20-year period compared with \$25,000 (2005 PPP) for the latter (the initial average per capita incomes were \$600 and \$39,000 respectively). Put differently, the top 5% of the world's population received 44% of the increase in global income over this period. Therefore, while standard measures of inequality show a small decline between 1988 and 2008, absolute gaps between the rich and poor increased strongly.¹²

Figure 3. Global growth incidence curve, 1988-2008



Source: Lakner and Milanovic (2016).

Note: Y-axis shows annualized growth rate in average income (in 2005 PPP USD) of the fractile group. Growth incidence evaluated at ventile groups (e.g. bottom 5%); top ventile group split into top 1% and 4% between P95 and P99. The horizontal line shows the growth rate in the mean of 1.1% per year.

¹² Relative measures of inequality obey the scale invariance axiom, which says that an inequality measure ought to be independent to any transformation that multiplies all incomes by the same constant (e.g. a simple rescaling from euro to USD). On the one hand, perceptions about rising income gaps often carry absolute connotations and experiments with university students in Germany, Israel, UK and USA show an approximately equal split between absolute and relative concerns (Ravallion, 2016). On the other hand, Milanovic (2016) argues strongly for keeping inequality measures relative, while recognizing that an analysis of the absolute differences provides a complementary perspective. Atkinson and Brandolini (2010) also argue that especially a global analysis needs to consider both absolute and relative differences.

II. Within-country inequality around the world

The analysis so far has treated the entire world as a single unit. By contrast, most studies of inequality focus on within-country inequality, which remains the level at which most policies to address inequality operate. There is another reason to emphasize within-country inequality: Some commentators have used the evidence on falling global inequality to dismiss concerns with rising within-country inequality for instance in the US. However, countries remain the relevant level for most concerns over inequality; in fact, studies show that wellbeing can be affected by very localized inequality.¹³

As the country decomposition in Figure 2 showed, the majority of the world's population lived in a country where inequality was increasing between 1988 and 2008. In such an analysis every country is weighted by its population, so this conclusion does not imply that inequality increased in the average country. It is important to clarify this because trends can be different whether or not population weights are used. I will briefly review the trends in within-country inequality for all countries in the world, before discussing the trends in Latin America, East Asia and Sub-Saharan Africa in more detail. At the end, I present the most recent numbers on the developments since the onset of the Great Recession. Throughout this section, I concentrate on within-country inequality (typically measured by the Gini index) without using population weights. I will draw mostly on the reviews by Alvaredo and Gasparini (2015) and Morelli et al. (2015) as well as new up-to-date calculations based on data from World Bank (2016c).¹⁴

In the *average developing country*, national inequality increased during the 1980s and 1990s, while it declined in the 2000s (largely driven by countries in Latin America). By contrast, the *average person* in the developing world (i.e. using population weights) lived in a country with steadily increasing inequality between the mid-1980s and 2010 (driven by the surge in China and more recently India). Despite the recent fall, inequality remains at a higher level than during the 1980s, and is substantially greater in the developing than the developed world. The overwhelming majority of developed countries experienced increasing inequality since the 1970s.

The decline in average inequality among developing countries in the 2000s was largely driven by the encouraging developments in Latin America, which have been widely documented (e.g. Lopez-Calva and Lustig, 2010; Lustig et al., 2013). This can be explained by a large number of factors, which certainly include more stable macroeconomics, the growth of low-skilled wages (Cord et

¹³ In the US, Luttmer (2005) finds that an increase in neighbors' earnings reduces reported happiness after controlling for individual income, where the spatial unit has 150,000 residents on average. By contrast, in Malawi such relative concerns are not the dominant concern, except for the better off (Ravallion and Lokshin, 2010).

¹⁴ There are notable differences between these three sources, so they need to be compared carefully. World Bank (2016c) is also the data source used by Alvaredo and Gasparini (2015). However, Alvaredo and Gasparini cover only developing countries and adjust for differences between income and consumption surveys. Morelli et al. (2015) cover only rich and (some) middle-income countries, tend to use equivalence scales, and a mix of primary data and secondary sources. My updated calculations based on World Bank (2016c) (see Figure 4) cover all income groups and mix per capita income or consumption without any adjustment.

al., 2014) and purposive policy intervention more generally (Kanbur, 2015a), such as conditional cash transfers, often made possible through booming commodity revenues. But to avoid painting an overly optimistic picture of inequality in Latin America, two additional facts need to be borne in mind: First, inequality followed an inverse-U shape, such that the fall in the 2000s came after a prolonged increase during the 1980s and 1990s. By 2012 the average Gini index had returned to the level during the early 1980s (Székely and Mendoza, 2015), so viewed from this long-run perspective progress has been limited.¹⁵ Second, even after the strong decline, Latin America remains one of the most unequal regions in the world (the other being Sub-Saharan Africa).

East Asia shows a different pattern than Latin America, with inequality increasing during the 2000s on average, although with a lot of heterogeneity at the country-level. Inequality increased in the two most populous countries in the region, China and Indonesia, but at different times. In China, inequality surged in the 1990s but stabilized in the 2000s while inequality increased in Indonesia during the 2000s. During the 1980s, the Republic of Korea and Taiwan, China, managed the structural transformation toward becoming industrialized economies without major increases in inequality (Kanbur, 2015b). In contrast, Chinese inequality increased strongly during its transition, not dissimilar to the sharp rise in inequality in many Eastern European countries after the fall of the Berlin Wall (Milanovic and Ersado, 2010). Although data remain seriously limited, the available sources suggest a stabilization of inequality in China since the early/mid-2000s, so the peak might have been reached (Milanovic, 2016). Again, there are parallels with Eastern Europe, where inequality has been declining lately.

While data availability presents challenges in many developing countries, it poses particular problems in Sub-Saharan Africa. Over the past two decades, data availability and quality have improved drastically, yet researchers are invariably constrained when looking at long-term trends. Levels of inequality are high in the region, especially in the southern countries. Seven of the ten most unequal countries in the world are in Africa (Beegle et al., 2016). This is remarkable given that all other high-inequality countries use income surveys while Sub-Saharan Africa uses expenditure surveys, which produce lower levels of inequality. Furthermore, inequality in the region is “too high” given its relatively widely shared land ownership (Milanovic, 2003). Looking at trends, a set of Sub-Saharan African countries with at least two strictly comparable and recent surveys (mostly in the 2000s) is split evenly into increasing and decreasing inequality (Beegle et al., 2016).¹⁶ Countries with increasing inequality are slightly larger, so around 57% of the population live in a country where inequality rose.

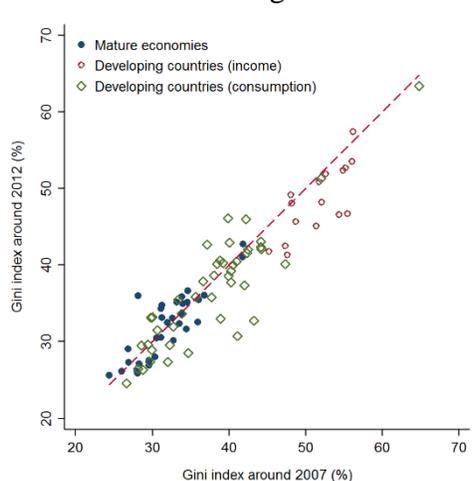
The levels and trends in within-country inequality reviewed thus far have covered a range of different time periods. This section ends by looking at the most recent past which spans the Great Recession of 2008. This is a rather special period, so any change in trend needs to be interpreted

¹⁵ Székely and Mendoza (2015) is part of a special issue on “Inequality and Human Development in Latin America: A Long-Run Perspective” in the *Journal of Human Development and Capabilities* (see introduction by Lopez-Calva et al., 2015).

¹⁶ This pattern of within-country inequality trends is confirmed by Cornia (2014) for a longer time period. Changes in survey design (e.g. urban or national coverage), implementation (e.g. effects of seasonality) or questionnaires (e.g. recall periods for consumption expenditures) can make surveys hard to compare.

with caution. Figure 4 plots for every country the Gini coefficient around 2012 against the Gini around 2007. Only countries with two comparable surveys in these years are included. A majority of countries appear to lie below the line, suggesting falling inequality. On average, the Gini index declined by approximately 1 percentage point from 38.1 to 37.1. Two-thirds of the countries (59 of the 93 countries included) experienced falling inequality. The moderation in the inequality trends comes from both sides: Inequality seems to have plateaued in China (Milanovic, 2016) and the developed countries (Morelli et al., 2016), which are both regions where previously inequality increased strongly. In contrast, Latin America has seen a stagnation in inequality trends in recent years after the strong decline earlier (Cord et al., 2014; Gasparini et al., 2016).

Figure 4. Gini index during the Great Recession



Source: World Bank (2016a), World Bank (2016b), World Bank (2016c).

Note: Showing Gini indices around 2007 and around 2012 for 93 countries for which comparable surveys exist in both years (defined in World Bank, 2015a). Initial year: 2003-2011; final year: 2009-2014; duration: 3-8 years, 5 years on average. Countries along the dashed line experienced no change in inequality. For countries below (above) the line, inequality fell (rose).

What does this mean for global inequality? The decline in inequality observed in Figure 4 was smaller for larger countries. Hence, the population-weighted Gini index fell only marginally from 39.4 in 2007 to 39.2 in 2012. Therefore, the within-country component of global inequality remained roughly stable.¹⁷ At the same time, average incomes continued to grow faster in poorer countries, so the forces of economic convergence remained active. In sum, this suggests that global inequality continued to fall after 2008, which is confirmed by the 2011 results presented by Milanovic (2016).

¹⁷ Figure 4 includes only comparable spells and thus covers a smaller set of countries than a pure cross-sectional analysis. The comparable sample covers 84% of global GDP and population, which is smaller than the coverage of Lakner and Milanovic (2016) (93% of global GDP and 91% of global population in 2008).

III. The role of globalization and technology

These changes in global inequality and within-country inequality around the world coincided with a period of rapid globalization, defined here loosely as an increase in international trade and increased movement of capital and people, as well as technological change, which in turn enabled much of the increased global integration and geographic spread of production processes.

The evidence presented above is consistent with the following story line: China and other parts of Asia grew rapidly over this period, taking advantage of increased global integration and reducing between-country inequality. At the same time, within-country inequality increased in both developed and developing countries. Taken together, the winners of globalization appear to have been the middle- and upper-classes in China, while the lower parts of the distributions in rich countries lagged behind (see Figure 3).

The remainder of this section will sketch a model of technological change which tries to explain some of these shifts – between skilled and unskilled labor, between labor and capital. Establishing a strict causal relationship between globalization or technological change and inequality, however, remains elusive because income distributions are the outcome of a multitude of factors. Therefore, my discussion is perhaps best taken as “well-informed speculation” (Ferreira, 2016). At a basic level, the main takeaways are that the effects of trade on income distributions are more complicated than a simple Stolper-Samuelson effect, and while globalization has brought huge benefits, some have benefitted more than others.¹⁸

In a recent paper, Basu (2016) distinguishes between two kinds of technical change – labor-saving and labor-linking. The category of labor-saving technologies also includes skill-biased technical change as a result of which the demand for skilled labor was growing faster than the supply. This increased the premium for educated workers and thus the inequality within labor incomes, as in the original Tinbergen (1975) model. However, one also needs to recognize the role of capital, which gets to the core of the labor-saving technology argument. As Atkinson and Bourguignon (2015) argue, capital could be complementary to high-skilled labor, but a substitute for low-skilled labor. This is hardly a new idea – Meade (1964) argued that automation would increase inequality.

Labor-linking technological change captures how labor links up with demand in faraway places. This can happen through a number of channels, such as trade, outsourcing or FDI. Maskin (2015) argues that advances in communication technology have led to an internationalization of the production process, such that a company can today employ workers on the opposite side of the

¹⁸ According to the Stolper-Samuelson theory, trade will increase the relative return of the abundant factor, i.e. unskilled labor in developing countries. The experience of the East Asian economies (e.g. Korea and Taiwan, China) that pursued trade liberalization after WWII and managed to create growth with equity is consistent with this theory (Wood, 1997). But increasing inequality in the 1980s and 1990s in both labor-abundant and labor-scarce countries that liberalized questioned this theory. Furthermore, the East Asian experience coincided with supportive initial conditions, such as land reforms and widespread basic education, which may be at least as important as trade liberalization by itself (Kanbur, 2015b).

world, thus creating a global labor market. Labor-linking technological change has affected different parts of the distribution in different ways.¹⁹ In developed countries, low-skilled workers at the bottom of the wage distribution have been hurt by competition from abroad, with their “wages being set in Beijing,” to paraphrase the title of Freeman (1995). At the same time, this technological progress increased the global reach of the highest-paid individuals, thus raising the wages of the superstars in a winner-takes-all market (Atkinson, 2008). As Bourguignon (2015) points out, the same is happening in developing countries, where Indian cricket stars or Chinese billionaires are profiting from their global reach. Furthermore, some of the employees in developing countries who were serving customers in rich countries were demanding wages far above local rates (Basu, 2016), so it might appear that “top wages are being set in New York”.

What does this all mean for inequality in poor and rich countries? Low-skilled workers in rich countries are being squeezed by technological change that gets rid of their jobs and competition of lower-paid workers from abroad. While low- and middle-skilled workers in poor countries in Asia have seen their wages rise, further increases will be constrained by the threat of capital substitution. One case in point: The world’s largest contract manufacturer, Foxconn Technology Group, is planning to add one million robots in the near future (Davidow and Malone, 2014). Top incomes in *both* rich and poor countries are benefitting in two ways: First, their wages are increasing with the size of the global market. Their incomes are being equalized due to the international tradability of high-skilled labor (Bourguignon, 2015). It appears this scale effect is particularly important for top incomes in poor countries where the general wage level is much lower. Second, top income recipients in both rich and poor countries own the capital, and the profit share has been rising over this period of global technological change (Karabarbounis and Neiman, 2014).

In summary, although the debate is often presented as a conflict between unskilled labor in poor and rich countries, or between skilled and unskilled labor within either set of countries, it is as much a conflict between shareholders and workers. It may “be that capital has been the main beneficiary of the globalization of trade and the resulting acceleration in economic growth [...] over the last two decades” (Bourguignon, 2015).

IV. Policy implications

When discussing policy proposals it is important to stress that it is not desirable to undo globalization. As Bourguignon (2016) points out, it is not clear that it would make people in rich countries better off since higher trade barriers would increase prices and thus reduce their purchasing power. But more importantly, a retrenchment may be bad for the poorest people on this planet. A globally integrated economy with easier movement of capital and labor complicates policymaking because it points toward a race to the bottom which needs to be taken seriously.

¹⁹ Similar to Kremer and Maskin (2003) and Maskin (2015), Piketty (1997) presents a model of migration in which open borders benefit skilled workers in poor countries, while hurting the lowest skilled workers in these countries who have too few skills to link up with high-skilled labor or capital in rich countries.

However, it is also clear that countries are not powerless and that policy making at the country-level matters. As I discussed above, inequality did not increase everywhere, although all countries were subject to the same technological change, at least to a first approximation. Furthermore, despite a global market for high-skilled workers, the salaries of the best paid American CEOs are approximately four times the salaries of their German counterparts (Bourguignon, 2015).

The burgeoning literature on (global) inequality is not short of policy proposals to address inequality. Instead of offering a comprehensive review, I will outline a few that have received relatively little attention in the development literature. Developing economies have underdeveloped fiscal policies that largely rely on indirect taxes and withholding on formal sector wages. According to Atkinson and Bourguignon (2015) “no advanced economy achieved a low level of inequality [...] with a low level of social spending, regardless of how well that country performed on other dimensions that matter for poverty, notably employment”. Social spending in developing countries is constrained by low fiscal revenues. While state capacity continues to be limited in the poorest countries, middle income or emerging countries are increasingly able to expand revenues. In these countries, households have bank accounts and credit cards which create information flows that can be exploited for the purposes of taxation using new technologies. This is particularly true of Asia, where tax systems do not score highly on progressivity (Kanbur, 2015b). Across the region, effective progressivity is limited by very high tax thresholds, such that the highest rates apply to practically nobody (Lakner and Ruggeri Laderchi, 2016).

The taxation of capital incomes is another aspect I would like to highlight. First, capital incomes are typically taxed at lower rates than labor incomes (not only in developing countries), which creates horizontal inequity.²⁰ That is, individuals with the same incomes and assets face different tax rates.²¹ Second, the revenue raised from property taxes is negligible, although they can be a relatively equitable, efficient and implementable source of revenues (Norregaard, 2015). Third, the issue of tax havens needs to be addressed. I am writing this at a time when the first details of the so-called Panama Papers are emerging, implicating numerous heads of state in using offshore accounts. Cracking down on tax havens is possible, but it requires coordination between countries, including rich countries, which account for the bulk of haven deposits (Zucman, 2014). Developing countries lose a significant share of their wealth to tax havens: Haven deposits account for between 20% to 30% of financial assets in many African or Latin American countries (Zucman, 2014). Developing countries lose around \$100 billion in corporate tax revenues to tax havens annually (UNCTAD, 2015).

But, because welfare states are coming under pressure in a global economy, achieving redistributory objectives only through the fiscal system may not be feasible, as argued by

²⁰ For instance, in Indonesia dividends and interest income are taxed at 10% and 20% respectively, which is substantially lower than the 30% top marginal tax rate which many dividend earners would face for their earned income. While capital gains are subject to standard personal income taxes, there is no withholding, so compliance is limited (World Bank, 2016a). As a result, only 5% of personal income tax revenues in Indonesia are from capital incomes with the rest coming from withholding on salaries.

²¹ Warren Buffett has famously said that he faces a lower tax rate than his receptionist (Mankiw, 2013), which can be explained by most of his income being in the form of dividends and capital gains.

Milanovic (2016). Instead, the distribution of market (or pre-fiscal) income also requires attention. Milanovic notes that while the levels of inequality in disposable income is similar between Western Europe and the advanced East Asian economies (Japan, Korea and Taiwan, China), the latter have much smaller redistribution through the fiscal system because they start from a less unequal distribution of market income. It is also striking that the East Asian countries that managed to create “growth with equity” during trade liberalization started from a relatively egalitarian land distribution and widespread basic education (Kanbur, 2015b). Market income is determined by an individual’s endowments with assets (here defined as labor and capital) and the returns to these assets (i.e. wages and rents), which I will discuss in turn.

Latin America, which stands out as the region that managed to reduce inequality, has extensively used conditional cash transfers that are redistributive and are designed to build human capital through their conditionality.²² While education has been a core part of the mainstream development economics toolkit, capital endowments have not received much attention. In the simple globalization model I outlined above, labor-saving technologies can have adverse distributional consequences precisely because capital is unequally distributed. If Bourguignon (2015) is right that capital has been a major beneficiary of globalization, then a more equal capital distribution would reduce some of globalization’s adverse consequences.

Policy proposals in this area fall into three categories: First, proposals that allow workers (or citizens more generally) to receive some of the benefits of automation, either through a profit sharing arrangement (Basu, 2016; Milanovic, 2016) or a sovereign wealth fund (Atkinson, 2016). Second, policies that enable the poor and middle-class to build up financial assets, which includes the formalization of ownership titles in developing countries. Third, and most important, are taxes on inheritance and inter-vivos transfers, which play almost no role in current fiscal revenues. Besides overcoming the injustices associated with the inter-generational transmission of advantage, capital-receipt taxes are less distortionary than other wealth taxes because they do not tax one’s own effort. To directly address the issue of capital endowments, Atkinson (2015) proposes to use some of the tax revenues to fund a minimum inheritance for every young adult independent of their family background.

Affecting the returns to these endowments is more difficult as they are the direct result of the market process. But it is important to recognize that governments interfere in the market process in a number of ways, two of which I want to mention in this context. First, governments directly affect the development of new technologies, for example through tax breaks for R&D or direct grants to universities and other research institutions (Atkinson, 2015). Therefore, they can influence the direction of technological change, such as the use of labor-saving technologies and the relative returns of skilled and unskilled labor and capital. Second, the rapid development of some East Asian countries such as Korea has often been explained by successful industrial policy.

²² At the same time, it is important to be clear that conditional cash transfers by themselves are too small to explain the trend reversal in Latin America (Kanbur, 2015b). Instead, the growth of low-skilled wages appears to explain most of the decline (Lopez-Calva and Lustig, 2010; Lustig et al., 2013; Cord et al., 2014).

While this has not worked in many countries, where it enriched a small elite, it needs to remain part of the policy toolkit, especially in the poorest countries (Bourguignon, 2015).²³ Freund (2016) summarizes the key elements of successful industrial policy, which include competition among multiple domestic firms and strict monitoring of export performance.

V. The future direction of global inequality

Given that C21 deals with long-run distributional forces, it is fitting to speculate about the long-run evolution of global inequality. According to Milanovic (2016), the future trend for global inequality depends on three forces: (1) Differences in mean income *across* countries (between-country inequality); (2) differences in income *within* countries (within-country inequality); and (3) differentials in population growth rates. While any forecast has a significant margin of error, population growth rates are substantially more accurate than the other two. Changing population patterns will put an upward pressure on global inequality, since the population in the poorest countries, notably in Africa, is growing faster than in the rest of the world (Bourguignon, 2016). While the most recent data on within-country inequality appears to show that it has reached a plateau, especially in the largest countries such as China, it would be premature to interpret this as a change in trend. This is because the period straddles the Great Recession and as always there exist measurement issues. Milanovic (2016) proposes a theory of Kuznets waves, which captures the up and down of within-country inequality in the long-run. The bottom line is that within-country inequality is not immutable, but depends on deliberate policy choices, and while the Great Recession and globalization place some constraints, domestic policy remains powerful.

The largest changes to global inequality are likely to come from changes in the between-component. Despite its decline, between-country inequality remains the dominant source of global inequality. Furthermore, in cross-country data, changes in country means tend to be larger than changes in within-country distributions.²⁴ In the long-run, the powerful forces of economic convergence, i.e. faster growth in poorer countries, are likely to continue.²⁵ But there are at least three reasons to be cautious: First, growth in Sub-Saharan Africa is volatile and has benefitted from favorable terms of trade, without structural reform.²⁶ Second, growth outside China,

²³ Korea's *chaebol* are also a case in point. While they played an important developmental role during industrialization (Khanna and Yafeh, 2007), they often use opaque pyramidal holding structures and the chairmen of the three largest *chaebols* have all been charged with crimes (Economist, 2015).

²⁴ A sizeable literature discusses the relationship between poverty reduction and growth and inequality, as reviewed by Ferreira (2012).

²⁵ One reason, though an unwelcomed one, is that the outlook for productivity growth in the developed countries is gloomy (Gordon, 2016).

²⁶ In 2015 it weakened to 3.5%, the lowest level in the last 15 years (Bourguignon, 2015).

especially in India, will become much more important for the continued reduction of global inequality.²⁷ Third, climate change places considerable uncertainty on any such growth projection.

Regarding the overall level of global inequality, Hellebrandt and Mauro (2015) predict a decrease in the global Gini of almost 4 percentage points by 2035, which is substantial but leaves global inequality at a high level. Their results also show that growth (in GDP per capita proxying for survey incomes) will be crucial: In a scenario where poor countries grow slower than the baseline projections, the Gini index declines only by 1 percentage point. In contrast, overturning the decline in global inequality would require an increase of around 6 percentage points in within-country inequality in all countries, which is substantial.²⁸

VI. Research agenda and concluding remarks

More and better data have to be the top priority for future research on inequality in developing countries. First, good quality data on living standards are still missing in a number of countries, especially in the Middle East, the African continent, the Caribbean and the Pacific. Recently, the World Bank committed to support countries such that all poor countries have a survey at least every three years (World Bank, 2015b). Second, in middle-income countries, where agriculture and own-consumption is becoming less important, more attention ought to be paid to income data, as opposed to consumption expenditure. Levels and trends in inequality can be different if they are measured in terms of income or consumption expenditure, especially if the growth has been concentrated at the top where expenditure might be a poor measure.²⁹ Third, very little is known about capital incomes in developing countries, since many income surveys do not even attempt to collect this information.

Finally, and closely related, the measurement of top incomes needs to be improved in developing countries. The administrative records that have been used in developed countries are not available for the developing world. The most innovative approaches to inequality measurement combine income information from administrative records with household surveys for other questions.³⁰ Broad-based income taxes will generate these administrative records, similar to Piketty's proposal

²⁷ Roughly speaking, when the average income in China exceeds the global average, growth in China will have a disequalizing effect on global inequality. This is likely to happen very soon, as Milanovic (2016) explains in detail.

²⁸ While it is not unprecedented for individual countries over a 20-year period, this is unlikely to happen in all countries in the world.

²⁹ This does not necessarily apply to the measurement of absolute poverty, such as the \$1 per day poverty estimated by the World Bank. Even though the importance of the agricultural sector is declining in these emerging economies, many of the poorest individuals will continue to live in rural areas and work in agriculture. Furthermore, monetary and non-monetary transfers may be underreported at the bottom in an income survey. For example, the US Current Population Survey fails to capture many transfer payments at the very bottom, when compared with administrative records (Meyer et al., 2015). As a result, consumption is often surprisingly high for individuals on very low or even zero incomes (e.g. Brewer et al., 2013 for the UK).

³⁰ For example, France recently began using register-based information (including tax records) for some questions in its EU-SILC survey (Burrigand, 2013).

for introducing an even very modest wealth tax. But more needs to be done to exploit those opportunities. The World Bank (and other international organizations), for example, often provide loans and technical assistance to support tax reforms in developing countries. It would be relatively easy to require governments to release (suitably anonymized) distributional statistics to their citizens.

Armed with better data, a number of important research questions can be addressed, including some very basic ones: What is the ‘true’ level and trend of inequality? Can the trends in the micro data and the national accounts be reconciled after accounting for capital incomes and the top of the distribution? What do corporate tax data tell us about the true extent of economic concentration and should it be a concern for competition authorities? How do capital income dynamics compare with the more frequently analyzed dynamics of labor incomes? How does the current system of taxes and transfers affect the distribution of income? Is that fiscal system optimal? How do households in different parts of the income and skill distribution interact with the global economy – as consumers, sellers of their labor, owners of capital – and how is this different in poorer and richer countries?

This essay has provided a global perspective on inequality in an attempt to complement Piketty’s analysis in C21. In contrast to the sharp increases in top incomes in Anglo-Saxon countries observed by Piketty and co-authors, inequality viewed from a global perspective appears to have stabilized or even fallen slightly, driven by convergence in average incomes across countries. After rising strongly in the 1980s and 1990s, inequality within the average developing country has fallen in the 2000s. These results are based on household surveys, which are known to underestimate top incomes, especially capital incomes. Furthermore, these surveys often use consumption expenditures, which might not capture increases in living standards at the top. Hence, although much more evidence has become available in poor countries, these results are subject to considerable uncertainty. Therefore, better data in developing countries remains a top priority to move forward the research agenda on inequality in these countries.

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