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A GENERAL THEORY OF POPULATION AGING AND ITS IMPACT ON SOCIO-ECONOMIC DEVELOPMENT

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Abstract. *Population aging is becoming one of the discussed topics not only in Vietnam but all over the world and is one of the most important social transformation phenomena of the 21st century. This process will affect to most areas of social life such as the labor market, finance, demand for goods and services, education, social security and health care for the elderly, etc. Research on aging, especially in a developing country like Vietnam, has become more urgent than ever, when the aging rate is fast but the average income is low and the social security budget is tight. Therefore, population aging can slow down the economic growth and increase the burden on the budget, even affecting social stability. This article analyzes the current situation and aging trends in Vietnam. Next, it focuses on clarifying the general theory of the mechanism of population aging and pointing out the impact of population aging on socio-economic development. Quantifying the impact of aging on socio-economic growth is very complex, requiring in-depth, multi-disciplinary, multi-field and multi-dimensional research. This analysis has reviewed some reliable assessment methods in the world as well as in Vietnam on aging. The results suggest a more multifaceted perspective on aging, referring to the consideration of the age structure of the population in development. At the same time, research on aging requires the participation of scientists, policymakers, etc. to effectively respond to an aging society.*

Keywords: *population aging, elderly people, socio-economic development*

Introduction

Nowadays, when mentioning about population aging, it is not a latest issue anymore, for example, in Europe, Japan or Vietnam at the moment. Population aging is often referred to as an increase in the average life expectancy of a population, or the process by which older people make up a larger proportion of a population. The simultaneous dual effects of differences in past fertility and mortality, and recent decline in fertility and increase in life expectancy, are causing a significant change in the age structure.

By 2030, 1 in 6 people in the world will be aged 60 years or over. At this time the share

of the population aged 60 years and over will increase from 1 billion in 2020 to 1.4 billion. By 2050, the world's population of people aged 60 years and older will double (2.1 billion). The number of persons aged 80 years or older is expected to triple between 2020 and 2050 to reach 426 million[1].

Vietnam is likewise dealing with an aging population. According to the General Statistics Office of Vietnam (GSO), the proportion of the population aged 60 and over accounts for 11.9%, which indicates that the country is already aging. Vietnam's aging trend is comparable to the rest of the world which is steadily growing, but at a quicker rate. It is forecasted that in 2049, just about 30 years from now, the proportion of the elderly population (60 years and older) in Vietnam will reach 24.8%, or more than twice as much[2].

It is noticeable that the elderly are not only increasing rapidly in absolute numbers but also becoming healthier, the duration of healthy old age seems to be increasing. In addition, different age groups have variousneeds and abilitíe to work so a country's economy is likely to change in terms of the population ages.

A basic approachto quantify the socioeconomic impacts of aging population is usually based on two pillars: 1) it assumes that the behaviours do not change with age related to employment, consumption, and savings, and 2) changes in the size of the elderly population are in comparison to the working-age population. However, this simplistic method may not accurately reflect the effects of aging because increasing life expectancy may cause individuals to stay in the labour force longer and start saving at a later age. In addition, as life expectancy and aging populations increase, pension policy, wages and healthcare financing, labour and capital market efficiency, and the structure of the economic system are likely to be adjusted [1].

Therefore, in order to be able to accurately assess the status and impacts of population aging on the socio-economic situation, it is necessary to thoroughly research the theoretical basis of the population aging mechanismas well as its impact through the alternations in the age structure on socio-economic foundation, thereby proposing future research directions.

Theoretical foundations of population aging

Definition. Population aging is defined as a shift in the population distribution of a country towards an older age. This is often reflected in an increase in the average and median age of the population, a reduction in the percentage of the population that is made up of children, and a rise in the proportion of the elderly individuals [2].

Causes of Aging. In a population that does not take into account migration-induced fluctuations, there are three primary factors behind past and future attribute to increase the share of the aging population [1]:

Firstly, the decline in fertility in recent decades has reduced the relative number of young people and increased the proportion of the elderly. Most of this decline has been occurring in developing countries.

Secondly, as the number of people living to age 60 or more increases, the absolute number of elderly people will increase. Combined with a decrease in fertility, the proportion of

[1] Ageing and health // World Health Organization : [site]. URL: https://www.who.int/news-room/fact-sheets/detail/ageing-and-health (accessed on 25.10.2023).

[2] Completed Results of the 2019 Viet Nam Population and Housing Census / General Statistics Office. Hanoi : Statistical Publishing House, 2019. 840 p. ISBN 978-604-75-1532-5; Vietnam Population Projection 2014–2049 / General Statistics Office ; United Nations Population Fund. Hanoi : Vietnam News Agency Publishing House, 2016. 249 p. 978-604-945-768-5.

this group in total upsurge sharply.

Thirdly, population aging is related to differences in fertility and mortality in the past. For example, the baby boom caused by the growth fertility after the war.

It is obvious that when there is an component of migration, if the emigrants are young, the population of the destination will rejuvenate, and vice versa. In particular, when the immigrant group is a young generation of childbearing age, the proportion of the young population at the destination will increase rapidly, although immigrant youth often have a different birth rate than the native population.

A highly scientific and convincing analysis is provided by L. A. Gavrilov and P. Heuveline [2] to demonstrate the reasons and mechanisms of demographic change affecting population aging, specifically:

To understand the demographic factors that cause population aging, demographers often refer to stable population patterns. This model assumes that the age-specific birth and death rates remain constant over time, resulting in a population whose age distribution does not alter: It becomes "stable". In contrast, the model suggests that in a non-migrant population, any modifications in the age structure, in particular population aging, can only be attributed to changes in the birth and death rates.

The effect of changing fertility rates on population aging may not be obvious at first glance. However, holding all other factors constant, the decline in fertility rates reduces the size of the closest birth cohort compared to the previous birth cohort, i.e. a decrease in the size of the youngest cohort compared to the older groups. After one or a few generations, the low fertility rate in the past led to a decline in the percentage of people entering the childbearing years. As a result, a decrease in the proportion of young people (as the current fertility rate continues to decline compared to the former).

The effect of changes in the mortality rate on population aging may seem at first glance to accelerate this process. However, the fact that a reduction in mortality does not always contribute to an accelerated aging process. Specifically, reducing the mortality rate of infants, children, and those younger tends to decrease median ages. It is obvious that a drop in infant mortality indicates an increase in the number of people aged 0, as a result, a decrease in aging population and an increase in the birth rate. In contrast, when the old's mortality rate falls, it means that they live longer, resulting in a rise in the proportion of senior persons in the overall population.

From the above analysis, it is shown that population aging is related to demographic transition (Fig. 1). This model was built by French demographer Adolphe Ladry (1874–1956) and has been constinuously followed and developed by other scientists in the world such as Frank W. Notestein (1902–1983) [3].

Accordingly, in the demographic transition model, the transitions from the period of high birth and death rate (stage 1) to the stage of lower fertility and death rate (stages 2, 3, 4 and 5). Some demographers lump this model into stage 4, instead of stage 5 as shown below (with stages 4 and 5 combined as one)[3], but the rule is that during this transition, the age structure is affected differently.

[3] Williams, J. Understanding the demographic transition // Earthbound Report : [site]. URL: https://earthbound.report/2012/11/21/understanding-the-demographic-transition/ (accessed on 25.10.2023).

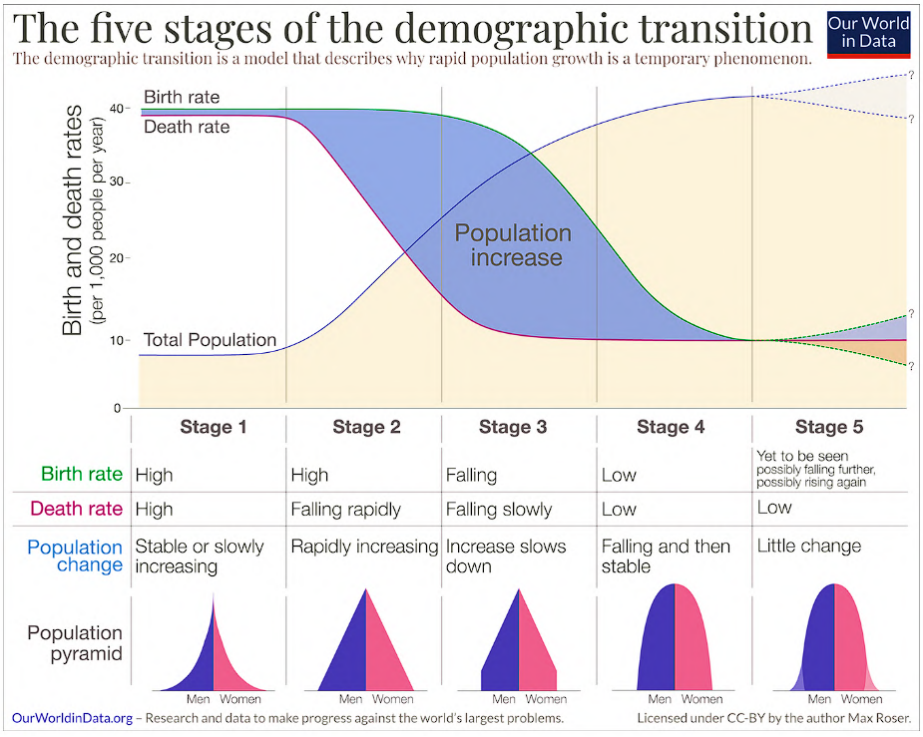

Fig. 1. **Demographic transition model**
Source: Our World in Data[4]

Stage 1: high mortality and high birth rate. For a long time before the population grew rapidly, the birth rate was high because the same pattern of the death rate and the population growth was rapid. At this stage, the population is characterized by a very young age with a wide base of the population pyramid because of the high mortality rate at all ages – and the particularly high risk of death for children – the pyramid is much narrower towards the top.

In sequence, in stage 2, mortality decreases but fertility remains high. The population transition begins with successes in preventing infectious and parasitic diseases that help reduce infant and child mortality. The result in addition to the sharp increase in population size is an improved life expectancy. However, fertility ratios tend to be flat, thus creating large birth cohorts and an increasing proportion of children to adults. Likewise, this initial drop in mortality still results in a younger population structure.

Stage 3: With a dramatic reduction in fertility, there is a low and slightly reduced mortality. After newborn and child mortality rates continue to fall, it becomes increasingly favorable for people of a later age, and fertility rates begin to fall sharply. Because of the enormous discrepancy, positive residual between fertility and mortality rates, the population continues to grow fast. The age group of 0–14 year olds will see little change in size due to the steep decline in fertility rates. Despite the fact that the population is relatively young, the population structure by age has begun to shift toward an increase in the proportion of

[4] Roser, M. Demographic transition: Why is rapid population growth a temporary phenomenon? // Our World in Data : [site]. URL: https://ourworldindata.org/demographic-transition (accessed on 09.10.2023).

people in the older age groups.

Stage 4: Low and slightly reduced mortality along with low fertility. The population growth quickly ended and the population turned into a strong ageing. Population size continues to increase, albeit at a slow pace, because of population growth – despite low fertility, the proportion of the cohort in reproductive age is large, so the number of births is still increasing. The population gradually changes in the lower age groups (shown in the population pyramid). After a decline in infant and child mortality, further declines in mortality benefit those of an older age, and eventually a decline in birth rates, and sometimes very rapid declines. Both of these changes contribute to reversing the effect of declining mortality on age structure, and this synergy is known as double aging. Most developing countries today are going through this process.

At the beginning of stage 5 which also known as useful population equilibrium (i. e. low fertility, low mortality), which is the post-aging period, the cycle will shape the size and structure of the population quite stable as situation at the end of stage 4. More in-depth studies are needed at this stage because if countries have a "very old" or "super-old" population at the end of stage 4, they will have to bear very heavy consequences. from its aging population.

As a rule, as countries become increasingly aware of the negative effects of population aging, policies are initiated and it is possible that the demographic transition will be impacted by changes in the population. the process of economic and social modernization. When a society develops at a very high level, unfortunately only very few societies achieve it, at this stage fertility will tend to increase slightly again.

The rate of population aging can be moderated by migration. When immigrants are younger than the population median age and have greater fertility rates than locals, immigration delays population aging (in Canada or Europe, for example). Working adult migration, on the other hand, hastens the aging of the population in the regions of origin (Caribbean countries).

Population aging patterns in Vietnam

Despite concerns surrounding medium- and long-term population projections, a basic observation at today's age structure makes it obvious that Vietnam is experiencing an unprecedented phenomenon in terms of population aging. The proportion of 60+ and 80+ age groups in the total population is increasing at a high rate. Vietnam's population has grown from 25 million in 1950 to about 96 million today[5]. By 2049, with the average fertility scenario, its size is expected to reach 108.5 million (Fig. 2). The number of elderly people over 80 years old will rise from 1.9 million in 2019 to about 4.3 million in 2049. Moreover, elderly populations are starting to make up a significant proportion in total, for example such as the residents age 80 and older will increase from 2.0% in 2019 to 3.9% in 2049[6].

[5] Vietnam Population Projection 2014–2049 / General Statistics Office ; United Nations Population Fund. Hanoi : Vietnam News Agency Publishing House, 2016. 249 p. 978-604-945-768-5; World Population Prospects // United Nations Population Division : [site]. URL: https://population.un.org/wpp/ (accessed on 25.10.2023).

[6] Completed Results of the 2019 Viet Nam Population and Housing Census / General Statistics Office. Hanoi : Statistical Publishing House, 2019. 840 p. ISBN 978-604-75-1532-5; Vietnam Population Projection 2014–2049 / General Statistics Office ; United Nations Population Fund. Hanoi : Vietnam News Agency Publishing House, 2016. 249 p. 978-604-945-768-5.

Table 1

Number and proportion of older persons in the total population of Vietnam, 1950–2049

Year	Population (million people)			Proportion (%)	
	Total	60+	80+	60+	80+
1950	24,9	1,7	0,1	6,9	0,3
2019	96,2	11,4	1,9	11,9	2,0
2049	108,5	26,9	4,3	24,8	3,9

Source: World Population Prospects[7], The 2019 Viet Nam Population and Housing Census[8], Vietnam Population Projection 2014–2049[9]

According to the legislation, specifically the Law on the Elderly, in Vietnam today, people aged 60 and over are considered as elderly[10]. The variation of the age group 60 and above is easily seen from Figure 2, with the size and proportion of the elderly group continuing to increase rapidly. In particular, the proportion of the age group 0–14 and the age group 15–59 also gradually narrowed, in which the size of the population group 0–14 decreased significantly, further exacerbating the aging process of the population in Vietnam in the future.

Based on actual data and analysis from the theoretical framework, Vietnam's population is currently in the second half of phase 4 in the demographic transition model.

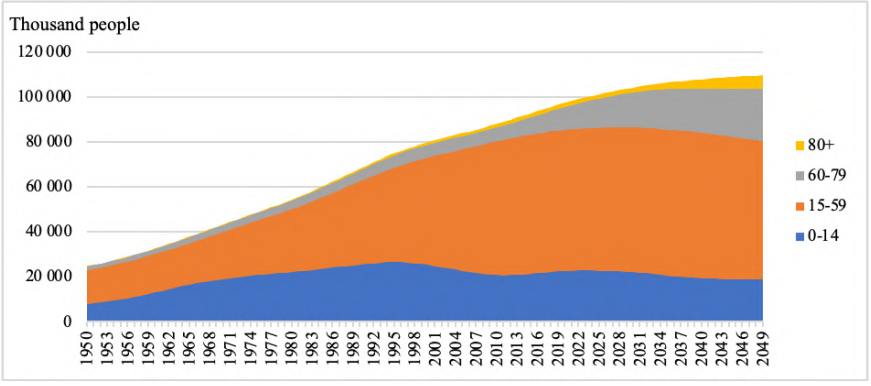

***Fig. 2.* Changes in size and age structure of Vietnam's population, 1950–2049**

Source: World Population Prospects[11], The 2019 Viet Nam Population and Housing Census[12], Vietnam Population Projection 2014–2049[13]

[7] World Population Prospects // United Nations Population Division : [site]. URL: https://population.un.org/wpp/ (accessed on 25.10.2023).

[8] Completed Results of the 2019 Viet Nam Population and Housing Census / General Statistics Office. Hanoi : Statistical Publishing House, 2019. 840 p. ISBN 978-604-75-1532-5.

[9] Vietnam Population Projection 2014–2049 / General Statistics Office ; United Nations Population Fund. Hanoi : Vietnam News Agency Publishing House, 2016. 249 p. 978-604-945-768-5.

[10] Luật số 39/2009/QH12 của Quốc hội: Luật người cao tuổi [Law No. 39/2009/QH12 of the National Assembly: Law on elderly] // Chinhphu.vn : [site]. URL: https://vanban.chinhphu.vn/default.aspx?pageid=27160&docid=92321 (accessed on 09.10.2023).

[11] World Population Prospects // United Nations Population Division : [site]. URL: https://population.un.org/wpp/ (accessed on 25.10.2023).

[12] Vietnam Population Projection 2014–2049 / General Statistics Office ; United Nations Population Fund. Hanoi : Vietnam News Agency Publishing House, 2016. 249 p. 978-604-945-768-5.

[13] Ibidem.

Socio-economic impacts of population aging

Scholars studying economic growth have pointed to many influencing factors and often focus on a few main directions, such as: 1) improving productivity in all industries and demand shifting towards sector, that is, reallocating labor from low-productivity agriculture to more productive industrial and service sectors; 2) technological progress, human capital, institutions and governance, macroeconomic policy and trade, and contingencies. However, it seems that the aging variable has received little attention and has only been interested in recent times.

P. Samuelson [4; 5] was one of the first economists to focus on issues related to population as a factor affecting economic growth. It is population growth, aging-dependence, income, and the central role of intergenerational transitions in accumulation. The analysis by D. Cutler et al. [6] localized and analyzed macroeconomic issues in detail with more realistic demographic models. Further, D. Weil [7; 8] analyzed the economics of aging. The studies of W. J. McKibbin [9] or R. Tyers and Q. Shi [10] also included demographic variables (gender, age, etc.) into the model when considering the feedback effect from economic growth to progress. technology and human capital accumulation, thereby affecting economic growth.

Population aging is often viewed as a negative rather than a positive, driven by the burden it places on economic development. To simplify, studies often compare older and younger working-age populations to examine the economic burden that aging population structure has on the economy.

Thus, the problem is to point out the impact of aging on socio-economic development and quantify it accurately. To solve this problem, it is necessary to review some assessment methods in the world as well as in Vietnam and it is necessary to have multi-dimensional perspectives.

Basic comparison

One of the basic indicators often used to show the impact of population age structure on socio-economic is the dependency ratio. This ratio reflects the relationship between the working age population and the non-working age groups (children and the elderly – considered the young and old dependent population).

Table 2

Some formulas for dependency ratio

No.	Working age	Dependency ratio	Child dependency ratio	Aged dependency ratio
1	15–59	$DR = \frac{P_{0-14} + P_{60+}}{P_{15-59}} \times 100$	$DR_{0-14} = \frac{P_{0-14}}{P_{15-59}} \times 100$	$DR_{60+} = \frac{P_{60+}}{P_{15-59}} \times 100$
2	15–64	$DR = \frac{P_{0-14} + P_{65+}}{P_{15-64}} \times 100$	$DR_{0-14} = \frac{P_{0-14}}{P_{15-64}} \times 100$	$DR_{65+} = \frac{P_{65+}}{P_{15-64}} \times 100$
3	20–64	$DR = \frac{P_{0-19} + P_{65+}}{P_{20-64}} \times 100$	$DR_{0-19} = \frac{P_{0-19}}{P_{20-64}} \times 100$	$DR_{65+} = \frac{P_{65+}}{P_{20-64}} \times 100$

Source: World Population Prospects[14]; Vietnam Population Projection[15]; Vietnam Labour and Employment Survey[16]

[14] World Population Prospects // United Nations Population Division : [site]. URL: https://population.un.org/wpp/ (accessed on 25.10.2023).

[15] Vietnam Population Projection 2014–2049 / General Statistics Office; United Nations Population Fund. Hanoi : Vietnam News Agency Publishing House, 2016. 249 p. 978-604-945-768-5.

[16] Labour and employment survey data warehouse // Portal.thongke.gov.vn : [site]. URL: http://portal.thongke.gov.vn/khodulieuldvl/ (accessed on 25.10.2023).

There are differences in the conventions of working age, old age, and the group of populations that are considered aged dependents in many countries around the world. Some countries follow the common convention of the United Nations to mark the aging population or elderly dependent group aged 65 years and over. Previously, in Vietnam, the working age population group (by convention from 15–59) was called the potential support group. The potential support ratio for the elderly group is the ratio of the population aged 15–59 to the age group 60 and older [11]. However, now Vietnam has also changed the age of old dependency according to the common convention of the world, from 65 or more[17].

The dependency ratio or potential (expected) support ratio is a simple and intuitive tool for analysis to capture purely demographic consequences, but it is not a accurate forecast.

There is a contradiction between the legal documents and the reality as well as the calculation of statistical indicators in Vietnam. For example, the Law on the Elderly of Vietnam stipulates that citizens aged full 60 years or older are the elderly, the revised Labor Law has also recently proposed reform to raise the retirement age (previously the retirement age for men was 60 and for women was 55), while, according to statistical reports, the labor force is still conventionally defined as the population aged 15–64. That is, female workers who are not old have retired while male workers are old but still working. Thus, general invisibility will make it difficult to compare statistical indicators, such as determining the potential support ratio for the elderly (or old people). However, within the scope of the research, this article does not go into analysis from the perspective of law-making, but only suggests the need for legislative reform to be consistent with the current situation.

Attempts to precisely quantify the impact

It is noticeable that the alternations in the age structure of the population can have a significant effect on economic growth. Calculating the impact of the conventional age structure only shows the trend but cannot accurately quantify its impact on the economy, so recent studies around the world have applied the new method, based on the life cycle perspective [1].

This perspective is based on the fact that people's economic needs and contributions are different at different stages of life, i. e. at different ages. Specifically, the consumption-to-production ratio tends to be high for young and elderly groups and low for people of working age. This means that the main drivers of economic growth such as aggregate labor supply, productivity, consumption and saving will tend to change depending on their point in the life cycle (in other words depending on the at their age). Among these factors, it is well understood that labor supply and savings are higher among people of working age than among those who are presumed to be elderly (e. g. in Vietnam it is from 60 years old, in many other countries it is from 65 years old or older). Thus, as a general rule, other things being considered equal, a country with a large proportion of children and the elderly will tend to grow more slowly than a country with a high proportion of people of working age.

One of the methods, according to D. Cutler et al. [6], that can help accurately quantify the contribution of the age structure to economic development is the "National Transfer Account" (NTA). For example, in Vietnam, by convention, the age to contribute positive growth to the economy will be from 15–59 (or 15–64, according to the new convention of the General Statistics Office from 2015), however, according to research results in 2014 by NTA method,

[17] Labour and employment survey data warehouse // Portal.thongke.gov.vn : [site]. URL: http://portal.thongke.gov.vn/khodulieuldvl/ (accessed on 25.10.2023).

the age of generating life cycle surplus is only from 21 to 57 years old[18].

With the estimated results from the NTA method, the data shows that based on the life cycle, in general, Vietnamese people start to have income from the age of 14, then income begins to increase rapidly between the ages of 15–63, and declines rapidly at age 64 and reaches zero at age 90. At the same time, spending increases rapidly from 0 to 18 years old, then begins to decrease slightly between the ages of 19–35, increases again between the ages of 35–57 and gradually decreases between the ages of 58–90. However, at this late stage, spending levels remain high (Fig. 3).

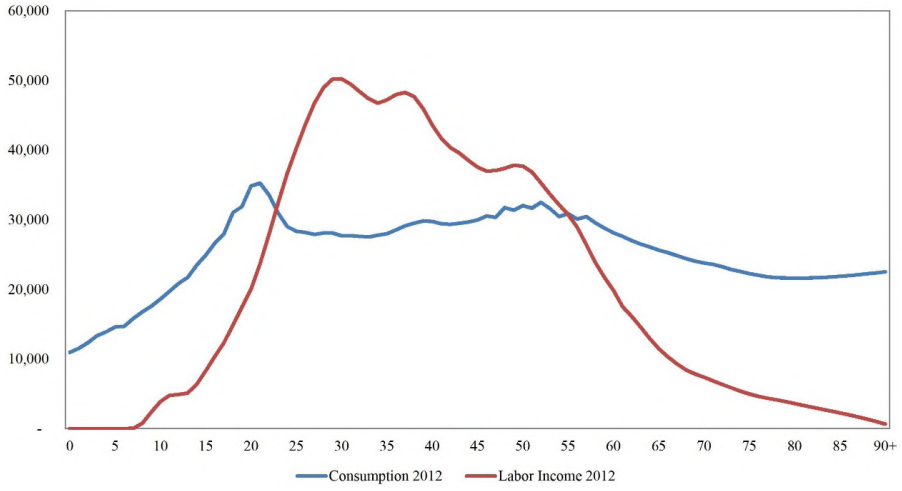

***Fig. 3.* Labor income and expenditure in Vietnam by age, 2012**

Source: Pham Ngoc Toan[19]

Are the effects of aging, particularly the elderly population, really all negative? If following the NTA method, not only the elderly group but also those who are 57 years old or older (i. e. not old), have also contributed to negative growth.

Limitations in impact accounting

When quantifying the impact of age structure on socioeconomic status, economists often rely on the assumption that if the specific behavior of individuals with the supply of labor and savings is fixed, then the supply of labor and savings are fixed. savings per capita will tend to decrease as the proportion of elderly people increases. Assuming that other factors such as productivity and migration are the same, this means lower per capita income. However, these assumptions are not true in practice because behaviors change over time.

Many scientists have made outrageous arguments and alarming views about the negative effects of aging. P. Peterson [12] suggested that "global aging could cause a crisis engulfing the world economy, Ken Dychtwald also raised concerns that the older generation would

[18] Impacts of Changes to the Population Age Structure on Viet Nam's Economy and Policy Recommendations // UNFPA Vietnam : [site]. URL: https://vietnam.unfpa.org/sites/default/files/pub-pdf/PD_NTA%20Policy%20Brief%202016_ENG_printed%20in%202016.pdf (accessed on 09.10.2023).

[19] Pham Ngoc Toan. Impacts Of Labor Productivity by Age and Changes in Age Structure on Labor Productivity in Vietnam // National Transfer Accounts Project : [site]. URL: https://ntaccounts.org/doc/repository/Toan%20Presentation.pdf (accessed on 09.10.2023).

"swallow all resources"[20]. Similarly, former Federal Reserve Chairman A. Greenspan [13] warned that aging in the United States "makes health care and social security programs unsustainable in the long run".

Aging certainly has a negative impact on economic development, however, it is not as severe as scholars have predicted. For example, a recent publication by N. Maestas [14] based on interstate population aging rates in the United States for the period 1980–2010 to estimate the economic impact of aging on output. per capita of the states. The results show that a 10% increase in the proportion of the population aged 60 and over reduces the GDP per capita growth rate by 5.5%. Two-thirds of the decline is due to slower growth in labor productivity by age, while one-third is due to slower labor force growth [14].

On the other hand, the fluctuations in the past through statistical analysis show that the population size increases, the proportion of elderly people increases, but the economy grows at a faster rate[21] [15] thanks to scientific and technical progress and increased labor productivity, therefore, the economy always has positive growth. This destroys the view of Malthus and its followers, both past and present, represented by P. Peterson [12] or K. Dychtwald[22].

One thing that cannot be forgotten is that child costs are largely provided by parents' costs (for raising children) which are private transfers and investment of human resources (partially financed and considered consumption at the moment), paid for by a mixture of public (state) and private (individual, household, etc.) transfers. The elderly's consumption in excess of their labor income is financed by a series of public and private transfers and asset-based reallocations. Excess labor income during prime years of employment is passed on to taxes, private transfers and savings [16].

The investment in the future human resources of parents (spending on children's education) will lead to an increase in the labor productivity of the young population in the future. As adult children enter the labor force, the economic increase from this generation will contribute to government spending on social security, and this is the result of investment in social security and human resources from the older generation – the parents themselves. The higher the investment level of parents in the future human resources (i. e. for their children), the higher the productivity and quality of potential labor of this generation, the more inevitable the world's contribution will be the greater the number of children in the government budget for social security.

From the side of businesses, employers can see that if acting quickly, tapping into and enhancing contributions from older workers can become a key competitive advantage. This can obviously be seen in Japanese companies, which are characterized by labor shortages and aging populations [17]. Older workers are often seen as a burden and weaker than younger candidates in hiring decisions. However, in an economy where knowledge is the rule, the experience of older workers develops value; older ones can contribute to the productivity of workgroups by sharing their expertise. With part-time job allocation, fit for health and remote working will attract older workers to continue working. In addition, the shift from a seniority-based to a performance-based pay system will lead to a loosening of company standards around retirement age.

[20] Dychtwald, K. Ken Dychtwald on the Future // SFGate : [site]. URL: https://www.sfgate.com/news/article/Ken-Dychtwald-on-the-Future-3312121.php (accessed on: 15.08.2023).

[21] Salmon, F. How poverty has tracked global population // Reuters : [site]. URL: http://blogs.reuters.com/felix-salmon/2011/10/31/how-poverty-has-tracked-global-population/ (accessed on: 15.08.2023).

[22] Dychtwald, K. Ken Dychtwald on the Future // SFGate : [site]. URL: https://www.sfgate.com/news/article/Ken-Dychtwald-on-the-Future-3312121.php (accessed on: 15.08.2023).

By market segmentation, the elderly population is also a consumer population. Although with a lower spending level than other population groups, they also promote the development of production of goods and services for the elderly[23]. Moreover, compared with young people, the elderly have a longer working time, so they will save, accumulate more and hold more assets. Thus, the view that an older person pays for consumption from his or her own property income is "dependent" on the worker as well as seeing population aging without taking into account its contribution to the economy. Economic development through the market is forced.

Behavioral changes of the elderly

As family size and life expectancy change, individuals' behavior may alter in a number of ways, in particular:

First, with better health and increased life expectancy, one can expect individuals to work longer [18], the theoretically optimal response to increasing age. Life expectancy is commensurately increasing years of service and retirement years, without changing time-specific saving behavior. However, in some recent works, the results show that in developed countries, although life expectancy increases and the intention to prolong working time of the elderly increases, in fact, the participation rate is not high. Their labor market participation did not increase as expected or even decreased [19]. This is explained by the fact that in developed countries, the system of social security and pension payment has ensured the life of the elderly. This is even more pronounced in countries with policies that encourage retirement or mandate retirement to receive pension benefits [20].

In general, in Vietnam nowadays, the pension and social security programs are regrettably only at the level of support, but do not guarantee a minimum life for the elderly after working time. Therefore, the elderly still participate in the labor force accounts for a high proportion. As of the deceber of 2021, 50,1% of the elderly (60–64) participated in the labor force, and 23,0% of people aged 65 and over continue to participate in the labor force[24].

Second, even if individuals decide not to work longer, the increased life expectancy can be expected to generate increased savings over the working life to finance a further life as well as continue to hold high standards in retirement. In the researches of D. Bloom et al. [21] showed that, in general, increased life expectancy is also associated with higher savings rates. Particularly, D. Bloom et al. [18] found that savings rates increase with life expectancy in countries with universal pension coverage and pension incentives, but not in countries with high wage systems demand and high replacement rate.

This once again illustrates that in Vietnam, when employees have low income, the savings rate during working time is very low. Inevitably, elderly population still continue to participate in the labor market.

Third, as fertility declines, which means the number of children per woman declines, women will have more opportunities for advancement and, as a result, more women will enter the workforce. D. Bloom et al. [1] estimate that labor force participation rates increase significantly over the years as fertility declines, with each unit decrease in the Total Fertility Rate (TFR) increasing the female labor force participation rate which ranges from 5 to 10 percentage points.

[23] Hepburn, D. Mapping the World's Changing Industrial Landscape // Chatham House : [site]. URL: https://www.chathamhouse.org/sites/default/files/0711bp_hepburn.pdf (accessed on: 15.08.2023).

[24] Report on Labour Force Survey 2021 / General Statistics Office. Hanoi : Statistical Publishing House, 2022. 2015 p. ISBN 978-604-75-2285-9.

Vietnam is currently a country that controls population growth at approximately replacement fertility rate (TFR = 2.09 children per woman in 2019)[25] with a labor force participation rate of female activity is up to 61,6%[26], which is considered one of the countries with the highest rate in the world, while this figure for the whole world is only 50,0%[27]. The proportion of elderly women in the labor force in Vietnam is also rather high, with 44,0% of women aged 60–64 and 18,3% of women aged 65 and over[28]. Thus, the achievement of fertility reduction has contributed to the liberation of women, but the issue of social security for women, especially elderly women in the future will become a great challenge.

Separating the effects of aging factors

Population aging due to declining fertility and increasing aging population because of reduced mortality are likely to have very different socio-economic consequences because they affect the age structure differently.

Reducing fertility will reduce the number of children today, but the impact on aging is significantly powerful after a few generations, when the young population enters the childbearing age. This means that the size of the workforce will shrink rapidly.

In contrast, today's increase in life expectancy is primarily related to a decrease in morbidity, disability, and morbidity with age. Individuals can meet expectations of a healthier life expectancy by working longer or saving more (i.e. consuming less). Longer working hours allow high consumption levels to be maintained in old age. Being healthier means lower spending on health care.

Impact on health and society

Many scholars have analyzed several effects of aging from the perspective of disease and health care models [1], specifically:

Trends in diet and lifestyle as well as advances in public health and medical care could combine to increase or decrease life expectancy in the future, where technology plays an important role. The compression of disease (reducing morbidity) today is partly due to advances in new medical technology; however, this is unlikely to hold in the future, and it will have implications on cost impact. Trends like obesity, etc. can reduce the positive impact of technological progress. Non-health related events, such as climate change (The meteorological agency predicts that from June to November 2023, there will be about 9–11 storms and tropical depressions operating in the East Sea[29] or war, which can also have an unpredictable impact on life expectancy.

The economic effects of aging appear to be uneven across societies. In developed countries, longer life expectancy is accompanied by a shift in support of older generations from family to state. In many developing countries, including Vietnam, the family still plays an important role in the care of the elderly [22] and as life expectancy becomes longer, family

[25] Completed Results of the 2019 Viet Nam Population and Housing Census / General Statistics Office. Hanoi : Statistical Publishing House, 2019. 840 p. ISBN 978-604-75-1532-5.

[26] Report on Labour Force Survey 2021 / General Statistics Office. Hanoi : Statistical Publishing House, 2022. 2015 p. ISBN 978-604-75-2285-9.

[27] Female labor force participation / The World Bank : [site]. URL: https://genderdata.worldbank.org/data-stories/flfp-data-story/ (accessed on 25.10.2023).

[28] Report on Labour Force Survey 2021 / General Statistics Office. Hanoi : Statistical Publishing House, 2022. 2015 p. ISBN 978-604-75-2285-9.

[29] Từ nay đến tháng 11 có bao nhiêu cơn bão và áp thấp nhiệt đới? [How many storms and tropical depressions will there be from now until November?] // Tổng cục Khí tượng Thủy văn [Viet Nam Meteorological and Hydrological Administration] : [site]. URL: http://vnmha.gov.vn/cong-tac-pctt-tkcn-130/tu-nay-den-thang-11-co-bao-nhieu-con-bao-va-ap-thap-nhiet-doi-14639.html (accessed on 25.10.2023).

structure Families could be disrupted, leading to a shift to systems of public transfers and savings similar to those found in wealthier parts of the world. Sadly, the budget for social security in developing countries is limited and Vietnam is no exception (with the share of government pensions accounting for less than 10% of pensioners' income). As a result, care for the elderly is and will be a conundrum for governments [23].

Conclusion

Force majeure population aging and slow population growth will affect the economies of all countries in different ways, influenced by cultural values, institutional arrangements and economic drivers.

The impact on socio-economic growth of population aging is based on the important premise that labor supply, productivity and savings change with the life cycle. This implies that the age structure of the population may be a consequence of economic performance, which is reflected in per capita income. A large proportion of children and the elderly can slow down economic growth, whereas a large proportion of the working age population can accelerate growth. However, besides these effects, it is not possible to simply calculate the consequences of changing age structure mechanically, because behavioral effects need to be taken into account.

It should be emphasized that income per capita is not by itself a measure of well-being because welfare depends on consumption, not income. More broadly, an aging population will require increasing support of various types, including income security and greater access to health care. Population aging is becoming a growing challenge to the sustainability of public finance and this is also the problem that Vietnam is facing when it is "old before rich".

Quantifying the impact of aging on socio-economic growth is not easy, requiring in-depth, multi-disciplinary, multi-field and multi-dimensional studies. In order to achieve successful adaptation to an aging society, the approaches of each country utilizes to address the challenge of aging will depend largely on the flexibility of markets, the appropriateness of institutions and policies from the government.

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ТЕОРЕТИЧЕСКИЕ ОСНОВЫ СТАРЕНИЯ НАСЕЛЕНИЯ И ЕГО ВЛИЯНИЕ НА СОЦИАЛЬНО-ЭКОНОМИЧЕСКОЕ РАЗВИТИЕ

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Аннотация. *Старение населения – одна из проблем, вызывающих озабоченность не только во Вьетнаме, но и во всем мире, и одна из наиболее значимых социальных трансформаций XXI века. Этот процесс затрагивает большинство сфер жизни общества, таких как рынок труда, финансы, спрос на товары и услуги, образование, социальное обеспечение и здравоохранение для пожилых людей и т. д. Исследования старения населения становятся все более актуальными, особенно в такой развивающейся стране, как Социалистическая Республика Вьетнам, где темпы старения населения высоки, но средний доход низок, а бюджет социального обеспечения ограничен. Поэтому старение населения может замедлить экономический рост и увеличить нагрузку на бюджет, влияя даже на социальную стабильность. В данной статье анализируется текущая ситуация и тенденции старения во Вьетнаме. Основное внимание уделяется разъяснению общей теории механизма старения населения и его влияния на социально-экономическое развитие. Количественная оценка влияния старения населения на социально-экономический рост очень сложна и требует глубоких, междисциплинарных, многоотраслевых и многомерных исследований. В настоящем исследовании были рассмотрены некоторые проверенные методы такой оценки в мире в целом и во Вьетнаме в частности. Полученные результаты предполагают более многогранный взгляд на старение, основанный на учете возрастной структуры населения в процессе развития. В то же время подобные исследования требуют участия не только ученых, но и политиков, чтобы выработать эффективный ответ на вызовы старения общества.*

Ключевые слова: *старение населения, пожилые люди, социально-экономическое развитие*

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