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on Demographic Issues

The Economic Analysis of Population Aging: Implications for Policy Making

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The Economic Analysis of Population Aging: Implications for Policy Making

Michael Herrmann[1]

Population aging worries many. Will population aging negatively affect economic output and lead to deflation? Can countries afford to cater for older populations? Can they prevent old-age poverty? Can they pay adequate pensions? Can they address the challenge of population aging by postponing the retirement age? Should they seek to counteract population aging through accelerated immigration and/ or should they focus on maintaining fertility rates above replacement levels? Although some answers to these questions are context-specific, this paper argues that the threat of population aging is overstated. It is hyped by media and too often based on partial analysis. A macroeconomic analysis provides a more adequate and less threatening picture of population aging than the microeconomic analysis that underlies most studies on this subject matter. The developed economies that already have a large share of older persons are well positioned to shoulder the economic implications of further population aging, and rapidly developing economies, which see an accelerated rate of population aging, are too. Many countries have the economic conditions to address population aging, but many lack the necessary resolve to implement the required policies. Popular policy responses to population aging are building up to a major wave of income redistribution, following the globalization of finance and the current responses to the global economic crisis.

A. Introduction

A fall in fertility and the associated aging of populations, or even a decline in population, has caused major concerns in many countries. The most pressing economic concerns of countries relate to pension and health care systems. Countries are worried that they cannot ensure adequate pensions for a growing number of retirees, and they wonder how they may finance rising health care expenses. And it sometimes appears as though countries are caught between a rock and a hard place, and have at best limited policy leverage to escape this situation. Either

[1] Technical Adviser on Population and Economic Development, Population and Development Branch, Technical Division, UNFPA. The paper benefited from UNFPA's Technical Meeting on Low Fertility and Depopulation, held in New York, NY, 29 November 2010, as well as valuable comments by Jose Miguel Guzman, Detlef Kotte, Andrew Mason and Ingo Pitterle. The author also likes to thank Natalia Dinello who has commented on an earlier version of this paper. The views expressed in this paper however are those of the author, and they do not necessarily reflect the views of commentators or UNFPA.

they increase taxes on the active labor force and effectively decrease the living standards of the labor force, or they decrease benefits to dependents and thereby decrease the living standards of dependents, or they run up public debt and thereby decrease living standards of future generations. Any possible action by countries, it seem, will lead to the impoverishment of somebody. And it may appear ironic that population aging, one of the greatest achievements of development, now poses serious challenges to the development of many countries. However, these choices are false choices.

While the challenges may appear daunting if viewed from a microeconomic perspective – which is often based on national transfer accounts -- they are less daunting if viewed from the macroeconomic perspective. And as population aging affects countries as a whole, it would be misguided to expect that associated challenges are addressed and resolved by households alone. Countries have many policy instruments at their disposal to cope with population aging, and most countries that have a rapidly aging population have sufficient economic policy space to shoulder the financial burdens that come with it.

In the advanced countries economic growth and labor productivity grow faster than the number of old-age dependents and young-age dependents together, indicating that the economy as a whole can theoretically cater for more dependents without decreasing the living standards of anybody. Furthermore, while population aging will lead to a shrinking of the working-age population in most countries in the coming decades, a smaller working-age population cannot be equated with a labor shortage. Several countries have recorded a shortage of very specific high-skilled professionals, but no country is likely to have a generalized shortage in the labor markets. Unemployment rates in most developed countries remain relatively high and are unlikely to fall significantly anytime soon, and the same is true for vulnerable and under employment in many developing countries. Furthermore, should countries be confronted by a generalized shortage in labor markets, they have several effective policy instruments to address such a shortage. The instruments required to address a general labor shortage however are

different from those required to address a specific labor shortage. At present there is a mismatch between policy instruments and challenges in many countries.

Just because economies have the capacity to cater for a growing number of older persons does not mean that each individual economic actor has this capacity as well. Over the past decade, returns to capital have outpaced returns to labor in all world regions, and in many countries income inequality has risen. These trends constrain the ability of the active labor force to significantly increase contributions to pension schemes, and shoulder other financial burdens that do come with the aging of populations. Thus, while population aging poses manageable economic challenges, it does pose important political challenges. Decisions about the reform of pension and health care systems have far-reaching implications for the redistribution of an economy's resources. At their core, the decisions about reforms are of a political nature. They have more to do with what governments consider feasible and fair rather than with economic challenges that they confront.

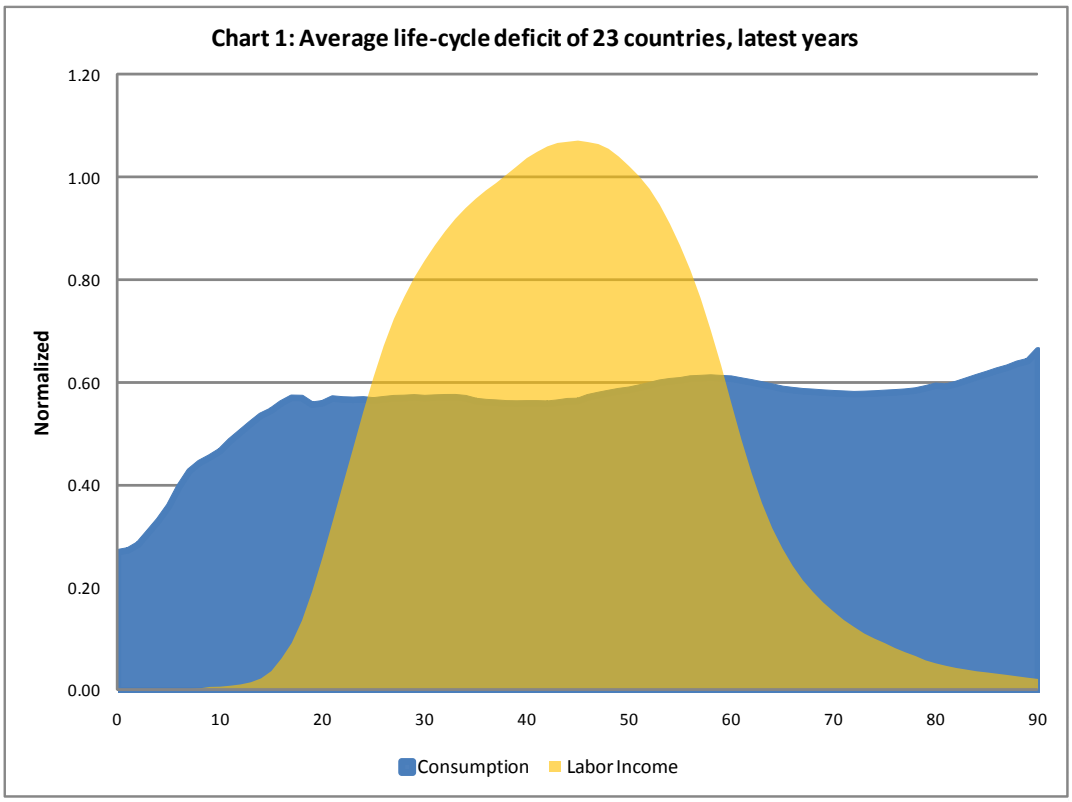
No doubt, pension systems, and possible health care systems, will require reforms. Simple accounting highlights that the current contributions to such systems are not sufficient to cover future claims on these systems. But economies have a choice whether they go for minimal reforms (e.g., increase in contributions by employees and/ or employers) or whether they go for fundamental restructurings (e.g., replacement of contributory systems with capitalized systems). The economic conditions of developed and rapidly developing countries, which already have a large older population or a rapidly aging population, are favorable and do not themselves prescribe any particular reform. However, there are differences between countries -- amongst the developed countries and especially the developing countries -- which require distinct policy responses to population aging. Countries that already have an established pension and health care system are in a very different position than those which have at best rudimentary pension and health care systems. And it would be desirable that the latter learn from the pitfalls of reforms, as well as their merits, implemented by the former.

Instead of rushing to hasty conclusions and policy responses, it would be important for policy makers to conduct a thorough analysis of the actual economic challenges posed by population aging. Such an analysis may start with the construction of national transfer accounts -- a methodology that is often employed to gauge challenges -- but must be complemented by a broader, more traditional assessment of the macro economy and labor markets. This paper puts forward such an analysis. While this analysis eases concerns, it also suggests that countries where the growth in total dependencies outpaces the growth in labor productivity, will find it more difficult to address the economic challenges of aging. But a more in-depth analysis of individual countries, which goes beyond the scope of this paper, would be required to tease out country-specific challenges and policy responses.

B. National transfer accounts and the life-cycle deficit

A common and useful entry point into the analysis of the economic implications of age-structural change, as well as an important background for the understanding of policy responses to age-structural transformations, is provided by national transfer accounts. National transfer accounts show the distribution of national accounts data by age. Thereby, they basically provide a description of who earns how much, who consumes how much, and who pays the difference, in the current arrangement of an economy (Mason et al. 2006; Mason et al. 2009; Lee and Mason 2008). The first step in the analysis is to chart the so-called life-cycle deficit (chart 1) -- which shows the distribution of labor income and a country's total consumption expenditures by age -- and a subsequent step is to show how the life-cycle deficit is currently being financed -- which shows the importance of both transfers and asset reallocations in a given economic arrangement. Both may be further distinguished into two principle types, namely transfers between current generations (taxes and contributions) and transfers from future generations (debt), as well as asset reallocations by households (household saving, real estate, art, etc.) and asset reallocations by governments (public-enterprises, public infrastructure, natural resources,

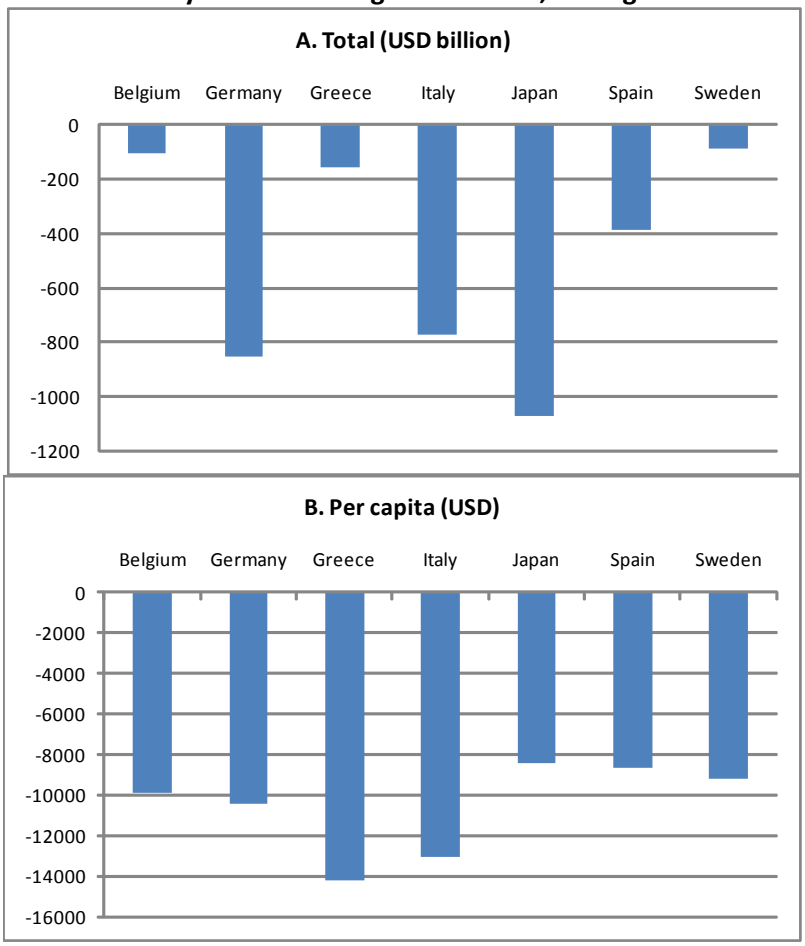
etc.). Households and governments can rely on these instruments to varying degrees, depending on their respective economic circumstances.



Source: R. Lee and A. Mason (2010).

The life-cycle deficit shows that the consumption expenditures on younger people (young-age dependents), which are largely related to education, and the consumption expenditures on older people (old-age dependents), which are largely related to health care and pensions, exceed their respective labor income. The balance between labor income and total consumption expenditures is positive only for those in prime working age. However, the income surplus of the population in working age is insufficient to cover the consumption surplus of the population below or above working age (chart 2). The result is a deficit that national transfer accounts term "life cycle deficit". In absolute terms, the deficit is largest fore Japan and smallest for Greece, but in per capita terms, the picture is inverted.

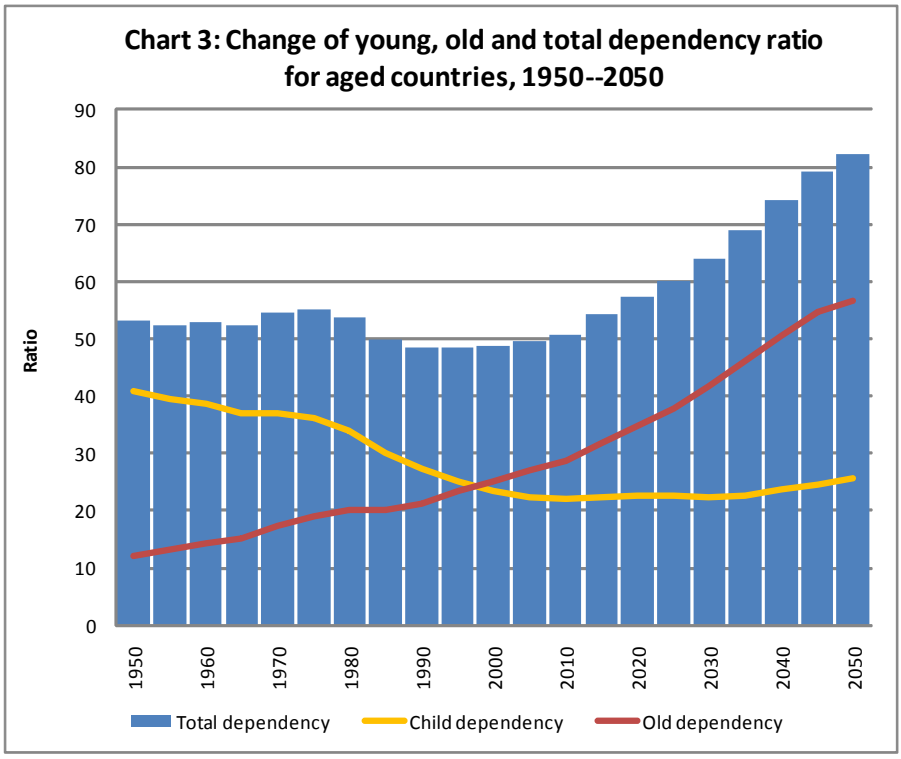
Chart 2: Life-cycle deficit of aged countries, average 2005-2009



Source: Based on OECD online data, 12 November 2010.
Note: Life-cycle deficit is approximated by difference between final consumption expenditures and compensation of employees (paid).

The information provided by national transfer accounts allows for simulations of possible effects of changes in age structures. Long-term population projections highlight, many countries which already have a significant share of older persons will see a further increase in the share of older persons over the next four decades (chart 3). The projected increase in old-age dependencies (64 and above) is partially, but not entirely, offset by a decrease in young-age dependencies (15 and below), resulting in a net increase in the total dependency ratio (chart 3). All else equal, an increasing number of persons would draw pensions and depend on health care -- which is expected to lead to a rise in total consumption expenditures -- and fewer persons could

participate in the labor force – which is expected to lead to a fall in labor income -- effectively increasing the life-cycle deficit. Accordingly, it is often expected that population aging will lead to a labor shortage, and it is argued that such a labor shortage will eventually undermine economic output. However, a mere increase in old-age dependencies does not say anything about a shortage in labor markets. The only meaningful indicator for a labor shortage is a low and falling rate of unemployment.



Source: Based on UN DESA/ Population Division, World Population Prospects, online 16 August 2010.
Note: Based on medium variant of population projections; rapidly ageing soceities include Belgium, Bulgaria, Germany, Greece, Italy, Japan, Spain and Sweden.

In short, while national transfer accounts provide useful information about current arrangements in economies, simulations based on national transfer accounts cannot provide an accurate picture of future developments of the life cycle deficit. This is due to several principle reasons:

Fragility of population projections: While long-term population projections enable simulations with national transfer accounts, these long-term population projections themselves rest on fragile assumptions about fertility, mortality and migration. And these variables are in turn strongly influenced by other factors, including education and health, as well as income and wealth. Available and internationally comparable population projections therefore vary widely.[2]

Definition of dependency ratio: Changes in the "common dependency ratio" – persons below or above working age (below 15 and above 64) relatively to persons in working age (between 15 and 64) -- provide an inadequate understanding of actual dependencies. Accordingly, policies that increase the share of the working-age population could be hailed as effective in reducing the dependency ratio (e.g., postponement of retirement or increase in immigration), even though such policies may increase the number of unemployed who depend on public and/ or private support. An inappropriate definition of the dependency ratio, in short, can encourage misguided policy responses to population aging. And it is therefore essential that the analysis of population aging – including the analysis grounded in national transfer accounts – be based on a more realistic definition of dependency ratios (box 1).

Box 1: The merits and shortcomings of dependency ratios

The most commonly used dependency ratio is the number of people in working age relative to the number of people outside working age within a country. This dependency ratio however has important shortcomings, and it therefore appears meaningful to consider alternatives:

Working-age population: While a working-age population of 15-64 is typically used for international comparisons, a working-age population of 25-64 may be more appropriate for the developed countries, whereas a working-age population of 15-80 may be most appropriate for the least developed countries, as many children in the former enjoy extensive education and

[2] This analysis is based on the medium variant of population projections published by the Population Division of the United Nations' Department for Economic and Social Affairs, which suggests a relatively rapid deceleration of population growth, compared with alternative projections.

enter the labor force only in their mid-twenties, and many adults in the latter do not enjoy pensions and therefore leave the labor force as late as possible. However, as most people in the least developed countries do not live to the age of 80, this change would only slightly affect the dependency ratios in most of the least developed countries. A variation of the working-age dependency ratio is the potential support ratio, which expresses the number working-age persons per old-age dependent (United Nations 2009).

Labor-force: Because of the shortcoming of the common dependency ratio, based on the working-age population, other studies favor a dependency ratio which is based on the economically active population. However, the economically active population includes not only the active and productive labor force that has labor income but also the unemployed labor force that has no income and the underemployed labor force that often has insufficient income, both of which depend on public and/ or private support. Furthermore, this dependency ratio is influenced by cultural and social specificities. Countries where women are essentially excluded from the active labor force could end up having a higher dependency ratio than countries where they actively participate in the labor force.

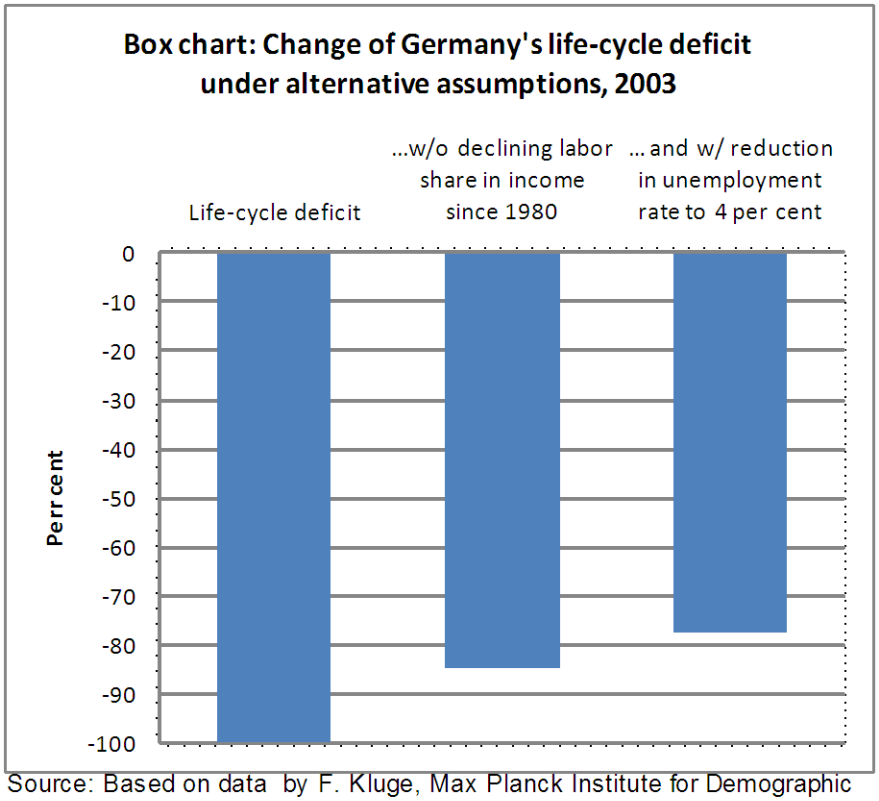
Employment: A more realistic picture of actual dependencies is provided by an "economic dependency ratio" based on employment. Like a labor-force based dependency, the economic dependency ratio is influenced by social and cultural factors, but unlike the labor-force based dependency ratio it adequately accounts for the unemployed. However, as a small but productive labor force may actually be able to support a relatively large number of dependents (e.g., in the advanced economies), whereas a large and unproductive labor force may be able to support only a relatively small number of dependents (e.g., in the least developed economies), the economic dependency based on employment could be complemented by a measure of the actual dependency burden which includes labor productivity and labor income. To facilitate international comparability, this measure of the dependency burden could be expressed in purchasing power parities.

As labor income does not necessarily coincide with labor productivity, the labor income per citizen may be viewed as the actual dependency ratio, whereas the labor productivity per citizen may be viewed as the potential dependency ratio. Accordingly, the actual dependency ratio would be lower where labor income closely matches labor productivity, and it would be higher where labor income falls short of labor productivity. In the latter case, labor would have a limited capacity to contribute to contribute to public consumption expenditures, but capital would have a stronger capacity to do so.

To distribute the burden of a rising dependency ratio in accordance with capabilities is ultimately the role of government. The advantage of the economic dependency ratios, and the associated measure of the dependency burden, is that it captures the main challenges associated with age-structural transformations and that it is coherent with policies needed to

address demographic change.

The case of Germany highlights the important effect of labor income and employment on the size of the life-cycle deficit. The deficit would have been considerably lower, if only the labor share in income had not declined, and if the rate of unemployment had been lower (box chart).



Source: Based on data by F. Kluge, Max Planck Institute for Demographic Research; M. Charpe and R. Torres, International Institute for Labour Studies, ILO; and OECD Labor Force Statistics, online, 1 September 2010.

Life-cycle deficit: The life-cycle deficit itself -- the difference between labor income and total consumption expenditures – may be seen to express a dependency ratio. However, advanced countries that spend a relatively large share of their income on education and health would have a relatively high dependency ratio, whereas developing countries which may not be able to spend a similar share of their income on education and health would appear to have a relatively low dependency ratio. Accordingly, this measure too is more of a reflection of the abilities and preferences of countries to cater for the young and the old, than a reflection of the pressures and opportunities emanating from demographic change. Furthermore, the ratio of labor income to consumption at a given point may not actually be sustainable.

This discussion highlights that all dependency ratios have shortcomings and in accordance all dependency ratios should be used with care. None of the discussed dependency ratios easily

lends itself to international comparisons, and most dependency ratios are at least partially influenced by cultural, social or institutional country specificities. However, on balance it appears that the economic dependency ratio is the most accurate and appropriate type of dependency ratio.

Changes in dependencies: Population aging associated with low fertility does not only lead to an increase in the number of older persons, but also to a decrease in the number of younger persons which partially mitigates the aggregate rise in total dependencies (Bloom, Canning and Fink 2010). It is too limited to focus solely on the former and disregard the latter. The projected increase in old-age dependencies can highlight pressures on pension systems, but it is the increase in total dependencies that will highlight pressures on economies as a whole. The changes in dependency ratios suggest that part of the additional expenditures on old-age dependents could be financed through a reduction of the current expenditures on young-age dependents. Governments could for example reduce spending on education -- in total, not in per-capita terms! -- and could instead increase contributions to health care and pensions.

Dynamism of economies: Simulations based on national transfer accounts do not adequately account for the dynamism of economies and are likely to misjudge the future development of the life-cycle deficit. On the one side, whether labor income will fall does not so much depend on the size of the labor force but rather on the productivity of the labor force (a higher productivity allows for rising labor income) and, on the other side, whether total consumption expenditures will rise does not only depend on demand for health care, but also on the changes in health care costs (lower heath care costs can curb rising health care expenditures). The development of labor productivity in turn is most directly determined by investments in human and physical capital, and the development of health care costs is dependent on changes in demand and supply, as well as technological progress and regulatory policies.

Although national-transfer-account based simulations seek to account for changes in labor productivity over time -- assuming an annual average rate of labor productivity growth -- these simulations do not account for changes in prices and costs. Yet, there is no reason why the cost of health care services should remain unchanged or increase. Over the past three decades or so the cost of air travel has significantly declined, for example, and it would be too simplistic to assume that over the next four decades the cost of health care services will remain unchanged or increase. Legislative changes could go a long way in reducing the cost of health care.

Conceptualization of the life-cycle deficit: The main feature of national transfer accounts – the allocation of economic resources to individuals at different ages – is also the main shortcoming of this methodology. It leads to a focus on households (as consumers and workers) and a neglect of firms (producers and capital). Yet, it is the cyclical interaction between both that are at the heart of macroeconomic developments. Accordingly, national transfer accounts focus on how age-structural change affects labor and consumption, but consequentially neglect how such changes affect capital and production. As with the effects, households become the focus of solutions.

The juxtaposition between labor income and a country's total consumption can give the impression that a country's total consumption expenditures mostly benefits individuals and that total consumption expenditures should therefore be paid out of labor income. Accordingly, it is expected that the projected increase in total consumption expenditures will inevitably place a concomitant burden on households, as they will need to allocate a higher share of their private consumption expenditures to their dependents, and/ or will need to pay higher contributions to public consumption expenditures on dependents. The working-age population has therefore also been referred to as the "sandwich generation" or, to highlight the severity of the anticipated pressure, as the "Panini generation".

Indeed, total consumption expenditures -- including private consumption expenditures by households as well as public consumption expenditures of governments – are largely financed

out of labor income, and this share has increased during the past decades. But who should be taxed is first and foremost a political decision and is not dictated by economic necessity per se. It is not necessary that labor income covers the consumption expenditures of households (households can cover their consumption expenditures through other sources of income, including the sale of assets), and it would be nonsensical to expect that labor income alone covers the consumption expenditures of governments (governments can cover their consumption expenditures through various revenues, including the sale of public assets).

Public consumption expenditures have important economic and social functions. They can help to promote productive investment, encourage output growth, develop human capital, and lessen harm. In short, government spending – be it on education and health, on science and technology, or on infrastructure – benefits society at large. It benefits households as well as companies, and it not only benefits the current generations but also the future generations. Therefore, the tax burden is most appropriately distributed amongst all economic actors, in a manner that accounts for their income differences.

Although the use of national transfer accounts can be misguided and misguiding -- as it may encourage hasty policy responses that do not adequately address actual challenges -- the construction of national transfer accounts can be useful and informative. National transfer accounts provide insights in how countries are financing their current consumption expenditures, and what challenges may arise to the current modalities because of age-structural changes.

Like national accounts, national transfer accounts merely describe an economic situation, and do not recommend any policy change. The fact that current contributions to pension schemes do not suffice to pay pensions of future generations is an important finding. This finding however does not prescribe any particular policy response. It does not provide information on whether older persons will need to accept a cut in consumption expenditures on pensions and health care, or whether employees or employers should increase contributions to pension and

health care systems. It also does not show how available policy options are circumscribed by economic development, including the growth of output and labor productivity, as well as changes in labor force participation. Many policy responses to population aging do not adequately take into consideration the many policy instruments countries have at their disposal to finance an aging population, and in many cases these policy responses will contribute to a further rise in income inequality.

For these reasons, it is essential that analytical exercises based on national transfer accounts be complemented by a more traditional economic analysis, and that policy responses not only focus on projected life-cycle deficits but are informed by the overall economic environment.

C. Economic Development and Policy Space

From an economic perspective it does not matter whether household income is sufficient to cover a country's consumption expenditures -- it is almost never high enough -- what matters instead is whether a country's economic development can sustain its consumption expenditures. It is therefore important to examine the economic development of countries in order to assess their capacity to respond to aging-related challenges.

Output and productivity: To examine how countries can cope with the financial implications of population aging, including an increase in health care costs and pension contributions, it is important to compare the actual and expected growth in dependents with the actual and expected growth of economic output. And as economic output is strongly determined by labor productivity, especially in an aging society, labor productivity effectively becomes the most important benchmark. The analysis of actual and projected economic growth will therefore need to be complemented by an analysis of actual and prospective labor productivity growth.

Consumption, saving and investment: The growth in output and productivity, in turn, is

strongly influenced by consumption, saving and investment. Market forces can change these variables, but so can economic policy. The design of pension systems for example influences consumption and saving, and through this the design of pension systems also has a strong effect on investment decisions.

Income distribution: The mere fact that the economy as a whole is growing does not mean that the income of all economic actors is growing as well. The initial distribution of income and wealth has important implications for the scope and effect of policies, including transfers and asset reallocations.

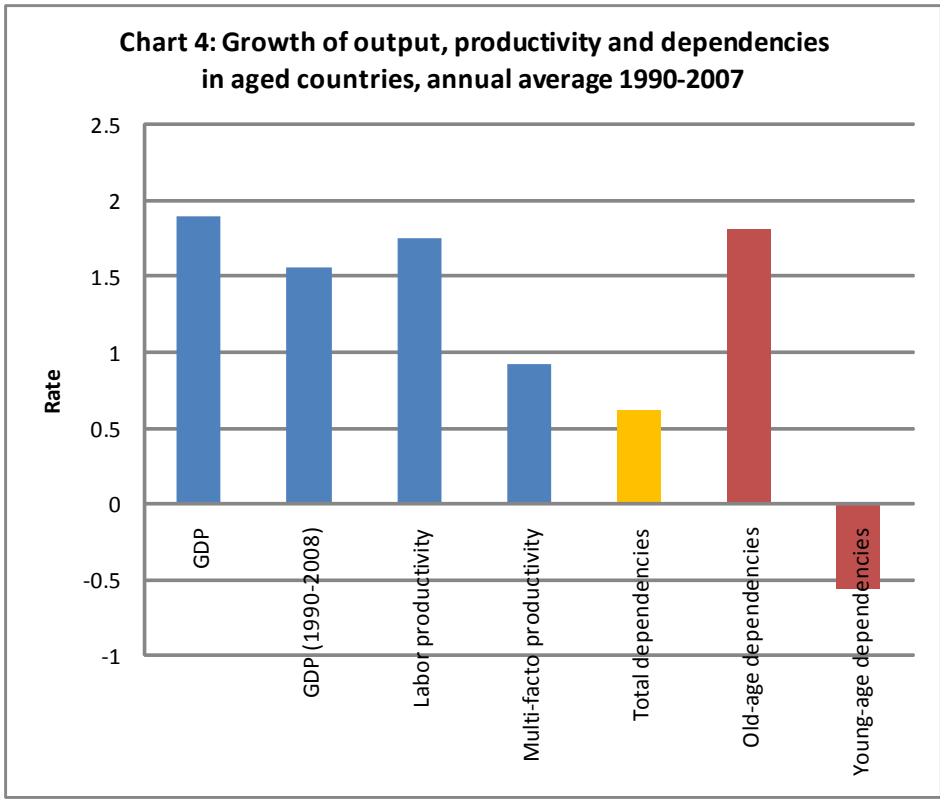
Labor markets: The most important way in which population aging could potentially threaten the growth of economies is by causing a shortage in labor markets. Therefore, the analysis of key economic variables would need to be complemented by an examination of labor market trends.

1. Output and productivity

The countries which have the highest share of older persons – Belgium, Bulgaria, Germany, Greece, Italy, Japan, Spain and Sweden – are countries that also had a comparatively strong economic development during the past years. The growth of economic output and labor productivity is higher in all these countries than the growth of old-age dependents and young-age dependents together (chart 4)-- and in most countries the projected peak in dependency growth until 2050 is also lower than the current rate of labor productivity growth, except in Italy and Spain (chart 5).[3] However, labor productivity growth does not need to exceed the growth in

[3] The German Statistical Office calculated that an average annual increase in labor productivity of less than 0.1 per cent is sufficient to address the challenge of population aging if the retirement age was set at 65, and that an average annual increase in labor productivity of less than 0.3 per cent is needed to cater for a growing number of old-age dependents if the retirement age was set at 63 (Bosbach 2008). The actual long-term average labor productivity growth is more than 1.6 per cent (chart 5), which highlights the absurdity of fears of population aging.

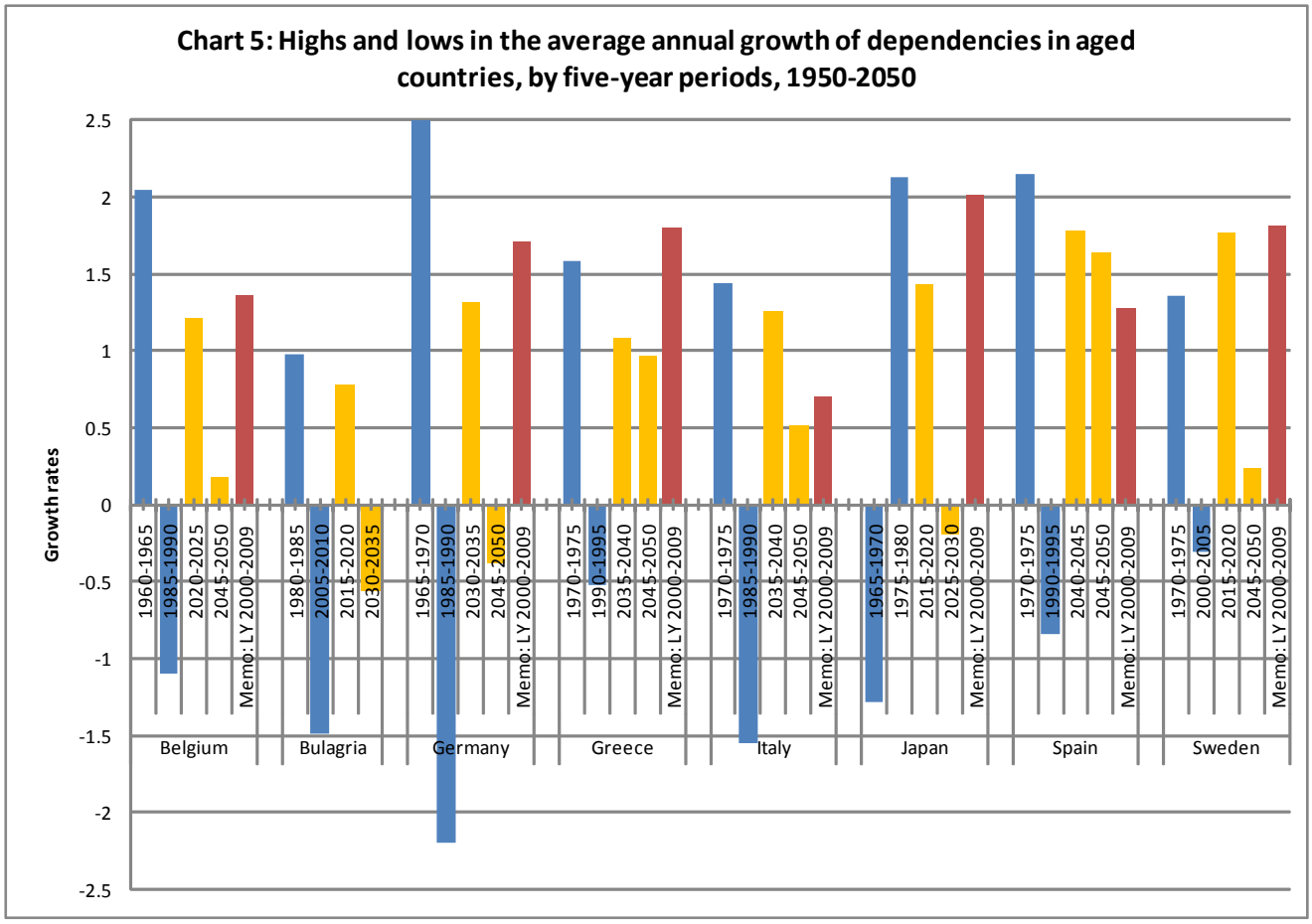
dependencies at every point in time; more important is that labor productivity growth is higher than the growth in dependencies over the medium term.



Source: Based WB, WDI, online; OECD online data and UN/ DESA World Population Prospects 2008, online, 15 October 2010
Note: Includes Belgium, Germany, Italy, Japan, Spain, Sweden.

The expected growth in dependency ratios is not an entirely new phenomenon, and many countries have witnessed an even higher growth of dependency ratios in the past. Past peaks in the growth of dependencies (1950-2010) were higher in all countries, except Sweden, than the projected peaks in dependencies (2010-2050). And while the growth in dependencies is projected to accelerate in the coming years, it is projected to decelerate thereafter and fall to a relatively low level towards the middle of this century. The growth in dependencies displays a cyclical pattern over time and it is important to focus on the medium-term average growth of dependencies (relative to the medium-term average growth in labor productivity) rather than

the peak growth in dependencies.



Source: Based OECD online data and UN/ DESA World Population Prospects 2008, online, 15 October 2010
LY: Labor productivity

By these indicators, the developed economies, as well as advanced developing economies, are well positioned to finance more dependents. However, future prospects for the growth of output and labor productivity strongly depend on changes in consumption, saving and investment, which are discussed in the next section; and the effect of economic growth on the distribution of income would suitably influence decisions on transfers and asset reallocations, which are discussed in the section thereafter.

2. Consumption, saving and investment

Population aging and the associated fear of an explosion of consumption expenditures have encouraged various measures to curb a rise in consumption expenditures, including reforms of pension and health care systems, as well as a the postponement of the retirement age itself. But what for? Is the reduction of consumption expenditures on and by the elderly supposed to enable higher consumption expenditures on and by others? If measures do not aim for such a switching in consumption expenditures, do they seek to promote a rise in saving? Economically, the former would be difficult to justify and the latter is not necessarily meaningful:

Change in consumption: From an economic perspective it does not matter so much what is consumed but rather how much is consumed and whether it suffices to stimulate investment. It is therefore unclear why spending on and by the elderly would be inferior to spending on and by others, or why spending on health care would be inferior to spending on cell phones, for example. It is also unclear why such expenditure switching should have any positive economic effects. Indeed, it seems easier to make a case for rather than against health care spending. Firstly, most people value health higher than any other good and, secondly, many health care services are provided domestically rather than imported.[4] For these reasons, efforts to reduce consumption of the elderly in order to increase consumption of others are difficult to justify on economic grounds. Politically, they may be defended where the elderly are much better off than everybody else, or where others are in greater need than the elderly. However, the type of expenditures – on whom and for what – has per se no positive or negative effect on economic development.

[4] Although measures to reduce consumption of health care services are not sensible, measures to reduce the cost of health care services could be. But a reduction of health care costs would ideally be based on a stronger competition between health care providers, rather than a reduction in the coverage or quality of care. The observed rise in health care costs is attributable not only to an increasing demand for health care services – which comes with an ageing population – but also to increasing fees charged by health care providers. The latter results from legislative changes which often place a cumbersome administrative burden on providers, as well as higher profit expectations by providers (United Nations 2007).

Increase in saving: Alternatively, consumption expenditures on the elderly may be reduced, so that the saving of others may increase. This is basically what is suggested by many pension reforms, which emphasize the need for households to put more money into private pension funds. Private pension schemes are often seen as a panacea to fixing the difficulties confronted by public pension schemes. But private pension systems, which imply a move from contributory systems to capitalized systems, have several shortcomings as well. It is not apparent that private pension systems are more efficient and safer than public pension systems (box 2).

Box 2: Private versus public pension systems

All else equal, rising claims on public pension schemes – which come with an increasing number of retirees -- cannot be satisfied with the current contributions to these schemes. The arithmetic has caused major anxieties. It was concluded that States cannot guarantee public pensions, and that individuals will need to rely more strongly on private pension plans. In accordance, many countries have undertaking, or are undertaking, major reforms of their pension systems. While the details of reforms differ, the reforms have common features: Individuals are required to pay higher contributions to public pension systems and to increase savings in private pension plans at the same time. But as people are required to set more money aside for their pensions – even if it is not fully reflected in deductions from pay checks – why has the State not simply and transparently increased contributions to public pension systems? By obliging individuals to rely on private pensions, the State has effectively spared employers from contributing more to public pension systems. This decision is presumably attributable to concerns of countries that higher payroll fringe costs could undermine international competitiveness of companies, encourage capital flight and lower investment, and negatively affect economic output and employment. But these concerns may be exaggerated as companies in numerous countries are benefiting from relatively low or falling unit labor costs.

But what about the benefits of private pension schemes over public schemes, one may wonder? Are private institutions not more efficient in managing funds than the public sector, and are they not promising higher returns than the public sector? Not necessarily. The safety of pensions, which crucially depends on prudential investment, rests uneasily with the profit-maximizing interest of pension funds, which encourages speculation. Speculation in the real estate market, for example, has resulted in a significant loss of pension funds. To minimize such risks will require safer investments, namely investments in credible government bonds. The countries that have a strong credit rating largely coincide with the countries that have an old

population. It is therefore likely that a German household will give money to a German pension fund, which then uses the money to purchase German government bonds. In other words, rather than giving money to the German government directly, through contributions to the public pension system, households are giving money to the German government indirectly, through the intermediation of private pension funds. But ultimately it is the German government that will receive the pension funds, and it is the German government that will guarantee their safety. The only apparent winner in this arrangement is the pension funds (Bosbach 2008). The German government will pay more to raise funds, and the German household will not necessarily receive higher returns. Pension funds can of course also purchase foreign government bonds, but in this case pension funds will also run exchange rate risks.

If countries do not want to accept lower pensions, amidst a growing number of retirees, countries will need to raise pension contributions. There is no reason why capitalized systems should be preferable over contributory systems, by contrast. Furthermore, reforms can be done in a balanced manner, which obliges employers to pay their share, or in an unbalanced manner, which requires that individuals will shoulder the burden. Although reforms are often justified on economic grounds, economic conditions do not prescribe any particular reform. Social policies, including reforms of pension systems, which alter the distribution of income, are rarely dictated by economic necessity; they are first and foremost determined by what societies find to be a fair or feasible social consensus, and by political compromise.

Furthermore, private pension systems do not work for all households – the poor who cannot sufficiently increase their saving may be stuck in poverty after their retirement – and capitalized systems can also have negative economic consequences. If all households increase saving, they will effectively reduce consumption. Whereas higher saving would lower interest rates and promote investment; lower consumption would increase inventories and discourage investment. And as the demand for goods and services falls, access to cheap capital may promote speculation and asset price bubbles rather than investment in production and services.

Pension reforms which require higher household saving can negatively affect domestic demand. Countries may seek to lessen a fall in domestic demand through the expansion of credit to households – an approach pursued e.g. by the United States, the United Kingdom and Spain – and/ or they may seek to compensate for a fall in domestic demand through a stronger reliance

on external demand – an approach taken e.g. by China, Germany and Japan. Neither response is sustainable however, as indicated by the most recent economic crisis. Eventually households will need to deleverage debt, and not all countries can simultaneously run current account surpluses. Furthermore, current account surpluses should ultimately vanish as prices adjust. The fact that this does not always happen and that current account surpluses are often persisting and global economic balances are widening can significantly undermine global economic stability. But this is the topic of another discussion.

Contrary to households that can save money for future consumption, including pensions, an economy cannot. The former suggestion is feasible – although not necessarily meaningful – but the latter recommendation would be simply nonsensical. Unlike a closed economy which must invest its saving (i.e., saving=investment), an open economy can hold some foreign saving (e.g., foreign treasury bills). But typically foreign saving result because countries have a strong export-orientation, as in China, and not because countries seek to fund aging-related expenses. Furthermore, efforts to increase foreign saving can negatively affect the level of domestic investment. The same is true for foreign investment, unless it complements and strengthens domestic investment.

In an economy everything that is a cost to some is a benefit to others, and has per se no negative net effect. Consumption is but the other side of income. If consumers were to save more and spend less on health care, for example, the health care sector would invest less and produce less. The subsequent fall in economic output would undermine rather than strengthen a country's capacity to cater for its dependents, including the elderly, and the associated fall in employment and labor income would negatively rather than positively affect a country's life-cycle deficit. It is therefore unclear why lower consumption, or higher saving, would be fashioned as an appropriate measure to curb the life-cycle deficit.

Importance of investment: The only way for countries to transfer wealth to the future (and thereby safeguard or raise living standards and cope with rising dependency ratios) is for

countries to increase productive investment in the present (Flassbeck 2000a). Productive investment, as discussed, is strongly dependent on demand and can therefore be negatively influenced by policies that constrain demand. This has implications for macroeconomic, trade and industrial policies, but it also holds implications for financial and pension reforms. Appropriate regulation of financial markets can help to promote productive rather than speculative investment; and an appropriate design of pension systems can further contribute to this objective. Therefore, capitalized system which favor saving over consumption, may not be as effective in promoting an increase in investment as contributory systems. To recommend that economies increase saving for future consumption is the same as recommending that economies store their products for future consumption. It defeats the purpose and makes little sense. The question of the appropriate pension system goes to the heart of a fundamental economic debate, on the role of saving for the promotion of investment (box 2).[5]

The mere fact that current pension contributions do not suffice to cover future pension claims certainly requires a policy response. But the responses may take many forms. They may range from efforts to fundamentally change the pension system – replace contributory systems with capitalized systems – to efforts to simply increase contributions to the current systems – by employees and employers, for example. While some countries have shifted from contributory to capitalized systems, many have effectively encouraged a mixed system. With some variations, most countries expect workers to work longer and retire later, pay higher contributions to public pension schemes, accept lower benefits from public pension schemes, and simultaneously increase their saving in private pension funds to prevent deteriorating living standards during their retirement. In addition many households are confronted by a rising cost of health care and health insurance which further decreases disposable income. It is these distributive

[5] The simple account identity that saving equal investment does not say anything about causality, i.e., whether economies will need to "mobilize" saving to promote investment, or whether they should rather generate saving through investment. Typically, it is investment that precedes saving. It is an entrepreneur who seeks financing of an investment, and not a bank that pushes its saving onto the entrepreneurs (e.g., UNCTAD 2008, Dullien 2009, Herrmann 2010).

implications of policy reforms that appear to be at the heart of public opposition; not the incapacity of the general public to understand the need for reform. The changes undertaken by many developed countries bear important lessons for developing countries that are now embarking on reforms.

The process of population aging is most appropriately understood as a process of structural economic change, where some industries will become less important (e.g., those that cater to younger generations), whereas others will rise and flourish (e.g., those that cater to older generations). But there is no reason why the costs associated with the former should outweigh the benefits associated with the latter and have negative net effects. The expenditures on and by the older generations provide income to the younger generations, and there is no reason why the provision of goods and services for older generations should lead to an under-provision of goods and services for younger generations. Such an under-provision could solely result from a lack of productive and remunerative employment and low household incomes that constrain consumption expenditures of the younger generations. Countries may seek to prevent or delay this process of structural economic change but they are ultimately better off embracing, supporting and seizing on this process. The expansion of the health care industry, for example, is a multi-billion dollar business which can encourage significant investment, and can contribute to both employment generation and higher labor income, and can therefore help to mitigate the expected increase in the life-cycle deficit. Concerns that changing age structures, which alter consumption patterns and labor force participation, will change production make little sense. Well functioning markets should do exactly that – respond to changing demand.

3. income distribution, transfers and asset reallocations

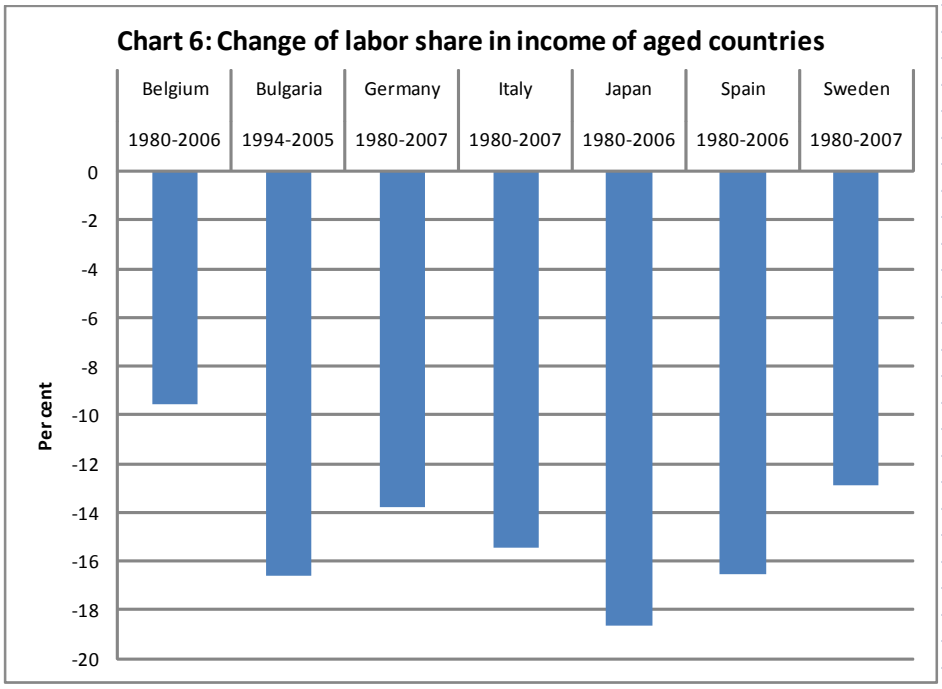
In theory, countries may entirely eliminate a life-cycle deficit if government spending was low and labor income was high, but in practice virtually all countries have a life-cycle deficit. And

indeed, the objective to eliminate the life-cycle deficit is not actually desirable. Both private and public consumption expenditures are needed not only to promote economic development, but also to promote social development and alleviate human suffering. This does not mean that an increase in government spending is always appropriate, sometimes it is not, or that an increase in budget deficits is nothing to worry about, sometimes it is. It simply means that a minimization of government sending per se is not a meaningful objective. What matters more than the relative size of government spending is the timing and purpose of government spending, as well as the financing of government spending.

Population aging is but a change in age structures, which should be reflected by a change in government spending on dependents. The net effect on government budgets will depend on the extent to which governments reallocate available resources to finance additional expenditures on the old-age dependents, and on the extent to which governments mobilize additional resources. An expected increase in government expenditures can be financed or mitigated by an increase in transfers and/ or asset reallocations. Economic growth can influence the policy space of governments, but appropriately income distribution would also influence their policy decisions.

Ideally countries benefit from inclusive economic growth, which generates sufficient employment opportunities, lifts household income, counteracts rising income inequality, strengthens social cohesion, and ultimately reduces the need for transfers. Workers can pay for an increase in pension fund contributions from 10 per cent to 20 per cent without a loss of disposable income if their income increases from USD 2000 to USD 3000 over the same period, for example. However, during the past three decades economic growth was not inclusive (Herrmann 2007; ILO 2008a; IMF and ILO 2010). Numerous countries witness job-less growth. And where economic growth does create new jobs, many jobs are insufficiently productive and remunerative to pay the bills, as reflected by the phenomenon of the working poor and an increase in short-term and vulnerable employment. For many workers wages have remained

constant or fallen (ILO 2008a and 2008b), in several countries unit labor costs have fallen (ILO 2008a and 2008b; UNCTAD 2008) and in virtually all regions the labor share in income has declined (chart 6), which is mirrored by an increase in the capital share in income.[6] Although not preferable, such economic growth is better than no growth at all, which would make it even more difficult for governments to justify, implement and sustain transfers. Most economists would theoretically agree that economic growth enables winners to compensate losers, even if many end up objecting to redistributive policies. In practice, a large share of public transfers is through taxes on individuals, especially income. A higher burden on households also encourages, explicitly or implicitly, asset reallocations by households.



Source: Based on data provided by M. Charpe and R. Torres, International Institute for Labour Studies, ILO.

Transfers between current generations: Strictly speaking, not all resources that flow to, and are expended by, governments can be classified as transfers to households. This is because some

[6] For a discussion of the falling labor share in income see also Guscina (2006) and IMF (2007), as well as Glyn (2010).

expenditures benefit companies rather than households (e.g., direct and indirect production subsidies), whereas other expenditures benefits both companies and households (e.g., infrastructure investment). But because most expenditures arguably benefit households more than companies (e.g., education, health care, unemployment benefits, welfare), national transfer accounts classify all public consumption expenditures -- regardless by whom they are paid and whom they benefit -- as transfers to households.

Rising returns on capital suggest that additional transfers to dependents may be most appropriately financed by taxes on and/ or contributions by employers. But because many governments are concerned that rising payroll fringe costs could encourage capital flight and negatively affect economic output, many have minimized the burden on employers and have instead increased the burden on employees. But in addition, governments have sought to reduce the need for transfers by reducing benefits to dependents. In many countries, unemployment benefits and welfare have been cut, and in some cases pension claims have been reduced or frozen.

However, efforts to increase corporate taxes and contributions face constraints. In a closed economy, companies that need to pay higher taxes and/ or contributions could pass on the burden to households by increasing the prices of their goods and services. But even in cases where this is not possible -- for example in an open economy where prices are set by international markets -- such policy changes may not bite. Rather than accepting a cut in their profits that would result from higher taxes and contributions, companies could seek to safeguard their profits through reallocations to other countries. All else equal, higher wages could have the same effect as higher corporate taxes. More often than not, companies can pass on the cost of social policies to employees.[7] The only way to ease the pressure on labor is to increase its productivity and income. But much can also be achieved through a strengthening of

[7] On this issue, see also Oberhauser (1989), who provides an excellent expose on social policy, employment and macroeconomic dynamics.

collective bargaining and the introduction of minimum wage legislation (ILO 2008b).

Transfers from future generations: The unwillingness and inability of the current generation to pay taxes and contributions may ultimately increase the size of the debt that will need to be paid by future generations. Many have warned that population aging and the associated increase in consumption expenditures will lead to an outright explosion of debt and will essentially impoverish future generations that will need to service the debt. This could happen, but it does not need to happen.

Debt does not rise or fall with the number of old-age dependents -- countries generally do not assume debt to finance expenses on older persons -- debt rather rises and falls with the level of economic output. And if economies increase debt when output is stagnating or shrinking, it is not a problem as long as economies decrease debt when output is picking-up again. So, unless an aging population leads to a shrinking economic output, there is no reason why an aging population should lead to mounting debt. The only way in which this could happen is if population aging was resulting in a general labor shortage; an unwarranted concern (see below).

Debt is an important policy instrument, and a general objection to it is misguided. What matters, is under what circumstances countries raise debt and to what use they put their resources. Debt can be justified if it helps to arrest economic recession, escape economic stagnation and boost economic output, as in the current economic crisis. The greatest responsibility that governments have is to use their resources for economic and social development, which benefits both current and future generations. This does not mean that all spending by governments should create a future stream of income -- governments are not commercial enterprises – but that the package of expenditures should foster the growth of economies. Investments that will contribute to economic development and directly benefit future generations include investment in education, science, technology, and infrastructure, to name but a few. The assets that are bequeathed to future generations can justify the liabilities

that are placed on them.

Asset reallocations by households: Policy reforms, which have increased the burden on labor and/ or decreased benefits to dependents, have also, intentionally or unintentionally, encourage asset reallocation. Households that are unable to make ends meet are effectively enforced to supplement their income by running down their assets. But while this can be a coping strategy for households that have assets (savings, real estate, art, etc.) it is not a viable strategy for poorer households that lack assets. Furthermore, asset reallocation -- by households and the public alike -- can provide only temporary relief. Eventually, assets will be run down.

Asset reallocations by public: Theoretically, governments can sell any or all of their assets in order to finance pensions, or other outlays.[8] However, extensive privatization during the past decades has reduced the scope of such asset reallocations. Furthermore, the sale of public assets, which firstly benefits the current generation, has important implications for the distribution of income amongst generations.[9] Many generations have invested in public assets, such as state-owned enterprises or public infrastructure, but their sale will primarily benefit the current generation. Similarly, many generations could potentially benefit from a country's natural resources, including its oil, minerals, ores and metals, but their exploitation over a relatively short period will also mostly benefit the current generations. It is therefore reasonable that national transfer accounts allocate the returns from asset reallocation to the current tax payers, but national transfer accounts do not adequately account for the cost of asset reallocations to future generations.

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[8] Accordingly, some analysts emphasize that population ageing will lead to a reduction in private and public assets, and they conclude that that this reduction will lead to a reduction in global wealth (e.g., McKinsey 2005). While the first part of this assessment is correct, the second is not. A reduction in assets does not mean that assets vanish; assets are simply transformed into something else. A reduction in saving means nothing else than an increase in consumption and investment, and both will support rather than undermine economic growth.

[9] Bravo (2005), for example, discuses implications of asset reallocations in Latin America for future generations.

To account for the income distribution between future and current generations, it would be necessary to discount the returns that result from public asset sales. Although it is difficult to identify an appropriate discount rate, this discount rate would probably be lower for assets that can be re-created (e.g., state-owned enterprises, infrastructure, forest) and highest for assets that are essential and cannot be re-created (e.g., minerals, ores, metals and oil).[10] Unlike public debt, which is a financial liability that must be matched by assets, natural resource wealth is an asset that comes without financial liabilities. It is basically manna from heaven. Nonetheless it comes with a moral obligation towards future generations. If current generations sell and exploit public assets, future generations will not be able to draw on these assets. For this reason, the current generation would ideally channel the resources that result from asset reallocations, like the resources from other sources, into productive investments that will also benefit future generations. Public asset reallocations are hardly objectionable under such circumstances. Even the depletion of conventional fuels can be justified, if countries use their resources for the development of alternative and renewable energy sources. What is difficult to justify is parking the car at the curbside and keeping the engine running until the fuel is used up.

In most countries asset reallocation -- by households and the public -- cover only small share of consumption expenditures. The largest share is financed through transfers, including various taxes and contributions (i.e., transfers within the current generations), but also debt (i.e., transfers from future generations). Many poorer countries also strongly depend on international transfers – including workers' remittances and development assistance – to finance their consumption expenditures. But ideally, the need for international transfers would be limited by both a stronger economic development of these countries, as well as a more equitable income distribution within these countries.

[10] The selection of appropriate discount rates is also a challenge for efforts to account for national wealth more generally. Whereas financial markets help in the discovery of some discount rates, the identification of discount rates is rather difficult where markets are weak or non-existing. This is the case for example where the emission of greenhouse gases is concerned.

3. Labor markets

The rise in the common dependency ratio is sometimes hastily associated with a decline in the labor force (e.g., Hewitt 2002). In accordance, it is suggested that population aging threatens living standards in the developed countries (Peterson 1999; Dychtwald 1999) and by inversion it is sometimes suggested that rapid population growth ultimately contributes to the global dominance of populous developing countries (Goldstone 2010).[11] However, population aging does not necessarily imply a shortage in labor markets, and even a decline in the active labor force would not necessarily spell lower output. The productivity of labor is more important for economic output than the mere size of the labor force. And if confronted by a labor shortage countries have many policy instruments to address this shortage.

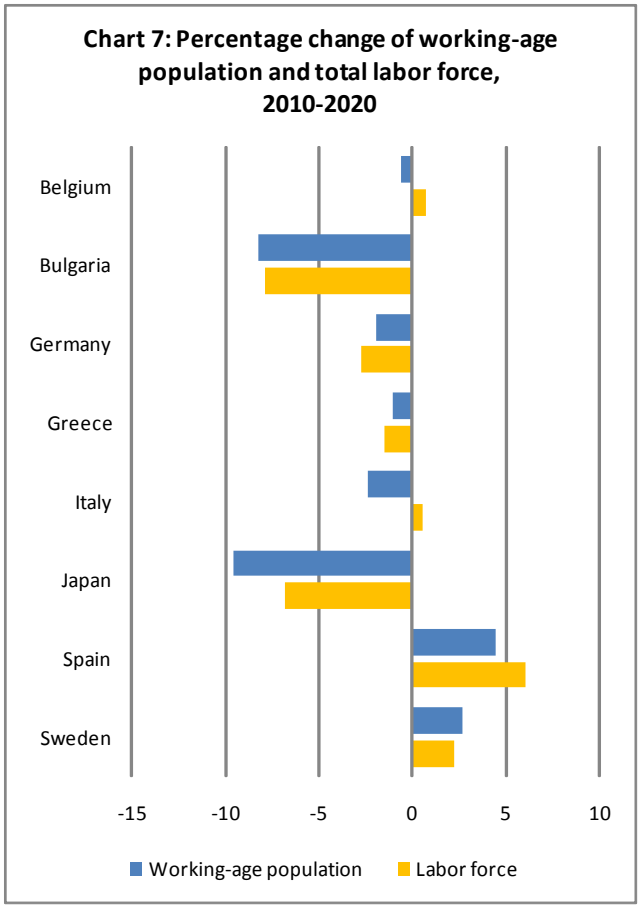
A rising dependency ratio does not immediately translate into a decline of the working-age population, a shrinking working-age population does not need to translate into a decline in the labor force, and a shrinking labor force does not need to result in a shortage in the labor markets. The only meaningful measure for a labor shortage is a low and falling rate of unemployment. What matters for actual dependencies is not whether people are in working age or not, but whether people have a productive and remunerative job and can independently sustain themselves. Dependents must include all those that do not have a job – the young, old and unemployed – as well as those that have a job but suffer from poverty nonetheless. A change in any one of these components can be exacerbated or mitigated by a change in any other component. Therefore the focus on the economic dependency ratio based on employment (box 1) is clearly preferable over the focus on the common dependency based on the working-age population. The failure to adequately account for the different dependents can

[11] For a critical discussion of some of these arguments, which are characterized by a lack of economic understanding and empirical foundations, see also Bosbach (2008).

encourage ineffective policy responses to population aging. These include a general postponement of the retirement age and/ or a general increase in immigration. Both measures would increase the working age population and contribute to a reduction in the common dependency ratio, but both measures could also increase unemployment and would therefore merely change the nature of dependencies.

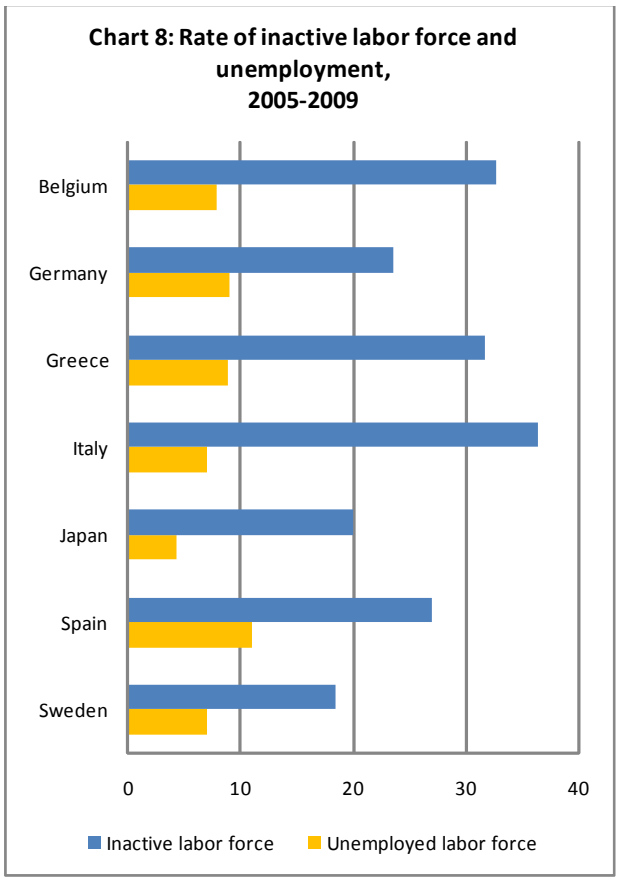
The economic dependency ratio highlights that countries that have a high dependency ratio paired with high unemployment or underemployment confront more serious economic challenges than the countries that have a high and rising dependency ratio but low and falling unemployment or underemployment. Many developing economies -- which have a high number of young-age dependents -- fall in the former group, whereas many of the more advanced economies -- which have a growing number of old-age dependents -- fall into the latter group. Furthermore, it is generally easier to address the challenge that come with a shrinking labor force than to create employment opportunities for a large and rapidly growing labor force (box 3).

Even the countries that have the highest share of old-age dependents are currently not confronted by a generalized shortage in the labor markets. A shrinking of their working-age population is not leading to an immediate and proportionate shrinking of the labor force (chart 7) and even a shrinking of the labor force is not leading to a generalized shortage in the labor markets (chart 8 and 9). All countries continue to have a large unemployed and inactive labor force, and could do more to better integrate and utilize this labor force (OECD 2005), for example by ensuring appropriate care facilities for toddlers and children, providing training for parents that seek to reenter the labor force, improving training programmes for people who suffer from long-term unemployment, and even by establishing public works programmes, where feasible. Some of these services could even be provided by the elderly. This could be one way in which countries could size the second demographic dividend that comes with an increaisng number of healthy, active and productive retierees.

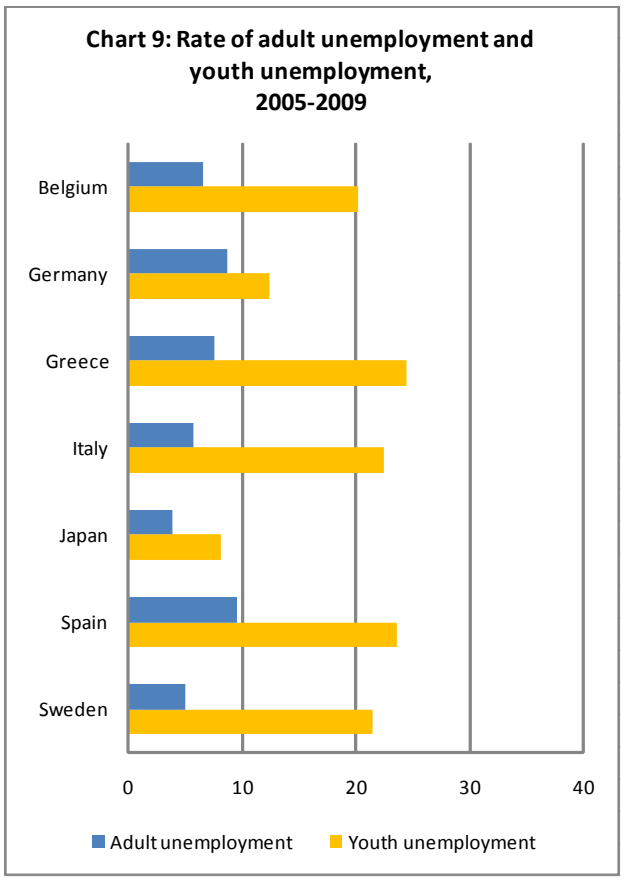


Source: Based on UN DESA/ Population Division, World Population Prospects; IILO LABORSTA; and OECD Labor Force
Note: Adults are defined as 25 years of age or older; youth is defined as 24 years of age or younger.

According to projections for the next decade, Bulgaria, Germany, Greece, Italy and Japan will see a fall in the working-age population and the economically active population; Spain and Sweden will continue to see a rise in both the working-age population and the economically active population; and Belgium and Italy will see a fall only of the working-age population. However, in all countries the inactive labor force is large (on average about 30 per cent) and unemployment amongst the active labor force is high (on average about 10 per cent).



Source and note: See chart 7.



Source and note: See chart 7.

Unemployment has increased because of the economic crisis, but unemployment has already been significant in some labor market segments, and unemployment is expected to remain high for most countries for some time. By contrast, many developing countries have a comparatively low unemployment, but many have instead relatively high underemployment. Both, unemployment and underemployment are particularly pervasive amongst workers with low educational attainment and skills, but unemployment and vulnerable employment is also a significant for young professionals that have just entered the labor markets.[12] In the different

[12] Youth unemployment, underemployment and vulnerable employment are particularly pervasive in many of the poorest developing countries (ILO 2010; World Bank 2009; Basten et al. 2011 forthcoming), effectively preventing these countries from reaping the potential demographic bonus that could come with a large and youthful population (box 3).

geographic regions, unemployment amongst young professionals is two to five times as high as unemployment amongst the adult population. Against the background, general measures to increase the working-age population may merely encourage a further increase in unemployment or underemployment. To increase the labor force makes no sense unless there is a labor shortage. Nonetheless, several countries have embarked on measures which effectively increase the labor force:

Postponement of retirement: The delay in the age at which workers can retire and/ or the age at which they can receive full pension benefits can serve two purposes. It can ease pressures on pension systems and it could potentially also address a shortage in labor markets. Many countries have therefore implemented corresponding policy changes. However, whereas a general labor shortage could theoretically be addressed through general policy responses, including an increase in the retirement age or a general increase in immigration, a specific labor shortage requires more targeted measures. Why should everybody continue working even though the economy lacks only specific workers? Why should the plumber keep working if the economy lacks engineers? [13] More promising than policies that simply delay retirement or increase immigration are policies that create a more "permeable retirement age" and loosen immigration restrictions. Accordingly, companies should be allowed to hire from the retired labor force or foreign labor forces, if they cannot find the needed skills in the active labor force of their home economy.

Increase in immigration: Like a general postponement of retirement, a general increase in immigration may appear to be a magic bullet to killing two birds with one stone. The developed countries which have an aging population could benefit from higher immigration to address a labor shortage, and the developing countries which have a rapidly growing and large population

[13] Developing counties also suffer from high youth unemployment, which significantly diminishes the opportunities of these countries to reap a potential demographic bonus. For a discussion of youth employment trends across the world, see ILO (2010), as well as World Bank (2009).

could benefit from emigration to reduce unemployment and underemployment. The problem with this reasoning is twofold: It is neither apparent that population aging will lead to a labor shortage in the developed countries, nor is it apparent that immigration could effectively address a labor shortage. Over the past years, many countries have seen far-reaching changes in their production structures. Whereas they previously required workers to man machines, many are now looking for workers who engineer machines. Yet, such workers are in short supply. The high-skilled workers that many advanced countries are looking to attract (OECD 2010) are the very same that many developing countries are trying to retain, and the workers that many countries could dispense are the same that many countries do not know how to employ already.[14] There is, in short, a growing mismatch between the global demand and supply of workers.

Increase in fertility: In response to low and falling fertility some countries have embarked on measures to boost fertility. Higher fertility is seen as a question of demographic security, as well as a way to stimulate economic development. But the success of such strategies is highly questionable. Higher fertility alone will not succeed in populating areas that are losing population (one of the objectives of demographic security), and it will not succeed in bringing about a more positive economic development. Indeed, this strategy appears to inverse the causes and effects of shrinking populations. Typically, it is not a shrinking population that undermined economic development, but weak economic development that contributes to a shrinking population. People often decide for emigration because they cannot find employment at home – as for example in Bulgaria, which experiences population decline – or they decide to have fewer children because they are uncertain about their future economic prospects. However, differences in fertility between households and countries suggest that decisions about

[14] Zoubanov (2000) and United Nations (2001) examine the question of whether replacement migration may help to counteract challenges associated with population ageing. The analysis however is focused on changes in the working-age population and labor force rather than changes in labor force participation and employment, which weakens its conclusions.

children are also influenced by the level of education.

Box 3: The challenge of age-structural transformations in developing countries

Although population ageing is most advanced in the developed countries, it is an emerging issue in several developing countries as well (United Nations 2007, 2009). The developing countries that have already undergone a fertility transition -- characterized by fertility decline below replacement levels – include some of the most advanced developing countries in the world. For the majority of developing countries, especially least developed countries, however, population ageing is at best a distant challenge on the horizon. They continue to have a high fertility and high population growth, which is associated with a large and youthful population. This age-structural change bears the promise of a demographic bonus, but the demographic bonus is only that, a promise, without productive employment. To seize this bonus, it is essential that the working-age population finds productive and remunerative employment; otherwise this population will be either unemployed or underemployed in mal paying jobs, and regardless of their working age may themselves come to depend on handouts.

The most pressing challenge that many developing countries, especially the least developed countries, confront is the rather classical challenge of promoting structural change and creating productive employment, amidst an essentially unlimited supply of inexpensive labor (Herrmann and Khan 2008; Basten et al. 2011 forthcoming). But a large, growing and underutilized labor force reduces rather than raises returns to labor, and it discourages rather than encourages necessary investment in human and physical capital. Rapid population growth makes it difficult for poorer countries to upkeep and increase investment in human capital, and – where labor can substitute for machinery – it also discourages companies from increasing investment in physical capital. Yet, a rise in labor productivity will require both types of investment. If investment in human capital is not complemented by investment in physical capital, in modern technologies and infrastructure, it will constrain the propensity to raise productivity levels, grow the economy, raise labor income and reduce poverty.

In the least developed countries, high and sustained population growth will spell poverty and hunger without higher and more sustained rates of economic growth. To boost fertility out of fear of population ageing, or in hope to seize a demographic bonus, would only aggravate these challenges. Higher fertility is not a meaningful policy option -- not for developed countries, and especially not for the least developed countries –to promote economic growth and higher living standards. The relationship between low fertility and prosperity is particularly strong at the level of households. Families that have fewer children tend to invest more in the development of each child. Therefore, a child that grows up in a small and poor family is more likely to attain

higher education, climb the economic and social ladder and escape poverty than a child that grows up in a large and poor family (UNFPA 2011).

For all countries, classical economic development – which focuses on promoting economic growth, full employment and higher household income through productivity growth, capital accumulation and technological progress – is the most promising way to address age-structural transformations. The advanced countries depend on such an economic development to safeguard living standards when they grow old; many developing countries depend on economic development to reduce poverty before they are growing old. The dilemma confronted by least developed countries is that a large youthful population can discourage some of the very changes that countries require to prepare for an ageing population.

Despite the immediate challenge of large youth populations, it is not too early for countries to start addressing the forthcoming challenge of an aging population. To establish functioning pension systems in countries that have only rudimentary pension systems can take at least one generation.

The immediate effect of higher fertility is a higher dependency ratio -- as households will need to take care of more children in addition to more older persons -- and the long-term effect of a higher fertility very much depends on economic circumstances. If the new generation finds remunerative employment, dependency ratios fall; if not, they remain high. Furthermore, a temporary increase in fertility would merely postpone the challenge of population aging, and a permanent increase in fertility could cause a whole set of new challenges. If relatively underdeveloped economies with a low labor productivity and labor-intensive production find it impossible to create sufficient employment (box 3), relatively developed economies with high labor productivity and a capital-intensive production will find it even more difficult to avoid mass unemployment. Furthermore, accelerated population growth will further intensify pressures on scarce and essential natural resources, both inside and outside the countries where it occurs (Herrmann 2011). High and rapid population growth can pose larger threats to living standards than slow and decelerating population growth.

To date, there is no sign that the developed countries, where a large share of the labor force is unemployed or inactive, or many developing countries, where a large share of the labor force is underemployed, are confronted by a generalized labor shortage. Furthermore, countries could rather easily address a generalized labor shortage -- for example through a postponement of the retirement age and or an increase in immigration -- and have also various policy options to address a specific labor shortage. Ultimately, however, the most important measures any country can take to discourage a shortage of high-skilled professionals, on the one side, and encourage a lower level of unemployment amongst low-skilled workers, on the other, is to invest in their domestic skill base. Investment in younger generations is a particularly important measure to cope with the challenges of an aging population. Investment in human capital, together with investment in physical capital, will help countries lift labor productivity and will enable the younger generations to better support dependents.

D. Conclusions

The fear of population aging – which is hyped by media and partial analysis – often encourages hasty and inappropriate policy responses to population aging. Needed is a more careful analysis of the actual challenges and better targeted policy responses to these challenges. The analysis provided by national transfer accounts -- which highlights challenges to an economic arrangement that result from age -structural changes, such as population aging-- will need to be complemented by a more traditional analysis of key economic developments. Such an analysis will highlight that an increase in the life-cycle deficit is itself not a cause for concerns, as an increase in the life-cycle deficit can be addressed through a number of different policies. Ultimately, the capacity of countries to finance a growing number of dependents without sacrificing living standards of the population depends on economic output and labor productivity.

By and large, the developed countries, which have the largest share of older persons, can cater for a growing number of older persons without sacrificing living standards. The same is true for the developing countries that benefit from high and sustained rates of economic growth and a strong increase in labor productivity during the past decade. So far there is no sign that population aging is leading to a general labor shortage which could undermine the growth of economic output.

However, many countries are not covered in this analysis and many of them may in fact be in dire straits. Population aging will pose the greatest challenges and will require the most difficult decisions in countries where the long-term rate of real per-capita growth is low, the increase in labor productivity is small, and the number of all dependents is high and rapidly growing. The situation is most severe, if these countries not only have an increasing number of persons above the working age, but also a high number of persons that are in working age who suffer from unemployment and underemployment. Where the general economic conditions do not allow for appropriate support for an increasing number in dependents, an increasing number of dependents may very well result in a rise in poverty incidents. To counteract such threats, countries will require external transfers. Development assistance would need to provide support to the poor, including the poor amongst the elderly, but at the same time it would need to contribute to the development of productive capacities, productivity and production.

In short, there is no meaningful recipe other than classical economic development – which focuses on promoting economic growth, full employment and higher household income through productivity growth, capital accumulation and technological progress – for countries to cope with age-structural change, including population aging. This challenge is not new but it is difficult enough. Population aging does not alter classical economic development priorities. Countries must do what they have tried to do all along -- to promote economic and social development -- but many countries have to get better in doing it than they have been thus far.

At its core, strong economic development requires the development of strong productive

capacities. And a strengthening of productive capacities depends on a better utilization of, and higher investment in, the different factors of production. Investment in human capital (health and education) will need to be complemented by appropriate investment in physical capital (infrastructure, technology and machinery).[15] Otherwise, countries may end up with a well educated labor force but lack infrastructure, machinery and technology to productive engage its labor force, or may end up accumulating capital but lack the appropriate labor force to turn available inputs into internationally competitive outputs. It therefore appears important that the efforts to promote human and social development – which are emphasized in internationally agreed development goals, including the Millennium Development Goals – be integrated with and complemented by a focus on further strengthening economic development.

To be sure, population aging will require policy response, including adjustments of pension systems. But contrary to common perceptions population aging is not a threat to our living standards. Many countries confront much more pressing and serious challenges than the challenges that come with population aging, notably high unemployment, underemployment, vulnerable employment and poverty; weak productive capacities and productive investments; as well as financial speculation, large and persistent exchange rate misalignments, and large and growing global economic imbalances. To keep challenges in perspective is the most important way to prioritize policies.

[15] A sole focus on human capital development suggests that it is the lack of human capital that explains unemployment and thereby this focus effectively puts the blame for unemployment on the unemployed themselves. But more often than not, unemployment is explained by a weak economic development, rather than a lack of education of the unemployed. Accordingly, "Hyman Minsky always argued that public policy that favours education and training over job creation puts "the cart before the horse" and is unlikely to succeed. [..] it lays the blame on the unemployed, which can be demoralizing and can validate public perceptions regarding undesirable characteristics supposedly endemic within the disadvantaged population" (Wray 2005: 5).

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