

# The Challenges of the End of the Demographic Transition

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## INTRODUCTION

The twentieth century was a decisive one in the history of humanity, marked by a demographic explosion and an unprecedented improvement in living standards of most of the world's population. It was also the century in which we realised that we inhabit a closed ecosystem; therefore, environmental limitations were no longer local problems but global ones. The last century was also noted for the culmination of the so-called "Great Divergence" (Pomeranz 2000), where the bulk of material economic progress was concentrated in a small group of countries now considered developed; meanwhile, the rest of the world grew, but much more slowly. A gradual convergence process only began to take root in the final decades of the century, led by China and other Asian countries.

The twenty-first century is the period in which we will have to struggle with the consequences of these phenomena. First and foremost, world population will continue to grow significantly, even though growth will be concentrated in the countries and groups that currently have lower levels of income. The income convergence process is consolidating, and it now impacts several billion inhabitants in

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1. This work is the result of research carried out while the authors were members of the BBVA Studies Service. We are grateful for this opportunity and would like to thank Fernando Gutiérrez and José Luis Escrivá for their support. We would also like to thank Angie Suárez and Stephanie Alfaro for their assistance.

developing countries, rather than the hundreds of millions in developed countries as was the case in the twentieth century. However, there is a very real risk that Malthusian restrictions will reappear, especially in the fields of fossil fuels and possibly in food, and the impact of human activity on the climate could thwart the material progress of humanity, possibly even endangering its very survival (Livi-Bacci 2012).

A second consequence is that the proportion of old people in the global population is set to increase dramatically, first in the most economically advanced countries, but followed closely by the rest of the developing world.

Another significant change is that the globalisation so widespread in the goods and financial services market may well impact the job markets with greater force. Currently, most skilled workers face a global market in some professions (e.g. health services and mining) and migration restrictions have been relaxed for these sectors. But we will also see migration driven by demographic imbalances: the richest countries will see their working-age populations diminish and their proportion of elderly people increase dramatically, so they are going to require immigrants. Traditionally, these people have come from nearby poor countries (from Latin America to the US, from the countries adjoining the Mediterranean to the north of Europe) or from countries with colonial links. But future migrations will not be limited in the same way because lower transport costs allow them to come from very distant regions, from very poor countries that still have high rates of population growth and a multitude of young people looking for opportunities.

In short, the world in the coming thirty or forty years will be very different from the present one, or the one that our parents and grandparents knew. The abovementioned changes will require very dramatic adjustments affecting not just the quality of life of future generations, but also their very existence. Over these decades, humanity will face challenges without precedent, except perhaps those faced at the start of the “Atomic Age.” We will explore some of these challenges later.

## COMPLETING THE DEMOGRAPHIC TRANSITION

One of the most dramatic changes of the twentieth century was the increase in the population. The century began with a little more than 1.5 billion inhabitants, of which just over one third lived in what we now consider to be developed countries. At the close of the century, world population had exceeded 6.1 billion and fewer than 20 percent lived in that same group of developed countries.

The latest United Nations demographic forecasts point to a world population that is continuing to grow; it is set to reach over 9.3 billion by the middle of the twenty-first century and

exceed 10 billion at the end of it. Whilst these forecasts appear fairly certain for the next twenty or thirty years (due to the inertia of demographic phenomena) the reliability of the figures drops when we look beyond this period. What is clear is that this growth will be concentrated in developing countries, and that the present group of developed countries will represent a smaller proportion of the world's population.

The Industrial Revolution set humanity on a path of progress towards better living conditions, bringing about a demographic revolution. This phenomenon is the result of the so-called *Demographic Transition* (DT) that began with the economic and social advances brought with the extension and consolidation of the Industrial Revolution and its processes of urbanisation (Livi-Bacci 2012). Previously, the global population had grown at an almost imperceptible rate (an average of 0.6 percent since the start of the Christian Age), with cycles marked by famines, wars and plagues, and slow technological advances. It was a “Malthusian” world with limited progress, frequently marked by catastrophes that meant following generations had to cope with severely limited resources (Clark 2007).

The pre-DT period was characterised by very high birth rates as well as high rates of infant mortality because of food shortfalls, and generally poor hygiene and sanitary conditions. The start of the DT was marked by a drop in infant mortality rates thanks to small improvements in hygiene and food for mothers and newborn babies. The current DT process<sup>2</sup> started at the end of the eighteenth century in the most advanced European countries, gradually spreading towards the periphery of the continent at the turn of the nineteenth century. It reached the rest of the world at the beginning of the twentieth century, although in regions with the most underdeveloped economies in Africa and central Asia, the transition began in the middle of the last century. This first stage was characterised by a sharp increase in the growth rate of the population.

A second stage then began, usually taking a more gradual form marked by a drop in birth rates: for countries that were the pioneers in this process, these lower birth rates are largely explained by the fact that more children survived per family. Other increasingly relevant factors were the urbanisation process and the growing numbers of women joining the job market, which along with newly available contraceptive methods and cultural changes that made maternity an option rather than a destiny. Population growth was highest at the start of this second stage.

The DT ended when the population stabilised thanks to lower birth rates prevailing over lower death rates. This occurred with significant overlap because there was a long period in which the total number of reproductive-age women kept increasing, even after fertility rates (the

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2. Livi Bacci (2012) distinguishes at least the two previous transitions: when organized hunter-gatherer clans formed, and when sedentary populations settled and developed around agriculture.



are economically further behind may reach the end of their DT towards the close of this century.

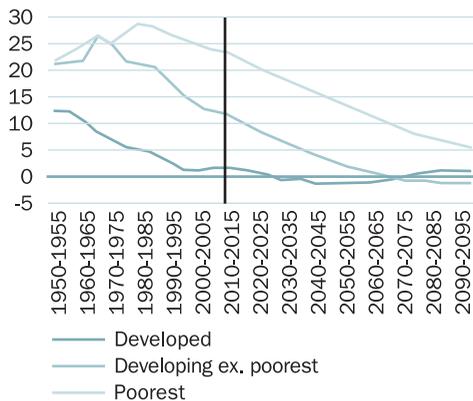
The graphs below demonstrate the difference between birth and death rates for the three groups of countries according to their level of development. We have chosen four countries that represent these three groups in some way, plus China, which as we will see, is having a very unusual DT.

The most advanced DCs in terms of DT are Japan and the southern European countries. We will elucidate many of the changes and challenges this group of countries is facing, taking the examples of Japan and Spain. One notable difference between both these countries is their very different immigration patterns, which have allowed them to defer the impact of this process. The MIDCs that are at a very advanced stage in their DT will be represented by Mexico, while Ethiopia is our example of a country still in the initial stages of DT.

The graph on the left shows that DCs are reaching a stage at which the population stops growing.<sup>3</sup> The MIDCs reached the point of maximum difference in the second half of the sixties, and they should finish their DTs in the middle of this century. By contrast, VPCs have spent less time at the point of maximum difference and their DTs are slower. This is why, according to the UN central forecast, they will not complete their DTs this century.

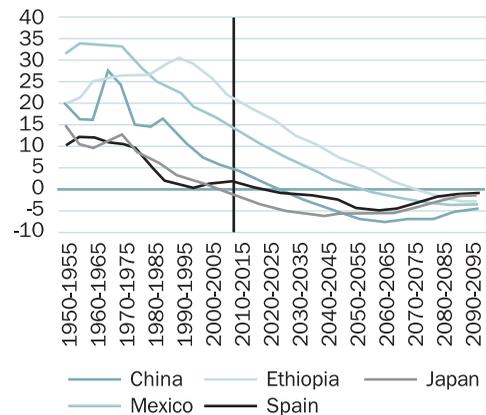


**Graph 2.1. Global panorama, by group of countries**



Source: United Nations 2011

**Graph 2.2. Selected countries**



Source: United Nations 2011

3. The United States is the main exception to this rule, partly thanks to immigration and the fact that the first generation of immigrants have higher birth rates.

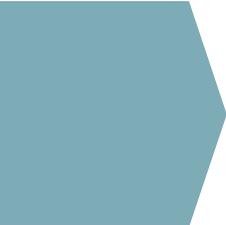




slanted by the accelerated ageing of China, but the situation is common to this group, with a gap of one or two decades.

Clearly, the DT challenges are different for each group of countries. VPCs lack infrastructure; basic services such as health and education are precarious and coverage is deficient. Social security is a privilege, so the central concern is to cope with the large number of children and young people who require health and primary education, and then grant them access to jobs. However, these countries also need to lay the foundations for social security institutions. Policies on birth control and childcare will be key to achieving individual economic development as well as avoiding global social and environmental disasters.

At the other end of the spectrum, DCs must confront the changes arising from population ageing, with its consequent impact on job markets and the demand for services, especially in health and extended care. These countries may have the institutional capacities to move forward, but most of them need to make significant adjustments to ensure the solvency of their social security systems. Moreover, the growing political weight of the largest age groups could complicate these changes. These countries will require migrant workers, although they will definitely maintain or even restrict their selection criteria.



**The twenty-first century will mark the end of the demographic transition, seeing the population stabilise and then age. This trend will hit the most developed countries first; those that are economically further behind may reach the end of their transition towards the close of this century**

MIDCs still have a window of opportunity of a few decades in which they must try their hardest to make the most of the growth stimulated by their increasing working-age population — who will be at their peak in terms of saving capacity — in order to build inclusive and solvent social security systems. At the same time, they need to invest in educating large groups of young people to help them navigate the increasingly demanding job markets they will face. Meeting these complex and very diverse demands will create a great deal of tension in countries that are not yet rich and with institutions that are often precarious. Those who make progress on these fronts can aspire to join the DCs this century. Those who fail could fall into zero-sum equilibrium, with average income levels, and many social and political tensions.

In essence, there are four aspects to the demographic evolution, both in terms of its timing and its geography, that are set to transform the world as we now know it. In “The shift in the global economic map,” we analyse the changes in the economic power map and growth hotspots. Right now, over 80 percent of the global population and practically 100 percent of the

population increase forecast for the twenty-first century are concentrated in developing countries. These countries are closing the gap in terms of living standards, measured by income per capita. This process is in its early stages and there is a long way still to go, but the global economic weight of these countries is already changing radically, displacing the focal points of demand that promote economic growth. Meanwhile, this is putting unheard-of pressure on resources and on the planet's capacity to absorb waste. At the same time, the increase in the proportion of the elderly, a phenomenon that is more accentuated in developed countries, will also affect global consumption patterns for goods and, above all, for services.

In “Impact on job markets” we will review the impact on the job markets. Countries in the advanced stages of DT will have to tackle challenges springing from the growing scarcity of manpower, especially of young people; they will also have to meet the needs of an older population who will need to stay in active employment for longer. By contrast, VPCs — which are still facing a significant increase in their working age populations — will have to educate their young people and then create jobs that facilitate economic development. MIDCs will face the unprecedented challenge of a scarcity of manpower in the coming decades, which could hit the two extremes of the job market: the most skilled workers and workers with fewer options who are willing to take any job just to contribute to the family income. These differences in the evolution of local job markets will promote a greater globalisation of employment opportunities.

In “Ageing and the risks for the social security system” we analyse the challenge of adapting social security systems to the massive increase in the proportion of retired people as compared to assets. The richest countries that adopted their distribution systems at the beginning of the twentieth century now find their solvency under threat; developing countries have to build social protection systems that are sufficiently broad and solvent so as to meet the needs of an elderly population that will increase dramatically in the coming decades.

These changes will have profound consequences on the distribution of power and the possibilities for conflict, a topic we explore in “Some political consequences of global ageing.”

## THE SHIFT IN THE GLOBAL ECONOMIC MAP

All medium and long-term predictions highlight the important role emerging economies are going to play in promoting global economic growth over the coming decades. Over the next fifteen to thirty years, many of these countries will bridge the economic gap — measured by average income per inhabitant — between them and current developed economies. The 2008 economic crisis not only revealed this phenomenon; it has also magnified it.

To quantify these effects, we projected income evolution by country and country distribution across different income bands, measuring the mass of consumers resulting from the process of

economic and demographic change. We combined this with United Nations' demographic projections, enabling us to estimate the number of inhabitants per country who exceeded a gross annual income of USD 10 000 (in 2012 currency) by country and by groups of countries.<sup>5</sup>

More DCs in the final stage of their DTs, such as Japan, will see their relative weight in the global economy decline.<sup>6</sup> Living standards in these countries will remain high, but their contributions to the increase in global demand will be marginal. Consumers will increasingly concentrate their spending on services such as health and entertainment, and they will spend less on others such as formal school education and transport. A higher proportion of older people also means that more people will stop saving for their retirement and will start to withdraw their savings to finance their consumption. This will have a considerable impact on the distribution of savings in the world and therefore of current account deficits and surpluses. Globally, the biggest net savers today are China, Japan and several emerging countries from Asia, along with oil-exporting countries, Germany and the Nordic countries. By contrast, the US, southern Europe and many emerging countries receive savings from overseas, which they use to finance their current account deficits. This map is almost certainly going to change, partly because Japan, Germany, China and other surplus countries are more advanced in their DTs.

Then we have the MIDCs,<sup>7</sup> which are fairly advanced in their DTs but still have between twenty and thirty years of positive growth of the working-age population ahead of them. Income distribution in these countries is usually quite unbalanced, and most of their people are in the low and middle-income categories. However, a combination of economic and demographic growth will probably spark a large increase in the mass of consumers, as economic growth translates into better job opportunities and higher real salaries. The protagonists of this change will be urban middle-aged families, with few children possibly of school or university age. Therefore, their consumption patterns will be even more focused on clothing, transport, education and eating, both outside the home and in. Over the projection period, the relative demand for services will increase, approaching the consumer patterns of developed countries such as Spain.

As we mentioned in the previous section, China, an MIDC, is taking its own path due its great size, fast economic growth and very unusual demography. This means it is now entering the final stage of its DT: its working-age population will soon start to dwindle, and the number of people aged 60–65 years old will increase dramatically. At the same time, nearly half a billion consumers with middle- and high-level incomes will emerge in China over the next twenty years. This phenomenon is extraordinary because of its scale and the

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5. For further details see Moreno and Vial (2010).

6. This group contains most of Europe, Canada and certain Asian countries such as Japan and Singapore.

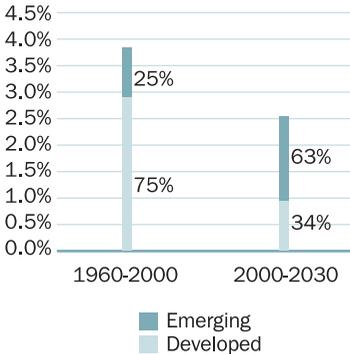
7. This group contains most of Latin America and emerging Europe, as well as China and others in emerging Asia.

characteristics of these consumers, most of whom will be people who have recently crossed the poverty threshold. Therefore, demand will be focused on basic consumable goods and durables, rather than on the services and expensive, sophisticated durables popular in better-off countries.

**Right now, over 80 percent of the global population and practically 100 percent of the population increase forecast for the twenty-first century are concentrated in developing countries. These countries are closing the gap in terms of living standards, measured by income per capita. This process is in its early stages and there is a long way still to go, but the global economic weight of these countries is already changing radically**

The MIDCs will take on a bigger role in the coming decades, thanks to their unique combination of large population, highly dynamic economies and population growth. Our estimates indicate that in the next twenty years, over 60 percent of the growth in global GDP will come from this part of the world. This is a reversal of the situation seen in the second half of the twentieth century, when three quarters of the world's economic growth came from developed countries.

Graph 5. Contribution to global economic growth by group of countries, according to development



Source: Moreno and Vial 2010

This shift in the gravitational centre of the global economy will also place a lot more pressure on the planet's resources, as well as on its capacity to absorb the waste

generated by increased human activity. Technical progress managed to ease this tension for much of the twentieth century, but this was only possible because economic progress was highly concentrated in a group of countries that represented less than 20 percent of the global population. As progress spreads and grows, extending to over 70 percent of the global population, the tension between economic progress, population increase and the planet's capacity to cope will be very great. Although this is a global phenomenon that will affect all of humanity — so all countries will have to contribute towards achieving a sustainable balance over time — our chances of success will hinge on what happens in the emerging countries.

Lastly, we have the VPCs, which are at an early stage of their DTs, and which will see almost half the world's population growth this century. A large majority of the population in countries such as Ethiopia are too poor for the country to have a critical mass of consumers with acquisitive power from the middle or upper classes. Their consumption will revolve around food and some basic services; any increases in income will mainly be used for these purposes, whether improving their diet, buying more clothing, or accessing basic services such as education, drinking water and sanitation. Their chances of development will depend on finding productive niches geared towards exports that are competitive enough to attract foreign investment. At global level, their economic burden will reduce and they are candidates for providing cheap manpower to more advanced countries through migration.

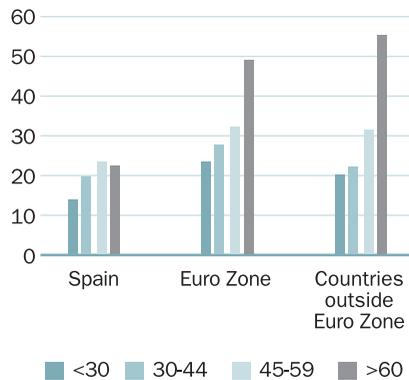
Another factor influencing the evolution of the global demand for goods and services is linked to ageing populations, something that we have already touched upon. There is evidence that the changes in consumer patterns over the course of a person's life, in particular during old age, are a universal phenomenon. Practically all of the surveys on family budgets in Europe (developed and emerging, see Eurostat), the US, the UK, Japan and Latin America, bear witness to this. However, there are variations because of other factors involved such as income, cultural differences, tastes and preferences (which change over the course of an individual's life), the relative availability of goods and services and the institutionality of each country (European Commission 2005). Harris and Blisard (2002) estimate that income-food elasticity increases significantly with age, especially for those aged over 65: using surveys on family budgets in the US they found that elasticity was 0.12 for people aged 65–74 and 0.21 for those over 75. The evidence for Germany (Deutsche Bank Research 2003) points towards significant expenditure in housing and health, and also in transport and entertainment items. The latter are more sensitive to income levels, and therefore possibly the impact on middle-income countries such as Mexico or those with lower levels, is more limited.

However, of all the changes observed in the spending patterns of those aged 60 and above, healthcare is the single most important item.



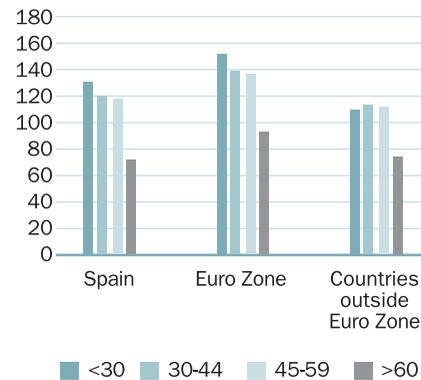
## Graphs 6. Impact of ageing on spending patterns in selected European countries

**Graph 6.1. Health**



Source: EUROSTAT

**Graph 6.2. Transport**



Source: EUROSTAT

The lighter burden of children, young people and young adults reduces the relative importance of spending on formal school education, transport, restaurants and hotels, as well as on clothing and footwear.

### IMPACT ON JOB MARKETS

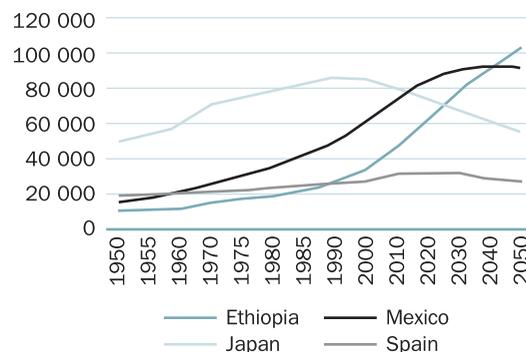
Another area that will be affected by these demographic changes is the functioning of the job markets. The challenges facing developing countries will be very different from those of developed countries, precisely because of their different DT phases.

The DCs at an advanced stage of their DTs are going to face shortages in their young work forces, along with an increase in the number of old people, many of whom will have to extend their working lives. The MIDCs will still need to improve the coverage and quality of their education systems, and strengthen the qualifications and specialisation of their plentiful and still growing manpower.

In addition — as we shall see later on — developed countries are starting to face serious problems regarding the sustainability of their pension systems as a consequence of their ageing populations. There is also a delay in people entering the job market because of the increase in the average number of years people spend studying: this makes the prolongation of working life in countries with ageing populations practically inevitable.



**Graph 7. Total Population 15-64 years of age**



Source: United Nations 2011

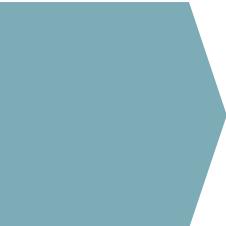
As shown in graph 7, Japan has seen a fall in its working-age population since the beginning of the century; Spain is now witnessing the same trend. By contrast, developing countries that are further behind in their DTs will start to suffer from this phenomenon in twenty or thirty years' time, while the poorest countries such as Ethiopia are around fifty years away.

In DCs, key factors will be the absolute reduction in the working-age population and the delay in entering the world of work. These countries will suffer a shortage of manpower and they will receive immigrants — as has occurred in recent decades — but with some differences compared to the current situation. This is because they will not only require low-skilled manual workers to take on the tasks that are unattractive for local workers; they will also require more skilled professionals and technical workers. Right now, we are seeing a rise in engineers, computer specialists, and health and sales professionals (Manpower Group 2011). This phenomenon will be accentuated by increased demand for extended care services and, in general, for all services demanded by the elderly.<sup>8</sup>

All developed countries will have to implement the right mechanisms to extend the working life of their citizens. Employability in old age is not homogeneous. Data from the OECD and the European Commission demonstrate that employability is much higher for workers with more qualifications because this type of “human capital” does not deteriorate as much as physical capability does, for example. In the OECD average, 86 percent of companies are in favour of extending the working lives of their employees, but only the most highly skilled ones, which could lead to problems of inequality.

8. As Fishman (2010) describes, the solvency of the systems that provide fundamental services for old people may well rest on attracting low-cost migrant workers to carry out most of the tasks.

For countries in the intermediate stage of their DTs, the challenge is to help their young people integrate into more demanding job markets, while at the same time reducing the obstacles and disincentives to the formalisation of their job markets. The latter factor is key to successfully building systems to protect income in old age. These countries will be the focal point of the increase in global economic activity, generating job opportunities for the most highly skilled. That is why these countries will play a vital role in globalising job markets, as they will experience increasingly higher migratory flows in both directions (incoming and outgoing). On the one hand, their most highly skilled workers will have opportunities in DC job markets, but they in turn will also require highly skilled workers wherever there are shortfalls in local markets. One current example of this is the extraction industries such as mining and oil, where global markets of workers are already functioning, something that has been facilitated by the traditional presence of multinational companies in these activities. Mexico is an interesting case: while poor peasants migrate to the US, very often temporarily, the country also exports and imports highly skilled professionals and executives who work in commercial and services companies. These countries will probably start to feel immigration pressures from lesser-skilled workers from poorer countries or regions that have been devastated by natural disasters or armed conflicts.



**All medium and long-term predictions highlight the important role emerging economies are going to play in promoting global economic growth over the coming decades. Over the next fifteen to thirty years, many of these countries will bridge the economic gap — measured by average income per inhabitant — between them and current developed economies**

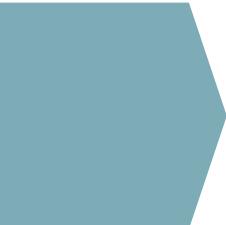
In VPCs, the situation will be different: the great challenge will be to provide health and education to young people and to create attractive conditions to entice investments that offer reliable and well-paid work to the new generations. There is no doubt that these countries will be the main source of emigrant workers in other parts of the world and their transfers of earnings, via remittances to their families, will continue to play a significant role in helping to alleviate extreme poverty amongst their relatives.

Time will tell, but it is very likely that we are at a turning point in the evolution of job markets, and that we are indeed heading towards a much more globalised job market. The world as a whole — particularly DCs — is facing a profound paradox: while almost 40 million workers are out of work according to data from the ILO (2012), it is very difficult to find workers with specific qualifications and skills to fill existing vacancies. This imbalance in the job market seems set to continue over the coming decades. Part of it will be covered by migration, but it is

also very likely that temporary or distance work systems will be implemented, thanks to greater connectivity. Meanwhile, large companies are already getting ready to transform their general processes, business and organisational models as well as their policies for training and re-skilling workers towards the most sought-after specialisations.

In geographical terms, the demand for workers is even more noticeable in emerging countries thanks to their higher growth rates. Perhaps the most spectacular change is occurring in Asia: over the next decade, demand for new workers in Asia is expected to increase by 22 percent, followed by Latin America (13 percent), the Middle East (13 percent) and Eastern Europe (10 percent) (Oxford Economics 2012).

Furthermore — as we have already remarked — the next decade will see emerging countries improving access to quality education. The highest annual growth in the talent pool, measured as the fraction of the population holding higher education qualifications, occurs in India (7.3 percent) followed by Brazil (5.6 percent), Indonesia (4.9 percent), Turkey (4.7 percent) and China (4.6 percent). The US and Canada, with rates of 1.4 and 1.3 percent respectively, lead the annual growth rate among professionals of the G7 economies.



**The level of public spending on protecting the elderly will increase by around 4 percentage points of the EU GDP over the next fifty years. Traditional distribution systems will have to undergo at least two changes: new parametric adjustments to reduce the value of pensions under the defined benefit modality; and a more significant role for individual defined contributions**

Therefore, the impact on the global distribution of technical and professional capabilities will be dramatic. At present, 54 percent of university graduates come from the most buoyant emerging economies (E7: Brazil, China, India, Indonesia, Mexico, Russia and Turkey) compared to 46 percent in the industrialised world (G7: Canada, France, Germany, Italy, Japan, the UK and the US). In the coming decade, this percentage will probably reach 60 percent for MIDCs.

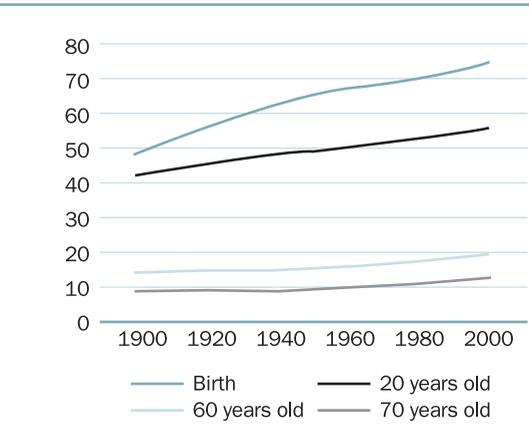
## **AGEING AND THE RISKS FOR THE SOCIAL SECURITY SYSTEM**

The social security system as we know it today is a quite recent invention. It dates from the end of the nineteenth century, when Germany introduced its workers to a mandatory system of contributions in order for them to receive pensions once they reached the age of 70. At that time, life expectancy at birth in DCs was around 50 years of age, a figure very much influenced by high rates of infant mortality. The idea of levying a charge on workers in return for providing a

secure source of income in old age once they stopped working seemed both revolutionary and very reasonable. Moreover, it was not too onerous at a time when the work force and salaries were growing rapidly and the over-65 population was just a small fraction of the total population. At the beginning of the twentieth century, the life expectancy of a 65-year-old worker in the US was 72, and the over 65s represented less than 10 percent of the working-age population, as shown in graph 8.1. and 8.2.

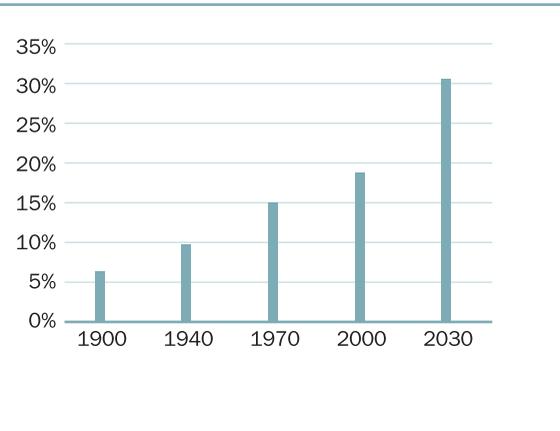


**Graph 8.1. Life Expectancy in the US in the 20<sup>th</sup> century**



Source: US Bureau of Census. Historical Statistics

**Graph 8.2. Dependency rates of the elderly in the US (population over 65 years old/ population between 14 and 64 years old)**



Source: US Bureau of Census. Historical Statistics

This changed radically during the course of the twentieth century. By the end of the century, life expectancy at 65 had risen by around 50 percent, while the proportion of the elderly as compared to those of working age had almost doubled. Yet fundamental parameters such as retirement age, contribution rates or the replacement values of pensions had not changed significantly. During the twentieth century, these systems offered income security and a standard of living in old age that were unprecedented in the history of humanity. It is true that this mechanism was limited to the developed countries and to certain privileged minorities in developing countries, but it was clearly the paradigm to imitate. The nightmare of an old age where people had to work until they died — or live dependent on the support of their closest family members — was replaced by the dream of a “golden old age” that had previously been the reserve of the very rich. The coverage of the pensions system, measured by the percentage of the work force that regularly contributes to them, exceeds 80 percent in most DCs, reaching

95 percent in Japan. Spain is at the lower end, with 69 percent (Pallares-Millares et al. 2012). However, the basic arithmetic of this income security does not add up: the other factor supporting this coverage is a high level of commitment of financial resources, as high as 8.8 percent of GDP in Japan and 8.0 percent in Spain in 2007 (Ibid.).

In VPCs such as Ethiopia, social security is a privilege enjoyed only by groups of public employees, and payment is so unreliable that it is very difficult to collect taxes and social security contributions. While we do not have the figures for coverage in Ethiopia, most countries in sub-Saharan Africa have pension coverage rates of between 1 and 12 percent of the workforce, with the exception of Mauritius (53 percent) and Zimbabwe (20 percent) (Ibid.).

Amongst the MIDCs, China is a special case. Coverage there is similar to that of other countries with an equal or lesser level of development, reaching almost 30 percent of the workforce. It covers public employees, the armed forces, the employees of large corporations and almost no one else; even so, public expenditure on pensions is 2.5 percent of GDP. The coverage problem is especially serious due to the speed of the DT, which means that China has to deal with an increase in retirement-age people from 2 million a year 12 years ago, to around 7 million a year at the end of this decade. The situation will stabilise at this level until the middle of this century. In other MIDCs, such as in a large part of Latin America, coverage rates are low because job markets are precarious. This means that only a small proportion of the population contributes to financing social security. In Mexico, for example, coverage barely reaches 27 percent of the workforce — one of the lowest levels of the region — whereas just in Uruguay, Colombia and Chile does it exceed 55 percent (Ibid.).

DT has generated significant increases in the old-age dependency rate, which has made social security an increasingly suffocating burden for governments. For countries in the European Union, the European Commission's *Ageing Report 2012* estimates that the public expenditure associated with care for the elderly amounted to 25 percent of GDP in 2010, with the biggest spending on pension payments (11.3 percent), followed by health (7.1 percent) and then extended care (3.8 percent). The OECD, using different methodology (OECD 2012), estimates that EU expenditure on pensions for that year amounted to 9.1 percent of GDP, while in the US it was just 4.6 percent — one of the lowest of the OECD.

The highest health costs derive from the fact that costs per capita increase significantly with age. In the US, it is estimated that the annual cost per capita of someone aged 65 is more than four times the annual mean cost from birth to 40 years of age (Alemayahu and Warner 2004). If this average figure is extrapolated for the whole population of the most developed countries, the health costs of the over 65s would go from representing just under 50 percent of healthcare spending to just over 60 percent, assuming prices stay the same.

The picture is much more diverse in developing countries. This reflects the fact that most are at an earlier stage of DT, they have varying degrees of certainty in their job market

(coverage) and also their social security systems are based on alternative models — something we will come back to shortly.

Three types of answers have emerged to these problems, which are setting the foundations of the social security system of the future:

- Parametric changes in distribution systems: This is the most common approach. It usually consists of a combination of increases in the statutory retirement age, tougher requirements for early retirement, and formulas for calculating less “generous” benefits, including rules about index-linking pensions. Most European countries are taking this route.
- Incorporating defined contributions into parts of the system: The traditional systems described above (of distribution, defined benefit or pay-as-you-go) all stipulate that those who have a right to a pension thanks to their contributions receive an amount defined by a formula usually set by law. However, in recent years we have seen the introduction of defined contribution mechanisms. These are essentially voluntary individual savings accounts in which workers accumulate funds that can only be withdrawn at retirement. Employers may also contribute to these funds, especially in the case of complementary defined pension plans offered by companies. These funds are invested in the financial markets and the interest is accumulated in the fund, which is why they are also known as individual capitalisation systems.
- Finally, some countries have opted to replace the distribution system with another one in which obligatory saving is managed under the modality of defined contributions in individual capitalisation accounts. This change was first introduced in Chile in 1981; since then, various Latin American and Eastern European countries have adopted it. In this system, private companies are in charge of account and fund management. The retired people of the twenty-first century will face greater financial risks in old age because of the financial crisis in the traditional social security system and the need to resort to savings mechanisms that do not guarantee a predefined pension. The security of interest in old age that we saw in developed countries in the second half of the twentieth century is not viable in the twenty-first century, with its much less favourable demography and where an increase in contributions would entail a loss of unsustainable competitiveness in the face of emerging countries with younger populations.

A great source of uncertainty facing traditional distribution systems is the difficult surrounding financial environment. In spite of the parametric reforms implemented in recent years, circumstances will not improve in the future. Moreover, the economic downturn of recent years has undermined the solvency of many developed countries, forcing harsh fiscal

adjustments, so the outlook for traditional social security systems' "defined" benefits appears less than rosy. Calculations published in the *Ageing Report 2012* (European Commission 2012) show that the level of public spending on protecting the elderly will increase by around 4 percentage points of the EU GDP over the next fifty years, in spite of the adjustments that have already been made. This seems difficult to resolve in current conditions and, almost certainly, the traditional systems will have to undergo at least two changes: new parametric adjustments to reduce the value of the pensions under the defined benefit modality; and a more significant role for individual defined contributions, which may become obligatory and be subject to tax relief. The end result of this will be that middle and high-income workers will face old age with more volatile levels of income that are less secure than those of the current generation of retired people, at least for sums above the minimum that can be guaranteed by the defined benefit system each government can sustain.

The elderly are facing several risks in terms of individual capitalisation: one is the scarcity of contributions, caused by employment instability, unemployment or voluntary redundancy — something more common in women with young children. A second risk is a financial one, associated with the changes in the value of the accumulated funds due to fluctuations in profitability. These two factors are very important while people are accumulating funds. Then once a person reaches retirement age, he or she can usually opt to contract a life annuity with a life insurance company, in which case there is a risk that the latter could go bankrupt. The other option is to gradually withdraw their funds, but the financial risk persists and then there is the risk of longevity — the probability of outliving the funds, despite applying one of the retirement programmes based upon accepted actuarial tables. Governments intervene to reduce those risks, whether by financing minimum pensions for those who do not manage to make enough contributions, or by establishing insurance policies or guarantees to cover the bankruptcy of the insurance companies. However, there is always an element of residual risk.

Faced with these problems and regardless of the type of pensions system, the great mitigating factor is the possibility of postponing retirement. As we saw in the previous section on changes in the world of work, this may become much more common in the future, thanks to the scarcity of workers associated with ageing, new technologies that facilitate distance learning, and a greater utilisation of partial work shifts.

MIDCs, whose pensions system coverage is limited by precarious job markets, are facing the multiple challenge of constructing inclusive pensions systems, providing a minimum level of coverage guaranteed by the State to the poorest retired people who cannot reach the minimum pension levels, and at the same time generating incentives for formalising job markets. Several countries in this group are constructing mixed systems: minimum pensions guarantees backed by the State and defined contribution mechanisms to finance pensions with replacement rates appropriate for middle and high-income workers. The balance is difficult because in many

countries these mechanisms coexist with very generous defined benefit plans, as is the case among public sector workers, or for employees of Mexico's state oil company (PEMEX). On the other hand, most of those countries have limited capacity to set levies on private incomes and the tax ratio seldom exceeds 20 percent of GDP. Meanwhile they are still facing the challenge of extending the coverage and quality of education, in order to assist the newest generations of young people.

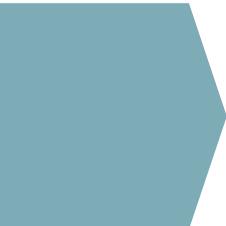
China is an extreme case in this group, owing to its scale and the speed of its demographic change. Points in its favour include the willingness the government has shown to experiment with different pension models and to rapidly implement an extensive system combining many of the elements described above. MIDCs are facing a race between economic growth and rapid population ageing. As Jackson and Howe (2004) describe so well, developed countries first got rich and then grew older, with Japan perhaps the last country to manage this just in time. The current MIDCs are running a serious risk of growing old before they grow rich, which could be a source of great tensions, and their growth expectations may be frustrated.

Finally we have the VPCs, which do not yet have systems to protect income for old age and where the population will continue to grow rapidly over the coming decades. These countries do not generally have the income or institutional soundness to build systems of this type, as their resources are scarce. Their main priority is still to establish education and health systems that put the development of young people first, so they can aspire to future economic growth. However, as far as possible, they need to start building inclusive social security systems, with incentives aimed at promoting saving and labour stability, precisely to foster rather than hinder the economic growth process. Some authors such as Sachs (2005) have argued in favour of providing economic aid so that these countries can start implementing self-sustaining growth processes. Part of that aid should support the construction of inclusive social security institutions and preventing these institutions from becoming profit mechanisms for groups closest to power, which could end up stunting the progress forecast for these countries (Acemoglu and Robinson 2012). If they fail, the fall in the fertility rates that usually accompanies economic growth will probably be postponed; this means these countries will maintain high levels of population growth, multiplying the risks of humanitarian and ecological disasters, which could have global implications.

## **SOME POLITICAL CONSEQUENCES OF GLOBAL AGEING**

The demographic explosion of the last two and a half centuries is largely explained by the wider availability of resources, thanks to technological and economic advances, and especially to the use of fossil energies in the production and transportation that came with the Industrial

Revolution. At the start of the twenty-first century, the developing countries that are home to over 80 percent of the world's population are entering a process of accelerated economic growth, gradually closing the income gaps that separate them from the most advanced economies in the world. Yet there are indications that our globally finite resources could once again limit human activity and, ultimately, put a brake on population growth. Food, energy and metal prices have risen notably since the middle of the previous decade. What first seemed to be the usual price cycle for raw material prices has now convinced many people that we have entered a “super-cycle,” caused by problems in meeting the developing world's increasingly higher demand for these resources. However, there are also global threats arising from the planet's limited capacity to absorb waste and emissions without affecting key variables such as the climate (Wilson 2002; Sachs 2008).



**Today, it seems reasonable to assert that humanity has reached an intensive stage in the exploitation of the planet's capacities. Additional increases in the population and improvements in living standards require profound technological changes that expand the planet's current capacities or reduce the adverse effects of human activity**

Some of these problems, especially those linked to the scarcity of resources, were resolved in the past through technological advances. This made it possible, in most cases, for the price of raw materials to maintain a downward or constant trend over very long periods. Whilst the potential scarcity of today's traditional energy sources (hydrocarbons) would appear crucial owing to the latter's involvement in all human activity, innovation does appear to be responding to high energy prices. There is therefore reason to feel confident that technology will be able to provide the answers, even if it is not currently clear when or what form these answers will take. By themselves, limited resources do not seem to be the obstacles that could radically change the demographic panorama of this century.

However, pollution and its potential climatic impacts are more difficult problems to tackle. Its effects are cumulative and slow to reveal themselves. Moreover, external factors often prevent pollution-related costs from being adequately reflected in prices, and therefore people, companies and governments do not have direct incentives to change. These problems are exacerbated both because they are global and because there are no supra-national bodies with regulatory and executive powers to tackle them. Scientific research into these issues is also very recent and there are still many grey areas.

Today, it seems reasonable to assert that humanity has reached an intensive stage in the exploitation of the planet's capacities. Additional increases in the population and improvements

in living standards require profound technological changes that expand the planet's current capacities or reduce the adverse effects of human activity. Since these technological changes do not occur smoothly or universally, it is highly likely that conflicts over resources will increase over the coming decades. It is also likely that countries or communities will suffer climate-related catastrophes. These events will not be evenly distributed and they will affect different countries and communities in different ways depending on their levels of economic development, demographic profiles and geography.

For countries with the most advanced DTs and which mostly belong to the DCs (China and Russia being the most important exceptions), the greatest challenge will be properly balancing the demands for greater social protection in old age with the changes needed to achieve sustained increases in productivity. One sphere where these tensions will show is in the tax sector. The evidence of the last two decades, especially in Japan and Europe, is that the disagreement about fiscal resources usually results in greater spending on health and social security, which is at least partly offset by reductions in defence spending. As some analysts have highlighted, this may widen the gap in military capabilities between the US and the rest of the developed countries, thanks to the fact that the US is under less pressure from its ageing population (Jackson and Howe 2008; Haas 2012). However, the current US supremacy may become increasingly less effective in non-conventional conflicts in faraway areas which require large troop deployments, such as may be the case with crises over scarce local resources (water, food).

Another issue for these countries — one currently felt in Japan — is the balance between the demands of an elderly population, which is increasingly more numerous and carries greater political weight, and those of younger families whose priorities are biased by longer horizons of reference. Recent press releases concerning Japan have highlighted the preferences of its pensioners for a strong Yen that makes their consumption cheaper, which conflicts with the interests of workers who see their jobs and salaries threatened by the loss of competitiveness. Disagreements surrounding the reconstruction of the regions devastated by the 2011 tsunami are also reported: the elderly are pressing for fast reconstruction with little change, while younger couples are willing to wait longer in exchange for improvements in the urban environment.

China and Russia, for their part, will face great tensions arising from the rapid growth in the proportion of their elderly and the reduction in their working-age populations in absolute terms. At macroeconomic level, this is almost certainly going to mean a relative fall in national saving and a rise in consumption, with a potentially positive impact on global imbalances but with unclear effects on national economic and social circumstances. The demand for greater coverage of social provisions, health and extended care for the oldest people is going to generate significant tensions that will affect the capacity to design and implement institutions,

as well as the allocation of tax resources. In these conditions, it is very hard for these countries to maintain their current rates of investment and military expenditure. Furthermore, they are vulnerable to the effects of climate change and they will need to use increasing amounts of resources to adapt to these effects. The biggest question mark lies over whether, in this context, they will be able to maintain high growth rates.

For the rest of the MIDCs in the final stages of their DTs, the situation varies greatly, but they share some positive features: they still have a couple of decades of “demographic window” ahead of them in which the working-age population will be growing in absolute terms, whilst the pressure for extending coverage in the educational system will start to fall. Their middle classes will become ever more prevalent and the youth bulge will dissipate, lessening the risk of social unrest and the breakdown of the democratic systems (Madsen 2012; Urdai 2012). However, they are also vulnerable because of their insufficient social security coverage and, in some cases, the potentially negative impacts of climate change and their dependency on certain natural resources. The size of this group — and the fact that it will see 40 percent of the increase in the world’s population and over half of the worldwide GDP growth in the next forty years — means that whatever happens in this segment will be crucial to how the map of economic and social power will evolve over the century, as well as to how successfully we will contain and adapt to climate change. Globally, the struggle for resources and the drive to make human development sustainable will unfold in this group of countries.

Lastly, we have the group of countries where DT is just beginning: the poorest countries on the planet. This zone may well see the biggest conflicts over resources and the largest environmental disasters, both because of its vulnerability to the climate (since many of its people subsist on agriculture) and because of the weakness of its institutions and the lack of resources needed to adapt and mitigate these problems. Although they are still not under pressure to extend social security on a massive scale, they are under pressure to feed their people, make health provisions and educate on a large scale, in the face of their growing number of children. Moreover, many of them are still facing several decades with a high proportion of young people, which could mean that tensions will turn more easily into armed conflicts. It is difficult to see how these countries can resolve these problems by themselves and move ahead without help from the rest of the world.

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THE WORLD DEMOGRAPHIC TRANSITION IS COMING TO AN END, BUT IN DIFFERENT PERIODS AND AT DIFFERENT SPEEDS. AS A CONSEQUENCE OF THIS HETEROGENEOUS PROCESS, THERE IS STILL SOME RESIDUAL GROWTH IN WORLD POPULATION THIS CENTURY. THIS WILL BE DISTRIBUTED IN EQUAL PARTS AMONGST THE POOREST COUNTRIES AND THE REST OF THE DEVELOPING COUNTRIES. THE MOST DEVELOPED COUNTRIES WILL LOSE RELATIVE WEIGHT IN ECONOMIC AND DEMOGRAPHIC TERMS, THEIR WORKING-AGE POPULATIONS WILL SHRINK AND THE BURDEN OF OLD PEOPLE ON THE TOTAL POPULATION WILL INCREASE TO UNPRECEDENTED LEVELS. THIS WILL CAUSE CONSUMPTION PATTERNS TO CHANGE, WITH AN INCREASED PROPORTION OF SPENDING ON SERVICES, ESPECIALLY HEALTH AND CARE FOR THE ELDERLY. IN A FEW DECADES, PRECARIOUSNESS IN JOB MARKETS WILL EXERT HEAVY PRESSURE TO INSURE INCOME FOR THE GROWING MASS OF WORKERS WHO REACH RETIREMENT AGE. FINALLY, THE POOREST COUNTRIES, WITH EVER-HIGHER BIRTH RATES, MUST FIRST CONCENTRATE ON PROVIDING THE BASIC SERVICES FOR THEIR GROWING POPULATIONS OF CHILDREN AND YOUNG PEOPLE, AND THEN START TO BUILD INSTITUTIONS THAT PROVIDE SECURITY TO OLD PEOPLE. THIS MUST ALL BE PROVIDED AMIDST GROWING PRESSURE FOR BETTER USE OF THE PLANET'S RESOURCES AND IN THE CONTEXT OF THE EARTH'S LIMITED CAPACITY TO ABSORB THE IMPACT OF HUMAN ACTIVITY, WHICH WILL ADD FACTORS OF TENSION AND CONFLICT OVER THE COURSE OF THIS CENTURY. THE SURVIVAL OF HUMANITY ITSELF DEPENDS ON FINDING REAL SOLUTIONS TO THESE CONFLICTS.

# BIOGRAPHY

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