University
of Economics
in Katowice

sciendo

Rshood M. Al-Khraif

Center for Population Studies
King Saud University
Riyadh, Saudi Arabia
cps@ksu.edu.sa

Asharaf Abdul Salam

 https://orcid.org/0000-0002-9813-0553

Center for Population Studies
King Saud University
Riyadh, Saudi Arabia
asalam@ksu.edu.sa

Mohd Fadzil Abdul Rashid

 https://orcid.org/0000-0001-6619-888X

Department of Built Environment Studies and Technology
Faculty of Architecture, Planning & Surveying
Universiti Teknologi MARA, Perak Branch, Malaysia
abrfazil@gmail.com

Demographic dividend in Saudi Arabia: From age structural changes to economic gains

Abstract

Aim/purpose – The demographic dividend, defined as the proportion of working age to the rest of the population, is an opportunity seen mainly in developing countries, resulting from demographic transition. Efforts to maximize gains from it are crucial, especially for the Arabian Gulf states, where labor force demands are met at the danger of native youth unemployment that leads to issues of human resources utilization. This research on Saudi Arabian demographic dividend aims at tracking changes in the age structure, labor force participation, and prospects leading to economic gains.
Design/methodology/approach – Data from various sources such as censuses (1974, 1992, 2004, and 2010), national labor force surveys 1999-2017 and United Nations (UN) Population Prospects are compiled and statistically analyzed with a historical approach for calculations of age distribution, median age, and labor force participation adopting standard procedures.

Findings – An age structural transition occurred: percentage of population 15-64 years increased from 47.2% to 67.3%, increasing the dividend from 89.6% to 205.5%. This influenced the labor force's sectoral distribution, and Gross Domestic Product (GDP) per working age population.

Research implications/limitations – The dividend's first phase, since 2000, is expected to last until 2050, followed by the second dividend which may last longer. Along with the dividend, there shall be policies executed to reap the benefits, including scientifically planned recruitment of potential candidates in various professions, both in public and private sectors.

Originality/value/contribution – This research concerns a population, which is unexplored in detail, especially at a macro level. Thus, such an in-depth analysis seeks importance in revealing special demographic dimensions to a wider international audience. There are no such studies conducted in Saudi Arabia, with a national perspective helpful for revamping efforts to boost labor force reforms and to make maximum gain during the short-lived demographic dividend period.

1. Introduction

Demographic transition in Saudi Arabia is characterized by a rapidly falling birth rate with an already achieved low death rate. This has led to age structural changes in the population, resulting in a constricted age pyramid. Such characteristics have created a situation with an increasing number of adults (at working age), which is often described as a demographic dividend (or demographic gift). It is defined as the proportion of working age population to the rest, including children and older aged (Groth & May, 2017) giving rise to the proportion of persons with earning potential to those in dependent ages. In such a situation, a special window of opportunity opens up, which allows for faster economic growth and development (Espineira, 2019; van der Gaag & de Beer, 2015; Ross, 2004). Demographically, it occurs when the working age population (15-64 years) outnumber dependents (children under 15 years and older persons aged 65 years and above). It results in a youth bulge (Ssewamala, 2015). Such a higher working age population, when utilized efficiently, contributes to improvements in health care and nutrition and thus living standards, and thereby increases infant and child survival rates (Song, Song, & Zhong, 2011).

Ross (2004) explained demographic dividend as a process accompanied by falling of birth rate which impacts upon age distribution, demanding lesser investments for younger population and thus, resources invested for economic development and family welfare. This period characterizes a smaller population at dependent ages but relatively more people in the adult ages with potential for productive labor force. This means a higher ratio of productive workers to child dependents implying faster economic growth but fewer burdens on families. Neither does this opportunity last long nor repeats itself. Therefore, this is the right time for creating favorable policies and strategies for development, particularly investments in education, health, and job creation.

The resultant resources and disposable income available for future development (nutrition, education, and skill development) boost economic productivity. These benefits lead to gains in family planning, health promotion, female education, and employment, and, thus, create a positive work climate with appropriate infrastructure. All these develop along a realization of demographic gains opening avenues to improve living conditions, quality of life, and life style modifications. Simultaneously, the public and the family gain from the increased human and physical capital to facilitate transfers from economically productive to dependent people (Jafrin, Mahi, Masud, & Ghosh, 2021; Lee & Mason, 2007). On the way, probably, families might gain resources, equitably, to invest in children under conditions of great economic potential and social order – a lowered number of children per woman, low population growth, and, thus, a relatively low proportion of children and adolescents in the population (Gribble & Bremner, 2012).

Accordingly, the opportunities generated by the demographic dividend are carefully pursued to attain economic benefits, such as job creation, improved productivity, and increased economic growth and other resources (Bloom, Canning, Fink, & Finlay, 2009; Ross, 2004). The resultant social and technological progress improves education and female employment, which facilitates economic growth. Subsequent to the declines in fertility, lowered mortality and increased life expectancy positively influence retirement planning leading to better investment in future generations (Bloom et al., 2009). Such transitions create a two-stage boost from the demographic dividend to per capita income: the first being a decline in the ratio of dependents to workers, and the second from young people's entry into the labor force as more efficient, professional, and productive workers than previous generations (as a result of high quality education), in addition to the net macroeconomic boost resulting from human capital investment

and payoffs (Abío, Patxot, Sánchez-Romero, & Souto, 2017; Cai, 2020: Cuaresma, Lutz, & Sanderson, 2014; Gribble & Bremner, 2012; Groth & May, 2017; May & Turbat, 2017; Oseni, Akinbode, Babalola, & Adegboyega, 2020; Pace & Ham-Chande, 2016; Renteria, Souto, Mejia-Guevara, & Patxot, 2016).

Demographically, such changes gradually accelerate the decline in the child population as well as an ageing of the adult population (Khraif, Salam, Elsegaey, & AlMutairi, 2015). As a result, family expenses increase, especially for education and health. This leads to a second demographic dividend, characterized by higher earnings mainly due to the improved professional and technical skills of the youth (Abío et al., 2017; Baerlocher, Parente, & Rios-Neto, 2019; Bixby & Robles, 2008; Cai, 2020; Klimanek & Filas-Przybył, 2020). It would take a longer period of time to happen, but such advantages facilitate the creation of improved technological and professional infrastructure, in both the public and private sectors, boosting efficiency, constructiveness, effectiveness, and creativity.

Saudi Arabia is, theoretically, passing through such a demographic phase, where the percentage of children declines noticeably. That is, age structure of the country is constricting, showing a wider working age population. This means that Saudi Arabia has the opportunity to reap the benefits. As pointed out by Ross (2014), now is the time to strengthen the mechanisms of opportunity delivery, such as labor supply, savings, and human capital through investments. In this context, the government policy of 'Saudization' (whereby Saudi companies and enterprises are required to fill their vacancies with natives), facilitates proportionately reaping of social and economic gains brought by demographic dividend. However, during its early stages this policy shaken the internal labor force markets and economic situation, as a whole. Presently, with the immigrant workforce that serves the country's massive commercial, construction and industrial sectors, that government faces immense challenges to build a professional, technical, skilled, and administrative national labor force.

As per the available national data, the Saudi Arabian population is increasing despite the steady decline in the birth rate. The increase observed in the working age adult population seems to be promising from 5.8 million in 1992 to 12.6 million in 2010. Despite all the efforts to employ the native adult population through revised labor laws and Saudization, the percentage of population in employment has not increased to expected levels.

The number of employed people has only increased from 2.0 million in 1992 to 4.5 million in 2010, which calls for concerted efforts and updated strategies aimed at the creation of new employment avenues, production of con-

sumer goods, and massive industrialization. All these would improve the economic productivity of individuals. Inspired by this state of affairs, this research considers the demographic dividend to be a window of opportunity, where age structural changes lead to economic growth. This is in line with Saudi Vision 2030, which aims at promoting a vibrant, dynamic society through a resilient economy (Kingdom of Saudi Arabia, 2017). Therefore, the specific objectives of this research are as follows:

− To analyze the changes in age structure leading to an increased working age population, i.e., the demographic dividend.
− To examine the associated changes in labor force – percentage distribution and median age.
− To explain the prospects of the demographic dividend in terms of its duration and future potential economic gains.

This research manuscript on demographic dividend in Saudi Arabia starts with an introduction on demographics of Saudi Arabia with its age structural transformations. It builds up to the recent trends, including dividend, and further an explanation of research problem and objectives. Followed by this is the data sources and analysis methods adopted. Results and discussions are merged together as seen in most of the demography (population studies) manuscripts. Finally, the conclusions and limitations are narrated.

2. Research methodology

This research utilized data from Saudi Arabian censuses 1974, 1992, 2004, and 2010. These censuses covered the entire population residing in the Kingdom, both natives and foreign. While the native population conforms to the demographic transition theory (a decline in birth and death rates changing age structure from an expansive to a constrictive shape), the foreigners who are under employment contracts based on labor force requirements, and consequently, show imbalanced age and sex distribution. Therefore, this research is restricted to the native population, to avoid possibilities of bias towards the results and interpretations distorting the demographic scenario.

Census age-sex data were classified into working age and others (say, children and the old aged). Further, their percentages were calculated for four different censuses. Then, demographic dividend as defined by Groth and May (2017) was calculated using the formula:

$$D = \frac{\text{P}(15 - 64\ years)}{\text{P}(< 15 + 65 +\ years)} * 100$$

Thereafter, an accounting effect (population aged 15-64 years – total population) was derived as per the definition given by Prskawetz and Sambt (2014):

AE= P*(15-64years)* – P*t*

Simultaneously, the GDP per working age population was calculated to reflect the impact of the dividend. In addition, we accessed the data related to National labor force surveys and the UN population prospects to trace changes, historically, thereby elucidating the prospects of demographic dividend, in the country.

Data analyzed in this research could be accessed from the following URL:
− Census – https://stats.gov.sa/en/13;
− Labor force – https://stats.gov.sa/en/814;
− UN Data – https://population.un.org/wpp/Download/Standard/Population/.

3. Research findings and discussions

The results of data analysis are discussed below in four sections, not only for better clarity and understanding of structural changes in population, but also for elaborating various dimensions and repercussions of demographic dividend.

3.1. Structural changes in the population

Population structure of Saudi Arabia has changed rapidly. The number of adolescents and people in early adulthood ages increased rapidly, especially during the period of 2004-2010, due to the baby boom of previous decade. During this period, as expected, the number of children decreased, both in absolute number and in percentage. Consequently, the ageing population increased (Figure 1) showing that the number of children increased during 1974-1992 but declined thereafter, during 2004-2010. The proportion of children was 48.7% in 1974 and 49.2% in 1992, declined thereafter to 39.9% (2004) and to 29.6% (2010). These declines increased the adult working age population from 47.2% (1974), to 47.5% (1992), to 56.5% (2004), and finally to 67.3% (2010): a sharp increase along demographic transition (Table 1). The resultant first demographic dividend lasts for a few decades, thereafter the dependency ratio increased, especially of old aged, which consequentially replaced child care with old age care as the growing form of care.

Figure 1. Change in the population age structure 1974-2010
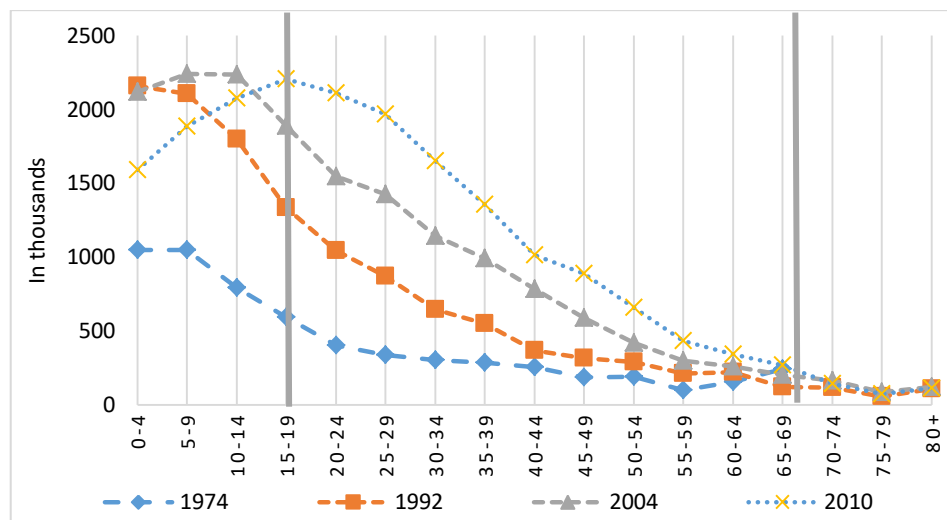
Age pyramid (age structure) of the native population has constricted remarkably during the last intercensal period of 2004-2010 (Figure 2). This means that there has been a decline in the percentage of children due to lowered birth rate as an outcome of demographic transition, leading to gains in life expectancy. This resulted in improvements in education and health care infra-structure, as avenues of progressing towards second demographic dividend.

Noticeably, this constriction started in the 1990s and, progressed in the 2000s, gained momentum thereafter. This trend will continue in the coming decades, thus widening the top of the pyramid. Such a rapid demographic change should raise concerns of health, education, housing, consumer products, environment, transport, and other services. As an outcome, the focus from maternal and child issues might shift to working adult and older person issues. In the near future, it would invite discussions, debates, and deliberations. As a result, marked changes in employment and thus economic productivity in Saudi Arabia are expected. However, economic and population policies, including job creation and economic growth, enhance gains from demographic dividend (Dramani & Oga, 2017; Espineira, 2019; Gribble & Bremner, 2012; Klimanek & Filas-Przybył, 2020; Manzano, 2015; Ssewamala, 2015). This is likely to lead to further changes in policies concerned with organizing adult working age population to ensure a productive society and social order.

Figure 2. Change in the population age-sex structure 1974-2010

Source: Based on: https://stats.gov.sa/en/13
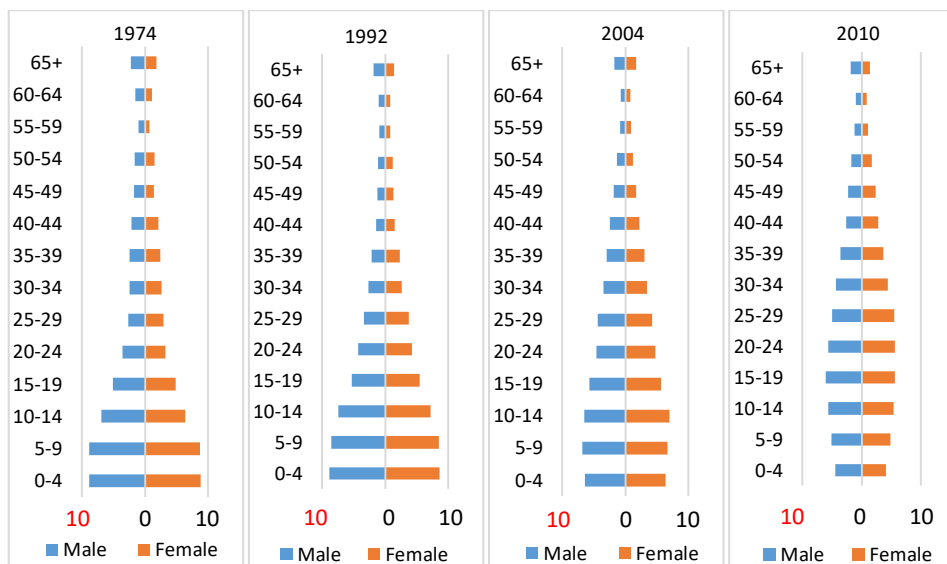
3.2. Demographic dividend

Demographic dividend, in this section, has been elaborated through broad age percentage distribution, support ratio, GDP per working age population, and accounting effect (Table 1).

Table 1. Demographic dividends across census years

Gender	Age group (%)				Demographic dividend (support ratio %)	GDP (current US$) per working-age person (15-64 years)
	0-14	15-64	65+	Total (N)		
1	*2*	*3*	*4*	*5*	*6*	*7*
Male						
1974	48.0	47.6	4.3	3,048,082	90.9	–
1992	49.4	46.9	3.7	6,215,793	88.4	–
2004	39.5	56.9	3.6	8,287,370	132.1	–
2010	30.0	66.4	3.6	9,575,257	197.4	–
Female						
1974	49.4	46.8	3.8	2,887,279	88.1	–
1992	49.0	48.1	2.9	6,094,260	92.7	–
2004	40.3	56.3	3.4	8,239,970	128.7	–
2010	29.1	68.2	2.7	9,201,253	214.3	–

Table 1 cont.

1	2	3	4	5	6	7
Total						
1974	48.7	47.2	4.1	5,935,361	89.6	–
1992	49.2	47.5	3.3	12,310,053	90.5	20,116
2004	39.9	56.6	3.5	16,527,340	130.4	20,261
2010	29.6	67.3	3.2	18,776,510	205.5	41,824

Source: Authors' own calculation based on: https://stats.gov.sa/en/13; https://stats.gov.sa/en/814

First, as per the broad age group distribution along census years, the childhood population (0-14 years) declined sharply from 48.7% in 1974 to 29.6% in 2010. This decline is accompanied by a corresponding increase in the working age, from 47.2% in 1974 to 67.3% in 2010. However, there is no change in the percentage of older people. To this extent, Table 1 illustrates the age structural transitions resulting from demographic change and surprisingly, the female population age structure changes are more pronounced than that of males in Saudi Arabia.

Second, the support ratio (as defined by Prskawetz & Sambt, 2014) was calculated with the conventional definition of working age as 15-64 years (Table 1). An increase from 89.6 in 1974 to 205.5 in 2010 was noted with a male-female difference (90.9 to 197.4 as against 88.1 to 214.3). Such a higher increase for female adults might be a result of the demographics – sex ratio at birth and child mortality of the past. However, the dividend effect on female adults is crucial. It is possible that such male-female differences in dividend might be attributed to the change in sex ratio. Still, the increase in the dividend is positive and beneficial.

Third, GDP per working age population is assumed to be an indicator of the demographic dividend, as working age population share (actual labor force) contributes to national economy. Therefore, GDP share of working age adults is important. As shown in Table 1, it increased from US$ 20,116 in 1992 to US$41,824 in 2010. This might be attributed to the greater contributions of the working age population measured in productivity and efficiency in the labor force (assuming other things remain constant).

Finally, the accounting effect, as explained by Prskawetz & Sambt (2014), is a surplus of consumers over earners, which obviously is negative. This index fell considerably during 1974-1992, but then slowly gained momentum, especially during 2004-2010. Demands for employment of young people have changed according to their credibility, skills, qualifications, and social standing. At this juncture, to keep these demands in line with national priorities, increasing efforts are made to enhance skills and abilities in aspiring youth to pursue jobs effectively and efficiently. It is advised to plan the labor force (require-

ments, specifications, and descriptions) to facilitate training and inductions, starting from the school level, to build manpower to meet job requirements. Such capacity building initiatives increase the earning potential of the younger workforce and thus their per capita income (Lee & Mason, 2007). As a result, people increasingly invest in education, health care, and quality of life, not just for themselves, but also for their dependents. Ultimately, first low-fertility generation gains tremendously from this dividend.

Instead, the accounting effect, number of earners to consumers, changed steadily from 3,131,524 in 1974 (1,596,767 males and 1,534,757 females) to 6,147,034 million in 2010 (3,219,137 males and 2,927,897 females). A marked gain was reported during 2004-2010 (Figure 3). In other words, this is a trend of an increasing working age population accompanied by a decreasing number of dependents. Under the prevailing demographic scenario, this trend will persist for a further period, until the number of older people increases significantly. There are differences in the figure for men and women: the decline in accounting effect is more prominent in females indicating marked male-female differences in demographic dividend, inferred as due to sex ratio at birth or any other such changes. This might be reflection of Saudization policy imposed in the late 1990s as an economic reform.

Figure 3. Gains in accounting effect (working age-total consumers)

Source: Based on: https://stats.gov.sa/en/13
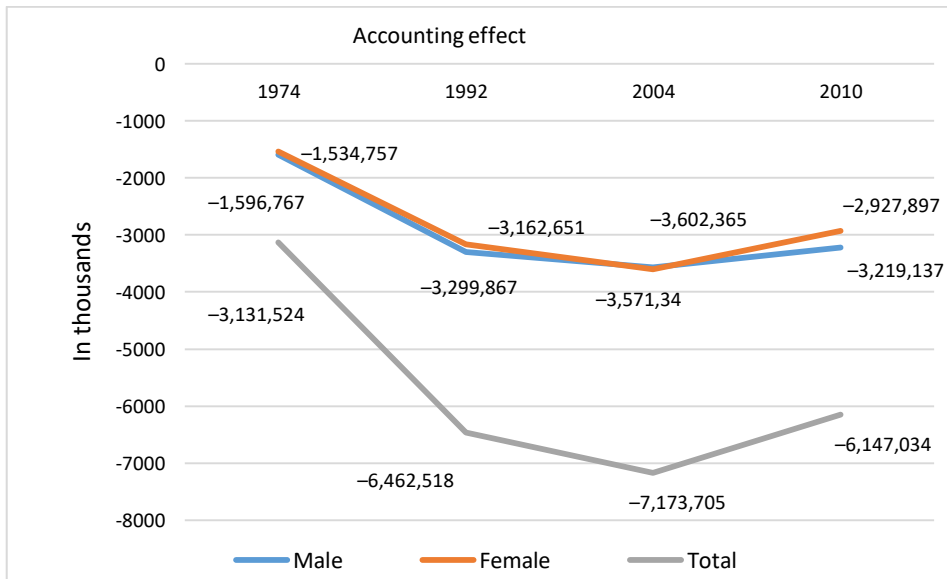
3.3. Associated changes in the labor force

Although a change in the employment has been observed, it has occurred slower than expected. That is, the percentage of the population aged over 15 years in the labor force increased from 31.6% in 1992 to 34.0% in 2010, with noticeable changes between men (57.4-65.9) and women (5.5-12.8). Even recent labor force survey results do not show significant increases in economic partici-pation. While the overall percentage of labor force increased from 35.8% in 2000 to 40.7% in 2017, the percentage of men changed from 63.0% to 62.6%, and of women from 10.1% to 17.8% (Table 2). That is, even with the extensive efforts of Saudization strategies, the utilization of opportunities of this demo-graphic gain stands below expected levels. This should raise awareness of the need for updated strategies and policies. Unless carefully managed, opportunities of this demographic gain for national economy will not be great.

Table 2. Saudi labor force participation rate (15+ population): 2000-2017

Survey years	Male	Female	Total
2000	63.0	10.1	35.8
2001	62.6	10.0	35.6
2002	62.3	10.1	35.3
2007	60.5	12.3	36.4
2008	61.0	11.5	36.3
2009	60.8	12.0	36.3
2011	61.0	14.4	37.7
2012	62.7	15.7	39.2
2013	64.6	16.4	40.4
2014	64.9	17.6	41.2
2015	63.3	17.4	40.2
2016	64.6	19.3	42.2
2017	62.6	17.8	40.7

Source: Authors' own calculation based on: https://stats.gov.sa/en/814

Due to the rapid demographic transition, the Kingdom faces a boom in the adult population that will raise many challenges, but also incredible opportuni-ties. A large increase in dividend calls for various sectors to utilize the increas-ing human resources to efficiently and constructively contribute to the economy. Such an output/outcome demands development and training of a professional team to consider the sectoral distribution of the labor force and its salient fea-tures, separately for men and women. Despite the classification of occupational sectors being inconsistent over the censuses (especially in 2010), percentage

changes show concentration and trends in labor force, with majority of workers moving towards administration, defense, social security, and education. However, sectors linked to wholesale and retail, vehicle and motorcycle repair, human health and social work, construction, finance and insurance, and professional, scientific, and technical fields seem to hold more prospects for future jobs. Currently, these occupations are filled with expatriates. In order to pave the way for a smooth replacement of these jobs with native, targeted and well-planned training programs to impart the necessary skills are advised.

Median age has increased in many sectors, especially, finance and insurance, real estate, and education (Table 3) whereas agriculture, forestry and fishing, construction, and wholesale and retail sectors have a noticeable decline in median age. Former group of occupational sectors has a higher median age (for both men and women). The agriculture, forestry, and fishing and mining and quarrying sectors have highest median age of female workforce. Overall, median age of female workers increased noticeably, while that of men increased marginally. Based on median age, workforce is still young, leading to a longer duration of employment. This is also reflective of the duration of the demographic dividend, aligning with economic and social prosperity. The 2010 data show that the average age of labor force has increased to 34.8 years from its mark of 33.2 years (1992) implying a progressive age distribution of labor force. This might increase further with progress in population age structure towards ageing as stated in demographic dividend theories. However, it shows passing trends of the economic gain period.

Table 3. Changing percentages and median ages of various occupational sectors 1992-2010

Occupational sector	Percentage			Median age		
	1992	2004	2010	1992	2004	2010
1	*2*	*3*	*4*	*5*	*6*	*7*
Agriculture, forestry, and fishing	7.09	2.10	1.60	51.0	52.4	40.7
Mining and quarrying	2.93	2.44	1.76	33.5	41.4	35.9
Manufacturing	2.72	2.87	2.66	32.9	33.0	33.1
Electricity, gas and water	1.57	1.32	–	33.8	37.6	–
Electricity, gas, steam and air conditioning supply	–	–	1.46	–	–	37.5
Water supply, sewerage, waste management and remediation	–	–	0.81	–	–	36.1
Construction	1.57	1.73	5.37	37.3	35.6	29.9
Wholesale and retail, repair of vehicles and motorcycles	5.90	5.19	7.20	40.6	35.9	32.3
Hotels and restaurants	0.19	0.40	–	35.7	30.0	–

Table 1 cont.

1	2	3	4	5	6	7
Transportation and storage	5.26	4.35	2.99	35.8	38.7	34.8
Accommodation, food service activities	–	–	0.79	–	–	32.9
Information and communication	–	–	3 .76	–	–	35.2
Financial and insurance activities (intermediation)	1.48	1.41	2.34	31.0	32.8	34.8
Real estate activities	1.40	2.18	0.87	35.9	34.5	38.5
Professional, scientific and technical activities	–	–	0.32	–	–	35.6
Administrative, support service activities	–	–	2 93	–	–	31.9
Public administration, defense, and compulsory social security	47.90	45.80	–	30.8	33.8	–
Administration, defense, social security	–	–	35.60	–	–	34.8
Education	16.75	23.85	20.75	31.9	34.2	38.1
Human health and social work activities	3.55	4.79	5.89	32.7	34.4	32.9
Other community, social and personal services activities	1.35	1.28	–	53.8	39.7	–
Arts, entertainment and recreation	–	–	0.08	–	–	35.3
Other service activities	–	–	1.67	–	–	30.9
Productive households activities	–	–	1.13	–	–	36.1
Activities of extraterritorial organizations and bodies	0.04	0.04	0.02	38.8	37.4	36.5
Private households with employed persons	0.25	0.24	–	38.0	38.7	–
Not stated	0.05	–	–	37.7	–	–
Total	100.0	100.0	100.0	33.2	34.6	34.8
N	1,975,222	3,298,179	4,492,277	1,975,222	3,298,179	4,492,277
Total aged 15-64 years	–	–	–	5,847,535	9,353,635	12,629,476

Source: Authors' own calculation based on: https://stats.gov.sa/en/13

Future planning aiming at building a self-sufficient society requires careful consideration of the labor force, including its demands, supplies, and cost-effectiveness. Human capital investment in education and health offers the best outcome for the demographic dividend (Abío, et al., 2017; Cuaresma et al., 2014; Dramani & Oga, 2017; Espineira, 2019; Gribble & Bremner, 2012; Ha & Lee, 2016; Oseni et al, 2020: Renteria, et al., 2016; Ssewamala, 2015). Moreover, this considerably facilitates an increase in women's labor market participation (Figure 4). In order to make major changes and improvements in

the economic transformation, and women's participation in the labor force as emphasized in Saudi Vision 2030 (Kingdom of Saudi Arabia, 2017). On the other hand, empowering male labor force is also necessary.

Figure 4. A comparison of number of males and females (15-64 years) by their labor force participation


Source: Based on: https://stats.gov.sa/en/13
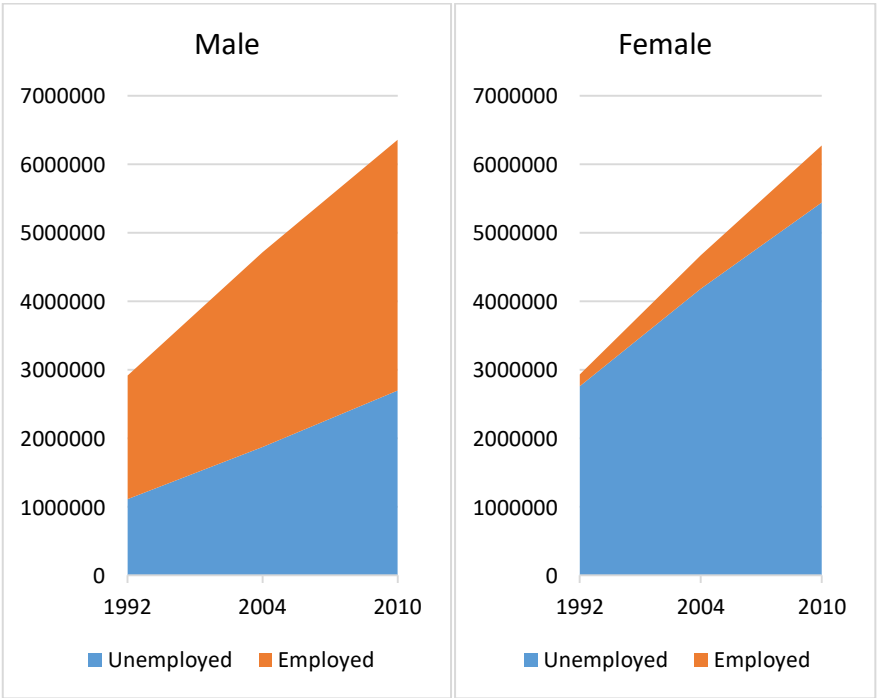
With changed policies and labor regulations, further sectors will open up for the employment of native, especially of women. This will increase percentage of women in the labor force. Nonetheless, it is comparatively lower than that of men, which might be due to the limitations of labor market demands or working conditions as well as cultural influence. Presently, supply and demand of human resources as depicted by the labor force structure facilitates calculations of foreign manpower required to fill the gaps. Accordingly, people are hired based on scientifically designed job descriptions so as to integrate them more efficiently. In the future, this will facilitate the development of a strong human resources panel to empower natives and revamp the work culture.

3.4. Future prospects

Theoretically, the first demographic dividend will lead to accelerated economic growth and more secure and pleasant living environments for of Saudi Arabia. This accompanies the second demographic dividend (Figure 5), where accelerated investments and improvements in education, skill development, public health, job creation, and good governance enable the labor force with better potential and skills to attain higher quality and productivity and thereby earning potential at individual level.

Figure 5. Change in population of working age and dependent age showing the two phases of demographic dividend
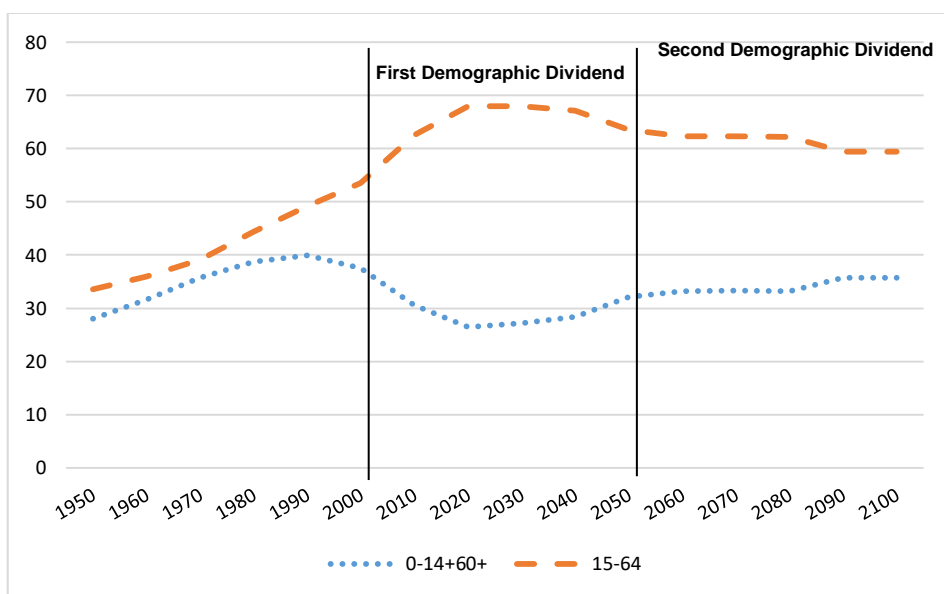
As seen, the first demographic dividend in the Kingdom has already developed, and is expected to last until 2050. Thereafter, the percentage of the working age population (15-64 years) falls but that of dependents (especially those aged 65 years and above) rises. Therefore, the Kingdom's window of opportunity will only be open for approximately another 30 years. This is a period to fully reap benefits – social and economic. Subsequently, the second dividend is expected to takeover for a longer period with increased stability and potential to add productivity and economic gains. To this end, careful, well-thought-out gov-

ernment strategies – adopted in developed and developing countries in East Asia – are essential to trigger economic gains (Abío, et al., 2017; Cai, 2020; Baerlocher et al., 2019; Prskawetz & Sambt, 2014; Ross, 2004).

This research explained the first wave of demographic dividend in Saudi Arabia effecting the population structures, particularly the working age population. The discussions focus on three specific topics: increase of working age population, positive impacts on labor force, and need for gaining prospects from demographic dividend. In short, an increase in the demographic dividend leads to increases in GDP. This paves the way for economic transitions involving changes in livelihoods, production, and consumption, from primary to secondary and tertiary sectors of the economy. All these changes are based on the demographic dividend, the common denominator, that is the total population, in this study. This impact shall be reflected in the GDP through the working age population.

4. Conclusions

The analyses carried out on the census data show clear evidence of a youth bulge, confirming demographic dividend, which is a window of opportunity that can lead to faster economic growth, higher productivity, fewer burdens on families, and improvements in educational quality. The steady increase in the dividend and accompanying steep increase in accounting effect show Saudi Arabian opportunity timelines.

Age structural changes impact up on economy, paving the way for a burgeoning youth population during the first demographic dividend, reaching a stable level in 2050 and stabilizing thereafter for a longer period – the second demographic dividend. An increase in the demographic dividend leads to an increase in GDP, paving the way for economic transitions involving changes in livelihoods, production, and consumption, moving from primary to secondary and tertiary sectors of economy. This impact shall be reflected in the GDP through the working age population, which continues to increase, clearly, due to second demographic dividend.

In this transitional stage, it is important to reap maximum benefits by efficiently utilizing the youth bulge in productive national activities. New entrants to the labor force with intensive job-oriented training should be encouraged by utilizing scientific human resource management strategies in matching personal and job specifications. To this end, a careful curriculum planning from school to

university levels (including technical and professional schools) is essential. Wherever necessary, people should be matched with jobs through special inductions and on-the-job training, as envisaged in Saudi Vision 2030. That is, emphasis needs to be placed on the organizational transformation process that converts input into output/outcomes, so as to create authority-responsibility-accountability relationships. In short, this is an opportunity to empower youth to take responsible roles in development and to build a sustainable system.

Disclosure statement

Funding

Acknowledgements

References

Abío, G., Patxot, C., Sánchez-Romero, M., & Souto, G. (2017). The welfare state and demographic dividends. *Demographic Research, 36*(48), 1453-1490. https://doi.org/10.4054/DemRes.2017.36.48

Baerlocher, D., Parente, S. L., & Rios-Neto, E. (2019). Economic effects of demographic dividend in Brazilian regions. *The Journal of the Economics of Ageing, 14*, 100198. https://doi.org/10.1016/j.jeoa.2019.100198

Bixby, L. R., & Robles, A. (2008). Demographic dividends and vital cycle economics in Costa Rica. *Papeles de poblacion, 14*(55), 9-34. Retrieved from https://www.redalyc.org/articulo.oa?id=11205502

Bloom, D. E., Canning, D., Fink, G., & Finlay, J. E. (2009). Fertility, female labour force participation, and the demographic dividend. *Journal of Economic Growth, 14*(2),79-101. Retrieved from https://link.springer.com/article/10.1007/s10887-009-9039-9

Cai, F. (2020). The second demographic dividend as a driver of China's growth. *China & World Economy, 28*(5), 26-44. https://doi.org/10.1111/cwe.12350

Cuaresma, C. J., Lutz, W., & Sanderson, W. (2014). Is the demographic dividend an education dividend? *Demography, 51*(1), 299-315. https://doi.org/10.1007/s13524-013-0245-x

Dramani, L., & Oga, I. J. B. (2017). Understanding demographic dividends in Africa: The NTA approach. *Journal of Demographic Economics, 83*(1), 85-101. Retrieved from https://ideas.repec.org/a/cup/demeco/v83y2017i1p85-101_9.html

Espineira, J. C. A. C. (2019). Cuba. Demographic ageing and dividend. Challenges to development. *Novedades en poblacion, 15*(30), 46-63.

van der Gaag, N. V., & de Beer, J. (2015). *From demographic dividend to demographic burden: The impact of population ageing on economic growth in Europe*. The Hague: Netherland Interdisciplinary Demographic Institute. Retrieved from https://pure.knaw.nl/portal/en/publications/from-demographic-dividend-to-demographic-burden-the-impact-of-pop

Gribble, J. N., & Bremner, J. (2012). Achieving a demographic dividend. *Population Bulletin, 67*(2), 1-13. Retrieved from https://www.prb.org/wp-content/uploads/2012/01/Population-Bulletin-2013-67-2-demographic-dividend.pdf

Groth, H., & May, J. F. (2017). Conclusions. In H. Groth & J. F. May (Eds.), *Africa's population: In search of a demographic dividend* (pp. 497-501). Cham: Springer. https://doi.org/10.1007/978-3-319-46889-1_31

Ha, J., & Lee, S.-H. (2016). Demographic dividend and Asia's economic convergence towards the US. *Journal of the Economics of Ageing, 8*, 28-41. https://doi.org/10.1016/j.jeoa.2016.03.006

Jafrin, N., Mahi, M., Masud, M. M., & Ghosh, D. (2021). Demographic dividend and economic growth in emerging economies: Fresh evidence from the SAARC countries. *International Journal of Social Economics, 48*(8), 1159-1174. https://doi.org/10.1108/IJSE-08-2020-0588

Kingdom of Saudi Arabia. (2017). *Saudi Vision 2030 document*. Riyadh: Council of Economic and Development Affairs. Retrieved from https://www.vision2030.gov.sa/media/rc0b5oy1/saudi_vision203.pdf

Khraif, R. M., Salam, A. A., Elsegaey, I., & AlMutairi, A. (2015). Changing age structures and ageing scenario of the Arab world. *Social Indicators Research, 121*(3), 763-785. http://doi.org/10.1007/s11205-014-0664-0

Klimanek, T., & Filas-Przybył, S. (2020). The statistical picture of population aging in towns of Wielkopolskie Province: TERYT and DEGURBA perspectives. *Journal of Economics and Management, 39*(1), 41-46. https://doi.org/10.22367/jem.2020.39.03

Lee, S.-H., & Mason, A. (2007). Who gains from the demographic dividend? Forecasting income by age. *International Journal of Forecasting, 23*(4), 603-619. https://doi.org/10.1016/j.ijforecast.2007.07.004

Manzano, F. (2015). The impact of the demographic dividend in the Argentine education sector period 2010-2040, an interdisciplinary approach. *International Journal of Sociology of Education, 4*(3), 225-256. https://doi.org/10.17583/rise.2015.1692

May, J. F., & Turbat, V. (2017). The demographic dividend in Sub-Saharan Africa: Two issues that need more attention. *Journal of Demographic Economics, 83*(1), 77-84. https://doi.org/10.1017/dem.2016.21

Oseni, I. O., Akinbode, S. O., Babalola, D. A., & Adegboyega, S. B. (2020). Government spending and school enrolment in sub-Saharan Africa: A system GMM approach. *Journal of Economics and Management, 40*(2). https://doi.org/10.22367/jem.2020.39.03

Pace, R., & Ham-Chande, R., Eds. (2016). *Demographic dividends: Emerging challenges and policy implications* (Demographic Transformation and Socio-Economic Development, Vol. 6). Cham: Springer. Retrieved from https://link.springer.com/book/10.1007/978-3-319-32709-9

Prskawetz, A., & Sambt, J. (2014). Economic support ratios and the demographic dividend in Europe. *Demographic Research, 30*, 963-1010. http://doi.org/10.4054/DemRes.2014.30.34

Renteria, E., Souto, G., Mejia-Guevara, I., & Patxot, C. (2016). The effect of education on the demographic dividend. *Population and Development Review, 42*(4), 651-670. https://doi.org/10.1111/padr.12017

Ross, J. (2004). *Understanding the demographic dividend* (Policy Project Brief of Futures Group). Washington, DC: USAID. Retrieved from http://www.policyproject.com/pubs/generalreport/Demo_Div.pdf

Song, S. B., Song, Q., & Zhong, T. (2011). Demographic dividend and economic growth in China Mainland. In *2011 International Conference on Applied Social Science* (Vol. 5, pp. 305-315). Changsha, China:

Ssewamala, F. M. (2015). Optimizing the demographic dividend in young developing countries: The role of contractual savings and insurance for financing education. *International Journal of Social Welfare, 24*(3), 248-226. https://doi.org/10.1111/ijsw.12131