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The international development strategy beyond 2015: taking demographic dynamics into account

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Abstract

Demographic dynamics have strong repercussions for development and need to be addressed in the definition of the global development strategy for post 2015. Despite divergent trends across countries, international migration offers no definitive solution. A comprehensive approach is needed. Countries with declining and ageing workforces need to sustain or raise productivity. Countries with growing labour forces need to embark in growth patterns that are labour intensive, offer possibilities for dynamic structural change and productivity increases. Both cases require investments in education, skill formation and upgrading. The impact of population ageing on economic variables is nuanced but should not be ignored.

JEL Classification: I3; J11; J21; J24

Keywords: population, ageing, pension systems, poverty, labour force, productivity, dependent populations, migration, fertility

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The international development strategy beyond 2015: taking demographic dynamics into account

Ana Luiza Cortez[1]

I. Introduction

This paper was originated as a contribution to the work programme of the Committee for Development Policy (CDP), a subsidiary body of the United Nations Economic and Social Council, on the United Nations development agenda beyond 2015. This research effort aimed at analysing and proposing alternative development models that could contribute to a sustained improvement in human wellbeing worldwide. While the views expressed here do not necessarily coincide with those of the CDP or the United Nations, the paper has benefitted from the discussions conducted at various workshops and plenary meetings of the Committee. Additional information on the CDP and its work is available at http://www.un.org/en/development/desa/policy/cdp/index.shtml

The repercussions of demographic dynamics for development (herewith understood in its broadest sense) are considerable. Among current and projected trends, the nature and magnitude of dependency ratios are changing thus bringing both opportunities and challenges for countries concerned. Whereas countries find themselves at different stages of their demographic transition, the world population is ageing. Demographic trends cannot be easily reversed as they have a momentum of their own, but they can be largely anticipated. The topic is obviously complex and vast. One needs to be selective. This paper will discuss some of the implications of demographic change for growth and distribution. It will also attempt to identify key policies that allow countries to offset possible negative effects or harness potential benefits of the anticipated demographic change.

Changes in the size and age structure of the population have implications for economic growth beyond the supply of labour and its impact on labour markets. Funding consumption and savings through life-cycle savings can affect investment and economic growth. At the same time, transfer systems, if not financially sustainable, may contribute to increased public deficits, lead to higher interest rates, or to increased taxation on the working population. This may entail negative implications for investment, growth, and intergenerational equity. Changing age structures also impact on economic growth through their implications for aggregate consumption patterns, as consumption needs vary during the life-cycle. Moreover, demographic changes have consequences beyond the national economy through trade, foreign direct investment, financial and migration flows as the national economy adjusts to trends.

But while demographic dynamics affect growth, economic growth has implications for the support of dependent populations as well. Economic growth is needed to support an appropriate distribution of consumption between active and inactive populations and avoid a high incidence of poverty among the inactive population. Providing for dependent populations is relevant to the fulfillment of both the current and future international development agenda and related goals. Both the old and the very young represent a considerable share of the poor, even though not all of those in their working years are productively engaged and rewarded accordingly.

1 This chapter relies heavily on research undertaken at the United Nations Department of Economic and Social Affairs under the context of the *World Economic and Social Survey 2007: Development in an Ageing World,* in particular chapters I, IV and V, which it revises and updates. I am grateful for the valuable contributions received from Jorge Bravo and Igor Ribeiro and for the comments and suggestions by Jose Antonio Alonso, Sakiko Fukuda-Parr, Frances Stewart and Rob Vos. The usual caveats apply.

This paper is organized as follows. Section II provides a brief overview of anticipated demographic trends for the period 2010-2050. The subsequent sections analyze the implications of demographic changes for economic growth. Challenges confronting countries with growing populations and labour force are addressed in section III, while those of countries with declining working populations are taken in section IV. Issues of distribution and the provision of support for dependent populations are taken in section V. Section VI concludes.

II. Demographic trends

The global population reached the 7 billion mark in 2011, and is projected to grow to about 9.3 billion by 2050. Overall, fertility will continue to decline, from about 2.5 children per woman presently to 2.17 children per woman, closely approaching the 'replacement level' of fertility (2.1 children per woman) in 2050. The increase in world population is taking place in developing countries (see table 1), particularly in low-income and some middle-income countries. In sharp contrast, in many developed countries but also in some developing countries population numbers are stable or in some cases even declining. The development implications, especially in a horizon to 2050, are consequently diverse.

Table 1.
Population by broad age group, 1970 -2050

	Population (thousands)				*Percentages*			
Age group	*1970*	*2010*	*2025*	*2050*	*1970*	*2010*	*2025*	*2050*
	World							
0-14	1 384 365	1 846 675	1 914 241	1 907 753	37.5	26.8	23.9	20.5
15-64	2 114 175	4 524 850	5 248 599	5 887 808	57.2	65.6	65.6	63.3
65+	197 646	524 364	840 138	1 510 567	5.3	7.6	10.5	16.2
Total	3 696 186	6 895 889	8 002 978	9 306 128	100.0	100.0	100.0	100.0
	Developed Countries							
0-14	261 713	203 946	213 449	218 179	26.0	16.5	16.6	16.6
15-64	645 084	834 910	806 671	756 340	64.1	67.6	62.7	57.7
65+	99 625	197 044	266 619	337 213	9.9	15.9	20.7	25.7
Total	1 006 421	1 235 900	1 286 739	1 311 731	100.0	100.0	100.0	100.0
	Developing Countries							
0-14	1 122 653	1 642 729	1 700 792	1 689 574	41.7	29.0	25.3	21.1
15-64	1 469 092	3 689 940	4 441 928	5 131 468	54.6	65.2	66.1	64.2
65+	98 021	327 321	573 519	1 173 355	3.6	5.8	8.5	14.7
Total	2 689 765	5 659 989	6 716 239	7 994 397	100.0	100.0	100.0	100.0
	Least Developed Countries							
0-14	137 763	334 007	409 641	504 276	44.2	40.1	35.8	29.2
15-64	164 869	469 955	688 653	1 100 620	52.8	56.5	60.2	63.7
65+	9 398	28 368	46 051	121 572	3.0	3.4	4.0	7.0
Total	312 030	832 330	1 144 344	1 726 468	100.0	100.0	100.0	100.0

Source: World Population Prospects. The 2010 Revision.

The size of world population is also influenced by trends in longevity. Worldwide, life expectancy at birth is expected to continue to rise, from about 68 years presently to nearly 76 years by 2050. However, many developing countries continue to have very high rates of morbidity and mortality, especially among children. With persistent communicable diseases and a growing burden of non-communicable diseases and injuries, most developing countries are facing a double burden of disease which is hindering development efforts.

Changes in demographic dynamics have led to a major transformation of the age structure of the world population. The world is getting older. Worldwide, the share of children (ages 0 to 14) is expected to decline from 26.8 per cent in 2010 to 20.5 per cent in 2050. However, many developing countries still have young populations, owing to their relatively high fertility. Meanwhile, the share of persons aged 65 and above will jump from 7.6 per cent to 16.2 per cent from 2010 to 2050, respectively (see table 1). While population ageing is more advanced in the developed economies, most of the increase in older populations will take place in developing countries. Already some 63 per cent of the world's older population lives in developing countries. The process of population ageing in these countries – in particular the middle income countries-- is taking place at a much faster rate and at lower levels of income when compared with past trends in developed countries. Developing countries are getting older before getting richer (see table 2). Moreover, the old population is getting increasingly older. There were some 72 million of people aged 80 and above, or 17 per cent of the world population aged 65 and above in 2010. By 2050 their numbers will reach 402 million, or 27 per cent of the older population.

Table 2:
Selected countries and regions: populations 65+, 2005 and 2050

2010 population 65 and above =100		
	2025	*2050*
Japan	125	134
Europe	127	159
USA	158	212
Canada, Australia, New Zealand	162	233
East Asia and the Pacific	164	264
South-Eastern Asia	178	384
South Central Asia	175	395
Africa	165	399
Western Asia	176	457
Latin America	172	462

Source: UN Population Prospects 2010 Revision online database

At the global level, the population of working age (ages 15 to 64) is expected to grow from the current 4.6 billion to 5.9 billion in 2050, but in relative terms, its share will decline from the current 65.6 per cent to 63.3 per cent. This age group encompasses the majority of workers and the evolution of the working age population (WAP) gives an indication of the dynamics underlying the future supply of labour and the potential for economic growth. The increase in the global labour force will take place in the developing countries, and it will be particularly high in the least developed countries (LDCs). In general, the population of working age is expected to decline for the developed countries as a whole during the period 2010-2050, particularly in Europe and Japan. Additionally, the world working age population itself has begun to age in recent years. By 2025, the number of older working-age people (aged 50-64) will outpace the young working-age population (aged 15 to 24) and reach 25 per cent of the WAP by 2050. Older persons in the WAP will gradually become more predominant in the labour force of the future, which may bring implications for productivity growth.

Diverging demographic dynamics and persisting economic inequalities imply that pressures for international migration will continue (Alonso, 2011). Since 1960s, the developed regions have been net gainers of emigrants from the developing regions. Annual net migratory flows to developed countries reached 3.4 million migrants during the period 2000-2010 but are anticipated to decline to 1.9 million per year by

2040-2050 (United Nations, 2011). Thus, while the projections presented here already take international migration into account, the feasibility of increasing migratory flows to offset anticipated demographic trends comes to the fore. However, as discussed below international migration cannot provide a definitive solution to the challenges of shrinking and ageing populations and of unemployment in poor countries.

Demographic dynamics and dependency ratios: key challenges ahead

The age structure of the population is reflected in dependency ratios, defined as the ratio of the dependent populations (children aged 0 to 14 and older people, at 65 and above) to the working age population (ages 15 to 64). Trends in total dependency vary across countries, conditional on the changes in child dependency (reflecting different stages in the fertility transition) and on longevity.

The demographic transition starts with a reduction of mortality, in particular for children. Population growth accelerates and the proportion of children in the population increases, leading to an increase in total dependency ratio. Eventually, longer survival rates among children contribute to a reduction in fertility and to a slowdown in population growth. Thus, the proportion of the working age group in the population increases, while the long-term increase of the old-age population has not yet started. During this period, dependency ratios decline and may provide a potential boost for income growth, a demographic dividend, if the larger labour force is productively employed. In time, sustained fertility declines, accompanied by increased longevity, lead not only to a lower proportion of children but also to a shrinking share of adults of working age in total population and to higher dependency rates—this time due to old age factors.

At the global level, dependency ratios are still falling, reflecting the decline in the child dependency ratio in developing countries. But the global total dependency ratio is projected to reach a plateau very soon, around 2025. It will then begin a gradual but persistent rise. The old age dependency ratio is expected to increase everywhere (see table 3). For the majority of the developed countries, such increase will be accompanied by rising child dependency ratios as well. But trends are also somewhat different within these two main groups of countries.

Among developing countries, one group of countries – largely in sub-Saharan Africa, Central America, South Asian and parts of and Western Asia (see table 4) — total dependency ratio will continue to drop during the period 2010-2050 as the decline in child dependency more than offsets the increase in old age dependency. The population of working age in this group of countries is increasing both in numbers and as a share of the total population. This situation can provide a significant

Table 3:
Dependency ratios, 1970-2050

	1970	*2010*	*2025*	*2050*
	World			
Child dependency	65	41	36	32
Old Age dependency	9	12	16	26
Total dependency	75	52	52	58
	Developed countries			
Child dependency	41	24	26	29
Old Age dependency	15	24	33	45
Total dependency	56	48	60	73
	Developing countries			
Child dependency	76	45	38	33
Old Age dependency	7	9	13	23
Total dependency	83	53	51	56
	Least Developed Countries			
Child dependency	84	71	59	46
Old Age dependency	6	6	7	11
Total dependency	89	77	66	57

Source: World Population Prospects. The 2010 Revision.

Note: The ratios presented in this table are multiplied by 10. Based on medium vairant projections after 2010.

Table 4:
Trends in Dependency Ratio, 2010-250

A. Countries with a decline in dependency ratios (child effects)		**B. Increase in dependency ratio (old age effects)**	
Afghanistan	Madagascar	***B1. Countries with growing WAP***	
Angola	Malaysia	***Developing Countries***	
Bangladesh	Malawi	Algeria	Lebanon
Belize	Mali	Argentina	Libya
Benin	Mauritania	Azerbaijan	Macedonia
Bhutan	Micronesia (Fed. States of)	Brazil	Maldives
Bolivia (Plurinational State of)	Mozambique	Brunei	Mexico
Botswana	Namibia	Chile	Mongolia
Burkina Faso	Nepal	Colombia	Morocco
Burundi	Nicaragua	Costa Rica	Myanmar
Cambodia	Niger	Korea, PDR	Oman
Cameroon	Nigeria	Fiji	Panama
Cape Verde	Occupied PalestinianTerritory	Georgia	Qatar
Central African Republic	Pakistan	Grenada	St Lucia
Chad	Papua New Guinea	Guadaloupe	St Vincent and the Granadines
Comoros	Paraguay	Indonesia	Sri Lanka
Congo	Peru	Iran	Tunisia
Côte d'Ivoire	Philippines	Israel	Turkey
Democratic Republic of the Congo	Rwanda	Kuwait	Uruguay
Djibouti	Samoa	Kyrgyzstan	VietNam
Dominican Republic	Sao Tome and Principe	Developed Countries	
Ecuador	Saudi Arabia	Australia	New Zealand
Egypt	Senegal	Canada	Norway
El Salvador	Sierra Leone	Iceland	Sweden
Equatorial Guinea	Solomon Islands	Ireland	United Kingdom
Eritrea	Somalia	Luxembourg	United States
Ethiopia	South Africa	***B.2 Countries with shrinking WAP***	
French Guiana	Sudan	***Developing countries***	
Gabon	Suriname	Armenia	Jamaica
Gambia	Swaziland	Aruba	Korea, Rep
Ghana	Syrian Arab Republic	Barbados	Mauritius
Guatemala	Tajikistan	China	Singapore
Guinea	Timor-Leste	Cuba	Thailand
Guinea-Bissau	Togo	Hong Kong, SAR	Trinidad and Tobago
Guyana	Tonga	***Developed Countries***	
Haiti	Turkmenistan	Albania	Latvia
Honduras	Uganda	Austria	Lithuania
India	United Republic of Tanzania	Belgium	Malta
Iraq	Uzbekistan	Belarus	Poland
Jordan	Vanuatu	Croatia	Montenegro
Kenya	Venezuela	Bosnia	Portugal
Lao People's Democratic Republic	Yemen	Bulgaria	Romania
Lesotho	Zambia	Denmark	Russian Federation
Liberia	Zimbabwe	Estonia	Serbia
		France	Slovakia
		Germany	Slovenia
		Greece	Spain
		Hungary	Switzerland
		Italy	Ukraine
		Japan	

Source: World Popualtion Prospects. The 2010 Revision

Note: Countries in italics are LDCs

boost for the growth of income per capita as resources previously employed in the support of dependent children can be released for investment and growth once enabling policies are in place. At the same time, these are low and middle-low income countries, some of which are challenged by structural and financial constraints and confront low and/or stagnant productivity growth, severely under developed human resources, youth unemployment and under employment and economic activities which are predominantly informal. They may not be able to benefit from the demographic dividend if policies are not adjusted accordingly.

Other developing countries (mostly middle-income countries in South America, parts of Western Asia and North Africa) and also some developed countries (largely the Anglophone countries) will experience higher overall dependency ratios due to the increased old age dependency while their labour force is still growing (albeit at declining and slower rates). This group of countries will have to continue to expand productive employment opportunities and, at the same time to provide for their larger and increasing dependent, older population, by introducing or reforming existing formal support systems or reinforcing informal support mechanisms. However, a growing labour force—ceteris paribus—should facilitate this adjustment process.

Finally, most developed countries but also a few developing countries will confront higher a dependency ratio with a shrinking labour force. For these countries, sustaining and increasing productivity levels by a graying and smaller labour force is a major challenge ahead. Nonetheless, the challenge is less pressing for developed than for developing countries. Given the level of resources at their disposal, developed economies are better placed to address the task at hand. In fact, what matters most is not the number of workers, but total output, which is determined by the number of workers and their productivity (Lee and Mason, 2011). Currently, societies with low fertility spend much more on health and education per child than countries with higher fertility, which means that the developed economies are also those with the highest levels of human capital, and consequently are better equipped to sustain and expand productivity.

III. Addressing the challenges in countries with young and growing populations

Changes in the size and in age structure of the population present a challenge for output growth and its distribution between the economically active and the dependent populations. The WAP in the first group of developing countries mentioned above amounted to some 1.7 billion people in 2010. It will grow to 3.3 billion by 2050. Based on current trends, at least 70 per cent of them will participate in the labour market. This implies that some 1.1 billion new jobs will need to be created from now to 2050 just to accommodate the increase in the labour force. And if poverty is to be reduced, the nature of jobs created needs to change.

Currently, a large proportion of the labour force of these countries is engaged in the informal sector and in low productivity agriculture. Nearly 75 per cent of those employed in South Asia and sub-Saharan Africa—two of the regions that comprise many of the countries in this group—were own account workers and contributing family workers, often earning low incomes and comprising a disproportionately large share of the working poor (less than $1.25 per day). In fact, the share of the working poor in total employment was 43.5 per cent in South Asia and 58.5 per cent in Sub Saharan Africa in 2009 (ILO, 2011). Thus, the quality of employment needs to be urgently improved, which requires continuous increase in levels of productivity. Relying on subsistence agriculture and the urban informal sector as the employers of last resort for an increasing labour force will simply not do for these countries.

Economic growth is a pre-requisite for employment generation, but growth per se does not guarantee that jobs are created rapidly enough to absorb the new entrants to the labour force and reduce existing

level of unemployment and underemployment.[2] Most of these countries experienced fast rates of growth in the first decade of the 2000s and yet the labour intensity of GDP growth was clearly not enough. The pattern of growth must be labour absorptive, which largely depends on productive specialization and on the quality of labour resources available in the economy (United Nations, 1997). In this regard, the neglect of agriculture –the largest employer in many poor countries—in the past decades has to be reversed. Moreover, with the ongoing feminization of agriculture, increased agricultural productivity also depends on removing specific constraints that women encounter as producers. Reducing the productivity gap between male and female farmers would significantly contribute to higher agricultural output (Agarwal, 2011).

A growing farm sector can increase the demand for the non-agricultural sector (often micro and small enterprises, which are important sources of employment in rural areas) and provide inputs to other sectors of the economy therefore reducing demand constraints and promoting dynamic linkages. But the challenges are great here as well. Although offering an important potential for job creation, these firms face significant structural challenges, including lack of access to electricity, finance and transportation infrastructure, which require structural solutions (ADB/OECD/UNDP/UNECA, 2012). They usually cater to the low-income sectors, supplying goods and services produced using simple or outdated technologies; many fail to forge productive linkages with the more dynamic sectors of the economy; most remain confined to one single entrepreneur, not an optimal size in many instances, and frequently have a very short life span (United Nations, 1997).

Strategies to increase productivity in agriculture and strengthen the rural non-agricultural sector need to include measures that enhance the quality of the human capital in a way that is consistent with the needs of these economies. Three main challenges are noteworthy. First, the supply of basic education to a large - if not growing - number of children. As seen on table 1, there will be 504 million children (0 to 14) in the LDCs by 2050, compared to the current 334 million. Yet, increasing enrolment is not enough; the quality of the education needs to be urgently improved. Moreover, barriers to secondary education need to be removed as primary education does not equip the individual with the skills needed to tap the opportunities of the labour market, especially if agro-processing and manufacturing activities are to be pursued and eventually upgraded. Second, post primary education, particularly of technical and vocational type, is often missing or insufficiently developed (CDP, 2011). In this regard, the particular needs of the rural economy and of the informal sector should not be neglected (ADB/OECD/UNDP/UNECA, 2012). Third, skills mismatches need to be avoided and the education system needs to be geared to produce graduates with the range and levels of skills the market needs. At the same time, poor countries experiencing rapid population growth are constrained in their capacity to expand public services that are fundamental for increased labour productivity and growth and therefore, improved welfare. The international cooperation has an important role to play in supporting these countries efforts while innovative forms of partnerships between the public and private sector need to be explored to remove these constraints.

While the increase in the older population cannot be avoided, some of the long-term pressures coming from population growth can. Young workers (15-24) anticipated to join labour markets in 2050 will only be born by 2025-2035. The already considerable increase in children and young people projected for the next 40 years in the LDCs, for instance, assumes a drop in fertility from 4.41 children per woman in 2005-2010 to 2.76 in 2045-2050. Lower fertility rates are associated with greater human capital invest-

2 On macroeconomic policies to support output growth and employment creation see Cornia and Vos (forthcoming)

ment per capita, with positive implications for productivity growth and development. But extending primary and secondary education does not guarantee, by itself, a reduction of fertility. It needs to be complemented by interventions in the area of family planning, reproductive health and by the promotion of the necessary adjustments in cultural and societal practices.

In a number of developing countries women marry very young, with a significant proportion of them before age 15, including in countries where the minimum legal age at marriage with parental consent is 16 to 18 years (United Nations, 2012). Adolescent birth rates are high and increase with the percentage of women married at young age, with ensuing negative consequences for the completion of education and better integration of young women and men into the labour market. A substantial proportion of young women have expressed unmet need for family planning, particularly in the marginalized segments of the population. As a result , more than 6 million unwanted pregnancies take place in developing countries annually (United Nations, 2012). Access to family planning services for young men and women should be promoted, and reproductive health should be included in primary care and with universal access.

Increasing the legal age of marriage and/or better enforcement of existing laws may help but are not sufficient to counter early marriage in societies where it is seen as beneficial or an accepted and encouraged practice. Thus, there is also need for culturally sensitive programmes that promote marriage at later ages and discourage dowry practices. Early marriage is also associated with low levels of education. The higher the level of illiteracy among women aged 15-24, the higher the propensity to marry young (United Nations 2012). The propensity is also higher among those with no education and primary education in comparison with women with secondary education. In this regard, removing barriers of access to education by girls and increasing family incentives to send them to school is crucial.

IV. Countries with smaller labour forces: enlarging the pool of workers

The rate of growth of GDP per capita can be expressed in terms of the growth of employment (often proxied by the growth of the population of working age) plus the growth in labour productivity. Thus, a contracting population of working age (or one that grows at declining rates) would lead to lower output growth, if labour productivity cannot be raised sufficiently to offset that contraction (or decline).

A number of policy options can be explored. Enhanced labour force participation, migration, outsourcing, and, as suggested above, increased labour productivity are among the possible responses. However, the impact of international migration on volume of workers and on fertility rate although positive in the short-term, it is unsustainable in the long-term. Despite some recovery in a few developed countries (Belgium, Denmark, Italy, Spain and Sweden, among others), it is highly unlikely that fertility will recover to replacement levels in the near future.

Turning to migration, it has been estimated that to offset the projected decline of population in Europe, annual net migratory inflows (1.8 million) would need to be twice as high as what was observed in 1995-2000 for the next 40 years. Levels of migration would be to even higher to offset the projected decline in working age population for Japan and several European countries. For Europe, the total amount of immigrants needed for the period 1995-2050 would amount to 235 million people, four times the migration experienced in the last 50 years. If such flows were to occur, post-1995 immigrants and their descendants

would come to represent (an implausibly) large share of the total population in 2050; between 30 and 39 per cent in the case of Japan, Germany and Italy (United Nations, 2000). It is far from clear whether social, political and cultural conditions in these countries can accommodate such large influx of migrants. Naturally, migration will help to offset some of the pressure and will continue to respond to trends in both developing and developed countries. There is already a noticeable raise in the number of female migrants as new jobs are created in the "care economy" (Alonso, 2011), while the need for increased participation of females in labour markets discussed below will contribute to add pressures to female migratory flows. But international migration even if it helps to ease the adjustment in the short-term will not solve for the problem of shrinking labour force in these economies in the long-term.

Increasing participation rates

While projections of the working age population give an indication of potential labour resources that can be productively engaged, they say little about how much of those in the working age group will be actually participating in the labour markets. Dependent populations are supported by those who are de facto working. Participation rates matter.

Overall, participation rates are often higher in developing than in developed countries. This is probably due to the higher participation rates at relatively younger ages (aged 15-24) in developing countries, particularly in low-income countries, as well as to the relatively lower participation rates among older workers (aged 55-64) in developed countries owing to early retirement.[3] Among those aged 65 and older, participation rates are, on average, twice as higher in developing than in developed countries owing to the limited old-age pension coverage and lack of alternative earnings options. Male participation rates are higher than female across the regions. In some instances, the gender gap in participation rate can be quite substantial (see table 5).

For a few countries, projected increases in participation rates among those aged 15 to 64 years will not be enough to ensure a growing labour for the period 2010-2020. Among regions or groups of countries with declining labour force increasing participation rates among women, older workers as well as among those aged 65 and above can partially offset declining labour force trends. It should be noted that participation rates among the working age population increased during the last decade and are projected to continue to increase during the period 2010-2020, largely due to increased female participation. Participation rates have also increased among older workers, probably reflecting the introduction of policies making early and disability retirement more difficult or more costly to obtain, therefore correcting for some of the design flaws in the pension schemes of these countries. For OECD countries, participation rate for those aged 55-64 increased from 50 per cent in 2000 to 57.5 per cent in 2010. While male participation rate increased, on average, by 5 percentage points during the period, the corresponding increase for females in the same age group was almost twice as much.[4] Participation rates have also increased for those beyond the statutory age of retirement.

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3 D'Addio, Anna Cristina, Mark Keese and Edward Whitehouse, Population ageing and labour markets, Oxford Review of Economic Policy, Volume 26, Number 4, 2010, pp. 613-635.

4 OECD Employment database (available at http://stats.oecd.org/Index.aspx?DatasetCode=LFS_SEXAGE_I_R; accessed on November 11, 2011.) OECD averages include Brazil, Chile, Israel, Korea Rep., Russian Federation and Turkey.

Table 5:
Labour force participation rates, 2000-2020

Major area, region or country	Total			Male			Female		
	2000	2010	2020	2000	2010	2020	2000	2010	2020
Labour force participation rates of population at ages 15-64 (percentage)									
World (total)	**70.3**	**69.9**	**69.8**	**83.6**	**82.6**	**82.7**	**56.7**	**56.8**	**56.6**
Africa	***67.7***	***68.8***	***70.0***	***81.5***	***81.6***	***81.8***	***54.1***	***56.2***	***58.2***
Eastern Africa	83.3	84.1	84.5	88.6	87.9	88.0	78.1	80.3	81.1
Middle Africa	73.2	73.3	74.2	86.4	85.4	85.2	60.3	61.4	63.3
Northern Africa	53.6	54.4	54.7	78.8	79.5	79.6	28.2	29.3	29.8
Southern Africa	56.4	60.2	62.1	64.5	67.9	70.1	48.6	52.7	54.0
Western Africa	64.1	64.7	65.5	78.8	78.1	77.5	49.6	51.3	53.4
Asia	***71.1***	***69.5***	***69.0***	***85.6***	***83.9***	***83.9***	***55.8***	***54.5***	***53.2***
Eastern Asia	81.4	78.6	78.1	87.6	84.4	84.4	74.8	72.5	71.4
South-Central Asia	61.4	61.9	62.5	84.6	84.2	84.7	36.7	38.3	39.1
South-Eastern Asia	72.6	72.1	72.2	85.3	84.4	84.3	60.1	59.9	60.1
Western Asia	53.8	53.2	52.3	77.5	76.3	75.1	28.1	28.1	27.7
Europe	***68.7***	***70.9***	***71.9***	***76.1***	***76.9***	***77.2***	***61.5***	***65.0***	***66.6***
Eastern Europe	68.0	68.6	69.8	73.1	73.4	74.1	63.1	64.1	65.8
Northern Europe	75.2	76.1	77.2	81.5	81.5	82.1	68.9	70.8	72.1
Southern Europe	63.4	67.8	67.7	75.7	77.3	76.4	51.1	58.1	58.7
Western Europe	70.9	74.7	75.7	78.5	80.0	79.9	63.1	69.4	71.4
Latin America and the Caribbean	***66.7***	***69.2***	***70.0***	***83.6***	***82.8***	***82.3***	***50.2***	***55.9***	***58.0***
Caribbean	64.8	66.3	67.4	79.7	79.0	79.3	50.2	53.8	55.6
Central America	63.4	65.2	66.7	85.6	83.9	83.7	41.9	47.3	50.5
South America	68.1	70.9	71.5	83.3	82.9	82.0	53.3	59.3	61.1
North America	***76.8***	***74.6***	***74.8***	***83.3***	***80.3***	***79.9***	***70.4***	***68.8***	***69.6***
Oceania	***73.1***	***75.3***	***75.9***	***80.8***	***81.2***	***81.1***	***65.3***	***69.3***	***70.6***
Memo items:									
More developed regions	71.3	72.3	73.1	79.1	78.7	78.8	63.7	65.9	67.5
Less developed regions	70.1	69.3	69.2	84.8	83.4	83.4	54.8	54.7	54.4
Least developed countries	74.8	75.1	75.7	86.5	85.0	84.6	63.3	65.4	66.9
Labour force participation rates of population at ages 65+ (percentage)									
World (total)	**19.0**	**19.5**	**19.9**	**30.0**	**29.2**	**28.6**	**10.5**	**11.8**	**12.8**
Africa	***40.5***	***39.7***	***38.7***	***54.1***	***53.0***	***50.8***	***29.3***	***28.9***	***29.0***
Eastern Africa	59.2	61.3	61.4	73.7	76.3	76.4	47.3	49.1	49.7
Middle Africa	51.3	50.4	50.1	63.0	62.3	61.7	42.1	40.9	40.8
Northern Africa	20.3	18.1	16.8	35.8	32.1	28.4	6.8	6.2	6.8
Southern Africa	14.2	7.2	5.7	20.7	10.5	7.2	10.0	5.2	4.7
Western Africa	45.0	44.6	44.3	57.6	57.4	56.1	34.2	33.6	34.3
Asia	***23.0***	***21.3***	***20.4***	***36.7***	***32.8***	***30.2***	***11.2***	***11.4***	***11.9***
Eastern Asia	20.2	19.7	19.1	32.2	30.0	27.6	10.1	10.8	11.7
South-Central Asia	23.0	17.3	15.5	40.1	31.7	28.0	6.7	4.6	4.6
South-Eastern Asia	36.3	39.7	39.8	49.3	51.2	50.0	26.0	30.7	31.7
Western Asia	20.8	14.6	13.9	33.2	24.0	22.5	10.8	7.2	6.8

Table 5 (cont'd)

Major area, region or country	Total			Male			Female		
	2000	2010	2020	2000	2010	2020	2000	2010	2020
Europe	***6.7***	***6.8***	***7.1***	***9.4***	***9.1***	***9.3***	***5.0***	***5.3***	***5.7***
Eastern Europe	11.4	10.6	10.6	15.9	13.5	13.2	9.0	9.1	9.1
Northern Europe	5.9	8.5	9.8	8.8	12.2	13.3	3.8	5.7	7.1
Southern Europe	4.8	4.6	4.5	7.5	7.2	6.8	2.9	2.7	2.7
Western Europe	2.3	3.5	4.1	3.7	5.1	5.7	1.3	2.3	2.8
Latin America and the Caribbean	***25.7***	***30.7***	***32.2***	***41.1***	***45.3***	***46.6***	***13.6***	***19.2***	***20.8***
Caribbean	19.3	18.3	17.4	28.3	25.9	23.5	11.6	12.0	12.4
Central America	30.5	28.6	26.4	50.1	44.5	38.8	14.7	15.1	15.8
South America	25.0	33.0	36.0	39.9	48.2	52.3	13.5	21.4	23.5
North America	***12.2***	***16.9***	***19.0***	***16.9***	***21.5***	***23.5***	***8.8***	***13.3***	***15.4***
Oceania	***8.8***	***13.0***	***15.1***	***13.3***	***18.2***	***20.0***	***5.1***	***8.7***	***10.9***
Memo items:									
More developed regions	10.0	11.0	11.9	14.6	15.1	15.7	7.0	8.2	9.1
Less developed regions	25.3	24.7	23.9	39.2	36.8	34.6	13.2	14.3	14.9
Least developed countries	49.2	46.2	45.7	65.3	61.0	60.3	35.3	33.9	33.7

Source: ILO, LABORSTA. Economically Active Population Estimates and Projections: 1980-2020 (EAPEP), table E5 (http://laborsta.ilo.org/applv8/data/EAPEP/eapep_E.html).

Female participation rates

Notwithstanding the above, the gender gap continues to be significant in the OECD countries (see figure 1). It reaches a peak at around 24 percentage points for the 30-39 age group, which reflects the decline in female participation rates as they temporarily withdraw from the labour market probably owing to child-bearing and child-rearing. Female participation rate increases subsequently and peaks at the 40-49 age group, declining afterwards.

Bloom, Canning and Fink (2008) argue that reduced fertility while contributing to an older age structure also allows for more women to enter the labour force which can partially offset the retirement of older workers. As in United Nations (2007) a decomposition exercise was conducted to assess the possible implications of increased female participation would have on the size of the labour force and on the rate of growth of the developed economies. The exercise was based on the accounting identity that states that growth of GDP is equal to the sum of the rate of growth of employment (proxied here by the rate of growth of the labour force) plus the growth rate of labour productivity (assumed to be constant at 2 per cent per year over the period of analysis) less the rate of population growth. For this exercise, female participation rates were assumed to converge to male participation rates by 2020 and remain at that level for the remainder of the period (2020-2050). Results were compared with a baseline where female participation rates in the more advanced economies retained their anticipated trajectory, that is to say, they would increase from 65.9 per cent in 2010 to 67.5 per cent in 2020, and remain at that level after 2020. Results are presented on table 6.

The shock to female participation rates (independently of its actual feasibility in such a relatively short period of time) would more than offset the anticipated decline in labour force during the period 2010-2020. Moreover, it would lead to an increase in the annual rate of growth of per capita GDP by 0.74

Table 6:

Developed economies: increased female participation rates and growth of per capita GDP, 2010-2050 (Average annual rate of growth, percentage change)

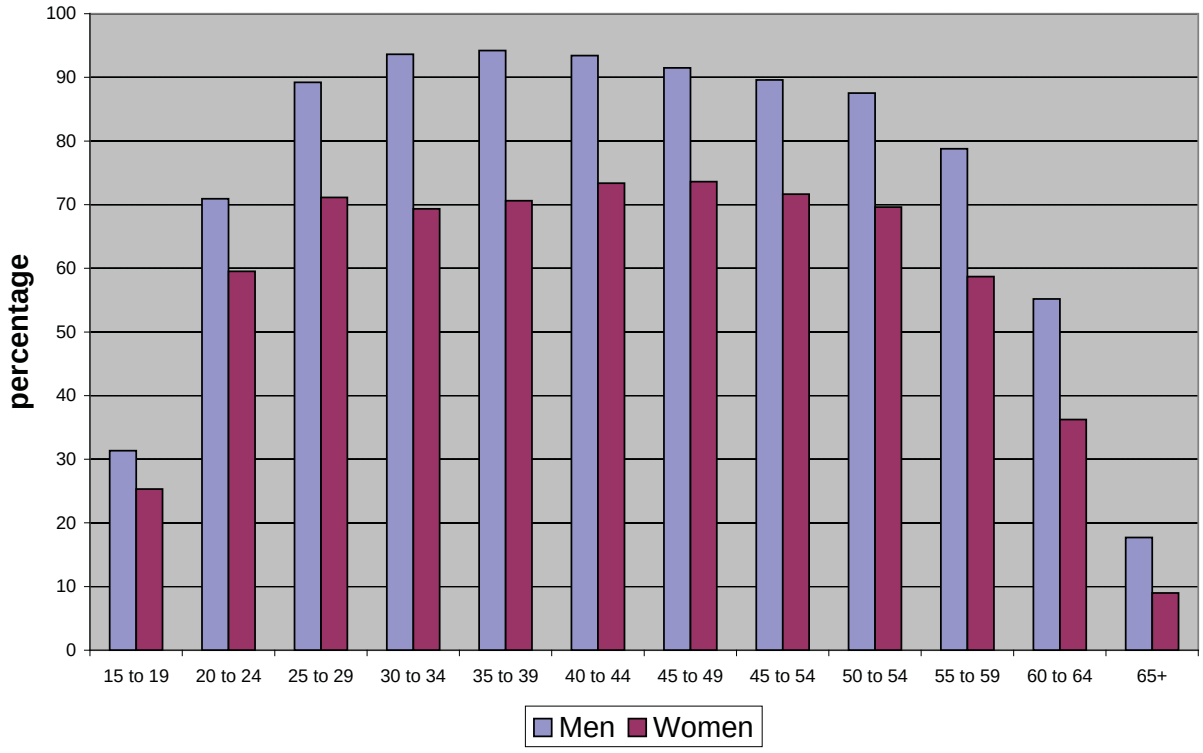
Baseline	***GDP per capita***	***Employment***	***Productivity***	***Population***
2010-2020	1.66	-0.1	2	0.24
2020-2050	1.78	-0.25	2	-0.03
Simulation	***GDP per capita***	***Employment***	***Productivity***	***Population***
2010 -2020	2.4	0.64	2	0.24
2020-2050	2.02	-0.01	2	-0.03

Source: Author's calculations based on UN World Population Prospects Database (2010 Revision).

Note: Annual rate of growth of per capita GDP = Employment growth + Labour productivity – Population Growth. Baseline: Male and female participation rates projected as in table 5 and remain at 2020 level until 2050.

percentage points over the baseline. With no additional surges in the female participation rate during the subsequent period (2020-2050), the annual rate of growth of per capita GDP is increased by 0.25 per cent over the baseline– not a negligible effect. At the same time, if the female participation rates were to converge to the male participation rates only by the end of the period (2050), its impact on the annual rate of growth would be almost negligible at 0.08 per cent per year during the period 2010-2050, when compared to the baseline. This is because the increase in female participation would have not been fast enough and would also impact over a smaller population. This may suggest that there is urgency in boosting female participation rates for the benefits (in terms of faster rates of output growth) would be greater the sooner that increase is.

Figure 1:
OECD countries: labour force particiaption rates by sex and age, 2010



Source: OECD Stat (Dataset: LFS by sex and age-indicators)

Naturally, these are very crude results which are based on a simple accounting identity. For instance, it is not clear whether there will be jobs available for these additional workers or how labour productivity will evolve. Moreover, there seems to be a trade-off for females between childbearing and joining the labour force. Accordingly, both population and labour policies would need to be better coordinated and supplemented by other interventions to facilitate and support parents in reconciling family and workplace obligations. Additionally, gender wage gaps need to be closed and women need to have greater access to decent employment opportunities.

In developing countries, women are often over represented in vulnerable employment. They work as unpaid family workers and own account workers, usually in the informal sector and in low productivity activities. Furthermore, unemployment is higher among females than males in several developing regions

(ILO, 2011a). Besides removing cultural and societal constraints to women's effective participation in the labour market, increasing women's access to education and enhancing their educational attainment have been correlated with increased female participation and higher productivity outcomes.

Older workers and working beyond retirement age

Projected declines of the labour force can also be partially offset by increasing the participation of older workers. In the OECD countries, participation rates are highest for the group aged 40 to 44 and then it starts to decline as workers age. Participation rates among older workers increased over the past decade; among those aged 50 to 64, gains in participation rates are larger the older the cohort is. Participation rates for those aged 65 to 69 and for those above mandatory retirement age (usually 65 for the period of analysis) increased by almost 6 percentage points from 2000 to 2010. This outcome can be explained by several factors. Policy reforms, structural changes taking place in the economy, and improved overall health status of the older population. Additionally, Borch-Supan (2008) argues that in the case of the American economy, where pension benefits are closely associated with developments in capital markets, longer labour market participation can be in part explained by volatility and declining returns of financial assets.

Nonetheless, the effective retirement age continues to be below the statutory pensionable age for the average of the OECD countries. For men, the average effective retirement age was estimated at 63.9 for the period 2004-2009, while the corresponding figure for women was 62.5.[5] D'Addio et all (2010) indicate that the most common pathways out of the labour markets are early retirement (Belgium, Czech Republic, France, Greece, Hungary, the Netherlands and Norway), unemployment, some types of welfare and disability schemes (Finland, Slovak Republic, Spain, Sweden and the UK). This may signal that—despite progress-- pension and disability schemes still have to be reformed further to address remaining incentives for early retirement. Moreover, there is need to look into old age and other types of social security and welfare benefits in an integrated manner to avoid that programmes are not used to meet objectives they were not originally designed for.

Yet, fine tuning access to pensions or solving for problems in the design of pension schemes addresses only part of the problem. Several other issues (besides individual preferences) may underline decisions to retire. The overall tax policy (if heavily tilted towards labour earnings), poor working conditions, including cultural norms and negative attitudes towards older workers, ill health, and low job satisfaction, among others, can contribute to declining participation rates among older workers. Another important factor is access to training and updating of skills has been found to be less frequent among older than younger workers (United Nations, 2007). As skills become obsolete, their employability is reduced, which calls for constant upgrading and investment in one's human capital. Approaches for ensuring continuous upgrading of knowledge and skills, such as lifelong learning, need to be encouraged.[6] Furthermore, a study by the OECD (2006) indicated blue collar and less skilled workers tend to retire earlier than white collar and more highly qualified workers. Thus, in additional to skill upgrading, changes in working environment may be necessary to retain older workers. Such changes should encompass not only the possible reallocation of older workers to tasks or job positions that are compatible with their age and skills but also the introduction of technologies and processes that facilitate their work.

5 OECD. Ageing and Employment Policies - Statistics on average effective age of retirement. Available at http://www.oecd.org/dataoecd/3/1/39371913.xls, accessed on 14 November 2011

6 See for instance, The World Bank, *Lifelong Learning in the Global Knowledge Economy: Challenges for Developing Countries*, WashingtonDC: The World Bank, 2003

United Nations (2007) assesses the impact of higher participation rate by older workers (aged 55 to 64) on the labour force size and on the growth of output per capita in 5 economies at different stages of their demographic transition and characteristics in terms of old workers participation rates: fast ageing (Germany, Italy and Japan) and moderately aging (India and United States). The exercise assumes that participation rates by those aged 55-64 will converge to the levels of those aged 15-54 starting in 2005. Results of the simulation were compared to a baseline scenario where projected participation rates did not change. The impact was positive but for a very small margin. It was largest for Germany, where per capita growth would increase by 0.13 percentage points per year. Additionally, the study also stakes into account the possibility of an eventual decline in productivity as workers age (see below).[7] With average productivity growth by older worker assumed to be lower than for workers in the 15-54 age bracket, increasing the participation rate by older workers will actually lower the rate of growth of per capita GDP when compared to the baseline scenario, with the exception of Germany. The results further indicate the need for a package of measures when addressing the issue declining labour force and the need to invest in human capital at all ages to sustain productivity growth.

V. The changes in the age structure of the population: implications for growth

Demographic dynamics and productivity growth

Productivity has significant potential implications for economic growth and wellbeing. If productivity growth is not fast enough to compensate for the impending changes in the labour supply, the burden of maintaining improved standards of wellbeing and supporting an increasingly dependent older population becomes heavier. It implies much larger transfers from the working to the non-working population, which may be difficult to sustain over time. In developing economies with surplus labour and large informal labour markets improvements in productivity are also needed not only to support an ever expanding older population but to raise the living standards of all and reduce poverty.

In view of the anticipated demographic changes, it is important to have a rough idea of the scale of productivity increases that would be required in the future to offset the increase in the dependent populations (both children and the aged). Figure 2 plots the projected annual rate of change in the potential dependency ratio (defined as the ratio of the population of working age population to the dependent population) for the period 2010-2050 to the observed annual rate of growth of labour productivity (GDP per person engaged, calculated at constant 1990 PPP exchange rates)[8]. The idea behind this exercise is that the increase in dependents per worker needs to be compensated by a comparable increase in labour productivity to maintain the status quo level of consumption per capita.

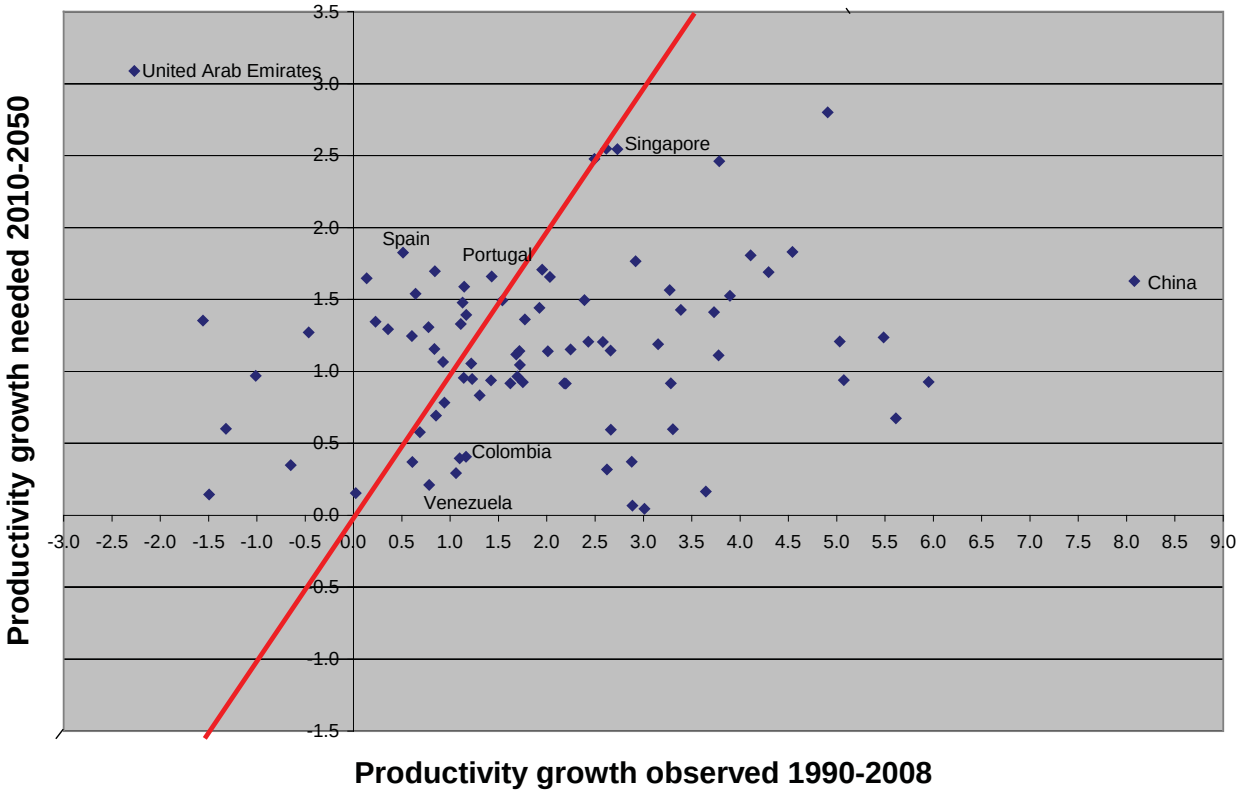
The good news is that among the 83 countries—largely middle income developing countries and developed countries—included in figure 3, only 23 countries—those located above the diagonal thick line on the graph—would need to accelerate productivity growth. Additionally, the increase in productivity seems to be reasonable at 1.5 per cent or below for the majority of the countries in the sample, with several of them already performing above that level. Naturally, for some countries 1.5 per cent implies in achieving higher productivity levels than in the past, which can be challenging. The not so good news is that these lev-

7 Labour productivity growth is assumed at 2 per cent per year for workers aged 15 to 54 and 1.5 per cent annually for those aged 55 to 64. For details see United Nations (2007).

8 The period 1990-2008 was selected—instead of a longer period— in order to increase the size of the sample. Similarly, output per person engaged was used instead of output per hour worker due to wider country coverage.

els would only allow for the maintenance of the status quo; higher rates of growth of labour productivity are required if the level of welfare is to increase. Moreover, it is not clear whether countries can maintain such level of productivity for extended periods, particularly in view of the potential impacts the change in the age structure of their labour force may have for the growth of productivity.

Figure 2:
Annual average productivity growth



Source: Author's calculations based on ILO, Key Indicators of the Labour Market (KILM) online database and UN-DESA Population Prospects: 2010 Revision online database.

Freyer (2007) shows that changes in the workforce demographics have a strong significant correlation with the growth rate of productivity. He argues that changes in the proportion of workers aged 40 to 49 seem to be associated with productivity growth: a 5 per cent increase in the size of this cohort over a ten-year period is associated with a 1 to 2 per cent higher productivity growth per year during the decade. Additionally, the developing economies have a relatively smaller share of 40-49 year-olds in their labour forces. Thus, differences in age structure of the population may also be related, to some extent, to the persistent productivity divergence between developed and developing countries. Freyer estimates that roughly one quarter of the productivity gap can be associated with differences in the age structure of the labour force. Since 1980 developed countries have been experiencing the ageing of their working forces while demographics have been relatively static in developing countries.

Werding (2007) confirms the inverted U-shaped relationship between the share of workers in different age groups and productivity and that contribution peaks for workers at the age 40-49. However, as younger workers are still in the process of accumulating human capital and skills while older workers have

lower final educational attainment than their successors, cohort effects in human capital accumulation may contribute to this pattern. Yet, the author indicates that other factors could have contributed as well such as specific education-experience mix, that is to say, how workers of different age groups interact with each other or indeed factors such as entrepreneurship and creativity that have been observed to peak—so far—in the so called prime age workers.

The relationship between age and productivity is a complex one. Individual non-cognitive abilities, such as physical strengthen, endurance, energy health and dexterity may decline with age, and therefore impact on productivity as one ages. Conversely, some cognitive abilities (communications skills, administrative and strategic capacity and so on) are enhanced with age and/or do not necessarily deteriorate with age. Reviewing existing literature Skirbekk (2008) highlights the relevance of different cognitive abilities and their evolution over the life cycle. Fluid abilities, which are related to the performance and speed of solving tasks related to new material, and they include perceptual speed and reasoning, tend to decline at older ages. Crystallized abilities or abilities that improve with accumulated knowledge, such as verbal meaning and word fluency, remain at a high functional level until a late age in life. Thus, it has been argued that the impact of ageing on productivity depends on the particular combination of cognitive and non-cognitive abilities required to perform a given task (Sharpe, 2011). The age and productivity relationship has been widely discussed at the micro-level, where findings from studies based on supervisors' evaluations, piece-rate studies, analyses of employer-employee data sets, age-earnings profiles and entrepreneurial activity show that any decline in productivity associated with age takes place gradually and, as indicated above, varies across occupations (Borsch-Supan, 2004). Already in 1953, Lehman had suggested the existence of a creative "age curve" showing productivity beginning to increase in 'creative occupations' such as the sciences, arts and athletics at around the age of 20. Productivity reaches a peak in the late thirties to mid-forties, and begins to decline thereafter (Lehman, 1953).[9] There are exceptions to the "age curve", political leaders and businessmen are cases in point.

Changes in organizational structure, more effective use of ICT in specific occupations and better access to knowledge, education and training throughout work life (ECE, 2006 and Black and Lynch, 2004) have also been identified as ways to maintain and improve productivity. This is pertinent particularly since age productivity profiles may change over time based on technological advancements and structural changes within an economy (ECE, 2006 and Nishimura et al, 2002) rendering some skills relevant to specific occupations more or less obsolete in the domestic labour market. In fact, technological advancements have decreased the demand for manual labour and increased the demand for highly skilled workers increasing the importance of analytical, communication and numerical abilities. At the same time, there is a changing relationship between age and cognitive functioning: mental health levels have improved as educational attainment among older workers have increased which also facilitates flexibility and adaptation to new technologies and processes. Thus, the importance of investment in human capital is central and needs to be stressed. This also holds true for developing countries, with younger and supposedly more creative working population and facing greater potential for greater productivity.

In sum, as indicated by Garibaldi et al (2010) and quoted in Sharp (2011, p.87), "the net effect of age-specific productivity determinants depends on how individual skills are used in the work process, how the work is organized, and how the individual interacts with other workers and firm-level factors such as

9 Specifically, Lehman finds that chemists reached their peak productivity in the age range between 26 and 30. In mathematics, physics, botany, electronics and practical inventions, peak productivity is achieved between the ages of 30 and 34.

technology and capital levels." Overall, concerns that aged and relatively smaller working population will lead to marked declines in economic growth seem to be exaggerated. While productivity growth remains central, levels required seem to be compatible with past experience (United Nations, 2007; Bloom and others, 2008). The challenge is thus how to maintain such productivity growth for prolonged periods.

Consumption, savings and investment

Changes in the age structure of the population have implications for economic growth beyond the labour market channel. Economic growth is affected by consumption, investment and saving decisions. Not only what one consumes changes according to age, evolving tastes and preferences over the life cycle but how much one consumes may change as well thus impacting on economic growth.

Insights from the economic theory on consumption (and saving patterns) and its relationship with ageing is derived from the life-cycle model and based on the consumption smoothing hypothesis. The model indicates a constant trajectory of consumption and a hump-shaped saving pattern. During their working years, individuals produce more than they consume, and save. This surplus is used to provide for their dependent children or to finance retirement. Outside their working years, the individual dis-save. However, available evidence is not conclusive. Consumption does not necessarily follow a relatively constant trajectory across the life cycle, and savings do not necessarily fall as one ages.

In some countries (such as the UK, Indonesia and Thailand) drops in consumption have observed among older people (a phenomenon called as "the retirement consumption puzzle"), while in other countries consumption actually increased among the old (USA, Japan and Sweden) whereas in others the levels of consumption remained relatively constant over old age (Taiwan, POC) (United Nations, 2007). In his review of the relevant literature, Hurst (2008) argues that the standard model of life cycle consumption smoothing augmented with home production and uncertain health shocks holds. He identifies five stylized facts. First, certain types of expenditures fall sharply as households enter into retirement. Second, the decline in consumption is largely confined to work-related items (such as clothing and transportation), which should not be surprising, and food. Third, food intake remains relatively constant despite the lower expenditure, and this is probably due to home production. Fourth, there is a segment of the population that in fact experiences consumption declines due to insufficient or inadequate accumulation of wealth prior to retirement. Fifth, the households that experienced consumption decline have often experienced involuntary retirement generally due to health shocks.

But the above conclusions apply only to individuals in their years before retirement and those who have just retired. It sheds little light on how consumption evolves at all ages throughout the life cycle in a systematic way, from the very young to the very old. Recently published results from the National Transfer Account (NTA) project provide individuals' consumption age profiles from age 0 to age 90+ for 23 developing and developed countries. The NTA framework considers both private and public consumption; both are further disaggregated into education, health care and other consumption. Consumption age profiles are mean values normalized by the mean labour income of ages 30-49 in each economy.

Results for the project indicate there is a great deal of variation of in the level of aggregate consumption across ages. Consumption does not necessarily seem to follow a relatively constant trajectory. In some economies, aggregate consumption actually peaks at relatively young ages, while in other economies the peak takes place at much older ages (after 65).

Cross country differences in part reflect diversity in the relevance of public consumption for aggregate consumption. The distributive or the consumption equalization role of public consumption is quite evident, particularly in the developed economies. These economies tend to have a higher share of public consumption in total consumption than the developing economies. Public consumption is the highest for the children in all countries (largely due to education), the smallest for the average individual of working age but increases at older ages in some countries (Tung, 2011).

Turning to private consumption, average child (aged 0 to 19) consumption is the lowest among the three age groups considered (the other two groups are aged 20-64 and 65+) in all 23 economies, while an average older person consume the most in only 8 out of the 23 economies. Private consumption declines for those aged 65+ in 15 countries. In general, the age profile of private consumption shows a great deal of heterogeneity. Overall, the level of consumption patterns seem to be country—rather than—age driven, reflecting societal preferences, level the overall rate of income growth, the investment effort/drive in the economy and to distributive or transfer mechanisms.

From the above, it is not obvious how consumption behaves over the life cycle. But ageing influences consumption patterns. For instance, a study on the Canadian economy—while showing that the level of total consumption did not change much—indicated some significant shifts in terms of the relative contribution of major categories of consumption for individuals from their late 40s to their early 70s. Accordingly, the share of spending on residences and properties in total consumption increased from 31 per cent when individuals were in their late 40s to 43 per cent when the individuals were in their early 70s. The increase was largely driven by spending in shelter and other accommodation, while expenditures on furnishing and equipment actually shrunk. The share of spending on transportation remained relatively constant (17-19 per cent) over the period, while the share of spending on food, clothing and other items declined (from 35 to 28 per cent and from 18 to 12 per cent, respectively). Private spending on health care increased over the period but still represented a small portion of consumption (less than 5 per cent) (Lafrance and LaRochelle-Cote, 2011).

Predicting consumption patterns and their change due to ageing is a complex exercise. There are several structural factors besides age—such as income, preferences, societal and technological change—underlining these patterns. Additionally, price movements influence consumption patterns independently of the age of the consumer. But if there are no strong cohort effects—the impact of variables that are characteristic to a particular age group—one should expect that spending on basic goods (such as food or clothing) will decline as societies age (and income rises). In particular, consumption of (non-tradable) services such as housing-related services, energy and health may increase. Health care expenditures will likely rise as a result of increased prevalence of illness and disabilities that tend to occur more often late in life. But little can be anticipated in terms of how fast the demand for health services will increase. Further policy interventions in preventive health care and in promoting healthy lifestyles can delay and/or offset some of this anticipated increase in consumption of health services. Additionally, technological progress may facilitate the way how goods and services are consumed thereby affecting demand.

Changes in demand brought about by ageing will have an impact on the allocation of investment across sectors and on employment. In this regard, the changing age structure of the population worldwide, through its impact on labour markets and changes in patterns of consumption, may have been one of the factors contributing to the increase of the relative importance of developing countries—with their relatively younger populations and rising incomes—in global manufacturing. This global structural shift however has

also been guided by the skill structure employed in different industrial sectors (Fehr et al 2010). Manufacturing in developed countries is dominated by skill intensive industries, while low skill manufacturing still predominates in developing countries.

At the global level, changes in the structure of production in economies with an ageing population will spill over to the rest of the world via trade. The implications for export-led growth in developing countries will depend not only on the magnitude of the change in the demand for tradable goods but also on the changes in production patterns taking place in developed economies. As production of tradable goods is transferred from developed to developing countries, the latter may see faster economic growth and a boost to the rise of income with positive feedback for the emergence of their own domestic market and continued growth in the future. This seems to have been the case in the last two decades, in particular for the developing economies in Asia.[10] A structural shift in consumption towards services, i.e. non-tradable goods, in the developed countries could translate in a lower external demand for tradable goods. At the same time, many services are increasingly becoming tradable: they can be outsourced to countries with significant labour surplus and the required infrastructure. The presence of India in the global information technology sector is a case in point.

Turning to savings, the life cycle model suggests that countries with high child or old age dependency ratios would have relatively low savings rate, while those whose age structure is dominated by those in their working years would exhibit higher savings ratios. Nonetheless, not always countries with highest old age dependency ratios do have the lowest saving ratios. Overall, cross national differences in savings and investment seem to reflect differences in a wide range of factors, particularly in the short term. In the long-term, however, it is not possible rule out that demographic features influence savings. On the basis of information on 85 developing and developed countries during the period 1960-2004 Bosworth (2006) finds a strong correlation of demographic structure with both saving and investment; reductions in child and old age dependency increase savings and investment, but changes in old age dependency have larger effects. In all, the significance of demographic effects is overall empirically small.

Savings patterns are influenced by the design of pension schemes whose sustainability has been increasingly questioned owing to changing demographics (and poor design). Pension deficits impact on the public deficit with its potential negative consequences on macroeconomic stability and growth. Reforms have been advocated to restore the financial sustainability of such schemes and to increase the overall level of savings in the economy. Yet, while the need for reforms is recognized, pension reforms per se do not solve the demographic problem. Pension schemes are essentially a tool for redistributing present output between those that are working and those that are not working. Whether fully funded, pay-as-you-go, privately or publicly managed or a combination of these elements; whether one, two of multiple pillars, the essence remains the same, that is to say, that consumption of workers and retirees must first be produced. And any pension-related "asset" acquired by today's working population is in the end a claim on future output. Hence, output growth is central in the discussion on sustainability of pension schemes. In this regard, a pension reform can only increase savings if consumption decreases (either of the current working through increased taxations or the retired populations through reduced benefits or both). And savings may only increase economic growth if properly and effectively invested.

10 However, the shift of manufacturing to Latin America, more specifically to Mexico and a few Central American and Caribbean countries, has not led to faster growth. See *World Economic and Social Survey 2006: Diverging Growth and Development* (United Nations publication, Sales No E.06.II.C.1), in particular chapter III, "Has trade integration caused greater divergence?" pp. 53-90.

Everything being equal, however, one may expect that savings will decline in those economies where an increasing share of income needs to be transferred to those who are inactive (and whose share in the population is increasing) so that their consumption needs can be met. The impact is anticipated to take place gradually and to be small (United Nations, 2007), while financial markets have an important role to play in accommodating the change. In this sense, "the kind of policies that are appropriate to reduce frictions and instability is a highly policy-relevant research area for global population aging." (Borsch-Supan 2008: 75). In today's world plagued by a deep financial crisis, these observations could not have been timelier.

VI. Avoiding poverty among the dependent populations

The eradication of poverty will undoubtedly remain a major objective of the international development strategy beyond 2015. Poverty has a strong correlation with income security, the individual's ability to generate income and the capacity of the economy to employ productively and remunerate that individual accordingly. The individual's earning capacity changes over the life cycle. The very young cannot and should not work. They need to be provided for while developing the skills necessary to be used later when they will join the labour force. Living standards often worsen for people at older ages due to reduced employment opportunities and deteriorating health status.

The provision of long-term care is a source of concern in view of the specific demands related to the care of persons with irreversible health conditions and the ongoing changes in the traditional family structure and the role of women in modern societies. But improvements in the overall health status of older populations can work as mitigating factor and should guide policy action. In developing countries, addressing the high prevalence of infectious diseases is still necessary while attention is also required to be given to preventive care and education to ensure increased longevity is accompanied by a healthy life expectancy. For instance, the use of tobacco and the excessive consumption of alcohol, which result in poor health in later life, are still prevalent, particularly in developing countries. In fact, few developing countries have implemented prevention programmes to encourage healthy lifestyle choices that would mitigate chronic diseases or delay their onset.

Currently older persons comprise 20 per cent of the dependent populations in developing countries; by 2050 they will represent 47 per cent. For the non-working, dependent populations, income security is provided through intergenerational transfers using both formal (public pensions and other sorts of public transfers, occupational pensions, family allowances, private pension schemes etc.) and informal mechanisms (through the family and the community). In developed countries, income security in old age is largely provided by formal pension systems and former accumulation of assets. In many developing countries, pension coverage is limited (largely due to employment in informal sector) and income security still depends on one's own work and/or informal transfer mechanisms.

Worldwide, nearly 40 per cent of the population of working age is legally covered by contributory old-age schemes. Differences across countries remain considerable largely reflecting differences in resource constraints. In Africa less than one third of the working age population is covered by legislation; effective coverage is even much lower at 5 per cent of the working age population. In view of the strong correlation between income per capita and pension coverage, it was expected that with faster economic growth and development, coverage would increase in developing countries. This has not been the case. The economic growth in the recent decades has been accompanied by limited generation of wage employment in the formal sector. Additionally, pension reforms introduced in the late 80s and early 90s did not deliver expected results in terms of greater coverage.

The impact of old age pensions on poverty reduction can be considerable; poverty among older people would be much higher in the absence of pensions. For instance, the U.S. Bureau of Census (2010) indicates that the (absolute) poverty rate among the aged (9 per cent) is below the national average (15.1 per cent) and significantly lower than among children (22 per cent). There is, however, wide variety of incidence of poverty among the old in the industrialized countries, which is largely explained by the level at which safety net retirement benefits are set. Incidence of poverty among in the developed economies (admittedly relative poverty: defined as income below half of the median income) is still more frequent among the aged than among the young. Among 29 developed economies, poverty rates for those aged 65 and above were higher than the national poverty rate in 21 countries, of which 17 countries exhibited a higher incidence of poverty among the old than among those aged 0 to 14 (OECD, 2011). These outcomes do not necessarily imply that older persons in these countries are not able to afford a minimum basket of basic goods and services. Rather, they indicate that the income distribution is not in older persons' favour in these economies.

Among pensioners, poverty has a strong gender connotation: it tends to be higher among women than among men due to women's shorter, intermittent participation or even lack of participation in labour markets, lower earnings and longer longevity. The latter implies not only in relatively lower survivor's benefits -often a fraction of regular old age pensions—but also in unfavourable living arrangements. The share of older women living alone is higher than men's, which does not allow them to benefit from economies of scale in consumption as those living in extended households (United Nations, 2007). Increased female participation in the labour markets should offset some of the risks of poverty in old age for women, but as long as women have shorter working lives and lower salaries the risk of poverty in old age is greater for women than for men.

Pension reforms: ensuring sustainability, avoiding poverty in old age

The reform of pension systems has been the focus of intense debate. The reform of pension systems is the focus of intense debate. Two channels are available to pension reform: parametric and structural. Parametric reform refers to the modification to underlying parameters of existing schemes. It is a feasible option where expenditure can be contained by reducing benefits through e.g. lower average replacement rates or modifying indexation provisions so that increases in benefits are lower than the growth in revenues and less frequent. Other options include increasing the retirement age or tightening eligibility requirements so that fewer people receive pensions. On the revenue side, parametric reforms include increasing contribution rates, raising maximum contribution ceilings or postponing the retirement age, thus extending the average contribution length of workers.

Structural reforms, in contrast, involve more fundamental changes. Such changes may affect the way pensions are financed, for example, by replacing PAYG system, where current contributions finance current pensions, with a fully-funded (FF) mechanism, where contributions are invested to finance future pensions. Other structural reforms include changes in the underlying basis of pensions, i.e. whether pension benefits are related to previous earnings of individuals, or are uniform across cohorts. They may also imply a move from a defined benefit (DB) scheme, where a certain level of benefits (such as a particular proportion of previous earnings) is guaranteed, to a defined contribution (DC) scheme, where a person's consumption after retirement will depend on his contributions, the rate of return on contributions and on life expectancy after retirement. The choice between DB or DC schemes has particularly important implications on risk diversification and who will bear the brunt of the impact of adverse events. Pension beneficiaries bear most risks in a DC scheme, whilst in DB systems risks are largely shifted to the sponsor or provider of benefits as there is a promise that pension will correspond to a certain fraction of the retiree's wage (Barr, 2006)

While financial sustainability is an important consideration, it should not be the only objective to be pursued. There would be little use for a transfer scheme that is financially sustainable but fails to deliver a minimum amount of benefits and does not ensure economic security. Burtless (2005) argues that pension reforms adopted in some developed countries in recent years will lead to much smaller wage replacement ratios in the future which can make poverty a larger problem for the elderly in these countries. Similarly, the privatization of pension schemes—which still requires a great deal of public involvement in guaranteeing and supervising the system—in some developing countries has shifted economic risks to the pensioner, do not offer sufficient social insurance for idiosyncratic risks (such unemployment or disease) and may imply in insufficient income during retirement.

Pension reforms also need to ensure accessibility, affordability, equity, offer the appropriate incentives and not intensify existing inequalities. There is no size fits all. Pension systems and their reforms largely depend on country contexts and reflect societal preferences in terms of redistribution of resources within and among generations. In this regard, pension systems could be approached as composite of several modules or pillars each addressing specific needs and characteristics of different segments of the labour market. Countries with large formal labour markets income security can be provided by a single basic public pillar, financed by earnings-related contribution. A solidarity mechanism should be built in to provide workers with unstable or insufficient earnings with minimum benefits. In countries with large informal makers or dual labour markets, two public pillars could be considered: one non-contributory, offering a minimum floor, and the other earnings related. In all cases, individuals with capacity to make provisions for their own old age income security to complement income to be received from the public schemes should be encouraged to do so (United Nations 2007).

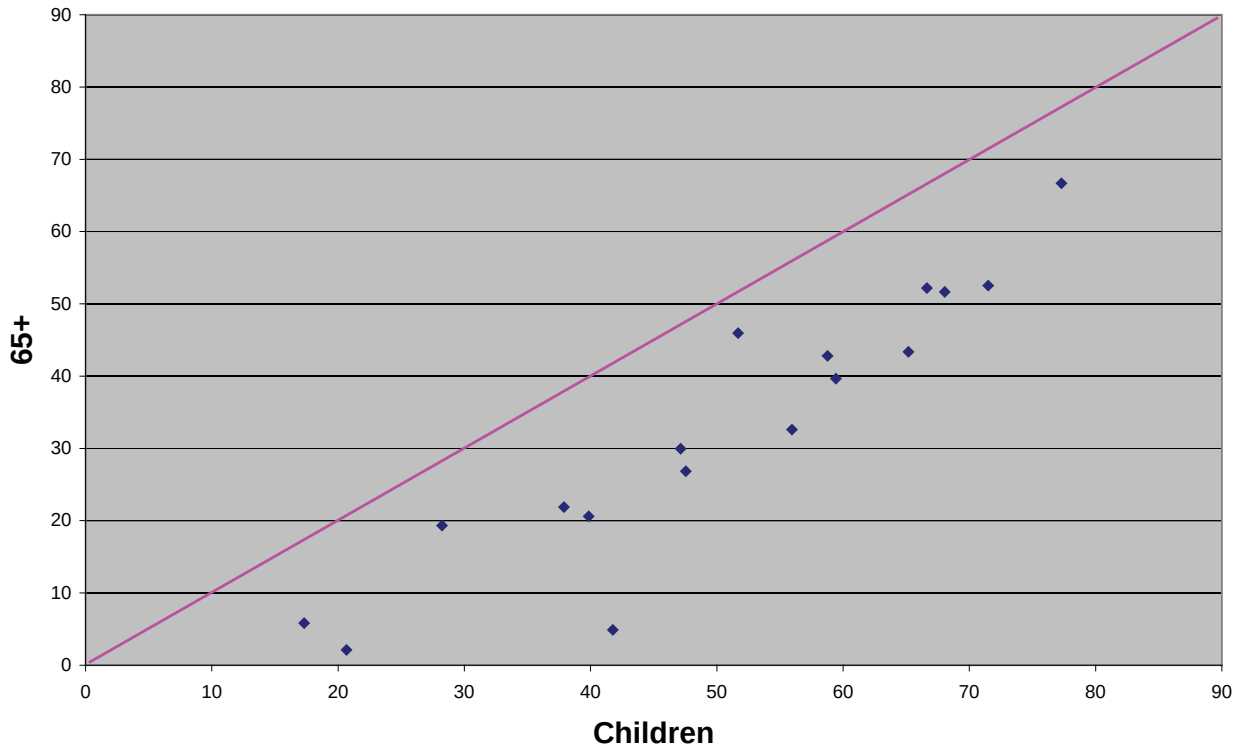
Additional challenges for developing countries

Informal mechanisms, while playing an important role in certain contexts, have been under increasing pressure due to repeated adverse shocks, the reduced size of families, migration and changes in attitudes. More importantly, such mechanisms operate in a small scale, cannot diversify risks efficiently and are often unreliable. Therefore, for developing countries, where informal mechanisms are more frequently the challenge is not only to ensure the sustainability of existing old age pension systems but also to increase coverage.

Even when benefits are modest, old-age pensions can contribute to reducing the intensity of poverty and strengthening livelihood strategies (United Nations, 2007). Accordingly, in view of the difficulties in expanding employment-related old age pensions, a few developing countries have introduced universal non contributory old age pensions (e.g, Botswana, Mauritius, Namibia, Nepal, and Samoa). There is wide variety in these arrangements; qualifying age rages from 60 in Namibia and Mauritius to 75 in Nepal, while pension benefits range from 10 to 26 per cent of per capita GDP (Willmore, 2006). In these countries, the introduction of non-contributory programmes providing minimum support has helped to reduce disparities of access to old age benefits.

But, as far as the dependent populations are concerned, this is not the only challenge confronting these countries from the demographic point of view. Poverty among children seems to be a widespread phenomenon. For instance, in Latin America, the incidence of poverty is higher among children than among the aged in all 17 countries considered in figure 3. On the other hand, evidence seems to be less conclusive in the case of Africa. Among 15 African economies, the poverty head count for children is higher than for older persons in only 6 countries, while the incidence of poverty in households where older persons were living with children (usually their grandchildren) is higher than the national average (Kakwani and Subbarao, 2005).

Figure 3:
Latin America: Poverty rate among children (0-14) and older people (65+), 2007-2009



Source: ECLAC

With their populations aged 0-14 still growing or remaining relatively stable in several developing regions during the next 15 years, children remain the most numerous vulnerable age group in all developing regions during the period 2010-2025. Addressing poverty among children should receive renewed attention by policy makers. Accordingly, moving forward, there is urgent need to develop additional mechanisms and interventions to address children poverty (probably a great deal to do with female poverty) while at the same time putting in places sustainable income support mechanisms for older persons. The preceding need not to be excluding, there is a great deal of synergies between providing income security for older persons and outcomes for children as well as for other family members. In Brazil and South Africa, for instance, earnings from pensions and work from older persons are important sources of income in households that include them (Lloyd-Sherlock, 2006). Hermalin et al. (2005) indicate that the levels of childcare provided by grandparents to co-resident and non-co resident grandchildren are significant sources of support in Thailand, Taiwan Province of China, and the Philippines.

In this regard, over the past years a new generation of social assistance schemes have emerge providing minimum income support not only to older persons but also working age individuals, children and their families. These cash transfer systems follow a wide variety of approaches: some are means tested, others are not; some are conditional. What is interesting to note is the fact that these programmes seem to be quite affordable. Often these programmes cover a rather large number of people (as in the case of Brazil and Pakistan) but cost just a small fraction of the GDP: between 0.3 and 0.5 per cent (ILO, 2010). The experiences of these (and

other) countries demonstrate that countries at relatively lower levels of income[11] can afford to offer some form of social protection to their populations once there is political willingness to create the necessary fiscal space.

VII. Concluding remarks

Economic growth is central for improving the welfare of populations worldwide. But population dynamics affect growth as well. However, these can be fully anticipated and policies—such as those discussed here—can be adopted to offset negative effects and harness potential positive impacts. But, however important—and without minimizing its importance for the design of future development strategies—demographics is one of the many factors affecting growth and its overall impact is more nuanced than implied by some analysis.

While the world population is ageing everywhere and will continue to grow on average, trends are diverse across countries. Some countries, largely the developed economies and also some developing countries, will experience a decline in their population of working age, while in other countries, mostly developing countries, the labour force is still increasing. Given the magnitude of projected trends, international migration, while offsetting some of the pressures, offers no solution to the demographic challenge in the long-term. Thus, the former group of countries needs to adopt strategies to sustain and/or raise the productivity of their declining and graying labour forces; the latter needs to embark in growth patterns that are labour intensive, but that offer possibilities for dynamic structural change and productivity increases in view of the significant welfare gaps their populations suffer. Structural impediments confronting these economies need to be addressed and the international cooperation has an important role to play in this direction.

Both approaches require significant investments in education, skill formation and updating; for the former group so as to increase productivity and avoid obsolesce of skills of an older labour force. It is not efficient to increase labour force participation at older ages and not address the potential decline in productivity of older workers. Interventions also need to be accompanied by the necessary adjustments in the institutional framework (to support longer labour force participation), in the work environment and how work is organized. While higher participation rates at older ages can offset some of the decline of the labour force and contribute to the sustainability of transfer systems, there are obvious limits to the feasibility of this alternative. For the latter countries, investment in human capital is needed to enlarge people's choices and to prepare the vast numbers of unskilled and uneducated workers for the needs of labour market. The correlation between higher levels of education and lower fertility is also noted.

Similarly, in both groups of countries there is need to recognize the important contribution women can make to overcome the demographic challenge. In the case of countries with fast growing populations, further declines in fertility are contingent on increased access to family planning and modern contraceptives as well as on changes of attitudes towards early marriage. Increased female labour force participation can offset the anticipated decline in labour force if promoted fast enough, but it requires additional measures to facilitate the reconciliation of parents´ family and work obligations. Addressing the severe gender gap in the labour markets in terms of opportunities, including access to education and training, and remuneration is also called for, both in developed and in developing countries. Removing obstacles to increased productivity by female farmers is central for enhanced food security and faster output growth in agriculture.

11 The ILO (2010b) indicates that currently there are some 30 developing countries with a minimum social security packages based on social transfer programmes.

Worldwide, dependency ratios are still declining but expected to rise from around 2025 onwards. Dependent populations need to be provided for. Old age pensions and social pensions play an important role in reducing the incidence and the intensity of poverty. But if poverty is to be avoided at older ages, the sustainability and adequacy of support systems need to be ensured. In countries where old age pensions are norm, that requires closing existing loopholes, extending mandatory retirement age where applicable and guaranteeing a minimum, socially acceptable, level of benefits, and offering adequate risk pooling so that idiosyncratic risks are genuinely diversified and not shouldered by the individual. Pension reforms, however, do not solve for the demographic challenge; output growth is key. For developing countries, with large segments of the population without access to formal protection mechanisms, coverage needs to increase. Recent experience has demonstrated that the expansion of coverage, including the provision of universal benefits can be affordable even in developing countries. Fiscal space requires political will.

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