

## Between-Country Global Inequality and Demographic Change (Ketaksamaan Global Antara Negara dan Perubahan Demografi)

**Michele Bruni**

University of Modena and Reggio Emilia

### ABSTRACT

*This paper revisits the debate over between-country inequality with a focus on demographic factors. We argue that population growth has played an important role in facilitating per capita income convergence of middle- and high-income countries while leaving low-income countries behind relative to both the global average and the high-income countries. According to our assessment, the exceptional economic performance of China, in contrast to India, is the result not only of an extremely high rate of GDP growth but also of a very limited increase of total population. The second part of the paper suggests that the demographic transition process, affecting the three major age groups in their natural order, generates several interlinked challenges -- the education challenge, the employment challenge, and the migration challenge. And it is the capacity to successfully confront these challenges that partly explains the differential economic performance of the two Asian giants - China and India -- as well as a number of Low-Income Countries and High-Income Countries. In the next decades, the demographic transition will create a "demographic polarization" between rich countries, leaving them in a structural shortage of labour. On the other hand, poor countries will be affected by a structural excess of labour making mass migration unavoidable. Whether these contrasting forthcoming demographic shifts widen between-country gap per capita income gap will critically depend on the global governance of migration flows.*

*Keywords: Income inequality; demographic transition; economic growth; low-income countries; international migrations.*

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### ABSTRAK

*Kertas kerja ini meninjau semula perdebatan mengenai ketidaksamaan di antara negara dengan tumpuan kepada faktor demografi. Kami berpendapat bahawa pertumbuhan penduduk telah memainkan peranan penting dalam memudahkan pemusatan pendapatan per kapita bagi negara berpendapatan sederhana dan tinggi sambil meninggalkan negara berpendapatan rendah relatif dengan negara berpendapatan purata global dan tinggi. Menurut penilaian kami, prestasi ekonomi China yang luar biasa, berbeza dengan India, bukan sahaja hasil daripada kadar pertumbuhan KDNK yang sangat tinggi tetapi juga peningkatan jumlah penduduk yang sangat terhad. Bahagian kedua kertas kerja mencadangkan bahawa proses peralihan demografi, mempengaruhi tiga kumpulan umur utama mengikut susunan semula jadi mereka, menjana beberapa cabaran yang saling berkaitan -- cabaran pendidikan, cabaran pekerjaan dan cabaran penghijrahan. Keupayaan untuk berjaya menghadapi cabaran ini yang sebahagiannya menjelaskan perbezaan prestasi ekonomi dua gergasi Asia - China dan India -- serta beberapa Negara Berpendapatan Rendah dan Negara Berpendapatan Tinggi. Dalam dekad yang akan datang, peralihan demografi akan mewujudkan "polarisasi demografi" antara negara kaya, menyebabkan mereka mengalami kekurangan tenaga buruh secara struktur. Sebaliknya, negara miskin akan terjejas oleh lebih struktur buruh yang menyebabkan penghijrahan beramai-ramai yang tidak dapat dielakkan. Sama ada anjakan demografi yang berbeza yang akan datang ini melebarkan jurang antara negara jurang pendapatan per kapita secara kritikal bergantung kepada tadbir urus global aliran migrasi.*

*Kata kunci: Ketidaksamaan pendapatanl transisi demografi; pertumbuhan ekonomi; negara-negara berpendapatan rendah; migrasi antarabangsa*



## INTRODUCTION

The growing literature on income inequality is characterized by an emerging consensus that, in the last thirty years (compared to the previous 250), within-country inequality has increased while global inequality has declined (Atkinson 2015; Bourguignon 2015; Piketty 2014; Milanovic 2007, 2012a, 2012b, 2016; Lakner & Milanovic 2013; Stiglitz 2012). What drives inequality around the world remains, however, a matter of great debate with respect to both within-country inequality and global inequality. The extant literature has considered a range of factors and processes – economic, geographic, political and historical. This paper focuses on between-country inequality and analyse the role of a factor that has received relatively less attention: population growth.

We elaborate on this by discussing 4 country/regional case studies: (i) the success story of China, (ii) the contrasting case of India, (iii) the dismal case of Low-Income Countries (LICs) and (iv) the case of High-Income Countries (HICs). Our main message is that mass migration from the Global South is unavoidable and a rational management of migration flows could help the LICs to successfully confront the educational challenge (Crespo et al. 2014) and in turn open the way to economic growth and catch up with the rest of the world.

The paper contributes to the literature on income inequality in at least three aspects. Firstly, it provides an assessment of the role played by population growth in limiting the impact of economic growth on the reduction of income inequality in the poorest countries. Second, it suggests that a linkage between population growth and economic growth can be found discarding the aggregate approach and considering the capacity of a country to successfully face the educational challenge, the employment challenge, and the migration challenge created by the DT process. Additionally, it will be affirmed that the capacity of a country to face the educational and employment challenges does not depend only on its capacity to intervene on the education system and activate the correct employment and industrial policies but also on the characteristics of its DT (speed and depth) and the existing demographic and geopolitical situation of the planet. The third contribution relates to a suggestion regarding how LIC could start a process of catch-up by taking advantage of the special situation that will be created by a demographic phenomenon that has gone largely unnoticed, a growing demographic polarization between rich countries, that will be affected by a structural shortage of labour, and poor countries, that will be affected by a structural excess of labour. It will be argued that this demographic polarization will make mass migration unavoidable, but the positive impact of this phenomenon on the poor countries will depend on whether the HIC will understand it would

be in their advantage to deal with it in a rational and humane way.

The rest of the paper is organized as follows. The first section offers an overview of the debate on global inequality. It starts with a short survey of the recent literature on income inequality, outlining the major scholarly viewpoints from different schools of thought. It is followed by the summary of the academic debate on the link between population growth and economic growth. Building on this discussion, the following part critically reflects on the role of population growth in influencing between-country inequality by offering a long-view, looking at the 250-year long debate on the relationship between population growth and economic growth. This discussion pays special attention to “the Great Population Debate” (GNAT TV 2021). The second section is about economic growth through the lens of demographic change where we present descriptive evidence on the evolution of the per capita gross domestic product (GDP pc) of the four World Bank income groups from 1990 to 2020. This includes estimates on how much population growth has affected the evolution of their GDP pc based on 4 country/regional case studies. Data on two Asian giants - India and China – are considered separately throughout. The result of this analysis is then contrasted with analyses of the labour markets over the last twenty years across four income group countries. This section further tackles our main research question: does population growth foster or impede international income convergence, or is it just neutral? We first spell out a “theory” regarding the relationship between population growth and economic growth which we test descriptively in the later section. Building on the work of the proponents of the “demographic dividend” (Bloom & Williamson 1998; Bloom et al. 2003; Crespo et al. 2014), it is argued that to understand the complex relationship between population growth and economic growth, we have to focus on the evolution of the population age structure brought about by the demographic transition (DT). It is further argued that this process does not create windows of opportunities, but a series of interconnected challenges: the educational challenge, the employment challenge, and the migration challenge. The final section is conclusion.

## GLOBAL INEQUALITY: A RE-APPRAISAL

### A BRIEF SURVEY OF THE LITERATURE

In the last two decades numerous studies have been devoted to understanding the impact of globalization on income inequality (Atkinson 2015; Bourguignon 2015; Piketty 2014; Milanovic 2007 2012a 2012b 2016; Lakner & Milanovic, 2013; Stiglitz 2012). Some authors argue that globalization has benefited the rich

disproportionately, while others contest that it has reduced world income inequalities (Anand & Segal 2006). Everybody does however agree with Atkinson that:

*“... there was first a period when inequality within rich countries was falling but inequality between countries was widening, now replaced by a period when inequality within rich countries is rising but inequality between countries is narrowing ... Inequality within countries has followed a U-shaped and inequality between countries has followed an inverse U-shape.”* (Atkinson 2015: 42)

If it is true that the relative distance between countries has declined, the absolute distance has increased and, according to an OECD projection, it will continue to do so till 2057 (Atkinson 2015: 44). While the works of Atkinson and Piketty are devoted mainly to within-country inequality, Bourguignon and Milanovic stand out for approaching the problem from a more inclusive perspective, that of global inequality. Global inequality is defined *“as the level of inequality between all inhabitants of the world”*. It is therefore *“a rather complex combination of inequality between nations and inequality within nations* (Bourguignon 2017: 9) that *“can be formally considered as the sum of all national inequalities plus the sum of all gaps in mean income among countries”* (Milanovic 2016: 3).

Since it spans from the richest to the poorest of the world, global inequality is considerably higher than that observed in countries with the highest levels of inequality.

Milanovic argues that because the process of globalization has introduced new rules that it is imperative to re-examine income inequality not as national phenomenon only, as has been done for the past century, but as a global one (Milanovic 2016: 2). In other words, economic history of the world can inform the current discussion on global inequality so much so that an examination of global inequality over the past two centuries, and in particular during the past twenty-five years, is essential for understanding contemporary inequality patterns.

In general, both Bourguignon and Milanovic agree that the drop in global inequality registered from the end of the 1980s is, as Bourguignon puts it, *“both undeniable and sizable”* and that the great gap in standards of living that emerged between developed countries and emerging countries starting with the Industrial Revolution has begun to close. Milanovic has famously visualized this result by a reclining S curve (that became known as the Elephant Curve<sup>1</sup>), which shows that

*“the top 1 percent grew much richer between 1988 and 2008, thus adding to global inequality, but inequality was reduced by strong growth among wide section of the world population between the 40<sup>th</sup> and 60<sup>th</sup> percentile.*

*The graph thus suggest that overall, global inequality may have decreased. And indeed, we find that the global Gini value decreased from 72.2 in 1988 to 70.5 and then to around 67 in 2011”* (Milanovic 2016: 118.<sup>2</sup>)

In conclusion, the decline in income inequality, which appears more evident since the beginning of the century and represents an historical turning point, is due mainly to the rise of a “global middle class” most of whom are located in China (*“the great global equalizer”*), and other countries in resurgent Asia (India, Thailand, Vietnam and Indonesia), *“coupled with a slowdown in the West”* (Milanovic 2016: 122).

An interesting question is whether global inequality, that is income inequality among the citizens of the world, has been driven by within-country inequality or among country inequality or, as Milanovic puts it, by class or by location. By decomposing global inequality into these two components, Milanovic shows that while in 1820 class inequality had accounted for 80% of global inequality and geographic inequality for the remaining 20%, by around 1980 the situation was completely reversed. Therefore, the increase in global inequality registered during the XIX and XX centuries is to be imputed to the increasing divergence of mean incomes. In the following period the situation dramatically changed with global inequality driven, not by rising gaps among countries, but by within-country inequality. However, we still live in a world where the place in which we live or where we were born has a prevailing role in determining our lifetime income, an advantage that Milanovic calls *“citizenship rent”*.

This aspect is even more evident when we consider the situation of the poorest countries whose citizens certainly do not enjoy any rent but are subject to many types of economic exploitation and whose performance (as noted by Bourguignon; p.30) and as our analysis will confirm, has been so modest that their distance from the richest ones has increased not only in absolute, but also in relative terms.

Both Milanovic and Bourguignon discuss possible scenarios of global income inequality and consider policies that could favour their reduction. As it will become clear to those who will endure reading this paper, I believe that the issue of between -country inequality cannot be properly analysed and relevant policies properly discussed without considering a factor that has received little to no attention in the extant literature: population growth.

The next section will try to account for what seems to me a “theoretical anomaly” recalling the history of the 250-year-old debate on the relationship between population growth and economic growth, while the following section will provide an estimate albeit very basic of the relevance of population growth on the evolution of GDP per capita.

THE DEBATE ON POPULATION  
GROWTH AND ECONOMIC GROWTH

The evolution of GDP per capita is the result of the relative growth of GDP and population. However, the functional relationship between these two variables has generated heated debates and opposing answers throughout the last 250 years.<sup>3</sup> The first debate occurred in the second half of the XVIII century when Robert Wallace, a Scottish minister, proposed that the perfection of society carried with it the seeds of its own destruction. Creating a “perfect government” organized on an egalitarian basis is conceivable, but it would be, at best, temporary since “mankind would increase so prodigiously that the earth would be left overstocked and become unable to support its inhabitants” (Wallace 1761). The opposite view was expressed by Condorcet (1795) in France and by William Godwin (1793) in Great Britain. Godwin, in particular, contended that a population would never grow above its means of subsistence and that man’s infinite perfectibility would lead to a society in which people live prosperously and harmoniously without the need for laws and institutions.

Malthus, on the other hand, shared Wallace’s pessimistic vision. He contended that man’s behaviour is driven by two basic needs: sex and food. However, between the two, the power of reproduction is infinitely greater than the power of production (Malthus 1798). Malthus’ ideas were strongly opposed by Marx and Engels who could not accept the idea that the poor are the cause of their own poverty as for them poverty is due to the structure of the capitalist system (Marx 1862).

The first censuses conducted in France made evident that alongside population growth, there was also an improvement in socioeconomic conditions. This data brought Paul Leroy Beaulieu, a French economist and initially a firm Malthusian, to realize that Malthus’ “Law of Population” was incorrect and to produce a different interpretation of the relationship between demographic and economic growth (Paul Leroy-Beaulieu 1895). In the following 50 years three scholars (Warren Thompson 1929; Adolphe Landry 1934; and Frank Notenstein 1944) proposed a similar analytical scheme later known as the Demographic Transition (DT) which, following WWII, became the dominant view.<sup>4</sup>

This “theory” posits that the process of modernization triggers and continuously encourages a society to undergo a shift from a “traditional regime” characterized by high fertility and mortality to a “modern regime” characterized by low fertility and mortality. Therefore, it also results in transition from a situation of population explosion and rejuvenation to one of population contraction and ageing.<sup>5</sup>

An interesting interlude from the period when the DT theory was “discovered” was the 1937 discussion between John Maynard Keynes and the Polish economist Michał Kalecki. The former stated that the demographic

decline which at that time he thought inevitable could bring about also a decline of aggregate demand (Keynes 1937), while the latter in a more Keynesian way argued that:

*“What is important... is not an increase in the population but an increase in purchasing power. An increase in the number of paupers does not enlarge the market.”* (Kalecki 1939)

After WWII, the DT approach with its strong empirical and policy orientation resulted in the production of demographic analyses and projections which made evident that:

1. the world population was growing at unprecedented rates;
2. population growth was concentrated in Asia (India being the main culprit);
3. population growth was not due to an increase in fertility but to a smaller drop in the rate of birth relative to that of the rate of death.

The prevailing opinion, shared by a relevant number of economists (Coale & Hoover 1958), was that demographic growth could not be matched by economic growth. This vision was heralded also by the neo-Malthusians (Ehrlich 1968; Meadows et al. 1972) and by Margaret Sanger and feminist movements. It also found strong political support due to the rising fear that the population explosion taking place in underdeveloped countries would create poverty, which would beget communism, that in turn would destabilize the capitalist order. The conclusion to this line of reasoning was the necessity of reducing population growth through what was considered the only effective method, acting on fertility.

It was in this context that in 1966 US President Lyndon B. Johnson decided to make foreign aid dependent on the adoption of family planning programs, a decision immediately replicated by Japan, Sweden and the UK. This resulted in a dramatic increase in funding available to international organizations and private institutions in charge of implementing fully-fledged population policies.

The US did however fail to obtain a global commitment on reducing the population growth rate. At the 1974 Population Conference held in Bucharest, Third World countries headed by the USSR, China and the rest of the Eastern Bloc argued that what was needed were not pills and condoms but rather massive amounts of economic aid, a position best summarized by Karan Sing’s slogan “*development is the best contraceptive*”.

The Bucharest Conference represented a turning point in the Great Population Debate as it resulted in the US withdrawing from its leadership position at the head of the population movement.

The years following the Conference witnessed the adoption of public family planning policies and an expansion of public health services in many Asian countries, while Latin American countries instead favoured the intervention of NGOs to avoid an open contrast with the Catholic Church.

They also witnessed the enforcement of fully-fledged population policies<sup>6</sup> by India and China, which, however, had notable differences. On the one hand, China's one-child policy was the result of a national process of analysis and an intense political debate, alongside a powerful push for economic reform in a political phase characterized by a pragmatic and rational problem-solving approach (Greenhalgh 2005; Bruni 2022). On the other hand, India, had been under the pressure of the US and its allies to reduce the number of births since the 1950s. After more than 20 years of a voluntaristic approach to population control, India changed course by launching a campaign of compulsory sterilization<sup>7</sup> headed by Sanjay Gandhi, made possible by the state of National Emergency declared by his mother, Prime Minister Indira Gandhi.

Starting from the 1980s, the Great Population Debate began to lose its intensity as a series of events began to favour a very different scenario both in the US and at international level.

An early symptom of this shift was the appearance of a very influential book, *The Ultimate Resource* by Julian Simon (1981). Simon believed that the institutions humans set up allow them to avoid nature's traps and, more importantly, that people are resource creators, not resource destroyers. Taking a historical perspective, he claimed that empirical analysis showed no correlation between population growth and per capita income and that it was evident that humanity has always been able to solve problems of scarcity by either increasing the supply of natural resources or by developing substitutes for overused resources. Human ingenuity, he argued, is "*the ultimate resource*" that makes all other resources more plentiful. Therefore, population growth, far from being a hindrance to economic growth, is in fact the solution to resource scarcity and environmental problems.

The first dramatic change took place in 1984. At the second World Population Conference held in Mexico City, the Reagan administration announced its decision to revise the US' position on population control: to receive US government global family planning funding foreign NGOs were required to certify that they would not perform or actively promote abortion as a method for family planning, even when using non-US funds.

This new policy was motivated on both economic and moral grounds. At the economic level, the US' new position, clearly inspired by the work of Simon, was that the world was not facing a population crisis and that population growth was neutral with respect to economic growth. At the moral level, the US stated that

it did "not consider abortion an acceptable element of family planning programs".

The AIDS outbreak, the decision of the environmental movement to distance itself from the population movement in response to the harsh hostility the latter received from the Reagan administration, and the change of course undertaken by the feminist movement and human rights groups – which felt that more emphasis should be devoted to individual and, especially, women's health and rights – dominated the following years.

Consequently, the third International Conference on Population and Development held in Cairo in 1994 registered a real paradigm shift clearly shown in its Program of Action. The Program did not contain the phrase "population problem"; no demographic factor was identified as the principal cause of any of the issues, and more importantly it assigned an explicit feminist agenda to population programmes:

*"Advancing gender equality and equity and the empowerment of women, and the elimination of all kinds of violence against women, and ensuring women's ability to control their own fertility, are cornerstones of population and development-related programmes"* (Hodgson & Watkins 1997)

In the following decades population growth lost the centre stage as clearly suggested by the fact that no more global population conferences were held. However, in this period some interesting findings shed new light on the relationship between population growth and economic development (Fox & Dyson 2015).

Firstly, analyses of the remarkable economic trajectory of East Asian countries in the late 20th century suggested that a sizeable fraction of their impressive economic growth was attributable to high levels of savings and investment facilitated by earlier fertility declines. This was due to the fact that the change in the age composition of a population (more specifically the presence of a large percentage of the population in working age) creates a window of opportunity during which a country can potentially raise its level of savings and investment – a phenomenon now known as the "demographic dividend" (Bloom & Williamson 1998; Mason 2001).

In the second place:

*"in contrast to assessments over the last several decades, rapid population growth is found to have exercised a quantitatively important negative impact on the pace of aggregate economic growth in developing countries"* (Birdsall et al. 2001)

More recently it has also been shown that in the post-1980 data there exists a negative relationship between population and growth, which has become only stronger over time (Headey & Hodge 2009). However, in the last 20 years population growth and its implications have not

attracted much attention; demographers and economists have been focusing more and more on migration and ageing, while the international debate has been centred around climate change and global warming. This lack of interest also clearly emerges in the recent books on inequality.

#### BETWEEN-COUNTRY INEQUALITY AND THE ROLE OF POPULATION GROWTH

The previous analysis suggests that the reduction in global inequality is due to the economic growth registered by China, India and other Asian populous countries and its impact on the standard of living of the people close to the mean income. It also suggests that the between country-inequality has been decreasing, but the differential of the poorest countries has probably increased. These analyses, however, have not assessed the role played by population growth. This section aims to estimate the change in GDP pc of the four World Bank income groups with China and India analysed separately and verify the impact of population growth.

In the final part of this section, we will ascertain whether the labour market trends of the four World Bank income groups reflect and support our conclusions.

Table 1 reports the GDP pc at purchasing power parity for the planet, the four World Bank income groups [Low-Income Countries (LIC), Low-Middle income countries (LMIC), Upper Middle-Income Countries (UMIC), and High-Income Countries, (HIC)], China, and India for the period 1990-2020.<sup>8</sup>

The first element which clearly emerges is a substantial generalized improvement of standards of living. Between 1990 and 2020 the GDP pc of the planet has increased threefold (+208%) from 5,558 to 17,135 dollars. Furthermore, the GDP pc of the four income groups registered notable increases, with the highest growth registered by the two central groups (183% and 192% respectively) and the lowest values by the HIC (177%) and especially the LIC (161%). However, the rates of growth of all four income groups are lower than that of the world average. This paradoxical result is explained by the fact that China, and to a lesser extent India (the two most populous countries and among the

TABLE 1. World Bank income groups, China and India: GDP pc, PPP (current international USD), absolute values, as Percentage of world and High Income Countries values and total Percentage change (1990 to 2020)

	China	India	LIC	LMCI-India	UMIC-China	HIC	World
Absolute values							
1990	982	1,201	787	2,682	6,494	18,427	5,558
1995	1,861	1,573	845	2,985	7,033	22,515	6,581
2000	2,921	2,096	988	3,415	8,283	28,082	8,017
2005	5,054	2,953	1,248	4,517	10,907	34,274	10,164
2010	9,254	4,237	1,579	5,849	15,104	39,615	12,896
2015	12,898	5,465	1,765	6,728	17,518	45,696	15,140
2020	17,211	6,504	2,057	7,583	19,170	50,967	17,135
Percentage change							
1990-2020	1652.8	441.6	161.4	182.8	195.2	176.6	208.3
Percentage of world value							
1990	17.7	21.6	14.2	48.2	116.8	331.5	100.0
2020	100.4	38.0	12.0	44.3	111.9	297.4	100.0
Percentage of HIC value							
1990	5.3	6.5	4.3	14.6	35.2	100.0	30.2
2020	33.8	12.8	4.0	14.9	37.6	100.0	33.6

Source: elaboration on World Bank 2022

TABLE 2. World Bank four income groups, China and India; compound annual growth rates of GDP, population, and GDP pc; 1990-2020

	China	India	LIC	LMIC-India	UMIC-China	HIC	World
GDP	10.8	7.4	6.1	5.4	4.7	4.1	5.2
POP.	0.7	1.5	2.8	1.8	1.0	0.6	1.3
GDP pc	10.0	5.8	3.3	3.3	3.7	3.4	3.8

Source: elaboration on World Bank, 2022

biggest also in terms of GDP), have registered rates of growth respectively of 1,653% and 442%.

Considering the situation in relative terms, two elements emerge:

1. a moderate convergence toward the world average of the four income groups due to the low growth rates registered by HIC: the distance between high- and low-income groups as percentage of the world average has in fact declined from 317 percentage points to 285.
2. the relative distance of HIC and UMIC from the world average has declined while that of LMIC and LIC has slightly increased.

The situation of China and India is radically different. In 1950, the GDP pc of China was 17.7% of the world average, by 2020 it was slightly higher; that of India, on the other hand, increased from 21.6% of the world average in 1950 to only 38% by 2020.

In conclusion also our elaborations suggest a small convergence in between country inequality and a relative deterioration of the situation of poor countries.

A similar conclusion emerges when taking HIC as reference point. However, in this case the GDP pc of the UMIC and LMIC have relatively improved, while that of the LIC has relatively deteriorated with their GDP pc in 2020 being only 4% that of HIC. Again, the situation of India, and especially China, is quite different. The GDP pc of the former with respect to that of HIC has doubled (from 6.5% to 12.8%) and that of China has increased more than 6 times (from 5.3% to 33.8%).

At the same time, as it was to be expected, the absolute difference between rich and poor countries has enormously increased. For instance, the absolute

difference in GDP pc between LIC and HIC, has passed from USD 17,500 to USD 49,000.

Let's now move to the impact of population growth on the evolution of the GDP pc. Starting from the planet as a whole and considering the 1990-2020 period, the compound annual growth rate of GDP pc is a notable 3.8%, which however results from a rate of growth of total GDP of 5.2% and of total population of 1.3%. Moving to the four income groups, we can observe that both the rate of growth of GDP and that of population are inversely related to income level:

1. Going from the poorest to richest, the rate of growth of GDP declines from 6.1% for LIC, to 5.4% and 4.7% for the two middle income groups, to 4.1% for HIC.
2. Similarly, the rate of growth of population declines from 2.8% for LIC, to 0.6% for HIC, with LMIC and UMIC registering respectively a rate of growth of 1.8% and 1%.

It is therefore evident that demography has played an extremely important role in determining the evolution of between-country inequality: the high rates of GDP growth registered by the poorest countries have, in fact, been nullified by their high rates of population growth

At the same time the success of China is the result of both a very high rate of growth of GDP, in fact the highest one, and of a very low rate of population growth, in line with that of HIC. India has performed better than its fellow LMIC having registered both a higher rate of GDP growth and a lower rate of population growth. Its performance is, however, very modest with respect to China's.

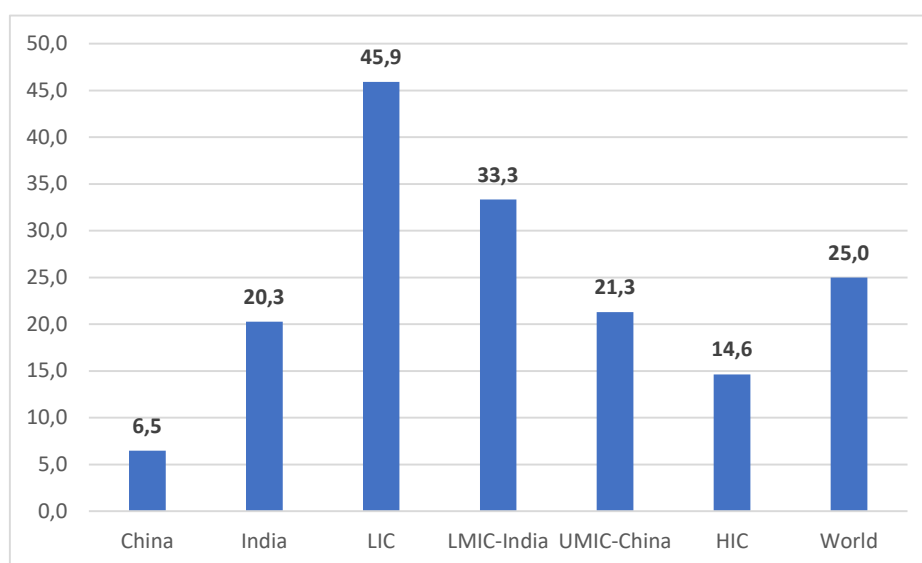


FIGURE 1. World Bank income groups, China and India; ratio of the average compound rate of growth of Population and GDP  
Source: elaboration on World Bank 2022

TABLE 3. Employment (formal, informal, and total), working age population and total population; absolute values in 2000 and 2020 (in thousand), absolute change and percentage change 2000-2020; rate of employment and rate of formal employment; 2000 and 2020

		Employment			Working age population	Total population	% Formal Employment	RoE	RoFE
		Total	Formal	Informal					
World	2000	2,618	912	1,706	3,870	6,141	34.8	67.6	23.6
	2020	3,325	1,305	2,019	5,084	7,792	39.2	65.4	25.7
	2000-2020								
	Abs. change	707	393	313	1,214	1,651.0	4.4	-2.2	2.1
	% change	27.0	43.1	18.3	31.4	26.9			
Low-income countries	2000	176	32	145	241	461	18.2	73.0	13.3
	2020	302	61	240	430	776	20.2	70.2	14.2
	2000-2020								
	Abs. change	126	29	95	189	315	2.0	-2.8	0.9
	% change	71.6	90.6	65.5	78.4	68.3			
Lower-middle-income countries	2000	824	208	616	1,362	2,283	25.2	60.5	15.3
	2020	1,138	352	786	2,005	3,098	30.9	56.8	17.6
	2000-2020								
	Abs. change	314	144	170	643	815.0	5.7	-3.7	2.3
	% change	38.1	69.2	27.6	47.2	35.7			
Upper-middle-income countries	2000	1,126	395	731	1,520	2,286	35.1	74.1	26.0
	2020	1,299	556	743	1,827	2,654	42.8	71.1	30.4
	2000-2020								
	Abs. change	173	161	12	307	368.0	7.7	-3.0	4.4
	% change	15.4	40.8	1.6	20.2	16.1			
High-income countries	2000	491	277	214	744	1,112	56.4	66.0	37.2
	2020	586	336	250	821	1,263	57.3	71.4	40.9
	2000-2020								
	Abs. change	95	59	36	77	151.0	0.9	5.4	3.7
	% change	19.3	21.3	16.8	10.3	13.6			

Source: elaboration on ILO 2020

To better grasp the scope to which population growth has affected the rate of growth of GDP pc, let's note that in the last thirty years the planet population's rate of growth has been  $\frac{1}{4}$  that of GDP. Therefore,  $\frac{1}{4}$  of the growth in production has been absorbed by population growth (Fig.1). At the income group level, the relative relevance of the demographic factor is inversely related to income with the poorest countries having almost 45.9% of the economic growth absorbed by population growth and the richest countries only 14.6%, with China registering the lowest value (6.5%) and India a value online with that of the UMI countries.

The evolution and the characteristics of the labour market of the four income groups can provide interesting additional clues to help us understand the impact of demography on the standard of living.

According to ILO (ILO 2020), in 2020 the working age population of the planet amounted to 5,1 billion and total employment to 3.3 billion. However, only 39% of

the employed had a formal employment, while around 2 billion people only had an informal job (Table 3).<sup>9</sup>

In the previous 20 years, WAP had increased by 1,651 million (+26.9%) and employment by 707 million (27%). The rate of employment (RoE)<sup>10</sup> had therefore slightly declined from 67.6% to 65.4%. On the positive side, formal employment had increased more than informal employment (18.3% vs 43.1%). However, also in 2020 only 1 person in working age out of 4 had a formal job.<sup>11</sup>

Moving to the four income groups (in this case including India and China), the rates of growth of the WAP present a very large spread inversely related to the income level: 10.3% in HIC, 20.2% in UMIC, 47.2% in LMIC, and 78.4% in LIC.<sup>12</sup> Also the percentage growth of employment presents a very large spread between a minimum of 19.3% in HIC and a maximum of 71.6% in LIC, with UMIC and LMIC at 15.4% at 38.1% respectively. It is interesting that only HIC have



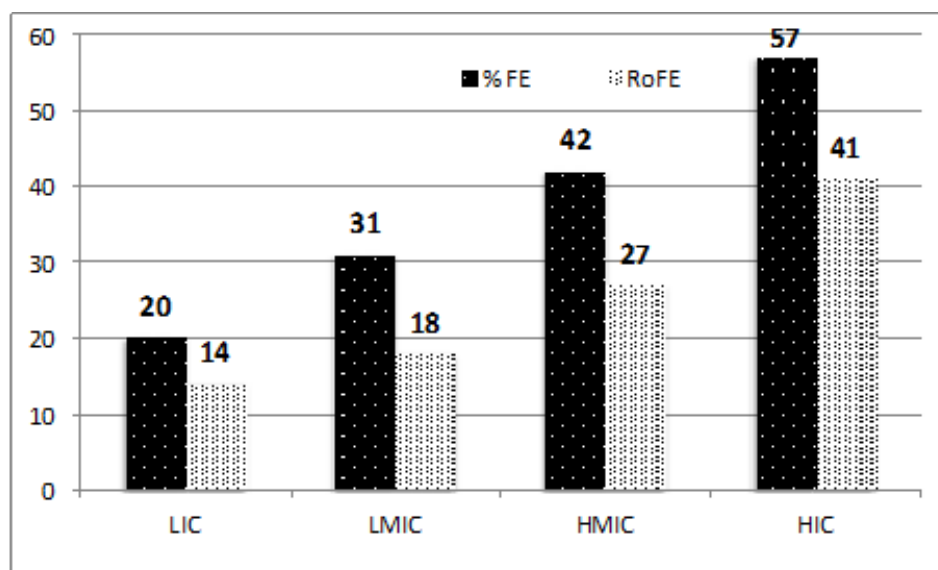


FIGURE 2. World Bank income group countries; percentage of formal employment on total employment and rate of formal employment 2020

Source: elaboration on ILO, 2020

registered a percentage growth of employment higher than that of WAP and therefore an increase in the rate of employment (from 66% to 71.4%).

Finally, in 2020, the percentage and the rate of formal employment (RoFE) show a strong inverse relation with the income level: the former ranges from 20% to 57.3%, the latter from 14% to 41% (Figure 2). It should be noted that the rate of formal employment is especially relevant since in poor countries the level of employment is inflated by the size of the agricultural sector<sup>13</sup> while survival pushes people to accept any kind of job and invent any kind of precarious activity.

In conclusion, the labour market data shows population growth's strong negative impact on the main labour market indicators, the rate of employment, and the rate of formal employment.

#### SUMMARY

Our analysis has confirmed that the modest relative between-country convergence registered in the last 30 years is due to the extraordinary economic growth of China and, to a much smaller extent, India.

It has also shown that:

1. The absolute and relative distance between the poorest countries and the richest ones has increased.
2. Population growth had an extremely relevant impact since it obliterated the positive difference between the GDP growth of the poorest countries and that of the richest countries and conditioned the different evolution of the labour market in countries at different level of income.

Therefore, the message that global inequality is declining, while formally correct, should not distract our attention from the extreme poverty affecting low-income countries. Moreover, it seems of vital importance that the role of demographic trends, which has almost completely disappeared from the literature, be brought back into the debate. However, to do so properly we have to explore in which way population growth impacts economic growth. This is the aim of second part of this paper.

#### ECONOMIC GROWTH THROUGH THE LENS OF THE DEMOGRAPHIC TRANSITION

It has been argued that to understand the complex relationship between population growth and economic growth, we should not only focus on total population size and growth, but also on the evolution of the population age structure brought about by the demographic transition (Bloom et al. 2003; Crespo et al. 2014). More specifically:

*“Because people’s economic behavior and needs vary at different stages of life, changes in a country’s age structure can have significant effects on its economic performance. Nations with a high proportion of children are likely to devote a high proportion of resources to their care, which tends to depress the pace of economic growth. By contrast, if most of a nation’s population falls within the working ages, the added productivity of this group can produce a “demographic dividend” of economic growth, assuming that policies to take advantage of this are in place. In fact, the combined effect of this large working-age population and health,*

*family, labor, financial, and human capital policies can affect virtuous cycles of wealth creation. And if a large proportion of a nation's population consists of the elderly, the effects can be similar to those of a very young population. A large share of resources is needed by a relatively less productive segment of the population, which likewise can inhibit economic growth*" (Bloom et al. 2003: xi and xii)

However, the demographic dividend is not automatic and to produce a sustained period of economic growth it is necessary to intervene in critical policy areas such as public health, family planning, education and to adopt measures that promote labour-market flexibility, openness to trade, and savings (Bloom et al. 2003)

This original vision of the demographic dividend has been extended by taking into consideration another element of population heterogeneity and a driver of economic growth, education, resulting in the introduction of the "education dividend" (Crespo et al. 2014).

A revisit of the DT and a definition of its phases functional to labour market analysis (Bruni 2022) bring us to further specify education's role with respect to economic growth while at the same time placing it in a different, more realistic light.

The DT is a process that brings countries from a situation of high fertility and high mortality to a situation of low fertility and low mortality, from a phase of rejuvenation to a phase of ageing, from a phase in which the population grows at increasing rates to one in which it decreases. The DT has the same impact on all the age groups that make up the total population (Bruni 2022) and more specifically, on all the three main age groups relevant for the functioning of the economic system: the population in the training phase (0-14), the population in the working phase (15-64), and the population in the post-working phase (65+) (Bruni 1988). The age group 0-14 (that for simplicity we assimilate to the population in the training phase) is the first to be affected by the DT. In the first phase of the DT, the share of the young can reach values close to 50%. Then, it is the turn of the population in working age and its share can reach values of up to 75%. Finally, it is the turn of the elderly, and their weight can reach and exceed a third of the total population. To be noted that in this phase ageing is accompanied by a phenomenon that is perhaps even more relevant, the decline of the WAP.

To fully understand the relationship between population change and economic growth, we should consider the impact that the DT has on the three main age groups relevant for the socioeconomic development of a country (the young, the WAP, and the elderly). Moreover, it seems more realistic to clearly state that the DT does not create windows of opportunities but three interconnected challenges:

1. the educational challenge;

2. the employment challenge;
3. the migration challenge.

Indeed, the economic success of a country depends also on its capacity to successfully deal with these challenges, in their natural order.

In the following sections we will test this idea analysing the cases of China, India and LIC that up to now have gone through the first two phases. To have the complete picture we will then consider the case of HIC and the different national and international context they faced when undergoing the first phases of the DT.

## COUNTRY AND REGIONAL CASE STUDIES

### CASE STUDY 1: CHINA

Since the Chinese Communist Revolution, China has succeeded in eradicating absolute poverty despite a dismal initial socioeconomic situation and massive population growth (China's population grew from around 550 million in 1950 to more than 1.4 billion in 2022). A World Bank report proposed a detailed analysis of the "historically unprecedented" speed and scale of China's poverty reduction (World Bank 2021). According to this report: "*China's poverty reduction story is primarily a "growth story"* and China's success can be attributed to two factors: "*(i) a broad-based economic transformation and (ii) a targeted support provided geographically disadvantaged areas and the lack of opportunities and later to individual households*" (World Bank, 2021; p 9). In substance, the report supports an institutional explanation of China's success with poverty reduction based on effective governance:

*"The process of economic transformation was facilitated by sound macroeconomic management, and substantial public investment in connectivity infrastructure, which supported the competitiveness of industries and favoured domestic market integration."* (World Bank 2021: 9)

The report acknowledges the DT's positive role, noting that China profited from a low fertility rate and a large demographic dividend. In fact, China's total fertility rate (TFR) declined very rapidly, falling from a value of 6 children per woman at the beginning of the 1970s to around 3 toward the end of the same decade (that is, before the implementation of the one-child policy) and fell below replacement level by the beginning of the 1990s (Figure 3).

This generated a very fast and quite extreme demographic evolution described in Figure 4 by the trends of the crude birth rate (CBR), the crude death rate (CDR), and the natural rate of growth (NRG). This data shows that China did complete the first phase of the DT toward 1965 when the NRG rate of growth peaked at 2.7%. The second phase, in which population increases

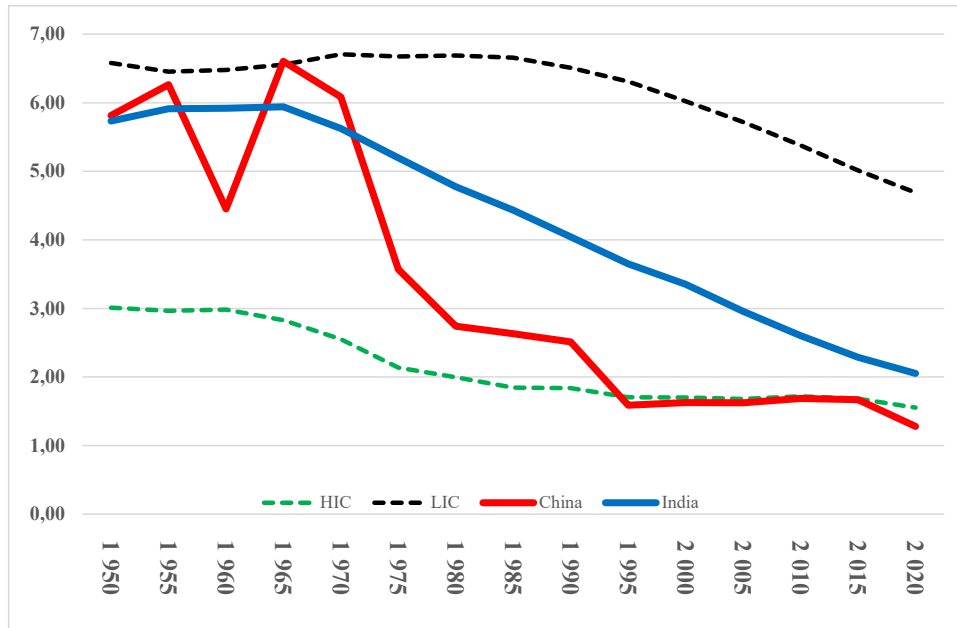


FIGURE 3. China, India, High Income Countries and Low Income Countries, total fertility rate: 1950-2020  
 Source: elaboration on UNDESA, 2022

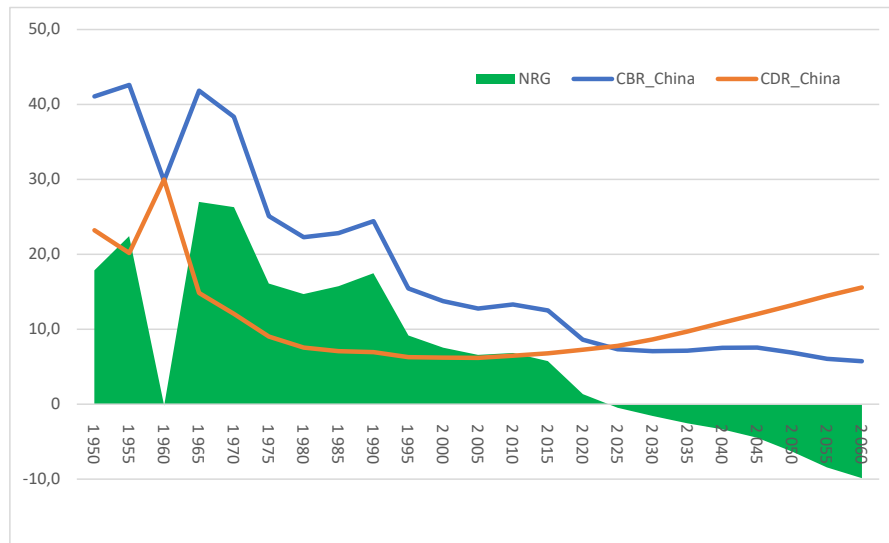


FIGURE 4. China; crude birth rate, crude death rate and natural rate of growth; 1950-2060  
 Source: elaboration on UNDESA, 2022

at declining rates<sup>14</sup>, will probably end in the next couple of years due to the dramatic impact that COVID-19 had on fertility<sup>15</sup>. The third phase during which the total population will decline is at present projected to last for the remainder of the XXI century.

The first phase of the DT lasted until 1975 (Fig. 5; Table 4 and Table 5). In this phase of rejuvenation, the first age group almost doubled, increasing from 189 to 369 million and reaching almost 40% of total population. In the following 40 years it was the WAP that almost doubled increasing from 519 million to

more than 1 billion while the number of young notably declined with their percentage of the total population falling to 18.1%. In the following 45 years the elderly are expected to increase by 268 million (reaching a share of almost 30%) and the WAP to decline by around the same amount.

These numbers make evident the dimension of the demographic challenges that China confronted in the last 70 years and will continue to confront in the following decades.

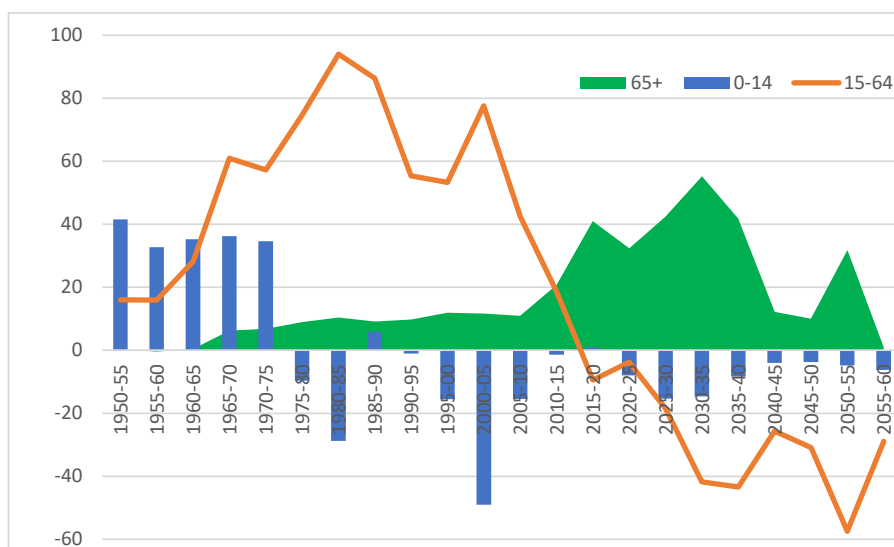


FIGURE 5. China; three main age groups; absolute five years changes (million) from 1950-55 to 2055-60  
*Source:* elaboration on UNDESA, 2022

TABLE 4. China; total population by main age group; values in million; selected years over the period 1950-2060

	0-14	15-64	65+	Total	0-14	15-64	65+
	Absolute Value				% composition		
1950	189	341	25	554	34.0	61.5	4.4
1975	369	519	38	926	39.8	56.1	4.1
2015	254	1022	131	1 407	18.1	72.6	9.3
2060	190	762	399	1 351	14.1	56.4	29.6

*Source:* elaboration on UNDESA, 2022

TABLE 5. China; total population by main age group; absolute changes (values in million); percentage changes; selected intervals from 1950-2060

	0-14	15-64	65+	Total	0-14	15-64	65+	Total
	Absolute change				Average yearly value			
	Total				Average yearly value			
1950-1975	180	178	13	372	7.2	7.1	0.5	14.9
1975-2015	-115	502	93	481	-2.6	12.6	2.3	12.0
2015-2060	-64	-260	268	-56	-1.4	-5.8	6.0	-1.2
	Percentage change				Average yearly value			
1950-1975	95.5	52.3	54.1	67.1	3.8	2.1	2.2	2.7
1975-2015	-31.2	96.7	247.0	51.9	-0.7	2.4	6.2	1.3
2015-2060	-25.2	-25.4	204.1	-4.0	-0.6	-0.6	4.5	-0.1

*Source:* elaboration on UNDESA, 2022

By now China has successfully overcome the first two challenges. Around 1950 only 15-20% of the 550 million Chinese citizens could be considered literate. China's efforts to provide basic literacy was extremely successful despite the average yearly number of children entering the training phase of life increasing from 14 million at the beginning of the 1950s, to 26 million by the beginning of the 1970s. According to Census data, the literacy rate increased to around 66% by 1964 and to 77% by 1982, when a report to UNESCO noted that:

*"China's efforts in anti-illiteracy are clearly the greatest experiment in mass education in the history of the world"* (Bhola 1985)

In the following years, the literacy rate continued to increase reaching 95.1% (97.5% for men and 92.7% for women). At the same time, the gross enrolment rate in higher education reached 54% in 2019. Finally, in 2019 the number of boys and girls graduating with a first level university degree reached a record 7.6 million, a value that exceeds the joint production of the US and the EU27, both at around 3 million. While the number of university graduates with Master and Ph.D. degrees (around 650,000) remains lower, the trend in enrolment shows that China will soon take the lead also in this metric. Let's finally recall that the number of Chinese students attending foreign universities in the last ten years has increased from 230,000 to 660,000.

Equally impressive has been the way in which China faced the employment challenge. From 1975 to 2013, the WAP, the source of labour supply, increased from 520 to 1,006 million. In the same period, the Chinese economic system created almost 400 million jobs at an average rate of around 10 million per year. All this occurred while the country was shifting from a command economy to a market economy with Chinese characteristics, from a backward agrarian economy to one with a growth model geared around consumption and characterised by services, higher value-added manufacturing, and technological innovation, as well as by an increasing substitution of tangible components of production such as land, labour and physical capital by intangibles such as innovation and technology (Hill 1999).

There is no doubt that the success of China in eliminating poverty and reducing the relative distance in GDP pc with HIC can be ascribed to the capacity of the Chinese government to adopt, in a very pragmatic and timely manner, deep economic reforms that stimulated high rates of economic growth. However, it seems to me also evident that a central role has been played by China's capacity to provide its young people with increasingly higher education levels and, subsequently, with a quantitatively and qualitatively coherent labour demand.

In substance, China successfully faced the first two demographic challenges created by the DT while

they emerged. Now a third challenge is awaiting China, the immigration challenge, but before dealing with this issue let us consider the Indian case.

#### CASE STUDY 2: INDIA

As China, India has also eradicated extreme poverty (Bhalla et al. 2022) starting from a similar socioeconomic situation and despite more pronounced population growth. However, India's performance in terms of catching up with HIC has been much less impressive and its relative position with respect to China has also notably worsened. In 1950, India's GDP pc was higher than that of China, in 2020 it was only 38% of China's. Does the specific evolution of the DT in India and how New Delhi approached the first two demographic challenges provide a possible explanation (Wolf et al. 2011; Golley & Tyers 2011)?

The first relevant difference that emerges with respect to China is that the TFR has fallen at a much slower rate (Fig. 3). In 1950, the TFR of both countries was around 6 children per woman, but by the end of the 70s, while China's TFR had already halved, in India it was still equal to 4.75 children per woman. This was despite the country adopting population policies since the beginning of the 1950s, which at first were voluntary and then became harsh and compulsory. Moreover, India's TFR is only now approaching replacement level, while in China it fell below this threshold around 1995.

This has had numerous consequences. Firstly, from 1950 to 2020 India's population increased much more than China's (291% vs 160%). Secondly, this has slowed down the DT so that the first phase of the DT ended only around 1985, resulting in the NRG of India's population remaining constantly above 2% until that year. Finally, the second phase of the DT will last well beyond 2060 in India (Fig. 6).

The population in compulsory education age increased till the beginning of the XXI century and since the second half of the 1960s the pronounced growth of the children in school age overlapped with a sustained growth of WAP (Fig. 7). Therefore, from 1970 to 2005 India had to face at the same time a notable increase of both the population in education age and of the population in working age. The latter then increased even in a more pronounced way from 2005 to 2015 when the absolute average yearly growth was of around 15 million.

The way India faced the education and employment challenges has been certainly much less successful with respect to China. At the beginning of the 1950s India's adult literacy rate (15+) was in line with that of China, but its progress has been much slower. It reached 40.8% in 1981 and it was only 69.3% in 2017, with a notable gender differential (men 78.8%, women 59.3%) (Government of India 2020).

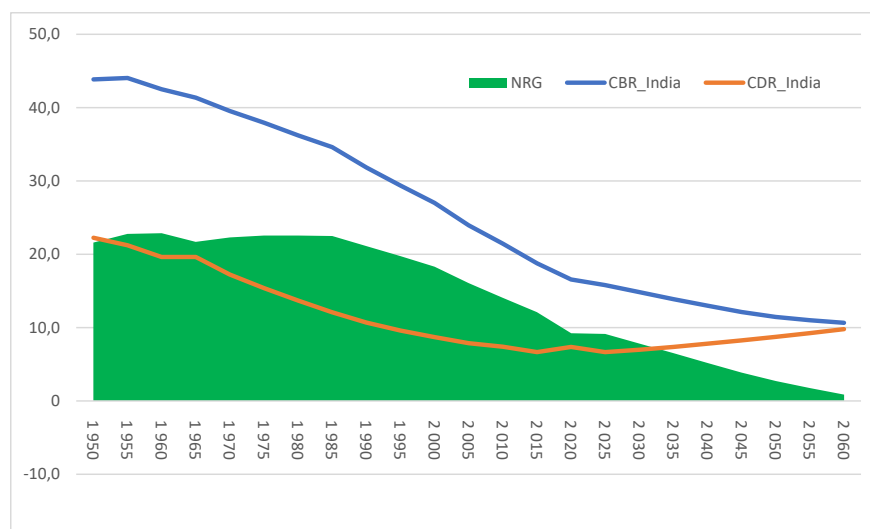


FIGURE 6. India; crude birth rate, crude death rate and natural rate of growth; 1950-2060  
 Source: elaboration on UNDESA, 2022

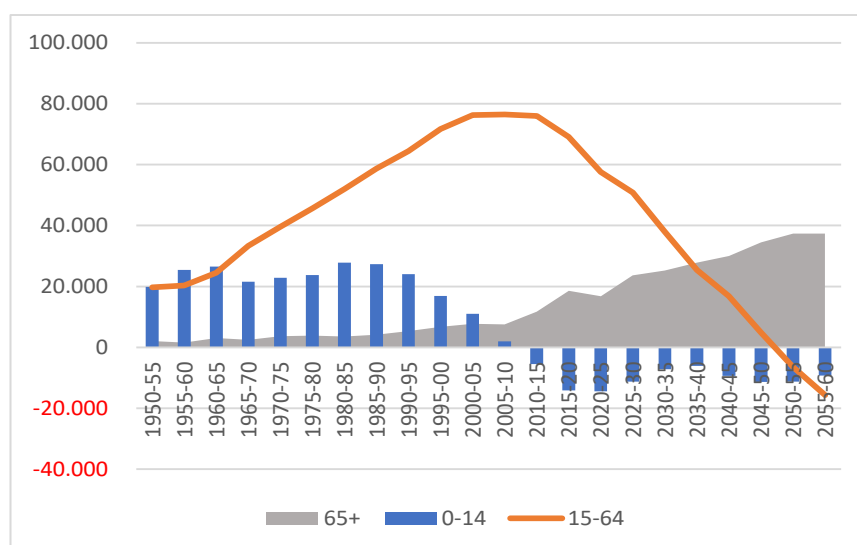


FIGURE 7. India; three main age groups; absolute five years changes (million) from 1950-55 to 2055-60  
 Source: elaboration on UNDESA, 2022

TABLE 6. India; total population by main age group; values in million; selected year for the period 1950-2060

	0-14	15-64	65+	Total	0-14	15-64	65+
	Absolute Value				% composition		
1950	135	211	11	357	37.9	59.0	3.1
1965	207	275	18	500	41.4	55.0	3.6
2005	382	717	55	1,155	33.1	62.1	4.8
2020	365	939	93	1,396	26.1	67.2	6.7
2060	284	1,110	326	1,720	16.5	64.5	18.9

Source: elaboration on UNDESA, 2022

Also, the other indicators show that the progress of India's educational attainment has been much more limited than that of China. In 2011, only 46% of the population between the ages of 25 and 64 had completed primary education, 29% upper secondary education, and 11% tertiary education. Moreover, opposite to what tends to happen in most countries, in India the educational attainment remains higher for young men than for young women. (OECD)

A lack of suitable data does not allow us to fully appreciate India's capacity to match the growth in working age population and therefore its potential labour supply. Based on the information available we can however safely state that India's performance in employment creation has certainly been much lower respect to that of China. In the wake of the pandemic, according to official data (Indian Ministry of Statistics 2021), the total RoE (15 and above) was 47.3% with a huge gender differential (71% vs 23.3%), a situation confirmed by the 25-59 age group (50.3% total; 75,1% men and 25% women).

This data does not suffice to prove the thesis that the key factor that allows for an emerging economy to close the relative gap with developed economies is the capacity to successfully face the first two demographic challenges in their natural order, but it is nevertheless quite suggestive.

#### CASE STUDY 3: LOW INCOME COUNTRIES

At the beginning of the 1950s, the TFR of today's LIC was in line with that of China and India (Fig. 3). However, differently from what happened in the two demographic giants and especially China, the TFR of the LIC remained above 6 till the beginning of the century. The demographic situation of these countries failed to attract the attention, and therefore the development aid of Western countries during the Cold War as their consideration was instead centred on those countries whose underdevelopment was seen as a menace to democracy and Western-led international order. Obviously, this was not the case for the twenty-eight countries presently classified as LIC as at that time they had an irrelevant demographic weight and many of them were just starting to heal from the wounds of colonialism. Moreover, it was only at the 1984 Mexico Conference that, while the US took the position that population growth was neutral, the majority of the African delegation reversed their previous pronatalist position and uniformly expressed concern over the consequence of rapid population growth. (Amy Ong Tsui 2001).

Therefore, it is not surprising that in 1994 Sub-Saharan countries came in last in an analysis measuring the strength of family planning programs (Ross & Mauldin 1996). As suggested by the evolution of their TFR, the decline in CBR was very slow and much

slower than that of the CDR (Fig 8). Consequently, the NRG progressively increased reaching and maintaining values around 2.9% basically up to now. The result: an unprecedented demographic explosion that brought the population of this group of countries from 120 million in 1950 to 719 million in 2020, and, in absence of migration, their population will reach 1.6 billion in 2060. While during the 1950s the population of this small group of countries increased by around 4 million per year, it now increases by 25 million and, in absence of migration, its absolute growth will peak at around 30 million by the middle of this century (Fig. 9 and Tables 8 and 9).

LIC completed the first phase of the demographic transition just before the turn of the century and, in absence of migration, will remain in the second phase for the rest of the XXI century. Figure 9 suggests the size of the educational and employment challenges that the LIC had to face in the last 70 years. The number of pupils in education age increased on average by 2 million a year in 1950, by 4 million in 1990, by 6 million at present, a value that will not substantially diminish for the next 15 years. It is evident that for these countries it was and still is impossible to successfully face this potential demand for education as clearly shown by the little available data. Moreover, as we have previously seen, they are also failing to successfully confront the employment challenge that will become more and more pronounced: the number of young people entering working age every year has presently reached 10 million and it will double in the next 30 years.

Should we conclude that these countries have no possibility to close their gap with the more developed regions? To answer this question, we will first analyse the DT of the HIC and the incoming demographic polarization of the planet.

#### CASE STUDY 4: HIGH INCOME COUNTRIES

The European countries that first experienced the process of "modernization" induced by the Industrial Revolution were also among the first to experience the DT. For these countries, which have now reached the status of HIC, the first and second phases of the DT were relatively long and not too pronounced. Moreover, the educational and employment challenges they had to face were less demanding because at that time the educational requirements of the labour market were lower and the employment challenge manifested itself when a large portion of the European structural surplus of labour could successfully migrate to other continents, attracted by the employment opportunities present (or forcefully created) in them. HIC have already entered or are on the verge of entering the third phase of the demographic transition of the WAP, during which the national source of labour supply declines. Furthermore, in this case the demographic situation has been and is

TABLE 7. India; total population by main age group; absolute changes (values in million); percentage changes; selected intervals from 1950-2060

	0-14	15-64	65+	Total	0-14	15-64	65+	Total
	Absolute change							
	Total				Average yearly value			
1950-1965	72	65	7	143	4.8	4.3	0.4	9.5
1965-2005	175	442	38	655	4.4	11.0	0.9	16.4
2005-2020	-18	222	38	242	-1.2	14.8	2.5	16.1
2020-2060	-80	171	233	324	-2.0	4.3	5.8	8.1
	Percentage change							
	Percentage change				Average yearly value			
	0-14	15-64	65+	Total	0-14	15-64	65+	Total
1950-1965	53.1	30.6	60.4	40.1	3.5	2.0	4.0	2.7
1965-2005	84.5	160.6	211.7	130.9	2.1	4.0	5.3	3.3
2005-2020	-4.6	30.9	68.4	20.9	-0.3	2.1	4.6	1.4
2020-2060	-22.0	18.2	249.6	23.2	-0.5	0.5	6.2	0.6

Source: elaboration on UNDESA, 2022

TABLE 8. LIC; total population by main age group; values in million; selected years for the period 1950-2060

	0-14	15-64	65+	Total	0-14	15-64	65+
	Absolute Value				% composition		
1950	82	109	7	197	41.4	55.3	3.3
1965	120	148	8	276	43.4	53.6	3.0
2005	318	408	24	750	42.4	54.4	3.2
2020	421	614	39	1,074	39.2	57.2	3.6
2060	634	1,454	172	2,260	28.0	64.4	7.6

Source: elaboration on UNDESA, 2022

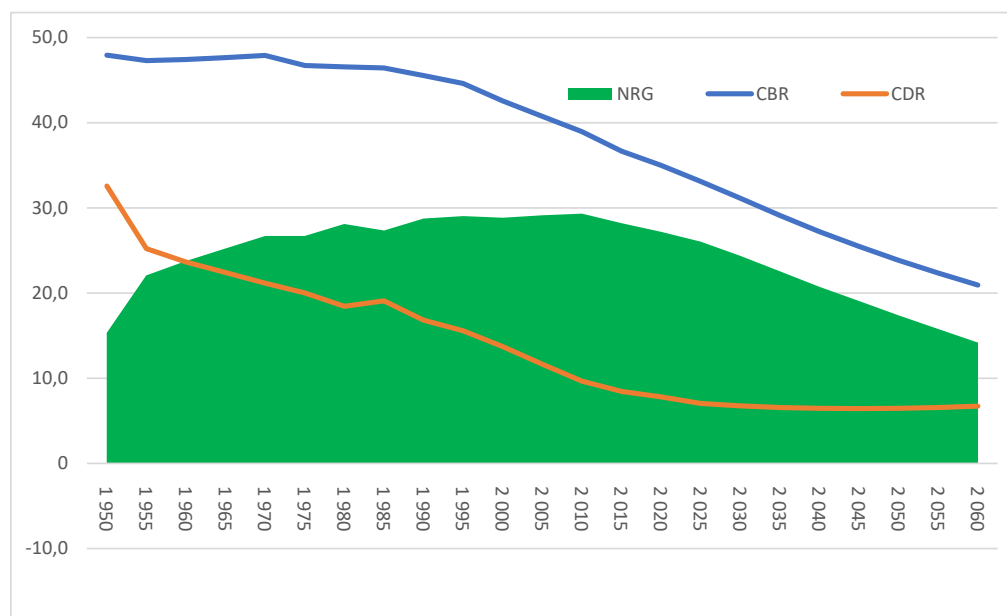


FIGURE 8. LIC; crude birth rate, crude death rate and natural rate of growth; 1950-2060

Source: elaboration on UNDESA, 2022



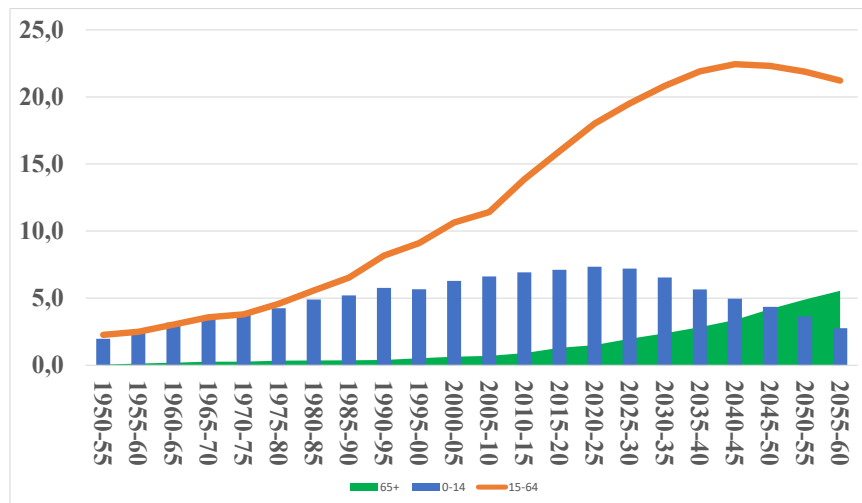


FIGURE 9. LIC; three main age groups; absolute five years changes (million) from 1950-55 to 2055-60  
 Source: elaboration on UNDESA, 2022

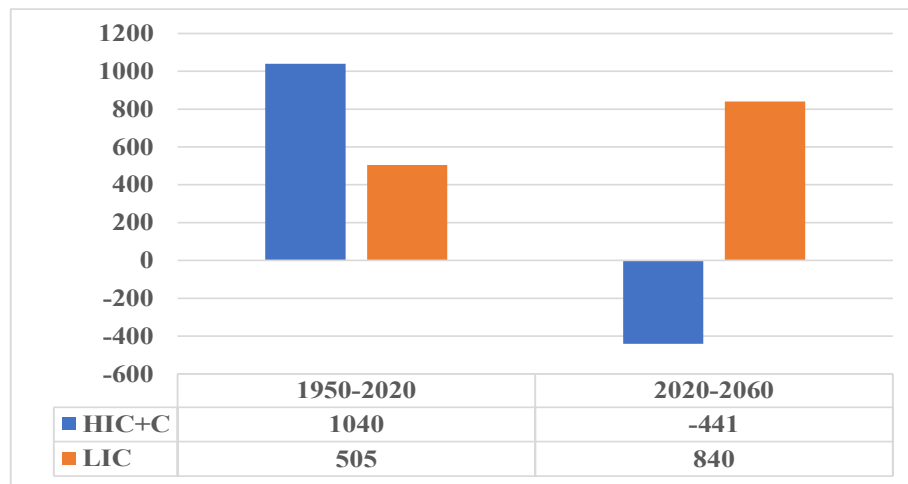


FIGURE 10. Working age population; HIC+ C and LIC; absolute change between 1950 and 2020 and between 2020 and 2060  
 Source: elaboration on UNDESA, 2022

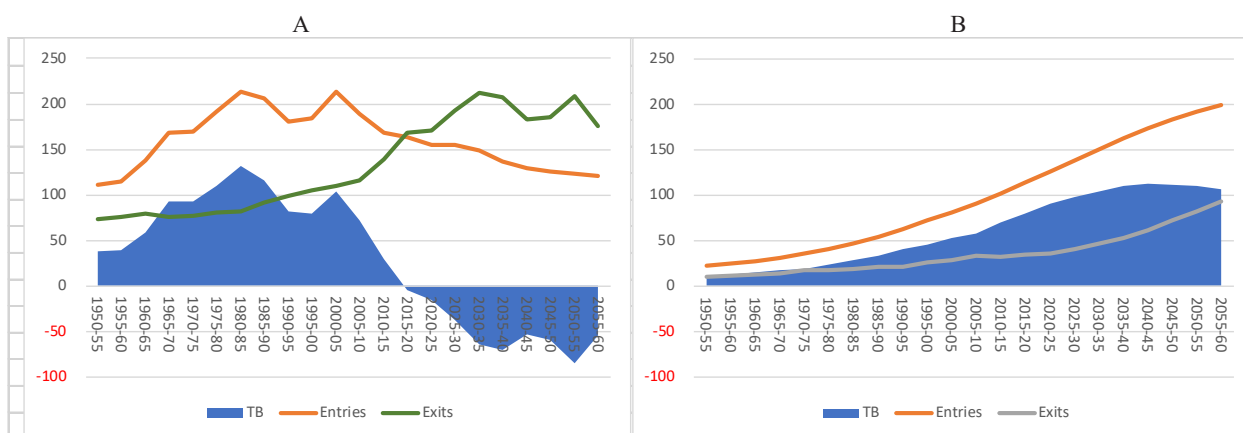


FIGURE 11. Working age population; generational entries, generational exits and balance; five-year absolute values in million; from 1950-55 to 2055-60  
 Source: elaboration on UNDESA, 2022

favourable since their need of foreign labour is paralleled by an unlimited supply present in other countries so that, despite the political opposition and the obstacles created by their governments, their labour markets have been supplied with the human resources that they needed, albeit mainly through “illegal” methods.

The most evident example is provided by Europe where the population in working age increased by 3 million between 1990 and 2020 while its migrant stock grew by 38 million.

#### DISCUSSION ON DEMOGRAPHIC POLARIZATION, INTERNATIONAL MIGRATIONS AND BETWEEN-COUNTRY INEQUALITY

The DT has affected different countries at different moments over the past 250 years, the poorest ones having begun the DT process only very recently. This has contributed to an increasing demographic polarization between countries where the potential labour supply is declining in some while exploding elsewhere. In the next 40 years, the WAP of HIC+China<sup>16</sup> will decline by almost 450 million at an average rate of 11 million per year. At the same time the WAP of LIC will increase by 840 million at an average rate of 21 million per year (Fig. 10).

The figures 11.A and 11.B illustrate the dynamics of the phenomenon by portraying the WAP generational entries, generational exits and generational balance in the two groups of countries, from 1950 to 2060. In HIC+China, the natural balance of WAP has just become negative as a consequence of the parallel decline of entries, due to the decline of births, and increases in exits due to ageing, and the balance will remain negative for the rest of the period considered. During the same period, as a consequence of the increase in the

number of births, the WAP of LIC has been growing at an increasing rate and will continue to do so till the middle of the century.

Given the above, immigration is unavoidable for the first group of countries (characterized by a structural shortage of labour) while emigration is necessary for the second group of countries (characterized by a structural excess of labour). Without immigration, HIC cannot continue along their path of socio-economic development, while in the latter without emigration unemployment would skyrocket and poverty would increase generating social and political unrest (Bruni 2022).

However, this situation offers a win-win solution transforming a global problem into an opportunity. For this to happen the countries affected by a structural shortage of labour should: (i) accept the evidence that their labour markets need foreign labour; (ii) estimate how many migrants they need by educational level and skill; (iii) agree with one or more countries affected by a structural excess of labour to organize and co-manage migration flows quantitatively and qualitatively coherent with their needs; (iv) organize the transfer of migrants from the country of origin to the place where they are needed; (v) organize their placement in the labour market while supporting the social integration of their families.

Moreover, and this is a fundamental aspect, recipient countries should finance and give technical support to the education and training systems of departure countries. In this way they will recognize the value of the human resources they will drain from departure countries and ensure that migrants will have the skills they need (Bruni 2017, 2022). The data presented in Fig. 11 suggests that rich countries could need and absorb up to 550-600 million of migrants in the next 40 years. This would have far-reaching consequences helping both rich

TABLE 9. Low Income Countries; total population by main age group; absolute changes (values in million); percentage changes; selected intervals from 1950-2060

	0-14	15-64	65+	Total	0-14	15-64	65+	Total
Absolute change								
	Total				Average yearly value			
1950-1965	72	65	7	143	4.8	4.3	0.4	9.5
1965-2005	175	442	38	655	4.4	11.0	0.9	16.4
2005-2020	-18	222	38	242	-1.2	14.8	2.5	16.1
2020-2060	-80	171	233	324	-2.0	4.3	5.8	8.1
Percentage change								
	Percentage change				Average yearly value			
1950-1965	53.1	30.6	60.4	40.1	3.5	2.0	4.0	2.7
1965-2005	84.5	160.6	211.7	130.9	2.1	4.0	5.3	3.3
2005-2020	-4.6	30.9	68.4	20.9	-0.3	2.1	4.6	1.4
2020-2060	-22.0	18.2	249.6	23.2	-0.5	0.5	6.2	0.6

Source: elaboration on UNDESA, 2022

and poor countries to face the demographic challenges created by the DT. It will provide rich countries with the human resources needed by their labour markets allowing them to proceed along a path of economic growth and support the growing ageing-induced needs of their pension and welfare systems.

In poor countries emigration could have even more far-reaching consequences. Firstly, it would speed up the DT accelerating the fall in the number of births and probably acting also on the TFR. The financial and technical resources put in the education and training systems by the destination countries could help them face the education challenge, which represents a fundamental preliminary step in promoting economic growth and social development. Mass emigration would then substantially reduce the potential labour supply, while a growing quantity of remittances, if effectively used, could provide important financial support for fostering economic growth and increase labour demand with the final result of reducing the risk of skyrocketing unemployment and its potential impact on civil unrest and political turmoil.

### CONCLUSION

In conclusion, massive migration flows could represent the solution for how the planet could begin to undertake a path of GDP per capita convergence between the poorest countries and the richest ones. The present attitude of HICs toward migrations suggests that the solution proposed in this paper is unrealistic. However, other scholars such as Milanovic have argued in favour of international migrations as a measure to reduce between-country inequality. While his supply side approach largely differs from the one presented in this paper and his analysis does not fully factor in future demographic trends and their labour market implications, some of Milanovic considerations are relevant. In fact, he sees migrations as an integral part of globalization, he also acknowledges that the best way to help the world's poor is to encourage unrestricted movement of labor. However, the proposed solution of "circular migration" is much less convincing. Implementing this idea requires major governance reforms and mass mobilization. To quote *Abrahamian (2017)*, the solution involves "...a diplomatic kind of workaround that attempts to respect the wishes of voters who feel screwed without sacrificing the gains that relatively poorer individuals have seen from globalization and an overall move towards more equal incomes between people in nations worldwide." Implementing circular migration requires partly giving up some "basic political ideals, like democracy and equal representation" and in the current geopolitical climate, it is unlikely to be achieved.

Nonetheless, in the coming decades, as the more developed countries are affected by structural shortage

of labour, there will be a strong upward pressure on wages and an increase in the illegal immigration. Considering the new reality, HICs should, alongside mobilizing public opinion towards foreign migrants, also pursue the much needed institutional change in migration governance. Such reforms and measures will also have the added dividend of triggering a new cycle of migration induced economic growth in LICs and in turn narrow the between-country inequality in per capita income.

### NOTES

- <sup>1</sup> The curve had already been used in Lakner and Milanovic (2013); it was proposed again by Alvaredo et al. (2018).
- <sup>2</sup> These results are based on a more detailed and precise set of income data by decile for more than 100 countries. The estimates of global inequality obtained from these sources are higher than previous estimates because the new data include more countries and more income groups (Milanovic, 2016: 123).
- <sup>3</sup> For a more detailed discussion of this topic see Bruni, 2022; chapters 2 and 3.
- <sup>4</sup> For a discussion of the reasons that determined the success of this approach see Szreter, 1993
- <sup>5</sup> For a revisit of the DT functional to labour market analysis see Bruni, 2022, Chapter 4.
- <sup>6</sup> Population policies represent a conscious government effort to influence the determinants of population change. They are not an invention of the post WWII period. During the 1930s pronatalist policies were adopted in a number of countries. Sweden and France were pioneers in providing financial rewards and services in kind to families with children, especially to larger families. Similar policies were applied with equal or greater vigour in fascist Italy and Nazi Germany (Demeny, 2003).
- <sup>7</sup> This led to more than 18 million sterilizations being performed in camps that only rarely met minimum hygiene requirements; the majority of sterilizations were unwanted and carried out using physical and moral violence.
- <sup>8</sup> The classifications are updated each year on July 1 and are based on GNI per capita in current USD (using the Atlas Method exchange rates) of the previous year (i.e., 2020 in this case). The income thresholds are kept fixed in real terms by adjusting them for inflation. The last thresholds of the four groups are the following: Low Income, 1046; Lower-middle income, 1046-4095; Upper-Middle, 4,096-12,695; High Income, 12,695. Therefore, India is included in the LMIC and China in the UMIC.
- <sup>9</sup> 1.4 billion were free-lance and/or contributing family workers and 600 million wage and salaried employees in an informal employment.

- <sup>10</sup> The rate of employment (E/WAP\*100) and the percentage of people in formal employment (FE/WAP\*100) provides a measure of the two concepts.
- <sup>11</sup> The percentage of formal employment with respect to total employment increased from 45.3% to 52.8%.
- <sup>12</sup> To be noted that the rate of growth of working age population is higher than that of total population in all income groups, except in high-income countries, which are more advanced along the path of the demographic transition.
- <sup>13</sup> It is often the case that the majority of people living off the land are classified as employed, independently of their contribution to the production process.
- <sup>14</sup> The increase in the number of births registered in the 1985-1990 period, when the one child policy was already active, was due to the lowering of the minimum legal age of marriage.
- <sup>15</sup> It was previously forecasted to end around 2032, 2033.
- <sup>6</sup> More countries will enter in the third phase of the DT of WAP, so that the global decline of WAP will be higher.

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#### REFERENCE

- Abrahamian, A.A. 2017, Winter. An economist's case for open borders. *Dissent Magazine*. <https://www.dissentmagazine.org/article/branko-milanovic-economist-proposal-open-borders-migration-citizenship>
- Alvaredo, F., Chancel, L., Piketty, T., Saez, E. & Zucman, G. 2018. The elephant curve of global inequality and growth. *AEA Papers and Proceedings* 108: 103–108.
- Anand, S. & Segal, P. 2008. What do we know about global income inequality? *Journal of Economic Literature* 46(1): 57–94.
- Atkinson, A.B. 2015. *Inequality: What Can be Done?* Harvard: Harvard University Press.
- Bhalla, S., Bhasin, K. & Virmani, A. 2022. Pandemic, poverty, and inequality: evidence from India. SSRN Scholarly Paper N. 4092620.
- Birdsall, N., Kelley, A.C. & Sinding, S. 2001. *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. OUP Oxford.
- Bloom, D., Canning, D. & Sevilla, J. 2003. *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change*. Santa Monica: RAND Corporation.
- Bloom, D.E. & Williamson, J.G. 1998. Demographic transitions and economic miracles in emerging Asia. *The World Bank Economic Review* 12(3): 419–455.
- Bourguignon, F. 2015. The Globalization of Inequality. In *The Globalization of Inequality* edited by François Bourguignon. New Jersey: Princeton University Press.
- Bruni, M. 2022. *China, the Belt and Road Initiative, and the Century of Great Migration*. Newcastle upon Tyne: Cambridge Scholars Publishing.
- Bruni, M. & Migration Data Analysis Unit of CAPMAS 2017. *Egypt Labour Market Report*, 226. International Organization for Migration (IOM). <https://publications.iom.int/books/egypt-labour-market-report>
- Bruni, M. 2013. Labor market and demographic scenarios for ASEAN countries (2010-35). Education, skill development, manpower needs, migration flows and economic growth. In *Department of Economics (DEMB)* (No. 0006). UniMORE, Department of Economics “Marco Biagi.” <https://ideas.repec.org/p/mod/dembwp/0006.html>
- Cimoli, M., Dosi, G. & Stiglitz, J.E. 2009. *Industrial Policy and Development: The Political Economy of Capabilities Accumulation*. United Kingdom: Oxford University Press.
- Coale, A.J. & Hoover, E.M. 1958. *Population Growth and Economic Development*. Princeton University Press.
- Condorcet, J.-A.-N. de C. Marquis de. 1795. *Outlines of an Historical View of the Progress of the Human Mind: Being a Posthumous Work of the Late M. de Condorcet*.
- Crespo Cuaresma, J., Lutz, W. & Sanderson, W. 2014. Is the demographic dividend an education dividend? *Demography* 51(1): 299–315.
- Demeny, P. 2003. Population Policy Dilemmas in Europe at the Dawn of the Twenty-First Century. *Population and Development Review* 29(1): 1–28.
- Dosi, G. & Nelson, R.R. 2009. Technical Change and Industrial Dynamics as Evolutionary Processes. In *LEM Papers Series* (N. 2009/07; LEM Papers Series). Laboratory of Economics and Management (LEM), Sant’Anna School of Advanced Studies, Pisa, Italy.
- Ehrlich, P.R. 1968. *The Population Bomb*. Sierra Club/Ballantine Books.
- Fox, S. & Dyson, T. 2015, December 22. *Part 2: Is population growth good or bad for economic development?* IGC. Retrieved May 27, 2021, from <https://www.theigc.org/blog/part-2-is-population-growth-good-or-bad-for-economic-development/>.
- GNAT TV (Director). 2021, July 29. *GMALL Lectures—Whatever Happened to the Population Explosion?* <https://www.youtube.com/watch?v=aBgxtr4MRgM>
- Goda, T. & García, A.T. 2017. The rising tide of absolute global income inequality during 1850–2010: is it driven by inequality within or between countries? *Social Indicators Research: An International and Interdisciplinary Journal for Quality-of-Life Measurement* 130(3): 1051–1072.
- Godwin, W. 1793. *Enquiry Concerning Political Justice: And Its Influence on Morals and Happiness*. G.G. and J. Robinson, Paternoster-Row.
- Golley, J. & Tyers, R. 2011. Contrasting Giants: Demographic Change and Economic Performance in China and India. In *Economics Discussion / Working Papers* (No. 11–04; Economics Discussion / Working Papers). The University of Western Australia, Department of Economics. <https://ideas.repec.org/p/uwa/wpaper/11-04.html>
- Greenhalgh, S. 2005. Missile Science, Population Science: The Origins of China’s One-Child Policy. *The China Quarterly* 182: 253–276.
- Headey, D.D. & Hodge, A. 2009. The effect of population growth on economic growth: a meta-regression analysis

- of the macroeconomic literature. *Population and Development Review* 35(2): 221–248.
- Hill, P. 1999. Tangibles, intangibles and services: a new taxonomy for the classification of output. *The Canadian Journal of Economics / Revue canadienne d'Économie* 32(2): 426–446.
- Hodgson, D. & Watkins, S.C. 1997. Feminists and Neo-Malthusians: Past and present alliances. *Population and Development Review* 23(3): 469–523.
- ILO. 2020. *World employment and social outlook: trends 2020*. International Labour Office.
- Indian Ministry of Statistics. 2021. *Women and Men in India, 2020* (No. 22; p. 178). Government of India Ministry of Statistics and Programme Implementation. <http://164.100.161.63/publication/women-and-men-india-2020>
- Kalecki, 1939. *Essays in the Theory of Economic Fluctuations*. Allen & Unwin.
- Keynes, J.M., 1937. Some economic consequences of a declining population. *Eugenics Review* 29: 13–17
- Landry, A. 1934. *La révolution démographique: Études et essais sur les problèmes de la population*. Institut national d'études démographiques.
- Lakner, C. & Milanovic, B. 2013. *Global Income Distribution: From the Fall of the Berlin Wall to the Great Recession*. World Bank.
- Leroy-Beaulieu, P. 1895. De la vraie loi de la population. *L'Économiste Français*: 416–417.
- Malthus, T.R. 1798. *An essay on the principle of population: As it affects the future improvement of society, with remarks on the speculations of Mr. Godwin, M. Condorcet and other writers*.
- Marx, K. 1862, June 18. Marx to Engels in Manchester. Stuttgart; Der Briefwechsel zwischen F. Engels und K. Marx.
- Mason, A. 2001. *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized*. Stanford University Press.
- Meadows, D.L., Meadows, D., Randers, J. & Behrens, W.W. 1972. *The Limits to Growth*. Universe Books.
- Milanovic, B. 2007. *Worlds Apart: Measuring International and Global Inequality*. Princeton University Press.
- Milanovic, B. 2012a. Global inequality recalculated and updated: The effect of new PPP estimates on global inequality and 2005 estimates. *The Journal of Economic Inequality* 10(1): 1–18.
- Milanovic, B. 2012b. *Global Income Inequality by the Numbers: In History and Now*. World Bank.
- Milanovic, B. 2016. *Global Inequality: A New Approach for the Age of Globalization*. Belknap Pr.
- Milanovic, B. 2018, November 19. Migration Into Europe: A Long-Term Solution? *Social Europe*. <https://socialeurope.eu/migration-into-europe-a-long-term-solution>
- Navaneetham, K. & Dharmalingam, A. 2012. A review of age structural transition and demographic dividend in south asia: opportunities and challenges. *Journal of Population Ageing* 4(5): 281–298.
- Notestein, F.W. 1944. The future population of Europe and the Soviet Union. *Population projections 1940–1970. Economica*, 11(43): 161.
- Piketty, T. 2014. *Capital in the Twenty-First Century*. The Belknap Press of Harvard University Press.
- Simon, J.L. 1981. *The ultimate resource*. Princeton University Press.
- Stiglitz J. 2012. *The Price of Inequality*. Allen Lane.
- Szreter, S. 1993. The idea of demographic transition and the study of fertility change: a critical intellectual history. *Population and Development Review* 19(4): 659–701.
- Thompson, W.S. 1929. Population. *American Journal of Sociology* 34(6): 959–975.
- Tsui, A.O. 2001. Population policies, family planning programs, and fertility: the record. *Population and Development Review* 27: 184–204.
- Wallace, R. 1761. *Various Prospects of Mankind, Nature and Providence: 1761. To which is Added Ignorance and Superstition, a Source of Violence and Cruelty, a Sermon Preached in the High Church of Edinburgh, January 6, 1746*.
- Williamson, J.G. 2013. Demographic Dividends Revisited. *Asian Development Review* 30(2): 1–25.
- Wolf, C., Dalal, S., DaVanzo, J., Larson, E.V., Akhmedjonov, A., Dogo, H., Huang, M. & Montoya, S. 2011. Population Trends in China and India: Demographic Dividend or Demographic Drag? In *China and India, 2025* (pp. 7–36). RAND Corporation. <https://www.jstor.org/stable/10.7249/mg1009osd.10>
- World Bank. s.d.. *Four Decades of Poverty Reduction in China: Drivers, Insights for the World, and the Way Ahead*. 76.

Michele Bruni  
 Department of Economics, “Marco Biagi”  
 Centre for the Analysis of Public Policies  
 University of Modena and Reggio Emilia  
 Foro Boario  
 via Jacopo Berengario, 51, 41121 – Modena, ITALY.  
 Email: mbruni.44@gmail.com

