

THE DEMOGRAPHIC DIVIDEND AND ECONOMIC GROWTH: AN INTEGRATED THEORETICAL FRAMEWORK

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Abstract

The transition to sustainable development and equitable societies has become a major concern for population scientists and decision makers. This transformation is in some countries coinciding with the demographic transition, as the evolution of the age structure poses a new challenge for demographers and economists. At the same time, technological unemployment is becoming a burning issue across the world owing to the rapid digital revolution and globalisation. However, there is a lack of an integrated theoretical framework that can be used to achieve the demographic dividend by eliminating technological unemployment, which would ultimately help bring about sustainable development. This paper attempts to build an integrated theoretical framework based on the theories of demographic transition, comparative advantage, human capital theory, and the demographic dividend hypothesis in view of the developmental challenges of technological unemployment. This proposed integrated conceptual framework would foster the use of the demographic dividend to promote economic prosperity in a country whose population is largely economically active. This paper also makes some recommendations on how to prepare working-age people against the threat of technological unemployment in a bid to enhance economic growth.

Keywords: Demographic transition, demographic dividend, human capital, technological unemployment, comparative advantage, economic growth

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INTRODUCTION

The world is constantly experiencing changes in the age structure of the population over time, a process that is known as the demographic transition. This is a natural process that has already been observed in some countries, while others are either currently

experiencing it or expect to do so in the future. Although the demographic transition takes place in various ways in society, it depends mainly on the historical, geographic, institutional, socio-economic, political, and cultural impacts of the society in question. And countries do not all go through

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this process at the same time (*Ahmad – Khan, 2018*). This demographic transition is of paramount importance for a country's economic performance, particularly during the transition's third phase, known as the 'demographic dividend'. This dividend is characterised by a larger proportion of young cohorts in the population and has a positive impact on per capita income as well as on savings and investments (*Lutz et al., 2019; Cruz – Ahmed, 2018*).

However, the demographic transition provides a unique framework for studying many aspects of development in an integrated manner (*Dyson, 2013*). The transition is an integral part of modern development that has, however, yet to be conceptualised. For development studies, population is a paradoxical issue. On the one hand, the population clearly cannot be ignored in the discussion of the development process. On the other hand, the most established theories of development fail to properly address the challenge of population. This situation implies that demographic problems can neither be excluded nor easily integrated into a development context (*Malmberg, 2014*). Even the importance of the demographic transition for the growth in per capita income has been long neglected, mainly due to several inconsistent correlations that exist between population and economic growth (*Sánchez-Romero et al., 2018*).

However, the transition to sustainable and equitable societies, a process fuelled by the demographic transition, has now become a major concern for governments, organisations, businesses, and intellectuals. Therefore, the evolution of the age structure poses a new challenge for demographers and economists. Although this evolution is happening in developing nations, there is a difference between the developed and developing countries in the process of demographic transition in terms of its pace and timing (*Ahmad – Khan, 2019*). Interestingly, the present transition in developing countries has helped them to manage the global crisis. For example, a number of economies, particularly those of the developed nations, were badly affected during the global economic crisis of 2007–2008 and struggled with the ensuing recession. However, populated countries such as China and India were not affected during this recession owing to the age

structure dynamics. The demographic transition helped these countries to become resilient, because a positive correlation existed between the dynamics of age structure and economic growth. Consequently, the general standard of living was also influenced during the transition period. This phenomenon further inspired researchers to examine the effects of age structure on economic growth (*Ahmad – Khan, 2018*).

Although every country has to cope with a changing age structure as a result of the demographic changeover, there is no optimistic outlook for a country that fails to offer the essential conditions such as a skilled workforce, sufficient employment opportunities, etc., to adapt to the demographic transformation, which may vary across countries (*Singh, 2016; Guengant – May, 2013*). This is because less-skilled human capital has a negative effect on the demographic dividend as well as on the so-called digital dividends in this era of digital revolution and globalisation. This means that a structured scheme of instruction and training is needed to upgrade the skills of the labour force, as the lack of skills will prevent society from taking advantage of the window of opportunity. For instance, technological unemployment is becoming a serious issue across the world because of the increasing number of technological innovations, which make difficult tasks easier to perform and consequently it is possible to save on human labour. In addition, technology helps to reduce wage costs, resulting in capital accumulation and profit maximisation. In general, it expands human abilities with advanced techniques. Unemployment among young cohorts, however, can result in serious health issues, such as malnutrition, stress, depression, and even cardiac problems, etc. Moreover, deprived youth may resort to criminal activities. Youth unemployment also affects the well-being of the families as well as nations in the long run.

Sustainability programmes or policies that can lead to economic prosperity in countries that are currently witnessing or anticipating the onset of the demographic dividend offer several opportunities that are, however, accompanied by numerous challenges. Population, economics, and technology are interconnected and cannot be separated in implementing

sustainability. Also, there continues to be an enduring connection between key global sustainability challenges, which include the issues of economic growth, the reduction of poverty, youth unemployment, and technological adaptation etc. These issues are interconnected across different dimensions, but they are often studied and managed separately. There is a dearth of literature on an integrated approach that would also consider prominent economic growth determinants such as the demographic dividend, technological innovation, and human capital. To deeply understand the demographic transition and benefit from its advantages, an integrated approach is needed. Therefore, this paper aims to take a step forward in this direction by proposing an integrated framework approach that seeks to utilise the demographic dividend in development. This paper conceptualises the framework for economic growth using three theories – namely, the demographic transition theory of Thompson (1929), and Notestein (1945), Ricardo's theory of comparative advantage (1817), and Becker's human capital theory (1964), the demographic dividend hypothesis (Bloom – Williamson, 1998; Bloom – Canning – Sevilla, 2003; Bloom *et al.*, 2009; Bloom, 2011) and examining the challenge of development, such as technological or structural unemployment, as the following section explains.

METHODOLOGY

This study aims to develop an integrated theoretical framework based on a thorough review of the popular theory of demographic transition, the theory of comparative advantage, and the theory of human capital. It also examines the demographic dividend hypothesis and the developmental issue of technological unemployment. To achieve this objective, the study uses document analysis as a qualitative method. The documents for the analysis were collected from secondary sources, such as journal articles, books, book chapters, and reports.

DEMOGRAPHIC TRANSITION THEORY

Demography emerged as an academic field after the Second World War and since then the demographic transition has received tremendous attention from researchers, particularly with respect to the reduction in the fertility and mortality rates (Friedlander

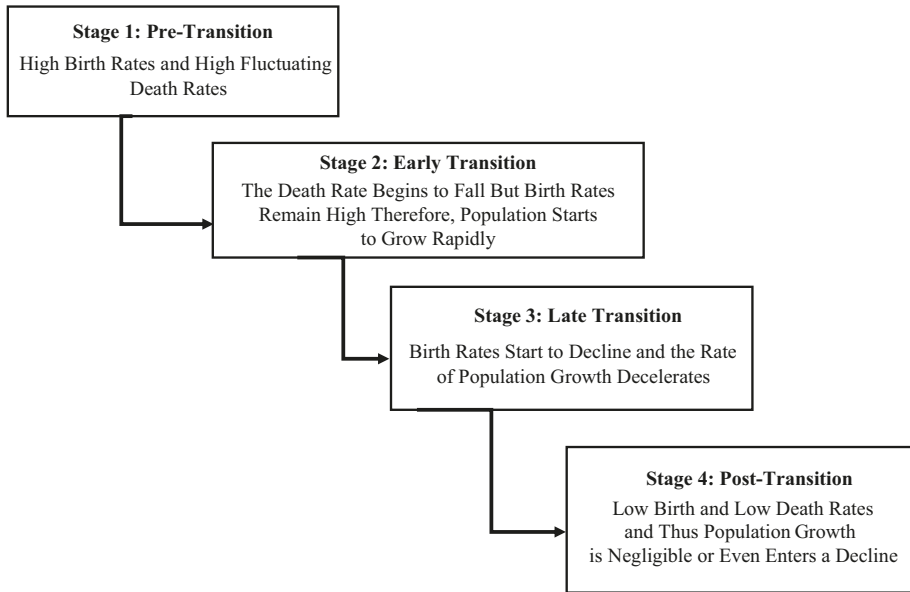
– Okun – Segal, 1999). The demographic transition theory basically provides a theoretical foundation for explaining past population dynamics and producing demographic projections. The revolutionary efforts of both Thompson (1929) and Notestein (1945) provided the foundation for understanding transitional change in the population (Loschky – Wilcox, 1974).

Thomson's and Notestein's versions of the transition outline different stages in a society's transformation from a higher to a lower level of mortality and fertility (Loschky – Wilcox, 1974). For example, Thompson (1929) revealed the different types of changes that occur in population rates; his observations resulted in the renewed interest in demographic research that has occurred over the last three decades. However, his notion was politically influenced and more applicable in the United States than the rest of the world. This means that Thompson's article had little wider impact. On the other hand, Notestein views established a more formal structure for the theory of demographic transition (Friedlander – Okun – Segal, 1999).

A demographic rebellion began in the late 18th century in Europe that later spread to the rest of the world in the 19th and 20th centuries, and the process continues till today (Fargues, 2011). Generally, the demographic transition is a natural process that results from changing population characteristics and involves four main stages, as shown in Figure 1.

The first phase is characterised by both high birth and death rates (particularly among children) in pre-industrial society. During the pre-transition period, mortality rates start to decline slightly as a result of improvements in health, nutrition, and medical expertise, which is also known as the mortality or epidemiological transition (Omran, 1971). Gradually and with improved food production and sanitation, health and life spans are also enhanced, resulting in a lower death rate amidst a high birth rate, and this characterises the second stage of the transition. Also, a positive relationship begins to emerge between wealth and reproductive success, which promotes population momentum. The third phase is the late transition period and is indicated by lower fertility rates, leading to a plunge in the rate of population growth. Finally, after a period of time, both death and birth rates balance at truncated stages, resulting in little or no population growth (Snopkowski – Kaplan, 2018).

Figure 1 The demographic transition theory



Source: Authors' compilation based on Thompson (1929), and Notestein (1945).

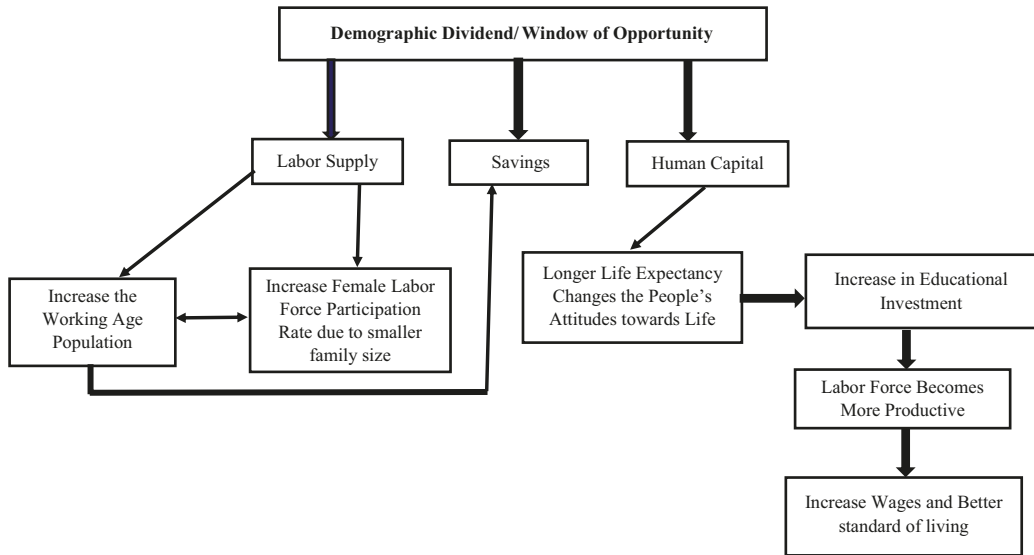
DEMOGRAPHIC DIVIDEND HYPOTHESIS

The idea of a demographic dividend has been discussed in the literature by researchers such as Bloom and Williamson (1998), Bloom, Canning and Sevilla (2003), Bloom et al. (2009), Bloom (2011), and Bloom et al. (2012). The developers of the demographic dividend hypothesis defined the demographic dividend as operating through a number of mechanisms such as labour supply, savings, and human capital (Singh, 2016). In general, each country has to go through the different phases of the demographic transition, but the third phase occurs when a country is approaching a low fertility and mortality rate while the size of the working masses is naturally increasing (Joe – Kumar – Rajpal, 2018). During this transition period, when a country welcomes a large proportion of young people owing to a rapid decline in fertility and mortality in the development process, a ‘window of opportunity’ opens, in which there will be low dependency ratio and the older cohort of the workforce has the ability to improve the country’s economic prosperity (Misra, 2015). During this period of opportunity, the share of the population between the ages of 0 and 14 years falls definitively to 30%, while the proportion of senior

citizens (60 years and over) drops to less than 15% (Narayana, 2018). This means that the working age population as the larger share can influence the nation’s social and financial growth (Bloom – Canning – Sevilla, 2003). For example, per capita income increased by more than 6% between 1960 and 1995 in East Asia, as the region was able to take the advantage of the ‘window of opportunity’. Moreover, the lower dependency ratio from 1970 to 1995 was responsible for one-fourth to one-third of the total growth of this region (Fang, 2016; Sengupta, 2015).

The demographic bonus is distributed via several mechanisms, and these are presented in Figure 2. The demographic shift affects the supply of labour in two main ways. First, there is a basic automatic effect that results from the steady and inexorable ageing of the baby boom cohort (Bloom et al., 2009; Bloom et al., 2012; Bloom – Canning – Sevilla, 2003). When this peer group is between the ages of 15 and 64, they are more likely to be working, which reduces the dependency ratio of the non-dependent population. Second, due to smaller family sizes, the likelihood of women participating in the labour market and obtaining an education will increase, since they will be less occupied with

Figure 2 The demographic dividend hypothesis



Source: Authors' compilation based on Bloom and Williamson (1998), Bloom, Canning and Sevilla (2003), Bloom et al. (2009), and Bloom (2011).

household chores. The demographic transition also helps to increase the growth of savings, which ultimately improves the investment and growth of a country. For instance, young people and the elderly consume more than they produce, whereas the active age population contributes more to economic output and savings (Bloom et al., 2009; Bloom et al., 2012; Bloom – Canning – Sevilla, 2003). Likewise, folks will only save if they have access to ample savings options and have confidence in national monetary markets (Bloom – Williamson, 1998). The evolution of the age structure generates an environment in which people are inclined to invest in their personal needs and in their children's well-being and education. This yields significant economic paybacks. Longer life expectancy causes fundamental changes in people's attitudes to education, the family, retirement, and the role of women. Therefore, as lifespan increases, parents are expected to prepare their offspring for subsequent stages in life. Healthier children are likely to benefit intellectually more from education and advances in education than their less healthy counterparts. Parents also focus on the quality of a child rather than the quantity of children, as they are able to devote more time and money to each child. The result of educational investment is that the labour force as

a whole becomes more productive, promoting higher wages and a better standard of living (Bloom et al., 2009; Bloom – Canning – Sevilla, 2003).

COMPARATIVE ADVANTAGE THEORY

Given the limited number of resources in the world, no one country can produce all types of products at a time. Even the level of technological knowledge varies between countries according to the physical and human resources that they possess. Every country has its own specific resources and by using them it becomes specialised in the production of particular products over others with lower opportunity costs. The county is therefore able to export these products because of their relative efficiency in producing them over other countries. This is known as a country's comparative advantage, which reflects the division of labour at an international level. The theory of comparative advantage was introduced by David Ricardo in 1817 in his famous book titled *On the Principles of Political Economy and Taxation* (Gupta, 2015; Sampson, 2017).

However, with the current technological innovations we see various types of new products and services emerging. This creates a dynamic demand for different products, the production of which requires

a dynamic skilled labour force in the labour market. Therefore, every county needs specialised knowledge to achieve a dynamic comparative advantage for all products in every sector. The dynamic Ricardian comparative advantage framework can be achieved through the continuous training of the workforce. Basically, a dynamic comparative advantage starts when the comparative advantage changes over time (Sengupta, 2015).

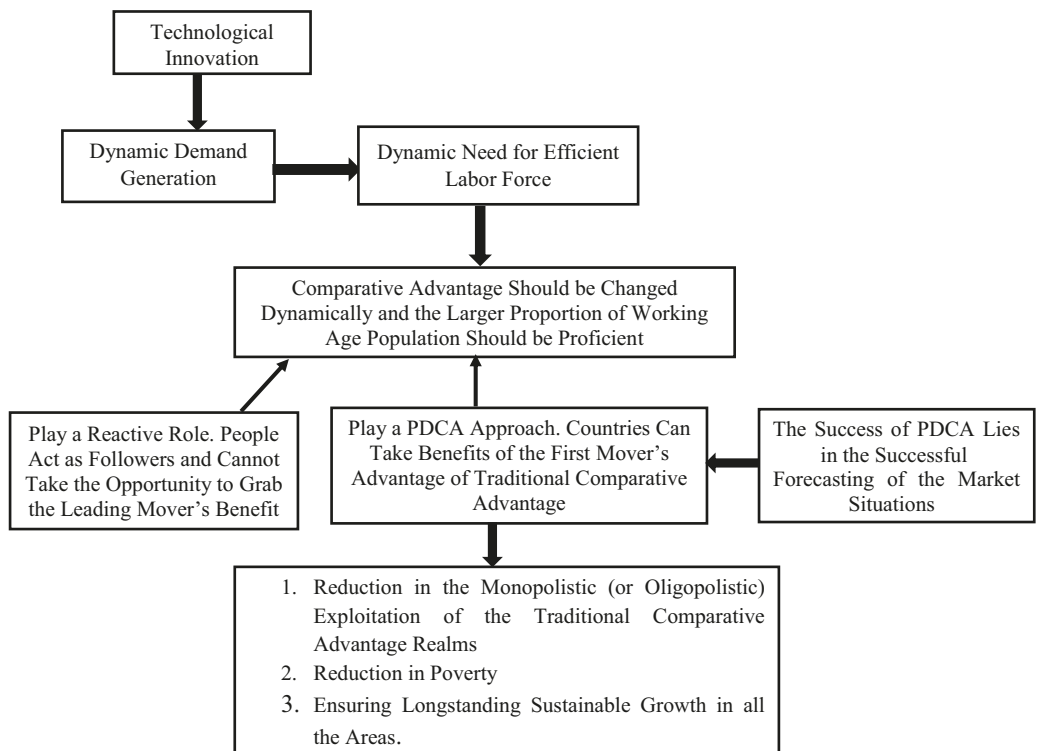
Sengupta (2015) has suggested that there are two ways to deal with the situation of comparative advantage in order benefit from a comparative advantage (Figure 3). First approach is that society can play a reactive role as a follower. But this approach has a limitation that due to act as a follower the county cannot take the opportunity of first mover’s advantage. Thus, to overcome the first approach, society must be proactive, and this will have a significant impact on the overall development of the country. What this

involves is adopting a proactive dynamic comparative advantage (PDCA) approach. Countries are facing a demographic shift towards the younger age group, so a proactive method of dynamic comparative advantage is crucial for ensuring sustainable progress in all sectors (Sengupta, 2015).

HUMAN CAPITAL THEORY

The world has become complex nowadays and because organisations are complex as well the people who run them need to solve many important issues; therefore, human capital has become central to the development of a society (Hage, 2017). Human capital is defined as the productive wealth that is embodied in the labour, skills, stock of knowledge, and health with which individuals can contribute to economic productivity. Skill sets can be acquired through on-the-job training, practical experience, and education (Figure 4). Further, practical experience allows individuals to develop

Figure 3 The comparative advantage theory



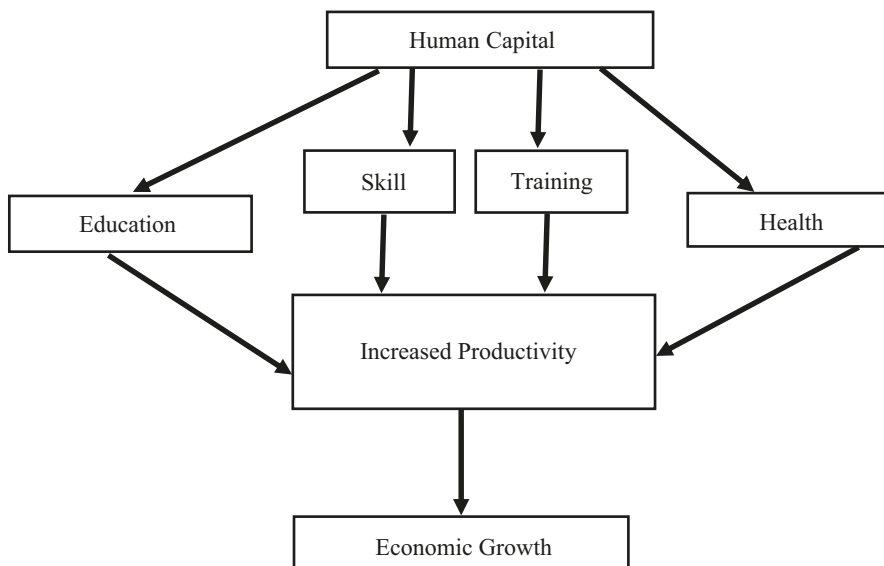
Source: Authors’ compilation based on Ricardo (1817), and Sengupta (2015).

tacit knowledge that helps them in their performance of work activities (Becker, 1964; Becker, 1993; Hage, 2017). However, the term ‘human capital’ has a long and discontinuous history (Tan, 2014). Human capital theory was formally introduced in this century, but the concepts behind it emerged centuries ago (Kiker, 1966; Sweetland, 1996). For instance, Schultz (1961) formulated the idea of investment in human capacity for the purpose of core economic development. He incorporated five dimensions of human capital into his concept: health, on-the-job training, schooling, adult education, and migration. Therefore, he gave utmost importance to education, like Alfred Marshall and Johann Heinrich von Thünen and also supported the ideas of younger academics such as Jacob Mincer and Gary Becker. Subsequently, Becker (1964) played a major role in reviving the interest in human capital research through the interaction of Theodor Schultz and Jacob Mincer. He also emphasizes the idea of ‘the economic approach to human behavior’ (Teixeira, 2014). Basically, there are two views of the human capital model regarding returns on investment. According to the narrow view, income level increases with a higher level of knowledge and skills. This means that the returns are higher compared to the

costs that are invested in an individual becoming knowledgeable and skilled (Diebolt – Hauptert – Goldin, 2014). According to the wider view of the human capital model, however, the learning process not only influences market earnings but goes beyond the labour income in ways that are not reflected in market earnings (Quiggin, 1999).

Human capital theory is not only linked to economic perspectives, as it also relates to sociological and demographic aspects (Quiggin, 1999), and human capital is regarded as a key element of a nation’s overall socio-economic well-being and development (Tan, 2014). For instance, the successful modernisation of economic growth, which started in the 19th century in different regions of Europe and the Western hemisphere, was influenced by technological advancement in conjunction with the fertility transition. However, both of these factors tie in with the idea of human capital, since technological development cannot be achieved without an educated population, and as knowledge levels rise in a population parents will favour child quality over quantity. For example, even a slight development in technological advances increases incomes, which encourages parents to spend some of their resources

Figure 4 Human capital theory



Source: Authors' compilation based on Becker (1964).

on their children's education. Their higher level of education then leads to further technological improvements, which in turn raise income levels in a continuous process (*Diebolt – Hauptert – Goldin, 2014*).

TECHNOLOGICAL UNEMPLOYMENT

Unemployment has become a major global problem. For example, during the great recession of December 2007, many countries, including advanced societies and developing countries, suffered from very high unemployment rates. Unemployment rates were 9.2% and 19%, respectively, in the United States and Egypt in 2011. The Arab Spring uprising in Egypt, Tunisia, Syria, Libya, Iraq and Bahrain, and elsewhere, was caused by unemployment, poverty, inequality, and dictatorship (*Mouhammed, 2011*). The economic literature attributed the cause of unemployment to the situation in the economy, to the demographic structure, to (problems with/poorly functioning) institutions, and to technology. However, technological unemployment has recently become more worrying than these other factors.

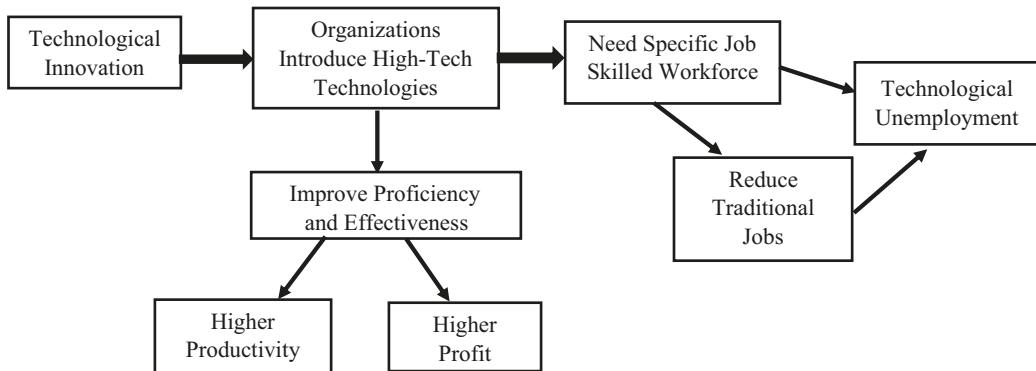
We cannot live nowadays without technology. Technological progress is one of the vital parameters of sustainable economic growth and human progress (*Broughel – Thierer, 2019*). Technological innovation makes it easier to perform difficult tasks and also to save on human labour. In addition, technology helps to reduce wage costs, resulting in capital accumulation and profit expansion. Therefore, most officials in different organisations are introducing advanced technologies in every segment of their commercial processes in order to expand effectiveness which will in turn lead to greater efficiency and a higher return on investment (*Martin – Leurent, 2017*). In general, human abilities are expanded with the aid of advanced techniques. Different techniques such as smart machines (advanced robots and machine learning) and smart devices (personal computers, laptops, mobile networking and smartphones) are considered as technologies. In addition, technologies are also defined by the smart techniques (cloud computing, big data and data analytics). Over a couple of decades, both the smart devices and techniques have significantly improved across the sphere (*World Bank Group, 2015*).

Technological unemployment has thus become a serious issue worldwide since the industrial period. Many people in society today are worried that technological advances will soon lead to unemployment. The incompatibility between the skills and abilities workers possess on the one hand and the skills and abilities organisations need from workers gives rise to structural unemployment in the labour market. This is due to technological innovations, which cause the structure of the economy and the organisational structure of companies to change frequently, and employers consequently need employees with specific job skills to fill the new types of jobs generated by these innovations (*Bennett, 2016*). If the labour force is unable to keep up with and adapt to these technological changes/innovations, structural unemployment is expected to occur (*Parker, 2010*). Owing to structural changes, employment in primary and secondary sectors has declined (Figure 5), as the acquisition of knowledge has become obsolete in these sectors. Construction, trading, retail, and graduate jobs are the sectors most harmed by technological advances. At the same time, new skills are needed to meet the needs of the service sector and new fields that are emerging as a result of advances in information technology, robotics, and other promising technologies. These new modern professions predominantly require advanced levels of qualifications with specific skills (*Bennett, 2016; Evangelista – Savona, 2003*).

DEVELOPING AN INTEGRATED CONCEPTUAL FRAMEWORK FOR UTILISING THE DEMOGRAPHIC DIVIDEND

There is a lack of literature on how to utilise the demographic dividend to achieve sustainable development. Rather, studies tend to discuss only the impact of young people on economic performance. Nowadays, population scientists have come to recognise the need for a sustainable society with more employment opportunities for the young cohort. However, to attain such a prosperous society, there is a need for an integrated conceptual framework to aid in the utilisation of the demographic dividend for economic growth.

Figure 5 Technological unemployment



Source: Authors' compilation based on literature review.

The association between working-age population and economic growth was examined in several studies by Lutz et al. (2019), Sánchez-Romero et al. (2018), Rizk (2018), Cruz and Ahmed (2018), Misra (2015), and Navaneetham and Dharmalingam (2012). These studies were conducted from the perspectives of both emerging and advanced countries. There are also a number of works (Cavallo – Sánchez – Valenzuela, 2018; Bloom – Williamson, 1998; Modigliani – Ando, 1957; Ando – Modigliani, 1963; Modigliani, 1966) that have highlighted the favourable impact of demographic factors on savings and investment behaviour. Other studies, such as those by Ahmad and Khan (2019), Song (2013), Bloom et al. (2012), Navaneetham (2002), and Bloom and Williamson (1998), have demonstrated the impact of human capital on the economic performance of a society. Yet other studies (e.g. Fiorelli, 2018; Schumpeter, 2017; De Liso – Leoncini, 2011) have provided many explanations for technological unemployment. However, there is a lack of studies showing how the demographic dividend can be utilised to improve the economy by eliminating technological unemployment.

This paper therefore proposes an integrated conceptual framework for utilising the demographic dividend (see Figure 6) based on the demographic transition theory of Thompson (1929), and Notestein (1945), the comparative advantage theory of Ricardo (1817), the human capital theory of Becker (1964), and the demographic dividend hypothesis of Bloom and Williamson (1998), Bloom, Canning and Sevilla (2003), Bloom et al. (2009), and Bloom (2011),

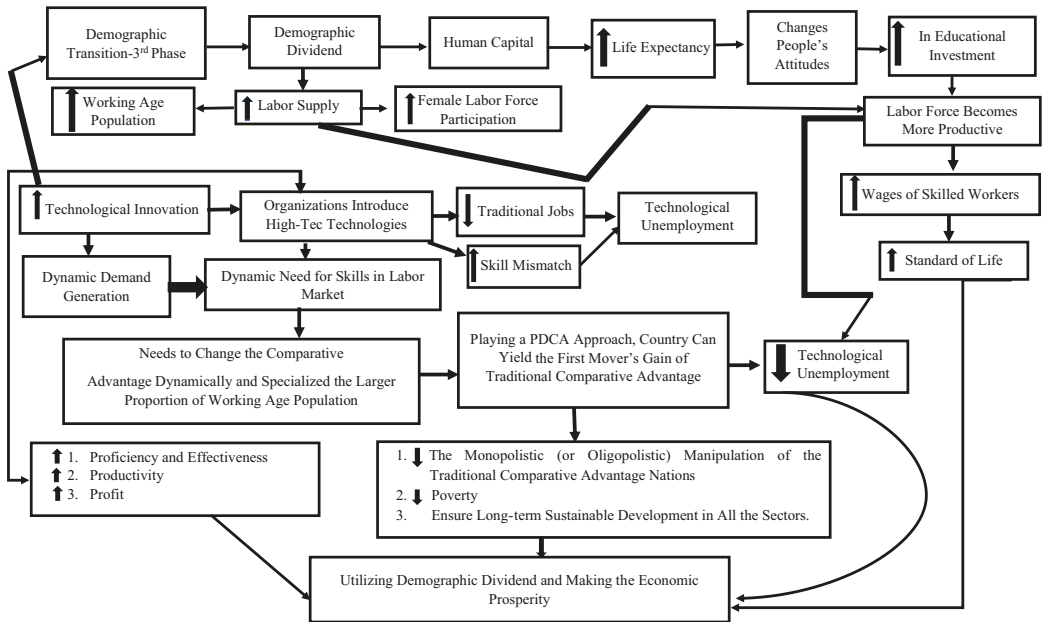
while considering along with developmental issues such as technological unemployment or structural unemployment.

When a country is entering into the demographic dividend stage, it has a comparative advantage over other countries in terms of its working-age cohort. To make improve the productivity of this large cohort, market-oriented education with effective training is needed. At the same time, technological innovations create a dynamic need and demand in companies for a technologically well-trained labour force and diminishes the rate of traditional job offerings. This adapted labour force can enhance the profits of organisations. Countries can utilise the first-mover advantage of a traditional comparative advantage by adopting a proactive dynamic approach that will/can ultimately undermine/break down the monopolistic attitudes of developed countries, success in which will also reduce poverty in these countries. This will also ensure sustainable development in every sector of the country. These integrated procedures can facilitate the utilization of the demographic dividend, which can bring long-term economic prosperity to the nation (Figure 6).

CONCLUSION AND RECOMMENDATIONS

De Silva (1997) found that many countries are neglecting to make the continuous investment in human capital that is necessary to achieve and maintain an effective and progressive economy. If a country's economic conditions are such that it is unable to offer what is required to build a trained

Figure 6 Demographic dividend and economic growth: an Integrated theoretical framework



Source: Authors.

and skilled labour force and ample employment prospects, that country may not be able to benefit from the positive effects of the demographic dividend. Insufficiently trained human capital negatively affects the demographic dividend as well as the so-called digital dividends that exist in the era of the digital revolution and globalisation. Thus, if the workforce does not keep up with technological trends, technological or structural unemployment may ensue.

To overcome this situation, developing countries that are experiencing the demographic dividend must play a proactive, dynamic role in combating structural unemployment. In fact, human capital is the most important resource that contributes significantly to a nation's economic growth. Therefore, a larger proportion of working-age adults must be taken into account as the primary boosters of development in order for a country to take advantage of/benefit from the demographic dividend or the 'window of opportunity'.

First, the education system must be reorganised and improved in order to accommodate the needs of high-quality/highly skilled employment, industry, investment, and trade so that the future working-age population will be prepared for innovations and

development. Second, educational institutions should introduce certain initiatives such as structured teaching and training workshops through a memorandum of understanding with companies and businesses so that students can improve their practical knowledge and be prepared for the job market when they graduate.

Third, working-age adults and especially young people are courageous and dynamic, and continuous training in the workplace and lifelong learning will allow companies to retain the talented workforce that can adapt to rapid changes and technological improvements. Fourth, in order to benefit from the comparative advantage that the demographic dividend offers, systematic human resource management practices should be developed in the public and private sectors.

Fifth, decent work is at the heart of a sustainable and dynamic system of development. Therefore, promoting decent work will increase the employability of the working-age population. In addition, a culture of decent work for the working-age population should be adopted, an effect of which will be to strengthen rural communities. Last but not least, the government, employers, educational institutions,

and training associations can adopt the proposed comprehensive and integrated framework in this paper, which involves utilising the demographic dividend to reduce unemployment and create job opportunities, which in turn will facilitate sustainable development.

The integrated framework proposed in this study has been developed on the basis of a thorough review of theoretical literature. However, future researchers can consider this framework for empirical study.

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