

SAMA Working Paper:

POPULATION AGING IN SAUDI ARABIA

February 2015

By

Hussain I. Abusaaq

Economic Research Department

Saudi Arabian Monetary Agency

The views expressed are those of the author(s) and do not necessarily reflect the position of the Saudi Arabian Monetary Agency (SAMA) and its policies. This Working Paper should not be reported as representing the views of SAMA.

POPULATION AGING IN SAUDI ARABIA*

Abstract

The proportion of people in Saudi Arabia aged 60 or more is predicted to be 25 percent of the total population of 40 million by the end of 2050. Moreover, the number of people aged 80 or more is expected to reach 1.6 million, or 4 percent of the total population in the same period.

This paper analyzes the impact of population aging on the economy of Saudi Arabia. Its main contribution is that population aging has a number of tough but manageable challenges. The dependency ratio in the Saudi economy will increase to 52 percent in 2050 compared with 46 percent in 2015. Moreover, the number of people claiming pension benefits will rise and working people will be charged more to pay for the extra pension costs in that period. Health expenditures are expected to increase during 2015 and 2050 due to the increase in the elderly rate from 5.4 percent (1.6 Million) to 25 percent (10 million) but the public expenses on education will drop in the same period as the youth dependency ratio decreases from 41 percent to 24 percent. Increased health expenditures and a reduction in public expenses on education are expected to offset each other.

Economic growth calculations suggest that the average annual growth rate in real per-capita GDP was 1.24 percent for the period 1970 to 2010. However taking the new age structure into account expected economic growth will be 1.74 percent per year for the period 2010 to 2050. Thus, the potential economic consequences of the increase in LFTP (due to the increase in the elderly population) for growth in real income per capita are positive.

Keywords: population aging, dependency ratio, growth rate.

JEL Classifications: J10, J11, J13, J14, J18.

* Author contacts: Hussain Abusaaq, Economic Research Department, Saudi Arabian Monetary Agency, P. O. Box 2992 Riyadh 11169, Email: habusaaq@sama.gov.sa.

1. Introduction

Saudi Arabia is currently entering uncharted territory in relation to the magnitude of its aging population. Recent research and data show that there has been a substantial change in Saudi Arabia's age structure due to an increase in life expectancy and a decline in fertility rates. This phenomenon can also be attributed to other factors such as fluctuations in birth and death rates. The proportion of people in Saudi Arabia aged 60 or more is predicted to be 25 percent of the total population of 40 million by the end of 2050. Moreover, the number of people aged 80 or more is expected to reach 1.6 million or 4 percent of the country's total population in the same period.¹

Another unprecedented factor is that the elderly have become healthier in recent decades. This phenomenon is known in demographic terms as the "compression of morbidity," a term described by James Fries and Aimee Swartz as the compression of the time horizon between the onset of chronic illness or disability and the time a person dies. There are two reasons for compression of morbidity. Firstly, there has been an increase in life expectancy; secondly, illnesses tend to have a shorter duration and usually happen in the later stages of elderly people's lives.

The population of Saudi Arabia is made up of diverse age groups. Levels of economic productivity and contribution to the GDP differ depending on the age group, as do economic needs. For example, income, employment, savings, and consumption patterns in the elderly are not the same as for young people.

¹ Data were extracted from the Population Division of the Department of Economic and Social Affairs of the United Nations.

As mentioned above, the population of Saudi Arabia is going through a transition period in terms of age structure. It stands to reason that the country's economic characteristics will also change, which will ultimately affect economic growth.

This paper investigates the impact of the new trend in population aging on the economy of Saudi Arabia. The paper is organized into sections as follows: section 2 contains some facts relating to population aging in Saudi Arabia; section 3 discusses the three main causes of this trend; section 4 looks at the challenges facing policy makers in Saudi Arabia in relation to population aging; section 5 provides a detailed description of the impact of population aging on the country's economy; and section 6 is the conclusion of the study.

2. Facts about the Population of Saudi Arabia

This section looks at some facts relating to population aging in Saudi Arabia, including current and past figures and statistics, and future economic predictions.

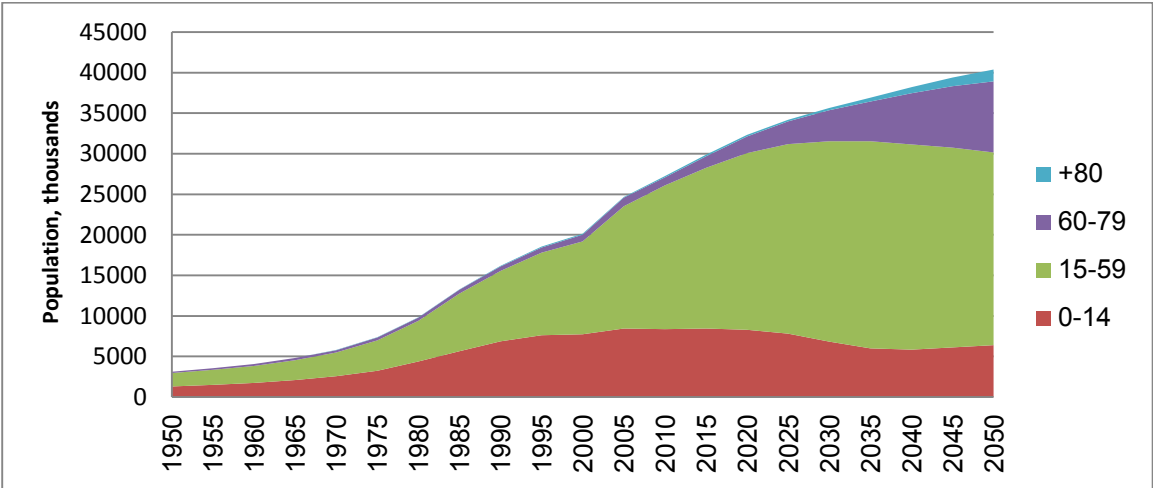
The United Nations publishes statistics and projections on the population of each country every two years as part of its role of updating the latest global demographic estimates and projections prepared by the Population Division of the Department of Economic and Social Affairs at the United Nations Secretariat.

In terms of Saudi Arabia, the demographic predictions of the United Nations show that population aging is entering a new phase and approaching its highest ever rate. For example, the population predicted for Saudi Arabia is approximately 40 million in 2050, twenty five percent of whom will be aged 60 or more. Thus, there will be more than 10 million people aged 60 or more by

2050. The population in the same age group (60 years and over) was 4.4 percent (1.1 million) in 2010 and 6.9 percent (2.1 million) in 2020.

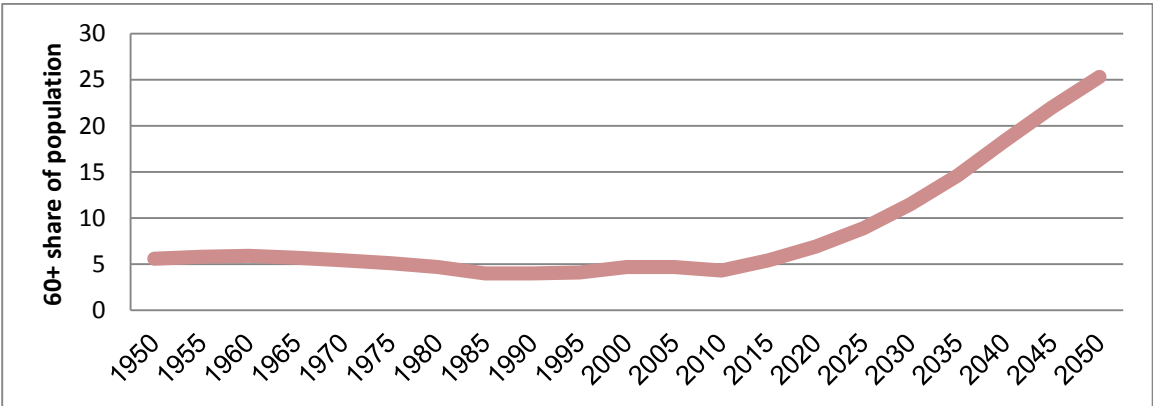
Figure 1 shows the changes in population age groups (in thousands) in Saudi Arabia between 1950 and 2050. It is clear that the age groups 60 to 79 and 80+ have increased at a higher rate of growth than other groups. Also, Figure 2 shows the expected proportion of the population comprising people aged 60 or more between 1950 and 2050. This figure has remained steady at around 5 percent between 1950 and 2015. However, it will see a sharp increase between now and 2050.

Figure 1: Saudi Arabia population by age group in thousands



Source: The United Nations

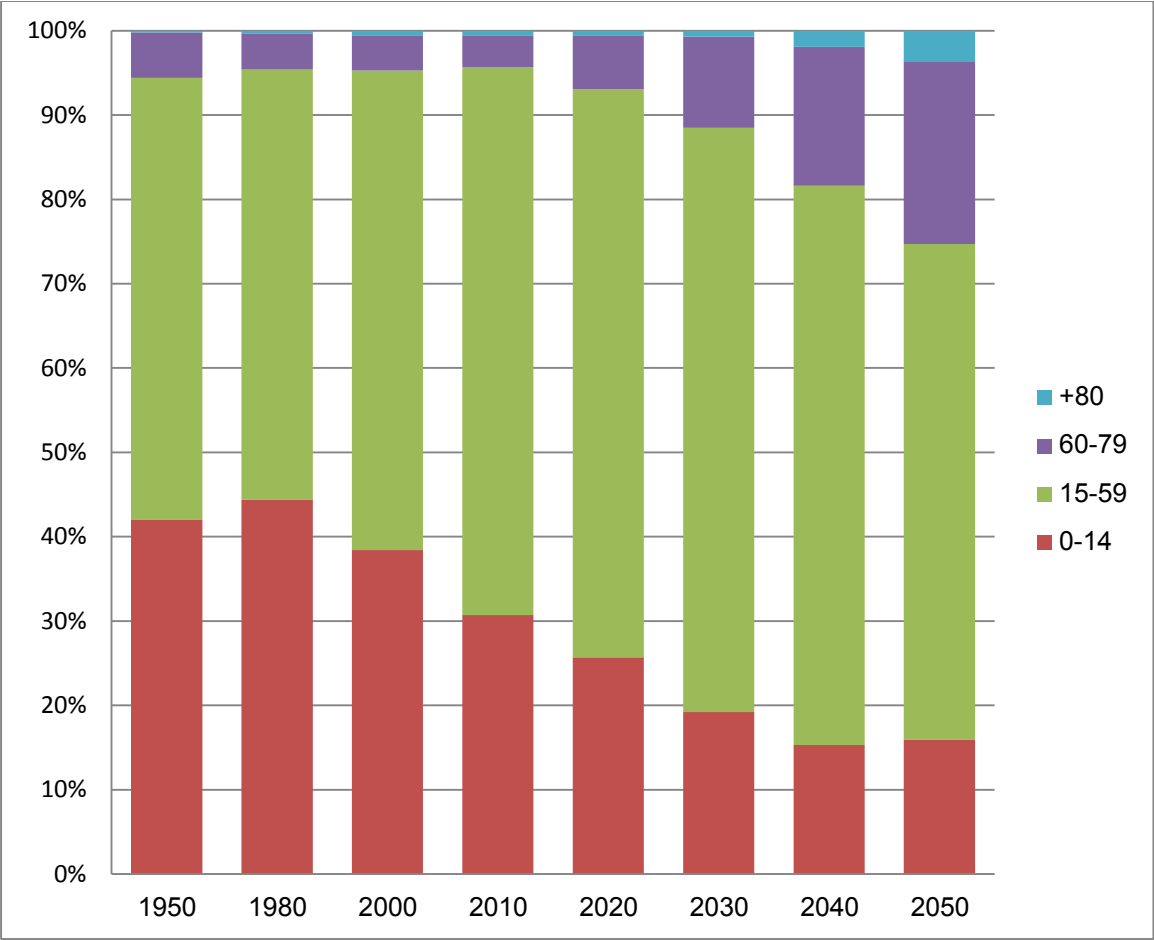
Figure 2: Share of population more than 60 years old



Source: The United Nations

The population aging phenomenon in Saudi Arabia is better explained in Figure 3. It is important to note that, not only has the 60+ age group increased over time, the age group between 0 and 14 has also decreased in the same period. This partly explains the aging population phenomenon and will be discussed further on in the paper.

Figure 3: Age structure changes in Saudi Arabia

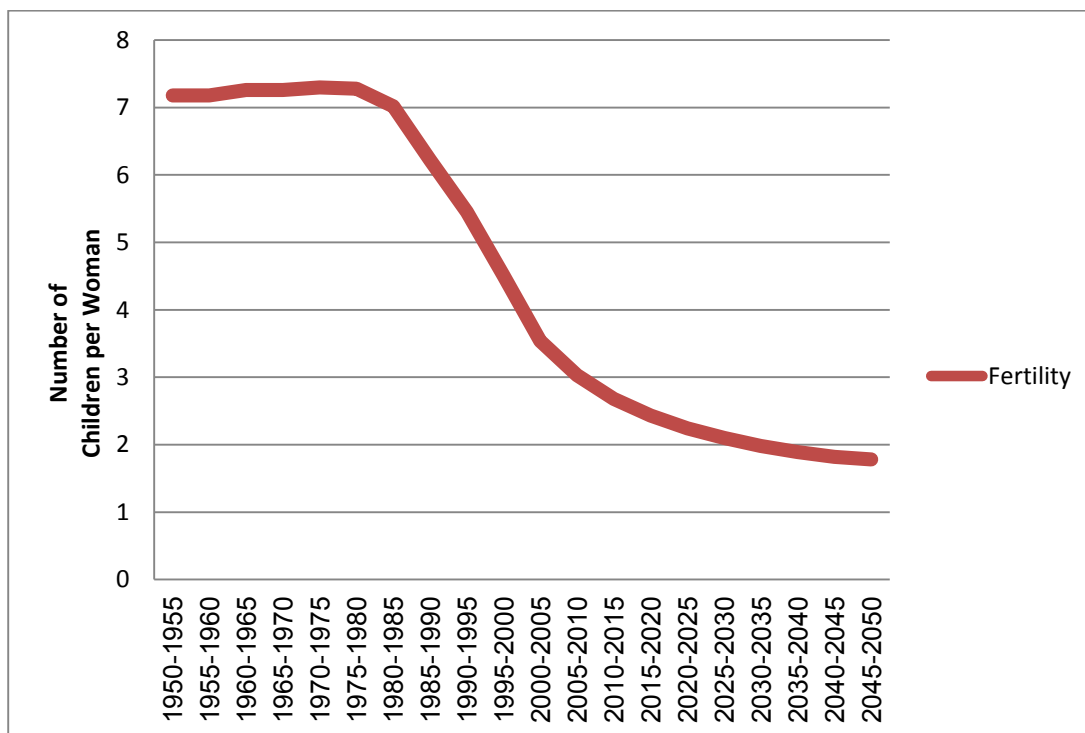


Source: The United Nations

3. Causes of Population Aging

The population aging phenomenon in Saudi Arabia can be attributed to three main factors. First, fertility rates have declined in the last number of years, leading to a smaller number of young people. The total fertility rate can be defined as the number of children that would be born to a woman over her uninterrupted reproductive lifetime in line with prevailing fertility rates. The total fertility rate in Saudi Arabia declined from nearly seven children per woman in 1950 to around three in 2010. In addition, the demographic predictions of the United Nations expect this rate to fall even further to 1.7 children per woman in 2050. Figure 4 explains the country's evolution in terms of total fertility rates between 1950 and 2050.

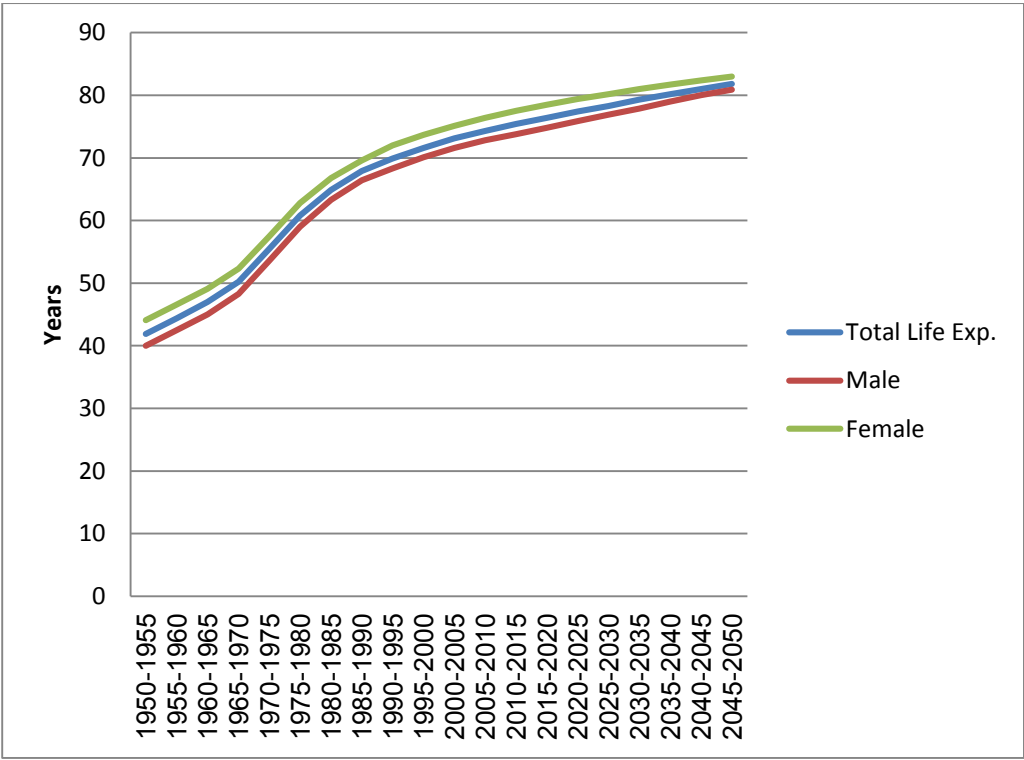
Figure 4: Number of children per woman



Source: The United Nations

The second reason for population aging is the upward movement in life expectancy. In 1950, life expectancy was short, at around 42 years. However, it had increased to 74 years by 2010 and is predicted to be 82 years by 2050. An increase in life expectancy combined with a simultaneous decrease in total fertility will bring about a sharp increase in elderly people relative to other age groups. Figure 5 explains the changes in life expectancy at birth according to sex in Saudi Arabia. Life expectancy is not the only reason behind population aging. Changes in the lifestyles of the elderly are also a factor, including access to technologically advanced health care, a move away from bad habits like smoking and junk food, healthy diet plans, and improvements in safety at home and work for example, emergency numbers and seatbelts to avoid accidents and other sources of injury.

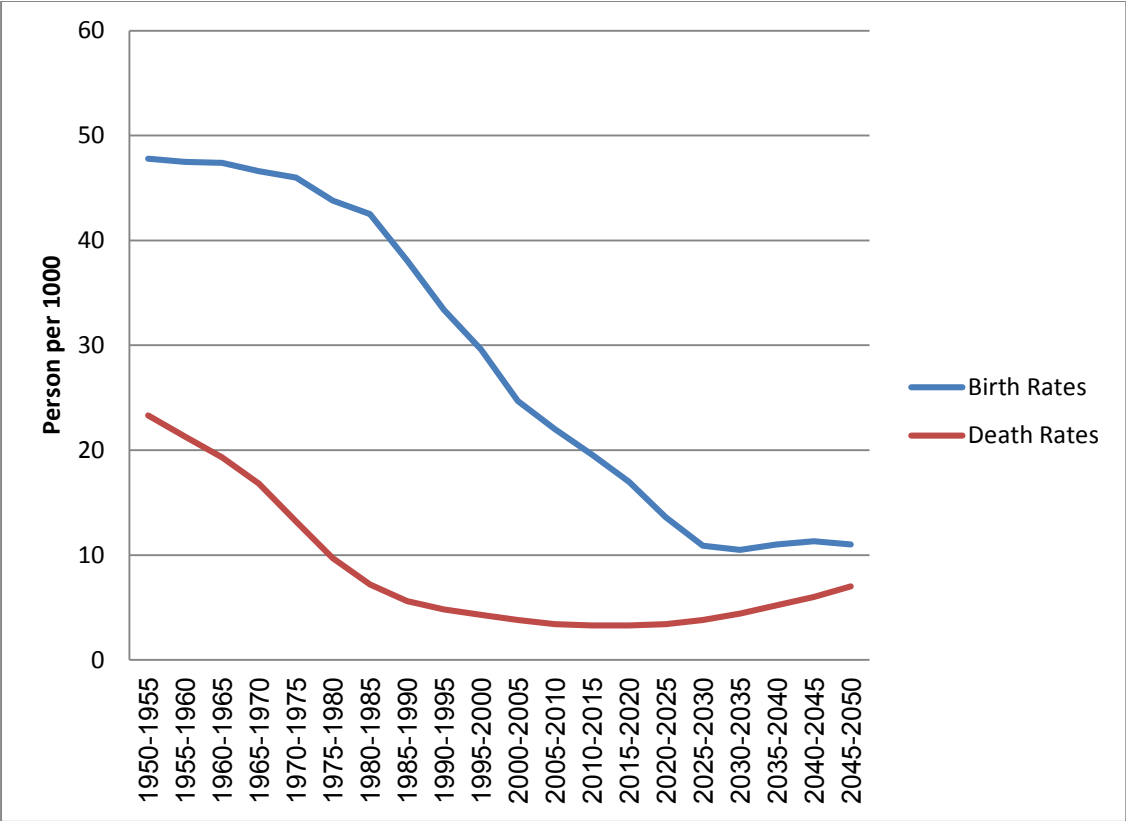
Figure 5: Life expectancy at birth by sex in Saudi Arabia



Source: The United Nations

The third factor behind the increase in the number of elderly is the fluctuation in birth rates (expressed here as the number of births per 1,000 people) and death rates (expressed here as the number of deaths per 1,000 people). Decreases in birth and death rates have led to a narrowing of the young generation and a widening of the elderly generation.

Figure 6: Birth and death rates, one person per 1000



Source: The United Nations

4. Challenges Facing Policy Makers

Population aging will pose a major challenge for policy makers in Saudi Arabia in the long term. Fortunately, relative to advanced countries, the situation in Saudi Arabia is currently manageable, since the proportion of people aged 60 or over is only 5 percent. However, the rate will increase rapidly between now and 2050, by which time it will have reached 25 percent. Thus, the sharp increase in the rate has not happened yet, but is expected to happen in

20 years, which will give policy makers more time to adjust and make the changes necessary to fit the new population structure. It is better to act at the early stages to mitigate and avoid any economic and social shocks.

As noted previously, the elderly have different behaviors and needs from those of the young generation. For example, when people reach 60, their saving, consumption, and work behaviors differ from those of young people just starting out in life. People in the 60 age bracket lean towards saving less and consuming more. Also, many of them are retired, need special health care, and depend on pension funds to provide them with most of their income. From an economic perspective, there will be some concerns that the number of working people paying part of their income into pension funds is not enough to cover the retirement program due to the large number of elderly people.

The key characteristic in terms of the elderly in Saudi Arabia is that they have become healthier overall, leading to the demographic phenomenon “compression of morbidity” described earlier. People of 60 and over are generally healthier than earlier generations were, and therefore have less need for health care and contribute more to the GDP. This is why in May 2014, the Shura Council² approved a proposal to extend the retirement age of government employees from 60 to 62. If this proposal is legislated, the income in the pension fund will increase, allowing the pension fund to more easily meet the needs of the country’s pensioners.

5. Impact of Population Aging on the Saudi Economy

Expected population aging in Saudi Arabia is anticipated to affect the behavior of people and will have enormous macroeconomic and fiscal consequences. This section outlines and briefly analyzes the economic implications of ageing. Usually, the economic implications of aging produce

² Shura Council is a legislative body that advises the King on issues that are important to Saudi Arabia.

debatable results. Thus, ageing consequences are likely to differ across countries due to different fiscal and social welfare structures. The main impacts of an ageing population are expected to include the followings:

- An upsurge in the dependency ratio in the Saudi economy to 52 percent in 2050, compared with 46 percent in 2015³. Assuming the retirement age remains fixed at 60 years old and life expectancy will increase between 2015 and 2050 from 75 years to 81 years, we expect that the number of people claiming pension benefits will rise (due to the increase in the elderly population) and the number of working people will decrease (due to a decline in fertility). The direct result of these trends is that the current working people will have to be charged more to pay for the extra cost of pension (save more for Pension Fund)⁴. One solution for this challenge is to raise the retirement age from 60 to 62 as the Shura Council proposed. Financially, this is useful because it increases contributions to the pension fund. Simultaneously, the government has the opportunity to delay paying pensions for two years and invest more. Another advantage of increasing the retirement age is to increase the labor supply with skilled and experienced workers.
- The increased contributions to Pension Fund may lead to lower rates of economic growth in the Saudi economy. Both consumption and investment might decline as each household is putting a higher percent of its income into pension funds.
- Saving is an important factor determining the economic welfare of households and the country as a whole. At the national level, higher savings increases the amount of capital available for investment and,

³ The dependency ratio is a measure showing the number of dependents (aged 0-14 and over the age of 65) to the total population (aged 15-64). Also referred to as the "total dependency ratio", source: INVESTOPEDIA

⁴ We could not give statistical results about the cost due to lack of data. This topic could be studied in future when data become available.

therefore, increases economic growth. Household saving and spending patterns in Saudi Arabia may change for many reasons such as population aging. As people in Saudi Arabia move forward to the retirement age, they change their spending and saving pattern (spend more and save less) and start to liquidate their assets to generate more income to pay for their living and healthcare. If the population aging rate is high in the economy, the new pattern of saving less and spending more will have a negative effect on the stock market and other assets held by the elderly (less investment in these assets leads to a decrease in their prices). The above scenario of a new pattern of saving less and spending more by the elderly is valid in the absence of the demographic phenomenon of “compression of morbidity” in the economy of Saudi Arabia. However, if the economy of Saudi Arabia experiences the “compression of morbidity” phenomenon (people become healthier and live longer), then the elderly are expected to work longer and save more.

- Health care and education: health care expenditures are expected to increase between 2015 and 2050 due to the increase in the elderly population share from 5.4 percent (1.6 Million) to 25 percent (10 million) but the public expenses on education will drop between 2015 and 2050 as the youth dependency ratio decreases from 41 percent to 24 percent. In general, the net expenditure is expected to rise due to the huge increase in the elderly ratio. As mentioned earlier, it is important to pay some attention to characteristics of the phenomenon of population aging. It is assumed that people moving into their 60s are healthier than earlier generations; thus, there will be less need for health care. In this case, it is expected that increases in health care will be partially offset by the decrease in the public expenditures on education.

The last few decades have witnessed a growth in the academic literature relating to economic growth. Most researchers concentrate on labor productivity as one of the main drivers of economic growth, and believe the economy should shift from low to high labor productivity. There are other factors that enhance labor productivity areas such as technology, regulations, international trade, and capital.

The main hypothesis of this paper is that dynamic changes in the population age structure of Saudi Arabia will have a substantial impact on economic growth in the long term. The idea behind this hypothesis is that each generation consists of age groups, with each age group contributing differently to the economy and needing different things from the economy (different behavior). Young generations tend to be more productive, work more, consume less, and save more. Conversely, people aged 60 or more tend to work less (due to retirement or illness), are less productive, consume more, and save less.

An economy with a high rate of saving and a large labor supply is expected to achieve a high rate of growth, and this is generally an economy in which working-aged adults are in the majority. However, an economy with a low rate of saving and a smaller labor supply is expected to achieve low rates of growth, and this is generally an economy that has a high percentage of elderly people. According to the United Nations data and to the above assumptions, Saudi Arabia's economy may suffer from slower economic growth, after 2035 due to the sharp increase in the 60+ age group (all other factors being equal). However, it might enjoy higher economic growth if the "compression of morbidity" is satisfied in Saudi Arabia and if members of that group are allowed to work longer.

Assuming that every age group's behavior is fixed regarding saving and labor supply, the saving rate and labor supply are expected to decline in the

economy of Saudi Arabia in the future as the proportion of elderly people rises. In order to quantify the economic impact of an increase in the over-60 population in Saudi Arabia, an accounting method is used to calculate the influence of the elderly on labor supply. According to this method, actual data from the International Labor Organization (ILO) is used to calculate labor force participation rates in Saudi Arabia for each age group for the year 2013. The data are then matched to United Nations data concerning the population of Saudi Arabia for each age group for the years 2010, 2030, 2040, and 2050. In order to calculate the total labor force participation rate (LFPR), the labor force participation rates are multiplied by the population of Saudi Arabia, the results for each age group added together, and that sum then divided by the population; the total of men and women active in the labor force is then divided by the total population over 15 years.

Table 1 shows that the total labor force participation rate (LFPR) is predicted to drop from 53 percent in 2010 to 48.6 percent in 2050, and that the LFPR will only change by 1 percent in twenty years (between 2010 and 2030) because the proportion of elderly people during this period will still be low. However, the LFPR will decline by 3.3 percent between 2030 and 2040 due to a sharp increase in the elderly population. Thus, the predicted escalation in the proportion of people aged 60 or over in the economy of Saudi Arabia will have a negative impact on the LFPR.

Table 1: Labor force participation rate (LFPR) in Saudi Arabia

	2010	2030	2040	2050
Labor force participation rate (LFPR)	53%	52%	48.7%	48.6%

Although the total number of men and women active in the labor force divided by the total population over 15 years old shows a potential decrease between 2010 and 2050, economists are now concentrating on another ratio known as labor force to total population (LFTP)⁵.

Table 2 shows that LFTP is predicted to increase from 37 percent in 2010 to 40 percent in 2050. The explanation for this increase is that, even though there will be an increase in the proportion of the elderly in the future which will cause the labor force to decrease, there will also be a future decline in fertility (drop in youth dependency) that will be more than enough to eliminate the impact of the increase in the elderly population; thus, the total LFTP rate will increase.

Table 2: Labor force to total population (LFTP) in Saudi Arabia

	2010	2030	2040	2050
Labor force to total population (LFTP)	37%	42%	38%	40%

To facilitate an understanding of the impact of LFTP on economic growth, total economic growth is divided into two components, growth in GDP per worker (W) and growth in LFTP. This result can be derived from the definition of GDP by worker $\frac{GDP}{W}$. If the denominator and numerator are divided by the total population figure (P), the following expression is derived:

⁵ **LFPR** (ratio of labor force to population aged 15+); **LFTP** (ratio of labor force to total population)

$$\frac{GDP}{W} = \frac{\frac{GDP}{P}}{\frac{W}{P}} = \frac{GDP}{LFTP}$$

The growth rates of GDP per capita can be calculated approximately by taking the log, as follows:

$$\ln\left(\frac{GDP}{W}\right) = \ln\left(\frac{GDP}{P}\right) - \ln(LFTP)$$

The growth rate between time (t) and time (t+1) can be computed as follows:

$$g = \ln\left(\frac{GDP_{t+1}/W_{t+1}}{GDP_t/W_t}\right) + \ln\left(\frac{LFTP_{t+1}}{LFTP_t}\right)$$

In order to apply the previous equation to the economy of Saudi Arabia, a small experiment has to be conducted. The GDP per capita is calculated for the period between 1970 and 2010 (actual data), and it is assumed that the same pattern will be followed for the period from 2010 to 2050. LFTP and W are calculated using International Labor Organization (ILO) data and the United Nations database for the years 1970, 2010, and 2050. The calculations imply that the average growth rate per capita is 1.24 percent for the period 1970 to 2010 and 1.74 percent for the period 2010 to 2050. Thus, the potential economic consequences on the increase in LFTP on growth in real income per capita are positive.

6. Conclusion

Saudi Arabia is entering a new, unfamiliar era regarding the magnitude of its aging population. Recent research and data show that the age structure in Saudi Arabia has changed due to an increase in life expectancy and a decline in fertility rates. Other factors such as fluctuations in the birth and death rates have also contributed to this scenario. The proportion of people in Saudi Arabia aged 60 or more is predicted to be 25 percent of the total Saudi population by the

end of 2050 (40 million). Moreover, the number of people aged 80 or more is expected to reach 4 percent of the total population of Saudi Arabia in the same period (1.6 million). The key feature of the country's new elderly is that they are healthier, a phenomenon known in demography as the "compression of morbidity."

The dependency ratio in Saudi economy is expected to increase to 52 percent in 2050 compared with 46 percent in 2015. Moreover, the number of people claiming pension benefits will rise and working people will be required to pay more for the extra pension costs in that period. Health expenditures are expected to increase during 2015 and 2050 due to the increase in the elderly rate from 5.4 percent (1.6 Million) to 25 percent (10 million) but the public expenses on education will drop in the same period as the youth dependency ratio decreases from 41 percent to 24 percent. Health expenditures and reduction in public expenses on education are expected to offset each other.

The total labor force participation rate (LFPR) is predicted to drop from 53 percent in 2010 to 48 percent in 2050. Thus, the escalation in the proportion of people aged 60 or more in Saudi Arabia's economy will have a negative impact on the LFPR. However, the labor force to total population (LFTP) rate is predicted to increase from 37 percent in 2010 to 40 percent in 2050 due to a combination of the elderly effect and the fertility effect.

The calculations relating to economic growth in the country suggest that the growth rate was 1.24 percent per year for the period 1970 to 2010. It will continue to grow by 1.74 percent per year for the period 2010 to 2050. Thus, the potential economic consequences of the increase in LFTP on growth in real income per capita are positive.

References

Bloom, D. E., Canning, D., and Fink, G (2010). Implications of Population Ageing for Economic Growth. *Oxford Review of Economic Policy*, 26(4), 283–612.

Bloom DE, Canning D, Fink G (2008). *Population aging and economic growth*. The World Bank. Commission on Growth and Development.

Institute of Medicine (US) Committee on the Long-Run Macroeconomic Effects of the Aging U.S. Population (2012). *Aging and the Macroeconomy: Long-Term Implications of an Older Population*. Washington (DC): *National Academies Press (US)*.

Swartz, A. and Fries, J. (2008). Healthy Aging Pioneer. *American Journal of Public Health*. 98:1163–1166. doi: 10.2105/AJPH.2008.135731.

United Nations (2012). *World Population Prospects*. New York: UN Population Division.