Neither ageing nor low fertility: the problem is the distribution of resources

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Introduction

Population ageing is a common and ongoing demographic phenomenon in developed countries, across most of the world. It means the increase of older adults, both in absolute terms and in proportion to the rest of the population. It is produced by an increase in life expectancy and a decrease in fertility in the same population.

Focusing on the increased social expenditure needed to maintain a growing inactive elderly population, there is increasing concern among intellectuals and politicians, in public opinion and in international organisations, about the economic 'burden' of ageing.

The identification of a serious problem leads principally to two positions: that the existing systems are unworkable on the one hand; and a concern about decreased fertility on the other hand. The fall in fertility contributes to demographic ageing by shrinking the future labour force relative to the elderly from earlier generations.

These positions give rise to arguments to reform and restrict social protection and / or to increase birth rates. The latter is in clear tension with concern about human overpopulation: after a century in which the population worldwide has almost quadrupled the ecological, urban and material limits to continued population growth are in question (see box: The falling birth rate…).

This paper aims to discuss the diagnosis of ageing as a serious problem in itself, and then deny that it is either essential or desirable to increase fertility or decrease pension protection.

The fundamental hypothesis is that the demographic transition is not a negative phenomenon in itself, but quite the opposite. It is the result of important social progress, and a phenomenon with inherent potential for even greater opportunities. It is under particular distributional contexts that it becomes a problem: contexts characterized by polarised income distribution and contributory social protection systems. Therefore, what really is in crisis with the new demographic dynamic is the current intra- and inter-generational distribution of resources.

The falling birth rate: A threat to humankind?

It had taken all the history of humankind until 1804 to achieve one thousand million people. Since 1974 there have been an extra thousand million people every 13 years.

In the twentieth century, the population increased by 4,661 million, reaching a world population that corresponds to 391% of what we had been a century earlier. That is to say, what took humanity tens of thousands of years to grow, almost quadrupled in the twentieth century.

Between 1800 and 1900 the growth was 60%, with 605 million more people on the planet, against more than 4 and a half billion increase in the twentieth century. In numbers of people, the increase during the twentieth century is almost 8 times that of the nineteenth century.

In view of this situation, the global population 'decline' is not so worrisome. After 2043 it is estimated that population growth will have decreased enough for us take 40 years to grow another billion, which was first reached in 1804 and took a further 123 years to reach again.

Concern about the decline of the world's population, or even the extinction of societies where the decline is a reality, is clearly premature.

It is resistance to recognizing the need for a dramatic change in distribution of the social product that produces the accusation that demography is the real problem. In contrast, here it is argued that systems of contributory pensions which transfer income from the active population to the inactive, whether through individual or corporate means, are unable to socialize the economic benefits of societies which are both more aged and more productive. By

contributory system here we mean one where the financial equilibrium is based on a fixed ratio between contributors and beneficiaries.

Moreover, the consequences of an ageing population and falling birth rate cannot be conceived without taking into account the economic and employment context in which these phenomena are produced. By considering the evolution of GDP, the labour market, and income distribution as a determinant of demand, we arrive at very different conclusions than are reached by the classic demographic arguments.

Statistical analysis is used to ascertain whether it is the data or their interpretation that locates the problem in ageing and a falling birth-rate, rather than questioning the distribution of resources. This article identifies the economic impact of ageing, and then the implications of ageing for contributory pension systems. The analysis applies to Latin America in general and Argentina in particular. Argentina represents a paradigmatic case for advanced population ageing in the Latin American context, as well as in regard to a funding crisis for the pension system. This is because reforms and counter-reforms of the social security system have been tested, with extensive discussion about the institutional and financial design of old age social security.

The alleged imminent collapse of pension security and the problem of reduced fertility

Many politicians, especially in European countries[1], refer to the problem of ageing. The supposed problem is that, due to the increase in longevity, the growth of the retired population is changing the proportion of the retired relative to the active population, posing a growing imbalance for pension systems as this trend deepens. This appears to be a growing expense that society is not ready to face.

The most widely read literature[2] refers to ageing as a problem for social protection in general. In response to this problem there are several proposals to change pension systems for them to be viable. Privatisation, capitalisation, higher retirement age, and lower benefits are among the major reforms being talked about as a necessity, or as an inevitable outcome.

Other authors, in addition to making suggestions about adapting the pension system, are concerned to reduce the falling birth rate which they see as the primary cause of the problem.

Concern about the decline in fertility has taken hold with force in the pioneering countries of the demographic transition, countries in which population ageing is not a forecast but a reality. In Europe, intellectuals as well as international organizations, politicians and

media explicitly express concern about the fertility decline and have argued about the need to restore fertility to at least replacement level.

In order to contribute to the re-activation of fertility, economists and sociologists have developed "analysis of how public policy can help to promote the empowerment of women through employment and thus indirectly influence re-activation of fertility" (Moreno Minguez, 2008: 66).

Moreno Minguez includes international organisations amongst those expressing concern: "the recent decline in fertility in Europe and the ageing of its population have stimulated scientific study to identify the factors that explain that steady decline. These studies have served to bring to the fore in public opinion, media and politicians the idea that institutional policies should incentivise a fertility recovery, at least to the level of replacement. Proof of this are the documents from OECD, 2007, and the European Commission, 2005 and 2006." (2008: 65)

In the media, newspapers and magazines show a deep concern about the falling birth rate in Europe (Requena and Bernardi, 2003). For their part, politicians agree that "low fertility is one of the most pressing issues requiring urgent public action, and have suggested the aim of reducing the deficit in fertility" (Requena and Bernardi, 2003: 30).

The reasons for which the decline in fertility is a matter for concern have to do with the consequences of ageing on costs of social protection systems and the consequences of these costs on economic growth and competitiveness.

Espina, for example, worries about the sustainability of pension systems, and even the entire welfare system and suggests that the solution is necessarily demographic in nature. "Fixing the actuarial problem requires an increase in the medium term of the female and youth employment rates, and extending the retirement age for adults; in the long-term it is essential to increase fertility and migration, especially in Southern Europe" (2004: 5).

Some authors believe that the decline in fertility negatively affects economic growth. For example, Esping-Andersen considers that the other side of the coin of ageing and fertility decline is the fall in GDP (2007, 2008).

Another economic problem that is attributed to the decline in fertility is loss of national competitiveness: "Low fertility puts Europeans countries who suffer it in worse conditions to compete economically with other more demographically balanced societies" (Livi Bacci, 2003 cited in Requena and Bernardi, 2003:30).

Conceptual framework

An important and novel theoretical approach to rethink the demographic transition and the ageing population is the "theory of the reproductive revolution"[4]. This theory offers a reading of current demographic phenomena that questions the arguments made and suggests that they are intended as justification for regressive social policies. Pérez Díaz (2011a) argues that demography has been abused in order to attempt to legitimise scientifically cuts to social security, or recommendations concerning the urgent need to increase fertility[5].

MacInnes and Pérez Díaz (2008, 2009) have in the last decade deepened the theory of the reproductive revolution. Their conceptual framework permits understanding the positive consequences of current population dynamics. Thus, instead of considering trends of ageing and the falling birth rate to be a problem, they point out their many positive implications. From this perspective, society does not have a problem that is demographic but one of distribution, whose solution is therefore not demographic, but political.

There follows a brief summary of the main arguments included within the theory of the reproductive revolution[6].

An efficiency revolution in the production of lives

The theory of reproductive revolution argues that what is traditionally known as the demographic transition (in a merely descriptive sense) is really a revolution in the efficiency with which demographic systems reproduce populations.

Just as happened with industrial production, or with new information technologies, the production of life has experienced a quantum leap in efficiency. This has allowed less dedication (births and reproductive effort) to make possible increased production (larger populations).

The phenomenon that is called demographic transition cannot be explained only by decreased mortality and then fertility; the improvement of living conditions and the resulting democratisation of survival play a fundamental role as a trigger. In turn, the radical improvement of the productive / reproductive system has various effects, transcendental and simultaneous, on humanity's future, and human wellbeing in particular, thereby strengthening the conditions underpinning this new population dynamic.

Mass maturity as an explanatory variable

The fundamental concept of the theory of the reproductive revolution is mass maturity, since the duration of lives is a key factor. The survival of the majority to maturity (fifty), and the life-stage at which

they have had and have been able to raise children, is what these authors call mass maturity.

To address this concept and its explanatory power, the authors distance themselves from traditional demographic methodologies based on cross-sectional indicators and propose a longitudinal analysis which allows causal relationships to be established between mortality and fertility, taking into account the full life cycle. In this way the authors also distance themselves from a concern about the stock of population, so typical of the theory of the demographic transition. Making a generational rather than a cross-sectional analysis reveals how the improvement of mortality experienced by a generation from birth, influences the behaviours and collective characteristics of this generation throughout their life cycle, especially when it reaches reproductive age. What is crucial then is the proportion of each generation that survives to the age of maturity. Survival until children have passed through at least their early years of training and upbringing, impacts on the lives of those children. Thus the consequences are transferred to the new generation whose reproductive behaviour will be influenced by this trend.

The potential of reduced fertility for gender relationships

The authors note the new population dynamics are a factor relevant to understanding changing gender relationships. One of the main effects of the efficiency achieved, having no need for the high fertility of the past, is that women have been largely released from their ancestral restriction to exclusively reproductive roles. Thus, societies of higher survival and lower reproduction show broad potential to reshape the gender relations which determine female roles, and which have previously excluded women from the public domain and condemned them to economic dependence.

A virtuous circle for children and new generations

The lightening of the reproductive burden involves not only benefits for women but also for children. Smaller families allow parenting with more dedication to each child, and childhoods spent within less vulnerable households. Here the theory posits the existence of a virtuous circle where children receive increased attention, resources and training, benefitting the next generation when they become adults and raise their own children. Changes in child survival are associated with improvement in the resources devoted to them (material, emotional, medical, educational). Moreover, these changes make it more likely that the average number of children each generation has may be less than the previous generation. The virtuous circle is reinforced when those children take advantage of the possibility as

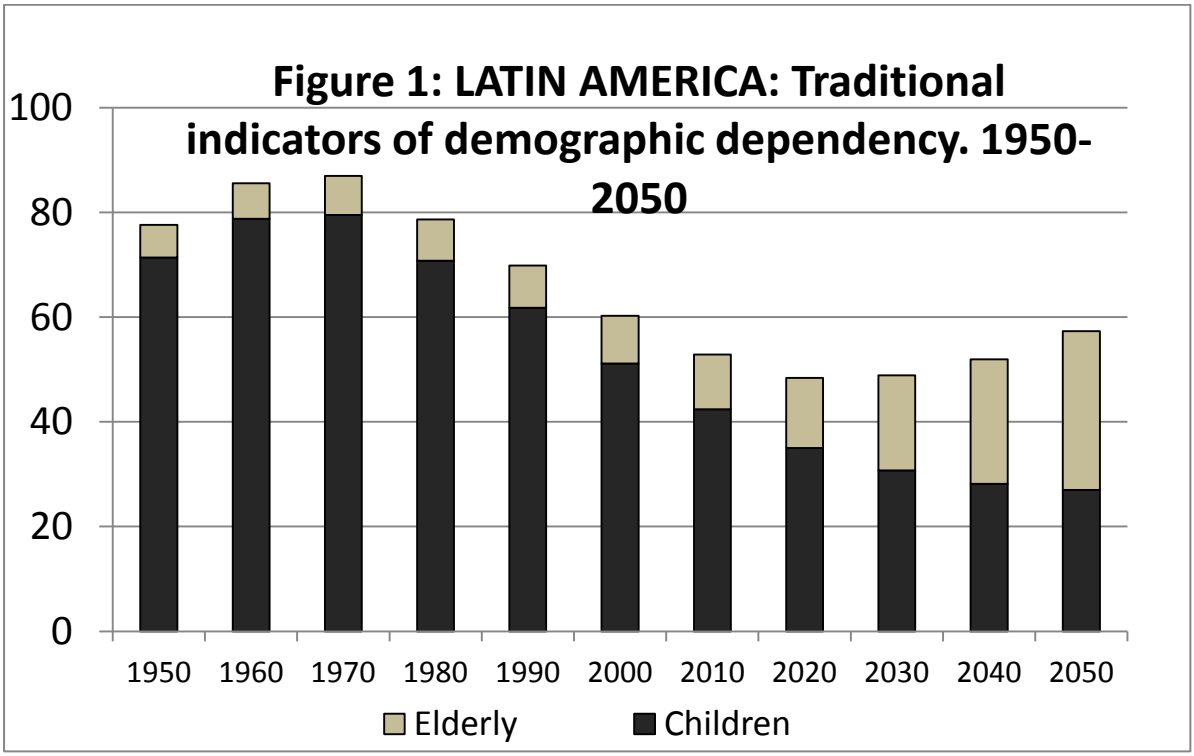
parents to improve and further concentrate resources devoted to their children, creating an intergenerational dynamic of sustained improvements as well as sustained fertility decline.

The economic Impact of ageing[7]

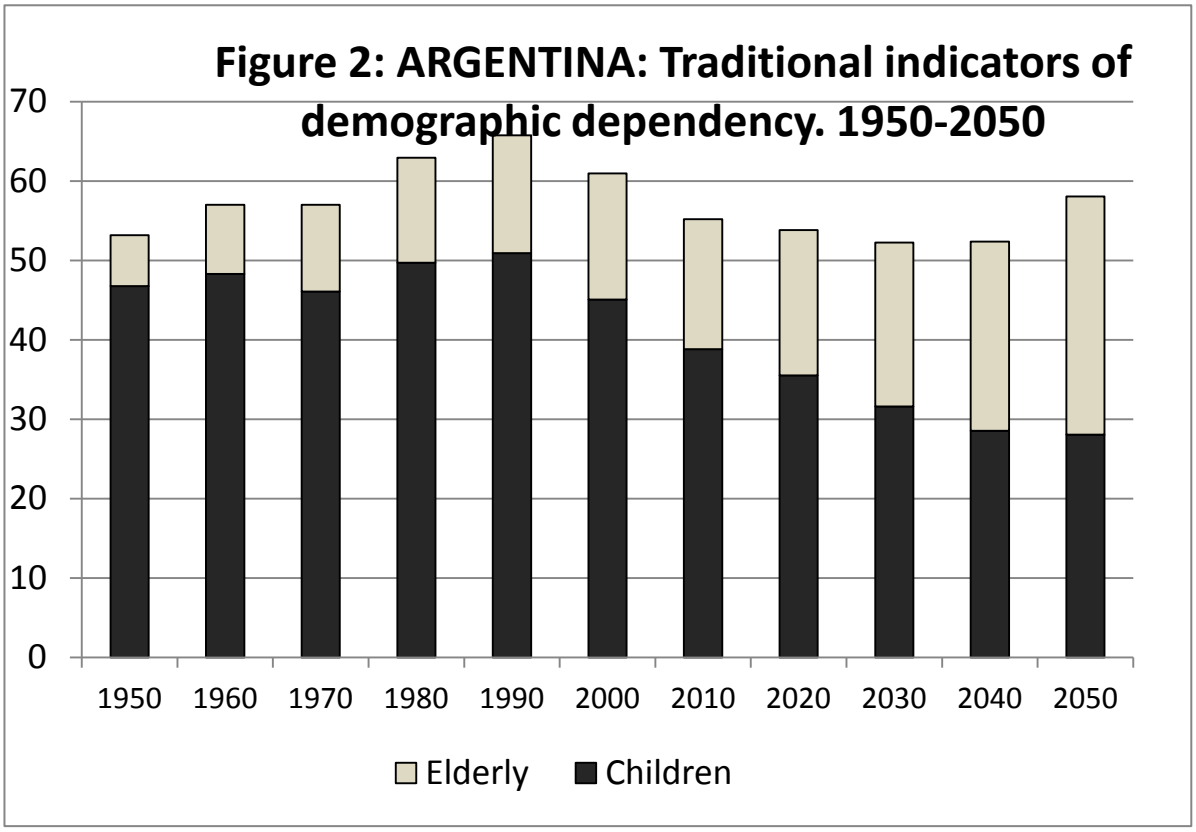
When academics and politicians refer to ageing and its negative consequences, they use indicators of population dependency[8] to reject the viability of social protection in old age.

> Traditionally, to get a measure of the pressure exerted by demographic change, an indicator of demographic dependency is used to link the number of individuals at extreme ages or inactive – for example under 15 years and 65 years and over – with the number of individuals of working age. Thus one has a measure of the effort that the potential workforce must perform to meet the needs of inactive population. (CELADE / CEPAL, 2008: 13-14)

Data on Latin America show sustained growth in old-age dependency, offset and even exceeded in the first stage of the demographic transition by the decreasing child dependency ratio, but increasing again when the latter stabilizes and the old-age dependency continues to grow. Thus, the evolution of the dependency ratio is U-shaped.



Data from CELADE/CEPAL 2011. Elderly (65 or older) and children (0-15) per 100 people of working age (16-64), estimated and projected.



Data from CELADE/CEPAL 2011. Elderly (65 or older) and children (0-15) per 100 people of working age (16-64), estimated and projected.

In Argentina, the trend is very similar to the region, although the phase of decrease in the dependency ratio is less pronounced, mostly due to a more advanced ageing.

It can be seen that the dependency ratio for old age in Argentina more than doubled in the last 5 decades of the 1900s, and that growth is projected to further double the ratio in the first 50 years of the 2000s.

How to interpret the dependency ratio? In general, it is considered positive for a society to have a low demographic dependency ratio, as this means that there are proportionally fewer people who constitute a burden that must be paid for by the working age population (Chackiel, 2004: 62-63).

The analysis based on the dependency ratio assumes that the cost of the income of the inactive population is directly related to the number of people of working age: the dependency ratio will show a greater burden the fewer of working age there are in relation to the inactive.

However fewer young people or fewer elderly may mean neither higher nor lower GDP. The impact of population on the GDP has nothing directly to do with number of people of working age, but depends on the capacity of the labour market to offer formal employment, income from work, and the level of productivity. The importance given to the

relative size of the labour force is mis-placed. In this day and age, does an increasing economically active population mean a growing economy? Does a larger economically active population mean greater profitability of the economy as a whole? If, to make an obvious argument, productivity increases, then GDP can increase without an increase in the economically active population, or even with a smaller one. On the other hand, a higher economically active population may simply mean higher unemployment and general deterioration of the labour market without impacting positively on the GDP.

It may be assumed then that in a society with unemployment the real dependency rate is even greater than shown by exclusively demographic indicators. However, the full extent of economic effort is found by considering total production in society, GDP.

Given this, this article investigates what happened to economic production during the demographic transition in Argentina, that is, the relationship between population dynamics and the behaviour of GDP. If it can be determined that the pension expense is a burden no greater than the material resources produced by society, there would be reason to believe that the real problem that ageing produces for society is related to the established distribution mechanisms for pension funding. That is, it is not a shortage of resources, but a problem that has to do with the restrictions of strictly contributory financing.

The dependency ratio is an incomplete concept for the analysis of the impact of the demographic transition on economic performance of society. Beyond the proportion of elderly in the total population or their relationship to the child population, including their ratio with the working age population, the financing of old age protection demands resources, not people of a particular age. Therefore, to assess the implications of ageing on the ability of societies to finance social protection systems of old age, it is essential to observe the evolution of economic resources.

For similar reasons the concept of demographic dividend is also a deficient measure. Since the dependent population is both old and young, several authors make the immediate impact of ageing relative, so that the decrease in young dependents offsets or even surpasses the increase of the elderly in a first stage[9].

> The lower pressure of children's demands, as their population is virtually stagnant, generates a lower dependency ratio, which lasts for several decades. It has been called the population bonus or demographic dividend, since it implies that society can have savings which can be turned to productive investment or

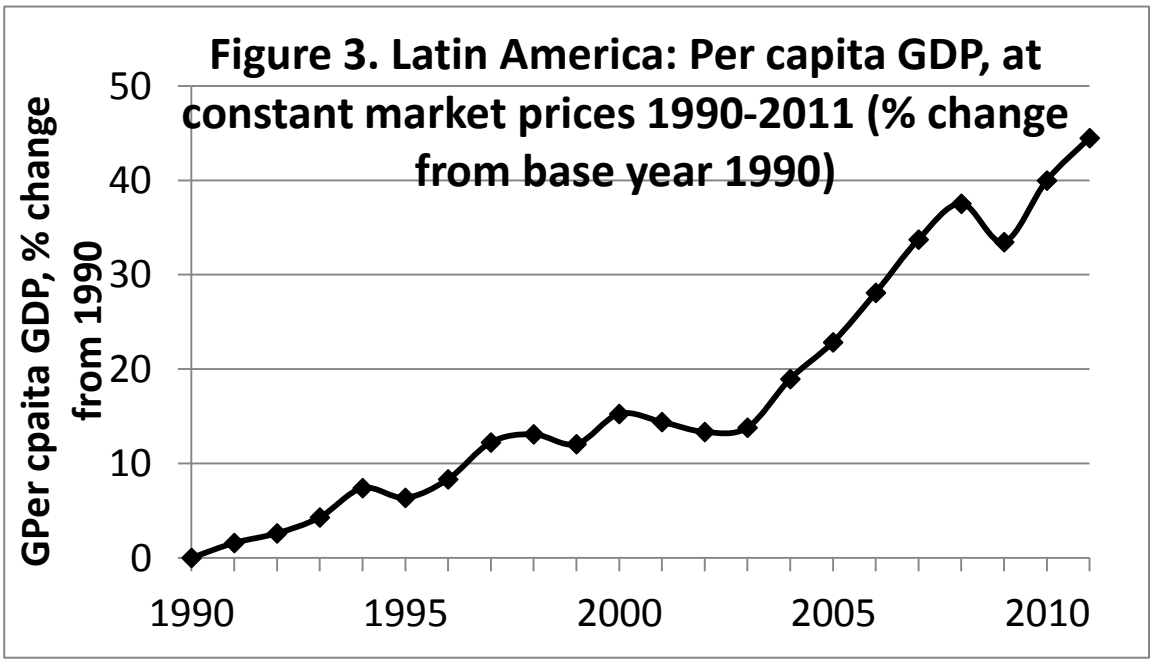
> reallocated to social benefits that so far have not been taken care of. (CHACKIEL, 2004: 63)

However, the very existence of the demographic dividend can be disputed when there are dependents of working age because they cannot get a job. If the labour market is not able to absorb available labour, the increase or decrease of people of working age has no mechanical impact in economic terms. Decreased child dependency does not imply that the dependence decreases if the population working age is also actually dependent.[10]

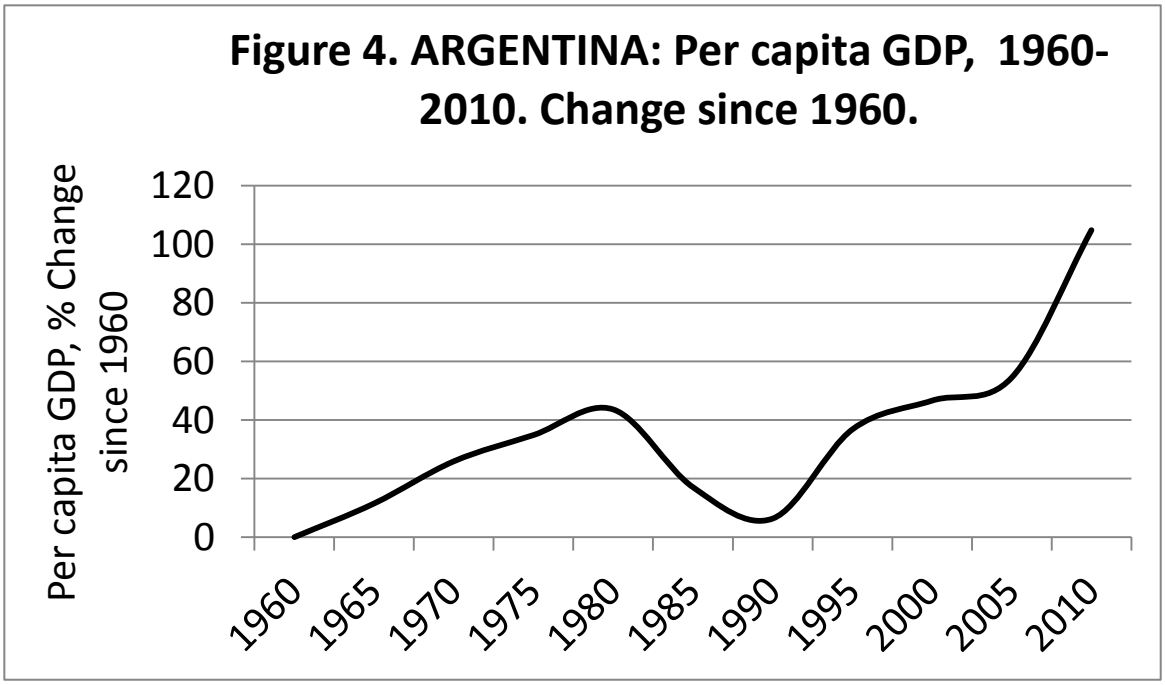
In view of all these considerations, the economic impact of ageing, and the burden that this increased older adult population has on Social Security, can be seen more correctly by observing what happens to social production throughout the demographic transition, that is, the relationship between the population dynamics of the population and the historical behaviour of GDP.

The economic impact of ageing in Latin America

First, to determine whether their increased share is detrimental to the income of the rest of society, we consider whether the increase in GDP has been sufficient to accommodate the net population increase, despite ageing and the consequent relative decrease in the active population. In other words, one observes whether per capita income remains constant. Whenever GDP per capita does not decrease, it will be argued that aging has not meant an economic loss to society as a whole, and that despite the smaller relative labour force, global production still maintains the per capita income level of the base year.



Source: Data from CEPAL (2012)



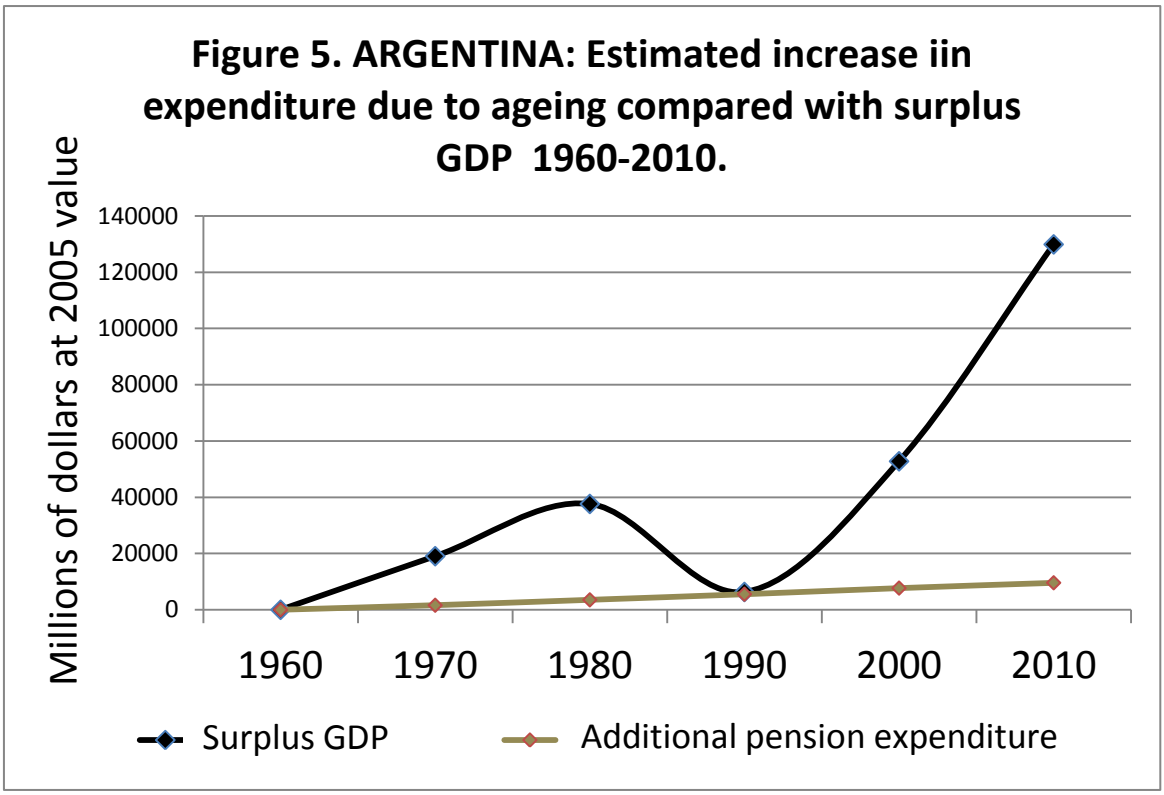
Source: Data form CEPAL (2012), World Bank (2013). Constant prices at 2005.

In Latin America GDP per capita has grown steadily since 1990. In Argentina, meanwhile, GDP per capita does not diminish in any year below its value in 1960. It is therefore possible to argue that the aging process has not produced an actual shortage of resources to address the pension expense, either in Argentina or in the region as a result of the aging process.

It is possible that GDP growth occurs over and above the need to compensate for the overall population growth (which can be seen when growth in per capita GDP is found). Thus it is possible to assess whether the increase in GDP is sufficient to offset the additional expense involved in ageing.

To calculate the economic growth in excess of the requirements of adaptation to demographic growth, we subtract from the real GDP of the year a GDP Basic Estimate, which is one in which the GDP per capita remains constant. Thus, by multiplying the total population by per capita GDP in the base year, the GDP estimated baseline is established. Then the observed "surplus" of GDP, can be compared with the increase in pension expenditure as a function of increasing elderly population. The pension expense is calculated by multiplying the estimated number of additional older adults (compared to the base year) by a constant elderly income, equal to the income recorded in the base year.

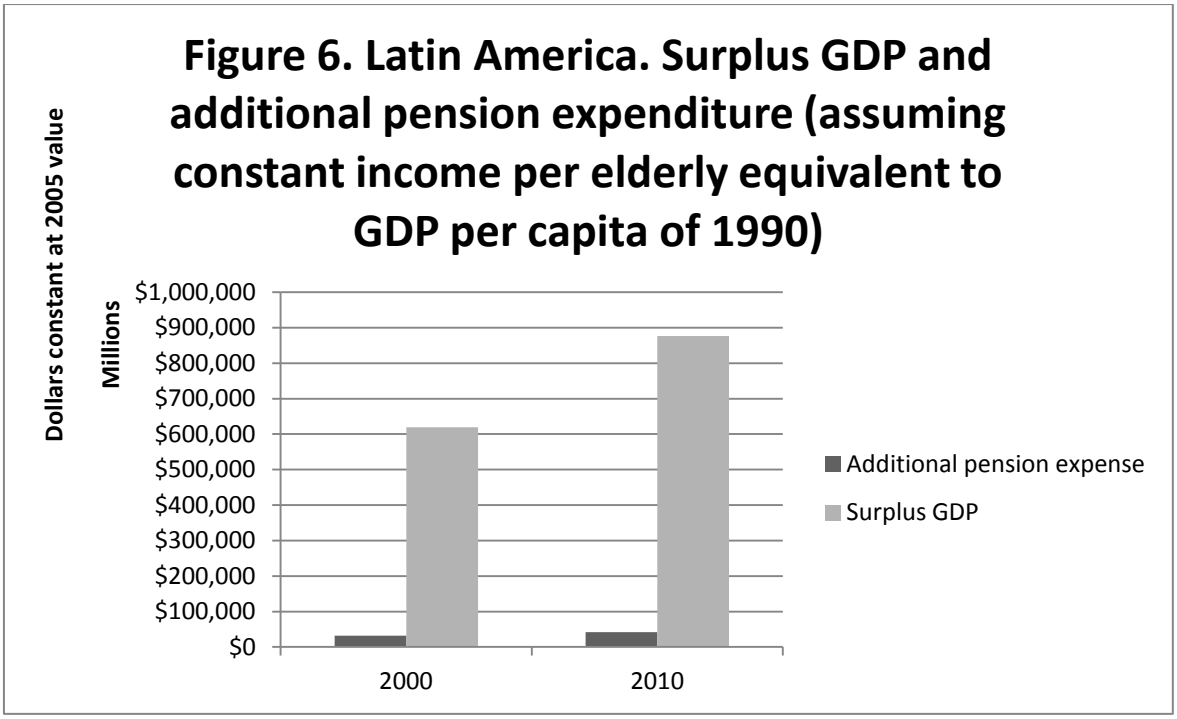
If the surplus is equal to or greater than the increase in pension expenditure, it can be argued that society has generated additional resources that compensate the pension spending added by the aging population. In Figure 5 the GDP surplus is compared with the estimated additional pension expense in relation to 1960, calculated on the assumption that income of older people is constant equivalent to the GDP per capita of 1960.



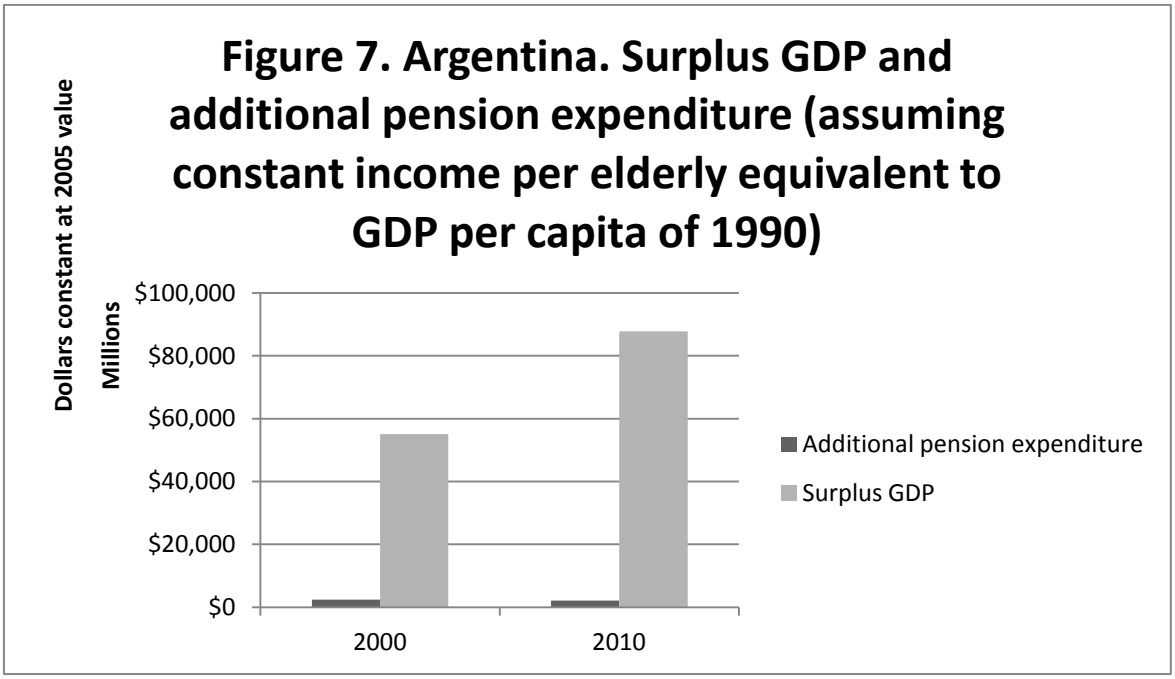
Source: Calculated from CEPAL (2012) and World Bank (2013)**.** The basic estimate of GDP and the additional expenditure on elderly each year were calculated in relation to 1960

The growth of GDP surplus relative to estimated additional pension expense, shows that the surplus has been higher than pension expense every year. Thus economic growth has been sufficient to generate the same or higher resources than the extra pension expense derived from the aging process.

The following graphs compare GDP surplus and additional pension expense in 2000 and 2010 with respect to the previous decade. The GDP surplus is in relation to 1960, and pension expense for the purposes of this analysis is estimated as the per capita GDP of 1960.



Source: Calculated from data in CEPAL (2012). The basic estimate GDP in each year is calculated in relation to the GDP per capita of the decade before (1990 for the basic GDP 2000, and 2000 for the basic GDP 2010), and the additional cost of elderly in relation to the population of older adults of the previous decade.



Source: Data in CEPAL (2012). The basic estimate GDP in each year is calculated in relation to the GDP per capita of the decade before (1990 for the basic GDP 2000, and 2000 for the basic GDP 2010), and the additional cost of elderly in relation to the population of older adults of the previous decade.

In both Argentina and Latin America the additional expense was not significant relative to the increase of GDP surplus. Thus, the main concern about aging, the alleged unsustainability of welfare spending, does not correspond to the evolution of resources in society

Under current production trends, it is therefore possible to predict that ageing will not increase the burden of the inactive population on the economy.

Ageing under contributory pension systems

It is true, however, that, especially in the most aged countries, security systems have become increasingly difficult to fund. Changing proportions of active and inactive people generated by the demographic transition makes financing the systems increasingly difficult, specifically, as the proportion of contributors decreases in relation to beneficiaries.

Therefore, while the economic impact of the increase in the older adult population is not negative, the burden that ageing puts on the pensions system is. This is because the pension system, due to its contributory character, is unable to cope with the new expenditure. In other words, the ageing population puts a strain neither on the economy, nor on the system of social protection as such, but specifically on the contributory model.

Demographic reasoning abstracted from the economic context to which it is applied, leads to erroneous conclusions and can justify cutting income in the third age as inevitable, identifying the elderly as a source of material instability for society.

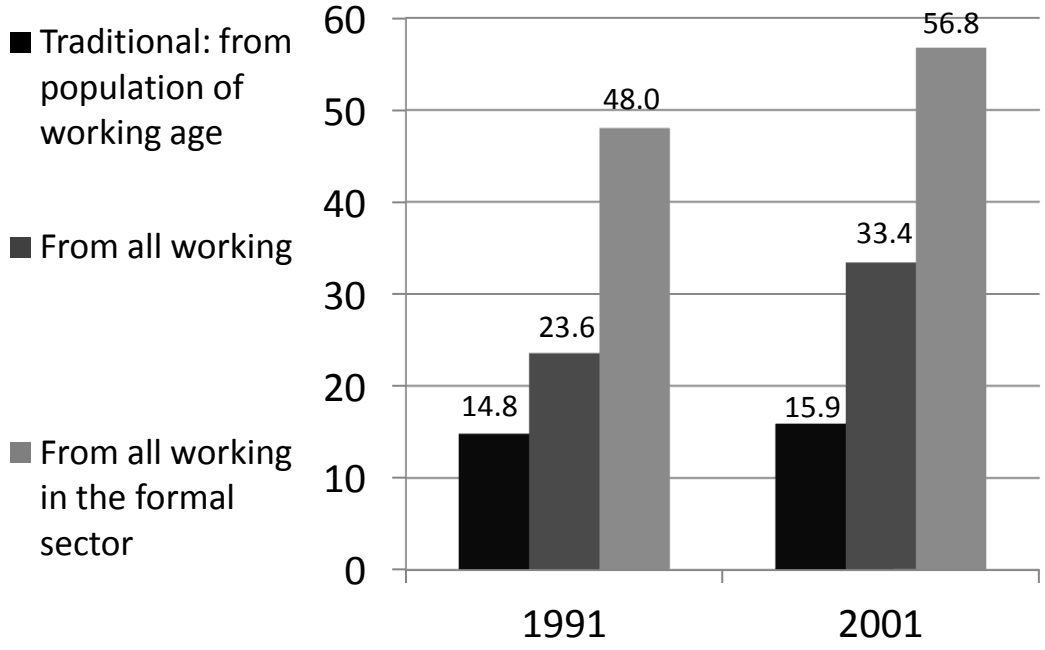
However, indicators of dependence do properly explain the problem that ageing involves in societies where intergenerational transfers are based on a balance between the currently active and inactive residents. If the system of social protection in old age is contributory, its economic viability will be subject to the relationship between workers and retirees.

In fact, the purely demographic dependency ratio is an optimistic view of the real dramatic consequences in the relationship between working taxpayers and inactivity. The adequacy or inadequacy of pension income is measured by the contribution of each worker employed in the formal labour market and not by the number of people of working age, whose relationship with the number of workers is not at all direct. In this context informality generates the same financial impact on the tax system as ageing. In addition, the relative decrease in working age population does not imply shortage of labour when there are persistent and high rates of unemployment. Thus, the labour market

has become the true issue on which ageing depends. Therefore, to see the impact of ageing on the contributory pension system and its underfunding it is necessary to incorporate the complex reality of work and the labour market when calculating the dependence ratio.

The formal dependency rate[12] of Uthof, Vera and Ruedi (2006) comes significantly closer to this goal. But for the purposes of this analysis the dependent population considered will be limited to older adults. This will allow us to see the effective pressure that demographic dynamics exert on the labour market, which is relevant to understand how contributory pension systems have been choked.

Figure 8. ARGENTINA: Old age dependency, calculated from the population of working age, from all those working and from all those working in the formal sector, 1991-2001



Source: Based on 1991 and 2001 census data (INDEC, 2011) and CEPAL (2010).

The traditional exclusively demographic analysis shows that there 4.33-4.25 persons of working age for every elderly person. If we consider the employment status of these working-age people there are 4.2 (in 1991) and 2.99 (2001) occupied workers per older adult, and only 2.1 and 1.75 effectively contributing workers (i.e. in formal employment) for every older adult in 1991 and 2001. The final figures reflect the balance that the tax system must negotiate to pay for a growing population of non-contributors.

Table: Different dependency ratios 1991-2001

	1991	2001
Working age for every elderly person	4,33	4,25
Occupied workers per older adult	4,2	2,99
Contributing workers for every older adult	2,1	1,75

Source: Based on 1991 and 2001 census data (INDEC, 2011), and CEPAL (2010).

This dependency ratio which considers the labour market shows a much more critical situation for the contributory pension system than the exclusively demographic calculation. If in 1991 the dependency ratio of old age was 14.8, the same dependence on active workers is 23 and is more when considering only workers who actually contribute, reaching 48. In 2001, meanwhile, the demographic dependency ratio of old age was 16.4, while the same on the employed was 33.4 and on the employed contributor climbed to 56.8. Thus in 2001, due to the severity of the problems of the labour market in the country, labour indicators were even more important than demographic indicators, in determining the dependency of old age. It is this that explains the difficulties of contributory financing of social security.

In sum, the new demographic ratios are a source of dramatic crisis, compounded by a restrictive employment context. But it is a crisis for a particular mode of distribution and intergenerational income transfer. In societies with large inequalities in the distribution of income, unemployment and informal work, and whose social security systems are based on contributory financing, ageing seems to be the coup de grace for the viability of social protection of older adults. But contributory pension models are only one way, not the only way, to transfer intergenerational income and achieve social protection of the elderly. Thus ageing should be treated as a threat to that distributive mode, and perhaps therefore a valuable opportunity to advance towards more equitable societies, incorporating in the new financial settlement criteria that allow a progressive redistribution of income.

Conclusions

The statistics are compelling. Demographic change effectively presents an inescapable challenge to our societies and particularly for pension systems. However, it is not at all apparent that there is a need to restore the demographic ratios of yesteryear. It is said that ageing brings into question the quality of old age benefits, their coverage and the age at which you receive them. But the data find that ageing produces those risks only within the contributory taxable paradigm, since the scarcity of resources is not observed when considering the economic production of society as a whole.

In reformulating the interpretation of traditional demographic indicators, applying its conclusions only to the consequences of ageing on contributory systems, it follows that it is these systems, and not the economy in general, which cannot cope with the increase in retirees. If old age is to be covered by contributions from current workers, the demographic transition makes it necessary to expand the formal labour market in the same proportion as the increase elderly population. But the problems of unemployment, underemployment, informality and instability, as well as deteriorating or stagnant wages, make the increase of the older inactive population a major source of financial problems. Although improvements in the economy potentially allow it to face new burdens, in a contributory scheme the mechanisms for transferring income to the pension system are excessively rigid, depending on the dynamics of the labour market and employee income. Thus it is possible that even with an increase in economic production adequate for increases in social spending, the contributory system for financing ageing imposes critical financial limitations for its sustainability.

If the intergenerational transfer of income becomes separated from dependence on the formal labour market, and is linked to general production, the new demographic ratios no longer automatically represent a significant imbalance for the funding of the pension system. Thus, a system could be designed based on general revenue financing, or the creation of a specific tax, dynamically linked to the trend of economic production.

From this analysis come two fundamental conclusions:

1) It is not true that ageing is economically unworkable. In Argentina, GDP has grown at higher rates than the older population. In Latin America, despite a less favourable ratio, growth in GDP has surpassed that of ageing. Furthermore, we have observed that the GDP per capita has not declined, rather

the prevailing trend is of sustained growth. Therefore, if an increasing proportion of GDP were allocated to the older population, consistent with its growing proportion in society, the rest of society would not see its income diminished. This is because an increase in productivity allows more production with a smaller labour force. In sum, a growing economy allows a greater proportion of GDP for the elderly population without affecting access by the rest of the population to the GDP, according to the proportion of the population that it represents.

2) If it is not necessary that the ageing process is reversed, then a demographic solution to ageing will not be necessary and nor will stimulating the birth rate. Similarly, the argument does not hold that the falling birth rate is creating a societal problem of a labour force shortage. The problems of the labour market in countries affected by ageing have little to do with demography. As could be seen in statistics related to the labour market, the prevailing trend is that there are more people of working-age than jobs (and sustained rates of unemployment). Curiously, the typical argument about the economic consequences of a fall in the birth rate excludes consideration of the economy itself. It establishes a direct relationship between the labour force and the number of workers, and between the latter with the total production of society. But when there are serious problems of unemployment, a declining population of working age will not necessarily impact on the number of workers, and therefore its economic consequences will be very different to those expected by that argument. On the other hand, a larger population of working age will involve a larger excluded population that not only do not produce, but are unable to access consumer goods and thus stimulate the market economy. Against this background the higher birth rate will not only not be a solution, but will even exacerbate existing distribution problems.

It is true, however, that an unequal distribution, and a contributory tax system that replicates these inequalities in intergenerational transfers, may be unsustainable in societies that face the challenges of demographic transition.

Perhaps the time has come to stop regretting ageing and to welcome the fall in the growth rate of the world population, designing economic and political strategies so that ageing and the fall in the labour force do not imply a problem, but instead open a path to more just and equitable societies.

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Notes

1 Berlusconi, former Italian President, Sarkozy, France's former president, Zapatero, former president of Spain ; Cameron, British Prime Minister. They all argue that ageing makes adjustment to the pension system inevitable. Changing the retirement age (representing more years of contributions, and fewer years of retirement benefit) is advocated as an unavoidable measure to prevent the collapse of social security systems of old age. For example: 'The effective average age of retirement in Spain is now 62.6 years, which "is not sustainable" financially in the long term given Population ageing, indicated Zapatero' (http://www.elperiodico.com/es/noticias/economia/20101218/zapatero-compromete-ante-retrasar-jubilacion-los/print-629307.shtml), and Sarkozy: '"If we want to save our pension system, we cannot delay decisions" because reform "is in everyone's interest", underlined the conservative president, who pointed out that the accumulated deficit of the system is of 30,000m euros, and that the relation between contributors and retired is ever more unfavourable and is made more grave by population ageing'. (http://www.malagahoy.es/article/mundo/632979/sarkozy/retrasa/su/anunciada/reforma/las/pensiones/para/evitar/estallido/social.html)

2 Among others, World Bank documents (Lee, Mason and Cotlear, 2010, World Bank, 1994) International Labour Organisation (OIT, 2002 and 2009), the European Central Bank (González Páramo, 2008) and distinguished authors of the Economic Commission for Latin America and the Caribbean and the United Nations (Chackiel, 2001; Mesa Lago, 2004).

3 The following statements are based on figures of Pérez Díaz (2011a, chart 1) and Fernández (2011, Table 1)

4 The first reference to the concept of reproductive revolution is in the text of Garrido Medina (1996). In this paper the author develops concepts that will be taken up by Pérez Díaz (2003, 2005, 2011, 2011a, 2011b, 2012) and MacInnes and Perez Diaz (2008, 2009) for development of the theory of mass maturity and reproductive revolution.

5 Pérez Díaz believes that behind these natalist discourses are hidden ideological prejudices of xenophobic, traditionalist, nationalist, or religious character. (Pérez Díaz 2011a).

6 The following summary is based on the texts of Pérez Díaz (2012, 2011, 2011b, 2009, 2008, 2005, 2003).

7 This section is based in part on an article by Torres Minoldo and Pelaez (2012)

8 The traditional indicator of demographic dependency relates the number of individuals of inactive age (under 15 and 60 or older) with the number of individuals of active age (15 to 59 years), as a way of measuring the effort that the potential workforce must do to meet the needs of the inactive and most vulnerable (Uthoff, Vera and Ruedi, 2006).

9 Initially, the decline in fertility leads to a rapid decrease in the proportion of persons under 15 years, a slight increase in the proportion of people aged 65 years and over and marked expansion of the proportion of working age (15-64 years); therefore, the rate of dependence tends to decrease. (CELADE/CEPAL 2008)

10 In the last section we show how the dependency ratio increases when considering labour indicators, diminishing the importance of the decline of demographic dependency due to the decline in the child dependency ratio.

11 Uthoff et al (2006) propose the modern-formal employment dependence indicator that takes into account not only the demographic dimension, but also individual working conditions. The new indicator considers as dependents not just people under 15 years and 65 years and older, but also people aged 15 to 64 who are inactive, that find it difficult to enter work or have a precarious situation in the labour market, such as unemployed and informal workers. As a result, the group of people not dependent is comprised of individuals aged 15 to 64 who are engaged in the formal sector of the economy. (CELADE/CEPAL 2008).

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This article has been updated from that published in *Astrolabio*, no. 8, 2012, published by CONICET in Córdoba, Argentina.

Translated by Ludi Simpson with author and editorial advice.

Quotations have throughout been translated into English from the Spanish given by Maria Sol Torres Monoldo, without reference to their original rendition even if in English. March 2014.