

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Introduction**

Ageing population is not something strange to any country in the world. It is part of a process in which every country will experience it. However, in Malaysia recently, this issue has been highlighted and becoming a concern among citizen's as well as the government's representatives. As Rafizi Ramli, a Minister of Economics of Malaysia said where Malaysia is expected to reach the status of an old country in 2044. More worryingly, other countries that go through this process is in a stronger economic and household financial position than Malaysia.

"Child Free" slogans is not ashamed to resound within social media platform of a Malaysian's newlywed couples recently. They express a statement that they are not wished to have an offsprings in their married life by giving their reasons that it is sort of economic burdensome to raise a child from infant stage until their young adult's life. This sentiment slowly arises and create anxiety to young adults to raise a child if the household income become the considerations. This case will contribute to the declination of birth rates among Malaysian population if this mindset were continuing to happen.

To enhance a rapid economy growth of a country, a large population were needed where bigger pool of labor, can increase productivity and drive industrial economic activities. Due to drops of birth rates in the long run, professionals need to increase their work-life spans due to shortage of local labor. To conclude, this issue needs to be emphasized, and a study needs to be done to address the declination of fertility rates that happen year by year to facilitates the government to take various measures and actions in order to sustain the future economic growth.

## **1.2 Problem Background**

In recent development of advanced digital era, young generation especially Generation Z who born in the year 1997 to 2012 seems faced difficulties in developing their social skills in the real world as they have spent most of their time by surfing the internet such as mindlessly scrolling social media, addiction to online games and staying indoors resulting they were less exposed in real-world problems making them socially incompetent and developed social anxiety within themselves. They are unable to hold long, deep, meaningful and eye-to-eye conversations anymore.

This situation affects their relationship with other people, and they will miss many opportunities in their life if they keep maintained that kind of attitude and habits. Or even worse, they will face an obstacle in finding a life partner due to lack of communication skills or not exposing themselves to positive communities or gatherings. This is a serious problem when young adults do not even get married even after they have graduated from college or university due to the quarter life crisis. If this situation continues to happen in the long run, our world will experience a seriously ageing population in 2040.

## **1.3 Problem Statement**

According to UNDP Malaysia Accelerator Lab authored by Rachel Yue, Malaysia is reaching a turning point in its demographic transition towards an increasingly ageing population. This is supported by the Department of Statistics Malaysia (DOSM), the proportion of the population aged 65 and older is expected to increase significantly, from 8.1% in 2024 to 14.5% by 2040. This proves that Malaysia will experience ageing nation with low productivity in workforce resulting to slow economic growth and might turn down the import and export activities in our country. Special measures and intervention from the authorities need to be taken as soon as possible to combat this issue for future long-term benefit of a country.

#### **1.4 Aim of Research**

The aim of this research is to study the drops of fertility rates in Malaysia and how it influences the economy of the country.

#### **1.5 Research Objectives**

The research conducted aims to achieve the following objectives:

- (a) To analyses the current population trends in Malaysia from year 1970 to 2023.
- (b) To determine the direction of the causal relationship declining fertility rate (TFR) to economic performance of a country.
- (c) To forecast future fertility trends in Malaysia through regression model approach.

## **1.6 Scope of Research**

To conduct an impactful research analysis, time is an important element that needs to be considered by a researcher. Due to time constrain, the researcher aimed to perform several capable methods within a certain period of time such as systematic literature review to achieve the first objective of this research which is to identify the underlying factors that contribute to the drops of birth rates in Malaysia.

As this topic is not something 'rare' within the population of the world, a few research papers can be obtained. This benefits the researcher to not spend too much time to make the analysis in order to achieve the research objectives. The dataset obtained from the website of Malaysia's Open Data Portal ([data.gov.my](http://data.gov.my)) with collaboration of Department of Statistics Malaysia (DOSM) is enough to represent the current population of Malaysia. The website provides easy-discoverable information and the relatable dataset categories can be attained such as demographic, annual live births, household income, labour rate market, national gross domestic product (GDP), education and healthcare.

## **CHAPTER 2**

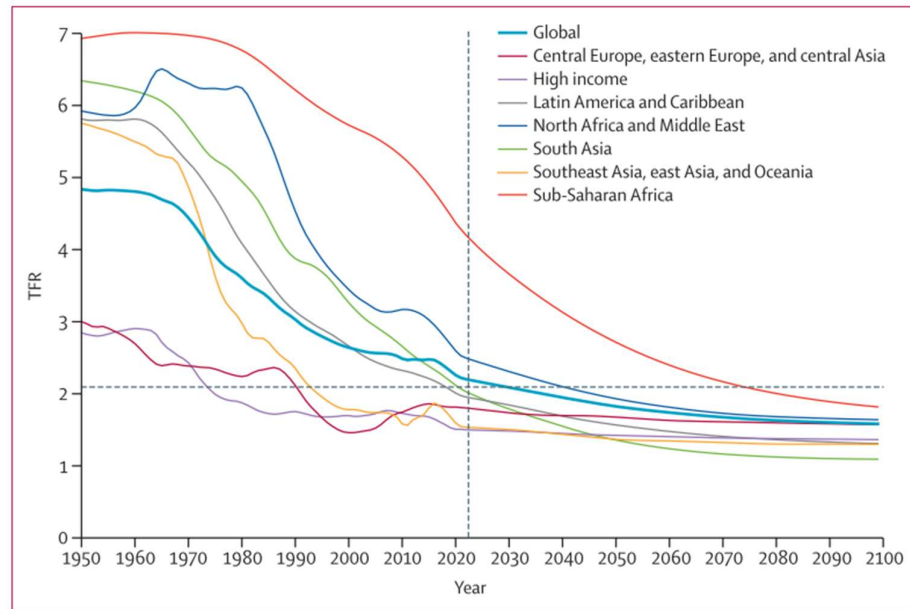
### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter discusses on the global overview on birth rates declination and factors that contributes to the declination. Besides, the content also consists of the impacts of fertility rate changes specifically on economic perspectives and past studies on the relationship between aging population and economic growth. In this literature review, it also highlights the forecasting model used to predict the future trends of birth rates of a population to help the researcher determine which model is the most and are capable to use to produce accurately and in short period of time.

#### **2.2 Overview of Global Population Trends**

Worldwide population undergoes birth rates declination since 1950 and continues to happen. According to (Bhattacharjee et al., 2024) in comprehensive demographic analysis report titled the Global Burden of Disease Study 2021 discovers that rate of fertility in all countries and territories declined since 1950 with Total Fertility Rate (TFR) remaining above 2.1 as figure 2.1 below. The figure 2.1 represents TFR, globally and by GBD super-region, 1950–2100 The dashed horizontal line indicates replacement TFR (2.1), and the dashed vertical line indicates the year 2022 (the first forecast year).



**Figure 2.1** TFR, globally and by GBD super-region, 1950 - 2100

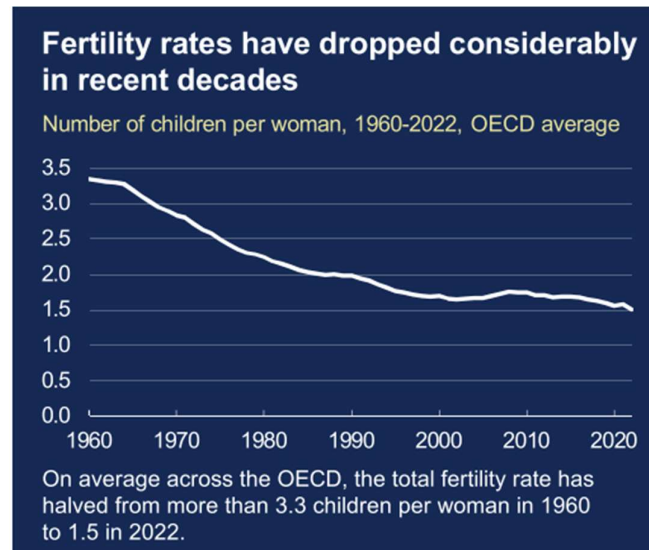
In a report that discuss of fertility rates issues cover OECD countries also highlights (OECD, 2009) that those countries such as Australia, Canada, Korea and Japan also experiencing a decline in the total fertility rate (TFR) for a longer time. In details, the decline was temporary stalled during 2000s but resumed its downward trend after 2007-08 Great Financial Crisis. The TFR of children per women fell to 1.5 in 2022 where average across the OECD where it is below "replacement level" of 2.1 children per woman.

More worryingly, it is reported that the TFR of some countries falls below the replacement level where it is the indicator for the minimum rate that is necessary for generational replacement of the population (Bhattacharjee et al., 2024). Across the OECD, there is a general tendency toward a rise in childlessness, however the degree of this trend differs. The frequency of persistent childlessness has at least doubled in Estonia, Italy, Japan, Lithuania, Poland, Portugal, and Spain, and it affects nearly one in four women in the 1975 cohort in Italy and Spain, according to a comparison of the cohort fertility of women born in 1935 and 1975. It is 28% in Japan (OECD, 2009).

### 2.2.1 Declining Rates

Fertility is declining globally, with rates in more than half of all countries and territories in 2021 below replacement level. This trend appears to be common in many countries, especially in Western nations, and is influenced by a variety of economic, cultural and social aspects. Since 1950, fertility rates have drastically decreased worldwide, and they will continue to do so in practically every nation and territory until the year 2100 (Bhattacharjee et al., 2024)

American families have changed in recent generations due to a variety of circumstances, including shifting social expectations. Birth rates fell into the early 1970s after the 1946–1964 baby boom, and then barely changed in the decades that followed. Fertility gradually increased in the years preceding 2008 before plummeting, and the Great Recession was another turning point. Since then, it has largely kept declining. According to the most recent data available, which covers 2020 and includes children born before the epidemic, 43 states saw their lowest general fertility rates in at least 30 years (State Fiscal Health, 2022). Figure 2.2 indicates the fertility rates have dropped considerably in recent decades on average across the OECD.



**Figure 2.2** Number of children per woman, 1960 – 2022 (OECD, 2009)

However, it is reported that the future fertility rates were projected to continue to decline worldwide where it is reaching a global TFR of 1.83 (1.59 – 2.08) in 2050 and 1.59 (1.25-1.96) in 2100 (Bhattacharjee et al., 2024).

Past literature review also revealed that Malaysia has been confirmed Malaysia is moving towards ageing population. According to (Mohd, Ishak, & Selvaratnam, 2021) it is predicted around 7% (2.3 million people) of the population consists of age categories of 65 years old and above in year 2020. It is considered as aging population if the 7% of the population is 65 years and above. This statements can be proven by (Mohd et al., 2021) in their study revealed the increase trends of the age dependency ratio for older people. Conversely, the fertility rate in Malaysia indicates a decreasing trend as per Table 2.1 below.

**Table 2.1** The age dependency ratio, fertility rate and government health expenditure from 2000 to 2018 (Mohd et al., 2021)

<b>Year</b>	<b>Age dependency ratio</b>	<b>Fertility rate</b>	<b>Government health expenditure (% of GDP)</b>
2000	6.241	2.78	1.17
2002	6.527	2.54	1.37
2004	6.695	2.36	1.46
2006	6.967	2.25	1.67
2008	7.238	2.19	1.60
2010	7.359	2.15	1.68
2012	7.812	2.11	1.86
2014	8.373	2.07	2.03
2016	8.980	2.04	1.89
2018	9.623	2.00	1.92
<i>Source: World Bank (3–5).</i>			



## **2.3 Factor Influencing Fertility Declination**

The drop in fertility rates involves many factors that contribute to it. This section will explain the factors that contribute to fertility rates decline in terms of socioeconomic development, access to education and healthcare, and cultural and social norms.

### **2.3.1 Socioeconomic Development**

When discussing the factors of socioeconomic development, it correlates with the urbanization of the population. Logically, urbanization growth often leads to smaller family sizes due to limited space, higher living costs and different social norms. This statement, supported by (Jaffe, 1942) a number of well-known demographers conducted analyses on the topic and their conclusions all pointed to urbanization as a major contributing cause to the decline in fertility in developed nations.

Apart from that, economics conditions also influence the sustained low fertility rates of a population where the increasing costs of child nurturing and uncertainty in the economy inhibit the growth of bigger families. This evidence supported by (Muadz Bin Zulqarnain & Md Yusuf, 2022) tells that in past researchers conducted a quasi-experimental data that income and direct costs of children are significant towards fertility behaviors.

Moreover, another author highlights that some workers nowadays limit their family size since they need to commit to their work and need to send their children to child daycare while at work thus resulting to high cost to raise a child (Muadz Bin Zulqarnain & Md Yusuf, 2022). All of this evidence implies that the more the urbanization of a population, the high cost needed to raise a child and smaller the family sizes.

### **2.3.2 Education**

This section reveals that in term of education landscape especially women that holds higher education and climb up the career ladder contributes to the declination rates for Malaysia. Few authors have concluded these statements several times such as research done by (Tang and Tey, 2017) in Malaysia found that higher education, career development of women, led to a decline in the fertility rate for Malaysia.

(Ketaki Chandiok, Prakash RanjanMondal, Chakraverti Mahajan, 2016) investigated the biological and social determinants of fertility in India. The study highlighted that women's self-determination, often reflected in their educational attainment and occupational status, significantly influences family size. Women who are self-determined often marry later and are more mindful about family planning. For working women, pregnancy can limit opportunities for personal development, as it involves extended maternity leave and attention to their health and their baby's well-being. Consequently, women's employment patterns may experience interruptions due to childbearing and family responsibilities (Yusuf, 2012).

Women are now participating in the labour force in significantly greater numbers and are staying active throughout their childbearing and child-rearing years. They are no longer seen as a secondary or reserve workforce. Historically, especially in developed countries, a "double peak" trend was common—women would join the labor force in their twenties, leave temporarily to have and raise children, and return later after completing their childbearing responsibilities (Mujahid & Uz Zafar, 2012).

## **2.4 Impacts of Fertility Rates Changes**

Changes in fertility rates can influence population growth, age structure, and workforce composition, thereby affecting economic development, resource allocation, and social policies. High fertility rates often strain resources and infrastructure in rapidly growing populations, while declining fertility rates can lead to aging populations and labor shortages. This section will emphasize the impact of this changes especially in term of economic impacts.

### 2.4.1 Economic Impacts

When the size of the populations of a country shrinks over time, indirectly will give impact to its economy and unbearable to sustain. The implications of fertility declines include life expectancy rising where the more individuals over 65 years than young generations called aging population. The shortages of workers in a country will likely happen due to decreasing number of young generations to contribute to growth of economy. Lastly, the government needs to

#### 2.4.1.1 Aging Population

Overall world population were expected to experience ageing nation due to sustained low fertility rates over the past few decades supported by (Mohd et al., 2021) claims that low fertility rates and increases in longevity can result in an increase in the aged population. Through researchers' findings there were several definitions regarding ageing population or nations and surprisingly there are differences between both "ageing society", "ageing nation" and "super-aged society".

Ageing society defined as where the population of a country consists of minimum 7 percent of the population who aged 65 and older according to (Sharayu Pillai, 2023). While the ageing nation has 14 percent or more in similar age groups. Moreover, the population who are aged 65 and older has more than 20 percent in the population called super-aged society.

**Table 2.1** The definition of Aging Society, Ageing Nation and Super-aged society  
(Sharayu Pillai, 2023)

Definitions		
Ageing Society	Ageing Nation	Super-aged society
"Population has at least <b>7 percent</b> of the population who are aged 65 and older."	"Population has <b>at least 14 percent</b> of the population who are aged 65 and older."	"Population has <b>at least 20 percent</b> of the population who are aged 65 and older."

Ageing population however will cause many consequences in country toward its population itself in terms of economic, health and social perspectives as claimed by (Bhattacharjee et al., 2024) where the authors stated that a sustained low fertility rate will result in ageing of the population will lead to challenges in the economics of the country and consequently creates pressure on healthcare systems, social security programmes as well as the labour workforce.

#### **2.4.1.2 Workforce Shortages and Low Productivity**

Following to the population of ageing nation slightly give an implication to reduction of labor force participants as higher proportion of older individuals with fewer children are being born leading to fewer young people entering the labor market in the future as portrays by (Mohd et al., 2021) the number of laborers may be impacted by an aging population since population growth is slowing down. Therefore, this situation could have many consequences to the job market and the economic growth of the country itself.

Since the number of labor participants has been reduced, the income of the country will decrease resulting to slow down the economy of the population as mentioned by (Otsu & Shibayama, 2016) the declination of the size of the workforce will decrease subside the income of the country as the number of workforce could participate to the industrial market is shrinking. Thus, the national income of a population can be challenging to sustain over the longer term, leading to various consequences if a country fails to implement effective measures to foster economic growth.

Consequences with the higher proportion of aged workers will decline in the productivity of the workers. The effect of this situation results in lower productivity outcome that can contribute to the decline growth of economy. (Börsch-Supan et al., 2021) who discovered that older people would produce less productive labor outputs after a certain age, can support this. The overall rate of technological advancement in society will decline due to the internal structure of the workforce is skewed toward "aging"(Mohd et al., 2021).

#### **2.4.1.3 Economic Growth tied to Demographic Dividends**

As we can review from the consequences of declination of fertility rates of a population where there is likely fewer new young generations and higher proportion of ageing people will lead to ageing society. The number of labor workforce participation will start to shrink, and the output of the workforce's productivity tends to be slower thus leading to a decrease in economic growth. This is proven by research done by (Maestas, Mullen, & Powell, 2016) in United States, the ageing population will lead to decrease in economic growth.

Above statement is further supported by another author (Mohd et al., 2021) shows that a 16.8% increase in the population who were 60 years and older led to a 9.2% reduction in GDP between 1980 and 2010. (Modigliani and Brumberg, 1954) through their life cycle hypothesis, support the opinion that an ageing population can slow down economic growth. It is concluded by (Mohd et al., 2021) Malaysia might not achieve to become one of the developed countries of 2030 results of this aged population.

Due to slow down of economic growth, it is hard for a country to plan for their national savings due to the early stage of aging population. In a study done by (Modigliani and Brumberg, 1954) , the life cycle hypothesis suggests that at an early stage, the ageing of the population will affect a rise in national savings. However, as the population continues to age and some relative proportions of the population reach their retirement age, this hypothesis predicts a reduction in aggregate savings due to an increase in the ageing population.

In a theory by Solow's growth theory indicates that stable economic growth of country seems difficult to sustain in economy where the population is aging. This supported by (Gruescu. S, 2007) the ageing of a population has a negative impact on economic growth based on this theory. Only when the population's age distribution stays consistent can steady state growth or stable growth circumstances be achieved. However, the age distribution of an economy with an aging population is not stable. As a result, this is only feasible while the economy is moving toward stability.

Past studies by (Maestas et al., 2016) also discovered that the decreasing fertility rate and increasing aging indicators like the old age dependency ratio and the population aged 65+) are likely to hinder economic growth. (Teixeira, Renuga Nagarajan, & Silva, 2017) discover that the increasing age of the population adversely affects the expansion of developed nations, unlike that of less developed or developing nations.

However, it is essential to sustain the population size to promotes long-term economic development to have more national income growth as the income can be use by the government to provide more public goods and facilities to Malaysians (Mohd et al., 2021). This raises questions by (T. & James, 1992) to the recent argument regarding the impacts of an ageing population. He states that humanity is fated to exist in perpetual poverty since the increase in agricultural output will consistently lag the rise in population.

Another researcher gives their opinion on the reduction in size of populations impacts the evolution of long term economy through endogenous growth models such as (Romer, 1990) states the size of the population is important for the long term development of the economy through endogenous growth. Same goes to (Prettner, 2013) integrates endogenous growth models from (Romer, 1990) with semi endogenous growth models and discovered that an increase in longevity positively affects per capita economic growth. The decline in fertility rates creates adverse effects on economic growth.

Moreover, the beneficial impact of longevity prevails over the adverse effect of fertility. Population aging encourages sustained growth within the endogenous growth model. (Prettner, 2013) concludes that ongoing demographic shifts do not inherently obstruct technological advancement and are a factor in economic prosperity. He also contends that falling birth and death rates may result in a rise in the rate of economic growth.

#### **2.4.1.4 Healthcare and Pension Systems**

Conversely, general government expenditure on health is rising slightly (Mohd et al., 2021). In 2018, Japan allocated 10.9% of its GDP to health expenditure, reflecting its high proportion of elderly citizens (Mohd et al., 2021). Selvaratnam et al. (2021) note that Malaysia's increasing life expectancy has led to higher government spending on pension costs, the Employee Provident Fund (EPF), and health services for the elderly. This trend creates a financial burden on individuals, families, and policymakers, involving significant expenses related to housing and healthcare (Mohd et al., 2021).

Louria (2022) suggests that life expectancy increases could push average lifespans to 100-120 years, leading to various social challenges. These include rising health expenditures for those aged 65 and over, quality of life concerns, potential strains on social security and pension systems, and other related issues. Baharin and Saad (2023), using the autoregressive distributed lag (ARDL) method and vector error correction model, confirm that the growing elderly population has a significant impact on Malaysia's health expenditure.

Similarly, Ismail et al. (2015) argue that reducing the old dependency ratio could lessen the tax and social security burdens on employees, potentially easing the financial strain associated with retirement income and elderly healthcare. Despite, India faces similar challenges, with an aging population potentially reducing saving rates and increasing unemployment risks.