Demographic Analysis, Segmentation and Perceived Retirement Preparedness of Thai Wageworkers: A Quantitative Approach

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Abstract

The stage of an aging society in Thailand has resulted in a decline in the working population. Additionally, ineffective retirement planning may result in financial insecurity after retirement. This article explores how other demographic variables interplay with wageworkers' financial behaviors. Hence, this chapter aims to study the relationship between the demographic characteristics of Thai wageworkers and their perceived retirement preparedness, as well as explore how to classify the workers into groups with similar demographic characteristics. A sample of 398 wageworkers from the Northeastern Region of Thailand based on the quota sampling approach and intercept survey. The cross-tabulation and cluster analyses were used to analyze the relationships. The cross-tabulation analysis demonstrates age, income, and education variables are the significant factors affecting an individual's perceived retirement preparedness. Explicitly, perceived retirement preparedness gradually rises as their ages increase. However, perceived retirement preparedness suddenly declines after the age range of 51-60 years. Additionally, wageworkers with low income (between 10,000 and 30,000 baht) reveal a low level of retirement preparedness, contrasting to other age ranges (below 10,000 baht and above 30,000 baht). The result also indicates that education positively influences perceived retirement preparedness. The results from cluster analysis divide wageworkers into four segments. Moreover, young and elderly wageworkers with low incomes and education levels are the two most susceptible groups.

Keywords: Retirement, Industrial Workers, Societal Burden, Demographic Analysis

1. Introduction

Aging has increasingly become a critical issue in Thailand. During the past two decades, there has been a drastic change in the pattern of the Thai population. Generally speaking, the population growth rate decreased from 3.0 percent in 1960 to only 1.1 percent in the recent year (Samutjak, 2015). The change in this population pattern has resulted from changes in mortality and fertility rates of the country's population, where mortality rates have played a relatively more crucial role in determining the pattern of the Thai population. To be more explicit, a continual and dramatic decrease in mortality rates after World War II coupled with a constantly high birth rate has caused a significant increase in the Thai population.

Interestingly, due to medical technology advancement and gradual increases in the number of health service centers, the life expectancy of Thai people has greatly developed. As a result, people who were born after World War II have gradually become older and eventually approached or reached their retirement age. At present, the mortality rate in Thailand is at a low level (6 out of 1000 people) (Thai Institute of Aging Research and Development, 2016). Due to family planning policies imposed by the Thai government, the reproduction rate (the number of children) per Thai female has gradually decreased from 6.3 in 1960 to approximately two presently (Ministry of Public Health, 2014). Applying the Demographic Transition theory (Caldwell, 1976; Kirk, 1996), in 2015, the aging population was approximately 7 million and was forecasted to be 17 million in 2020, which accounted for a quarter of the Thai population (Caldwell, 1976; Kirk, 1996). It is expected that the aging population in Thailand will surpass all other Asian Pacific countries in 2020.

According to the United Nations (UN), a country is classified as an "aging society" when at least 10 percent of its population is above the age of 60 or 7 percent is above the age of 65. However, a country is perfectly defined as an "Aged Society" when the same proportions of the aging population elevate to 20 and 14 percent, respectively (World Population Ageing, n.d.). Retirement is defined as a stage where a person aged 55 and older is not employed in the labor force and receives 50 percent or more of his/her total income from retirement-like sources (Bowlby, 2007). In Thailand, the Department of Older Persons (DOP) defines the elderly as people aged 60 or above, as referred to by the Older Persons Act 2006 (Department of Older Persons, 2006). At present, Thailand is now categorized as an aging society. It is predicted that a declining number of the working-age population will negatively impact the Thai economy. For instance, the aggregate household saving will reduce because as the working-age population incurs financial obligations to support their old-age relatives, a number of the retired population have already been restricted from their saving capacity due to unemployment (Prompakdee, 2016). The amount of investment at the household level will reduce as a consequence. Moreover, the GDP of the country is expected to reduce due to a decrease in productive capacity as a result of the declining working-age population.

Most changes faced by the retired can be separated into physical, mental, and societal changes. Evidence also reveals that there have been several problems encountered by the elderly in Thai society. First, with better educational and professional attainments as well as changing social norms, the future retired elderly may choose to live on their own rather than rely on their children (Tongdee, Rongmuang, and Nakchatree, 2014). This is because most Thai middle-income families are nuclear families and parents have obligations to financially take care of their children only during the school years. The tendency for family members to form extended families as in the past diminishes as society becomes more modern. Second, half of the Thai elderly reported insufficient income or financial assets to support themselves financially after retirement (Prachuabmoh, 2002).

This paper aims to study the relationship between demographic characteristics and the retirement preparedness of Thai workers. Retirement preparedness is defined as the extent to which a person is on track to fulfill his or her retirement-income goals in order to retain the quality of life (Agabalinda & Isoh, 2020). It is proposed that the following demographic characteristics: gender, age, marital status, education, and income would influence Thai wageworkers' perceived retirement preparedness. This paper employed a sample of wageworkers in the Northeastern region of Thailand. We employed a cross-tabulation analysis and an analysis of variance (ANOVA) to test the significance of these relationships. We also performed a cluster analysis to group the wage workers' characteristics and retirement behavior. Realizing the demographic characteristics influencing the worker's retirement perceptions and their demographic segments allows organizations and policymakers at the national level to understand the retirement expectations of workers specific to their groups in a meaningful manner.

The paper is constructed as follows. Section 2 begins with a review of the literature on demographic characteristics related to financial planning and retirement decision. Next, section 3 outlines the research method involving sample and data gathering as well as statistical models and testing. The findings and analysis of the results from the test models are deliberated in section 4. Finally, section 5 summarizes this research article by discussing major conclusions drawn from this study as well as suggesting policy implications.

2. Review of Literature

Essentially, demographic factors were related to an individual's motivation to plan and save for retirement (De and Estache, 2016) as well as his/her selection of retirement-saving products (Power and Hobbs, 2015). Past studies mainly use three demographic characteristics to explain retirement planning behavior: education, gender, and age (Kim & Feldman, 2000; Pinquart & Schindler, 2007; Hershey, Jacob-Lawson, &Neukam, 2003). Additionally, researchers have described a wide range of demographic factors related to retirement behavior (Mouna and Anis, 2017; Potrich, Vieira, and Kirch, 2015; Karaa and Kuğu, 2016; Bujan, Cerović, and

Samaržija, 2016; Agarwal et al., 2015; Kristjanpoller and Olson 2015). Those factors comprise gender, age, marital status, educational level, monthly disposable income, and other aspects. The followings describe how the selected variables (age, income, education, gender, marital status) influence an individual's retirement preparedness.

2.1. Age, Financial Planning Behavior, and Retirement Preparedness

Age was found to be a substantial determinant of an individual's financial knowledge, investment behavior, and, thus, financial retirement planning. Several research papers discovered youths to have comparatively low financial literacy (Glidden and Brown, 2016) and pointed out the need to educate them. In the US, as the educational program was proved to have little impact on teenage financial literacy, a study tried to investigate the role of parents in educating their children in this respect (Zimmerman et al. 2016). This study suggested tools and concepts parents might use to successfully educate their teens, especially starting at a young age. Another research paper also demonstrated the importance of financial education for youths and recommended that the country draft a national strategy for the development of youth and children's financial literacy (Fabris and Luburic, 2016). The level of financial knowledge was expected to increase as an individual aged (Xiao, Chen, and Sun, 2015). Specifically, a study was conducted to investigate the relationship between age and financial capacity demarcated by: objective financial literacy, subjective financial literacy, desirable financial behavior, perceived financial capacity, and financial capacity index. As a result, young adults demonstrated the lowest scores in all financial capacity aspects, but conversely for older adults.

However, a research article in both psychological and medical fields also suggested that lower financial literacy and poorer investment decisions correlate with older people (Santoso et al., 2016). A study on the financial decision-making capacity of aged participants was conducted and found prominent results (Gamble et al., 2015). As one's episodic memory and visuospatial ability declined, numeracy also declined. Additionally, as semantic memory reduced, the level of financial literacy reduced as well. This research also suggested that assistance with financial decisions may be required for participants with cognition reductions. Another research paper using a sample of 755 older persons investigated the association between financial literacy and their cognitive health (Wilson et al., 2016). This paper found that greater financial literacy correlated with decreased risk of developing incident Alzheimer's disease and suggested older persons maintain their cognitive health.

Furthermore, the Life-cycle Hypothesis theory sheds light on how individuals spend and save over their careers. A premise behind this economic theory is that lifetime spending and saving rely on an individual's anticipated future income (Modigliani & Ando, 1957). According to Figure 3.1, young people may incur debt with the expectation that future income will allow them to repay it. In other words, young people finance their consumption by borrowing from others or by consuming inherited assets from their parents. Note that CC' is the consumption line, and YY' is

the income line. During their working years, they spend less than their income, resulting in net positive savings. After the age of retirement, individuals begin and continue to dissave or spend more than they earn. This is due to the fact that retirees maintain their spending despite their reduced income.

Figure 3.1 Life-cycle Hypothesis
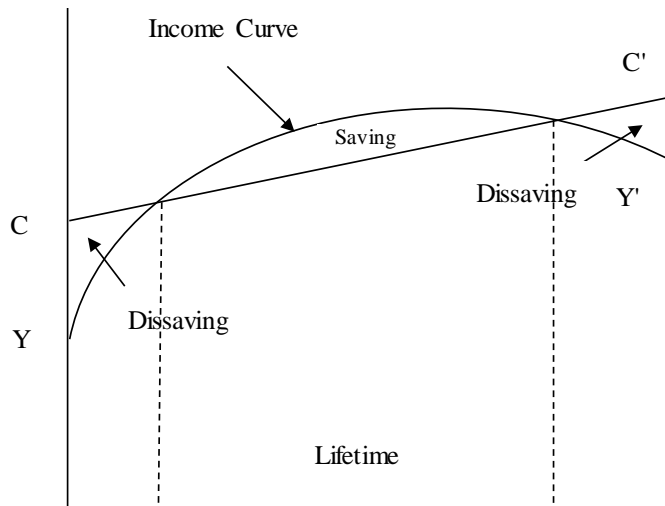
Source: Figure created by authors, 2022

In this current thesis, we use the term retirement preparedness to reflect the financial capacity proposed by Xiao, Chen, and Sun (2015) and retirement self-efficacy suggested by Earl et al. (2015). Based on the literature discussed in this section, we assume that young wageworkers could improve their financial preparedness as they age. However, a diminishing return may occur at some age level when wageworkers become older. Social norms about the appropriate age to retire might play a role (Zissimopoulos & Karoly, 2007). Nevertheless, retiring after the usual retirement age does not necessarily offer any advantages (Hershey, Jacob-Lawson, & Neukam, 2003). Thus, the following hypothesis was established.

H1: For a young worker, age has a positive relationship with retirement preparedness. When he (or she) becomes old, at a certain age, retirement preparedness may reduce.

2.2 Income, Wealth, and Retirement Preparedness

Salary refers to the remuneration for professionals in exchange for continuous work or service. Most employers evaluate individual performance to determine the pay decision, which is an important variable when considering a salary increase or promotion (Asaari et al., 2019). Even if you apply for a new job, this information may be valuable to your prospective employer because it provides a better understanding of your abilities. Salary is the most basic income for people. Employees, clerks, managers, and employers generally agree that wages are central to the

income of the vast majority of the labor force. Similarly, many pension plans are based on salary and motivation. In contrast, self-employed workers do not receive wages but sell labor directly in the market. Property and business owners earn income from rents, dividends, and other financial instruments. Better pay and bonuses often motivate employees. These increase their productivity.

A few research articles have discussed the association between wealth and income and financial retirement planning in different aspects. In the Netherlands, a research article was conducted to study the investment behaviors of retail bank customers (Kramer, 2016). Interestingly, this research article revealed that wealthy people who were highly confident in their financial knowledge tended to receive less financial advice involving retirement planning services. However, a paper studying financial planning behaviors of low-to-moderate income people suggested a contradictory result. People with low-to-moderate income with high financial literacy expressed the decision to save regularly for their retirements (Henager and Mauldin, 2015). As for the lower-middle-income class, a paper also tried to demonstrate essential factors determining saving behavior and investment decision (Steelyana and Lie, 2015). The results expressed that the retirement preparedness of lower-middle-income people significantly depended upon their level of financial literacy. On the one hand, a study on financial need assessment was conducted using a sample of low-income households (Tuominen and Thompson, 2015). The results suggested that social workers' financial advice services were required to address the low-income households regarding their immediate financial needs and ample financial planning knowledge. Based on the stated literature (Kramer, 2016; Henaher and Mauldin, 2015; Steelyana and Lie, 2015), the relationships between income and other retirement behavior variables are still inconclusive. However, these previous studies did not directly show how wageworkers' income may influence their retirement preparedness, leaving this a research gap in the present thesis. In the author's view, wageworkers with higher incomes should be more able to contribute financially to their retirement funds, improving their retirement preparedness. Therefore, the following hypothesis was established.

H2: Perceived retirement preparedness increases as income level increases.

2.3 Education, Financial Literacy, and Retirement Preparedness

The level of education impacts an individual's behaviors regardless of other demographic characteristics. Personal financial literacy was found to correlate to financial behaviors in many research papers across different respondents (Wright, 2016; Sayinzoga, Bulte, and Lensink, 2016; Lusardi, 2015). Many scholars have also demonstrated the importance of financial education at a young age (Koposko and Hershey, 2016) and developed some guidance to increase financial literacy at the national level (Murugiah, 2016). Without a sufficient level of financial literacy in its population, a country may face with hazardous economic downturn due to

ongoing personal financial distress and aggravated financial instability (Fabris and Luburic, 2016).

The level of education was also found to impact an individual's financial inclusion and contribution to retirement planning. Higher education has been associated with better outcomes for retirement (Kim & Feldman, 2000). A prior study conducted in Malaysia (Murugiah, 2016) indicated that an overwhelming majority of respondents had basic financial knowledge, and roughly half of them were highly educated at an advanced level. In India, the underprivileged and illiterate population demonstrated low financial literacy and hence low financial inclusion (Vishvesh and Venkatraman, 2015), which was considered an essential foundation for retirement planning.   Likewise, many research papers have illustrated that less educated and older people are associated with a lower degree of financial literacy and inclusion (Santoso et al., 2016; Vishvesh and Venkatraman, 2015) and vice versa. Financial literacy correlates to individuals' financial capacity in several dimensions, such as objective financial literacy, subjective financial literacy, and desired financial behavior signifying financial inclusion (Xiao and O'Neill, 2016). The stated relationships were derived using multivariate linear regression analysis.   Additionally, financial literacy, which interacted with the socio-demographic characteristics of respondents, was found to affect individuals' retirement savings, but the impact tended to vary among diverse individuals (De and Estache, 2016). However, using microdata from the Survey of Household Finances from the Bank of Spain, the logit model demonstrated ambiguous results (Sánchez-Campillo, Moreno-Herrero, and Rodríguez, 2016). Interestingly, individual financial habits strongly determine his/her voluntary retirement planning regardless of their educational level. We should also note that the results were contradictory to the arguments that many entrepreneurs in the US do not possess sound financial knowledge regarding the stock market and compound interest, for instance (Lusardi, Christelis, & Scheresberg, 2016).

Many academicians suggested the relationships between individuals' financial literacy, portfolio investment, and financial retirement behaviors. In Chile, a research paper was conducted to investigate the relationship between financial literacy and retirement planning (Moure, 2016). The results demonstrated that lower financial literacy, expressed by poor acknowledgment of compound interest and inflation concepts, significantly lower retirement planning scores. The stated results were consistent with a study conducted in Canada in that those with high financial literacy scores were likely to contribute to their retirement savings (BOISCLAIR, LUSARDI, and MICHAUD, 2015). Another research article regarding financial literacy and retirement tried to study the Federal Reserve employees' pension saving behaviors. The results revealed that the more financially literate employees contributed a greater amount than those with lower financial literacy. Remarkably, financially literate employees chose to invest in higher proportions of equity as compared to debt instruments in their pension portfolios (R. Clark, Lusardi, and Mitchell, 2017). Additionally, a research paper also found that ignoring simple financial concepts could lead to failure to plan for retirement, indiscipline borrowing behaviors, and ignorance of

investments in financial instruments (Lusardi, 2015). Those with higher financial literacy were also likely to divide a part of their portfolios between investing in mutual funds and/or private funds (Chu et al., 2016). The evidence also showed that financially literate people could possibly yield a positive return on investment on average. Hence, the following hypothesis was established.

H3: Perceived retirement preparedness increases as educational level increases.

2.4 Gender, Financial Planning Behavior, and Retirement Preparedness

Scholars have explored the roles of gender, which essentially contribute to effective financial retirement planning. Many research papers have demonstrated correlations between gender and financial literacy and highlighted significant gender differences in financial literacy in that male individuals are more financially literate (Riitsalu and Põder, 2016; Potrich et al., 2015). The level of financial literacy among high school students with age 15 to 18 was explored based on Lusardi and Mitchell's focus (Villagómez, 2016). It was found that the male slightly expressed a higher level of financial literacy than the female. Another study conducted on new high school graduates found that female participants illustrated significantly lower financial literacy across different measures, which also related to their mathematical and foreign language capacities and general cognitive aptitude (Erner, Goedde-Menke, and Oberste, 2016). A study by Pinquart and Schindler (2007) found that women were more likely to be part of the group of unsuccessful retirees (Pinquart & Schindler, 2007). Women have also been found to show a more considerable increase in depressive symptoms than men (Noone, Fiona, & Christine, 2010). Men and women seem to differ in respect of what matters in the retirement transition: former job-related factors and income were found to have a more substantial influence on men's well-being than on that of their counterparts (Noone, Fiona, & Christine, 2010) and marital quality had a more considerable impact on women's well-being. The effect of joint retirement was found to be less long-lasting for women than for men (Kim & Feldman, 2000), plausibly because most women were more likely forced to retire so as to take over the caregiver role. Results may change in the future due to women's changing social roles.

The existence of gender differences in teenagers was also expressed while in adolescence (Driva, Lührmann, and Winter, 2016). One research paper also suggested that financial socialization at home might be subject to a gender bias (Agnew and Cameron-Agnew, 2015), where male children demonstrated their first financial discussion with their parents at a lower age than females on average across varying socioeconomic statuses. On the contrary, adult females with superior socio-economic status may demonstrate a contradictory result (Chen and Gavious, 2016). Specifically, having a financially literate female as a member of the board revealed a significant impact on restraining earnings management. This study also found that financially literate female directors, on average, were more effective than their male counterparts. Nonetheless, only one research paper regarding a financial literacy survey of high school students in Mexico City demonstrated no generalized gender differences between male and female students' levels of financial literacy (Arceo-Gómez and Villagómez, 2017). In sum,

this implies that gender differences in financial literacy are varied among different targeted research participants.

Past research articles found gender differences in financial investment and risk tolerance behavior of individuals. A study regarding financial risk-taking via standard and sophisticated portfolio investment revealed that both men and women who participated in those financial investments demonstrated a high level of perceived financial literacy (Bannier and Neubert, 2016). However, female investors revealed a higher level of perceived financial literacy than males in terms of sophisticated investments (Bannier and Neubert, 2016). Also, a widened gender gap in risk tolerance expanded when controlling the level of financial literacy (Almenberg and Dreber, 2015). As for the micro-insurance decision, a study conducted in Bangladesh demonstrated that women expressed less engagement in financial decision-making and had relatively lower financial literacy than men, resulting in an inability to understand possible agricultural risks. Notwithstanding, statistical results showed no significant gender variations in willingness to purchase micro-insurance (Clarke and Kumar, 2015). Based on previous articles, though gender is rarely related to an individual's retirement preparedness, however, we decided to explore this aspect with the following hypothesis.

H4: Gender is related to perceived retirement preparedness. Explicitly, being male is related to higher retirement preparedness.

2.5 Marital Status and Retirement Preparedness

Not many research papers have reported the relationships between marital status and retirement behavior. A study regarding gender differences in financial literacy suggested that marital status was related to the individual's financial literacy, which could determine their retirement planning and wealth accumulation behaviors. This study found that single women (including widows) attained relatively weak financial knowledge concerning day-to-day financial decisions and strongly required some assistance to enhance their financial security when retired and unemployed (Bucher-Koenen et al., 2016). In addition, another study using a comparative analysis tried to identify persons who may be at risk of unlawful financing schemes caused by financial difficulties (Nivorozhkina et al., 2016). This study demonstrated that single respondents with and without children tended to make loans with the ratio of loan repayments triple relative to families with children and twice relative to families without children. As far as previous literature was concerned, there are still rooms for future studies regarding financial planning and retirement behaviors to take marital status into account. Hence, the following hypothesis was formed.

H5: Marital status is related to an individual's retirement preparedness.

2.6 Other Aspects

Research respondents with diverse careers and job statuses have been utilized in previous retirement planning studies. Research results found that four types of professionals (attorneys, social workers, high school teachers, and college professors) presented various retirement intentions (Kilty and Behling, 1985). The term intentions encompassed projection regarding when to retire, deliberation of early retirement, and perception about life after retirement. Additionally, research findings demonstrated that jobs with high ascendance were associated with better retirement planning, but jobs with high intrinsic rewards and positive social relations were inversely correlated with planning (Kosloski, Ekerdt, and DeViney, 2001).

Based on the review of related articles in retirement planning, the most common field of occupation that several researchers take into consideration is education. A study regarding the Executive Personal Finance Scale (EPFS) conducted on bachelor's degree students revealed that a preferred retirement income was determined by Impulse Control and Motivational Drive (Yang and Lester, 2016). As for educators' retirement planning, one research paper tried to examine the saving behavior of teachers enrolled in a hybrid pension system involving a defined contribution (DC) scheme (Goldhaber and Grout, 2016). A hybrid pension plan is used when an employer simultaneously gives access to two compatible benefit structures. A typical example of a hybrid pension plan is combining a small guaranteed income plan with a small defined contribution plan. This study found that as age, salary, and teaching experience increased, pension contribution rates tended to escalate accordingly. Remarkably, the hybrid pension plan was superior to the purely defined benefit plan in terms of retirement security for typical teachers. Consistent with the previous research papers, a study conducted in different public school districts investigated how differences in school district characteristics influenced employees' participation in different retirement-saving instruments and found some significant relationships among those variables (R. L. Clark et al., 2016).

Another highlighted career often mentioned in past research papers involves healthcare professionals. It was evident that senior surgeons are timid to think about retirement age and plan for retirement (Ahmed, 2016). This was largely due to their aging and cognition issues. On the other hand, a research paper conducted in India revealed that the retirement planning situations of dentists, in general, were well-organized (Pereira, Shetty, and Chande, 2016). On average, though dentists incurred some liabilities as a result of loans for their houses, clinics, and vehicles, proper retirement planning would allow them to possess a sufficient amount of wealth for comfortable lives after retirement. Moreover, migrant workers who were culturally and linguistically diverse (CALD) were used as a sample in research regarding the level of financial literacy and inclusion (Zuhair, Wickremasinghe, and Natoli, 2015). The study demonstrated that their financial literacy correlated with their level of education. This paper also suggested the need for sufficient financial advice and access to financial services in order to

assist CALD migrants in making suitable financial decisions. So far, no research papers have paid attention to wageworkers in the industrial sector.

Studies regarding retired seniors being a burden to society were conducted primarily by researchers in the health service arena. The following research papers are related to dementia senior patients as a burden to caregivers at the family and institutional levels. Zarit et al. (1980) found that caregivers' burden became lower when relatives paid more visits to dementia patients (Zarit, Reever, and Bach-Peterson, 1980). The results demonstrated that there was no correlation between severities of behavioral problems and the amount of burden. Additionally, a longitudinal study over a 2.5-year period tried to examine the level of social support, behavioral deterioration, and perceived burden of relative caregivers of dementia seniors (Grafström and Winblad, 1995). This study found that the relative caregivers perceived less burden and reduced behavioral problems because those demented seniors were admitted to senior caregiving institutions. Lastly, an effort to quantify the burdens of senior caregivers was made through a research paper regarding the Caregiver Burden Inventory (CBI) (Marvardi et al. 2005). Through factor analysis and ordinary least square multiple regression, this research found that patients' behavioral disturbances and disability primarily impacted the time-dependent burden, whereas the caregiver's anxiety and depression influenced the psychophysical burden. On the other hand, Bal et al. (2012) studied how two types of idiosyncratic deals (development and flexibility) influenced the motivation of employees to continue to work after retirement age (Bal et al., 2012). Idiosyncratic deals refer to special working arrangements which are agreeable to both parties (workers and employers), and both are communally satisfying. The results revealed that idiosyncratic deals positively affected motivation to continue working. This phenomenon worked well under circumstances of low accommodative or high development climate.

Nevertheless, to the best of the authors' knowledge, there has not been any article exploring the demographical influences as opposed to the wageworker's retirement preparedness in particular. Additionally, it is also essential to group wageworkers based on their demographics and retirement preparedness. Establishing well-defined groups would further allow the researchers to explicitly explore Thai wageworkers' retirement behaviors. Hence, this article fills those research gaps in the landscapes of human capital management at both the organizational and national levels.

Based on the literature review, the following research model is proposed (see Figure 3.2). More details are discussed in the methodology section.

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Figure 1: Research Framework
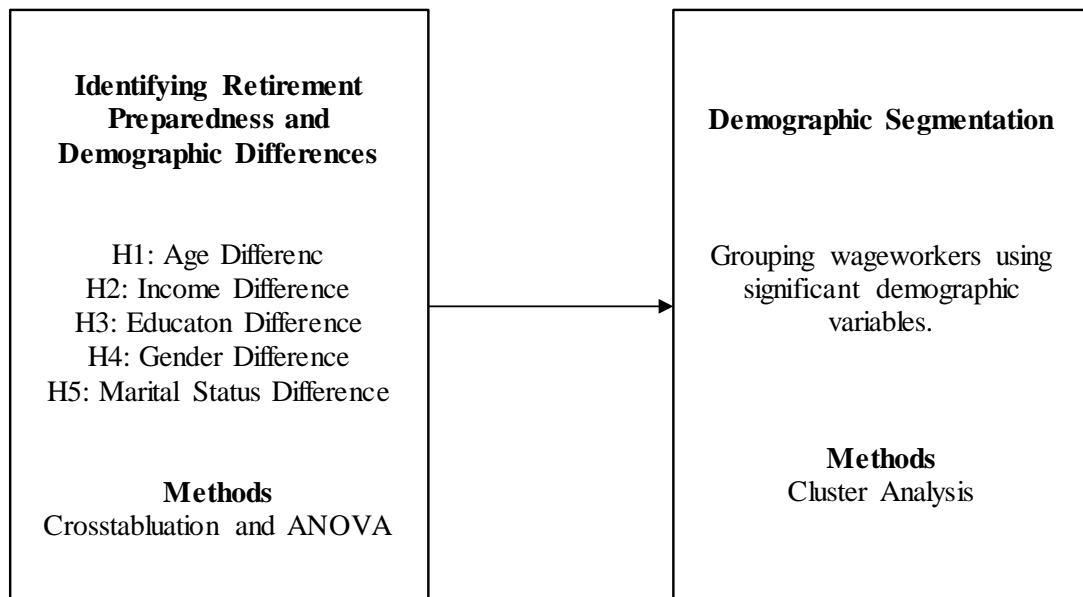
Source: Data created by the authors (2022)

3 Methodology

3.1 Sample and Data Gathering

Data for this research were gathered from respondents who were wageworkers from the Northeastern Region of Thailand. Based on quota sampling and size-wise, the following numbers of respondents (a total of 400) were assigned to 5 populated provinces in the region: Khon Kaen (80), Udonthani (80), Nakhonratchasima (80), Buri Ram (8), and Ubonratchathani (80). The data collection was done during the COVID19 pandemic. Therefore, social distancing and face mask practices were strictly performed. The respondents were informed of the confidentiality agreement and the purpose of this research before every data collection. Following the concept of intercept survey (Miller et al., 1997), trained surveyors were employed to collect the data using a structured questionnaire through a face-to-face interview. Of the 400 workers successfully interviewed, nonetheless, regardless of missing values and outliers, only the valid returned data from 398 participants were finally utilized in this study.

This study entails data on the wageworkers' demographic characteristics and their perceived retirement preparedness. The first part of the questionnaire asked about demographic information, which included gender, age, marital status, highest education, and disposable income. The stated demographic information were treated as categorical data and converted into numerical data using either the concepts of ordinal scale and dummy variable: gender (1 =

male; 0 = female), age (1 = between 20-30; between 31-40; between 41-50; between 51-60; more than 60), marital status (dummy variable: 0 = single; 1 = married), highest education (1 = lower than bachelor's degree; 2 = bachelor's degree; 3 = master's degree; 4 doctoral degree), disposable income (1 = between 10,001-20,000 baht; 2 = 10,001-20,000; 3 = 20,001-30,000; 4 = 30,001-40,000; 5 = 40,001 and above). In addition, the second part of this questionnaire encompassed a question pertaining to wageworkers' perceived retirement standings: To what extent do you think you are well prepared for retirement? (1 = very low; 2 = low =; 3 = medium; 4 = high; 5 = very high). Table 1 demonstrates the sample respondents' demographic characteristics using descriptive statistics.

Table 1: Demographic Characteristics of Respondents (n = 398)

	Classification	Frequency	%
Gender	Male	158	39.70
	Female	240	60.30
Age (Years)	20-30	54	13.57
	31-40	208	52.56
	41-50	74	18.59
	51-60	52	13.07
	> 60	10	2.51
Marital Status	Single	193	48.49
	Married	205	51.51
Highest education	Below bachelor's degree	106	26.63
	Bachelor's degree	220	55.28
	Master's degree	64	16.08
	Doctoral degree	8	2.01
Monthly Income (Baht)	< 10,001	112	28.14
	10,001-20,000	196	49.25
	20,001-30,000	48	12.06
	30,001-40,000	30	7.54
	> 40,000	12	3.02
Perceived Retirement Preparedness (To what extent do you think you are well prepared for retirement?)	Very Low	28	7.04
	Low	158	39.70
	Moderate	180	45.23
	High	20	5.03
	Very High	12	3.02

Source: Data adapted from Authors (2022)

3.2 Statistical Models and Hypothesis Testing

To analyze the relationship between workers' demographic characteristics and their perceived retirement preparedness, the cross-tabulation analysis and one-way analysis of variance (ANOVA) approaches were employed. These approaches are suitable for this research because the independent variables consist of an ordinal scale (age, education, and income) and

categorical data (gender and marital status), while the dependent variable involves a 5-point Likert scale (perceived retirement preparedness). The cross-tabulation analysis employs the Pearson Chi-Square test using an asymptotic significance of <0.001. Moreover, the one-way ANOVA approach uses an F test with a significance level of <0.001.

Next, Ward's hierarchical clustering approach was performed to segment wageworkers based on their demographic characteristics. The variables used for cluster analysis are the variables that pass the cross-tabulation and one-way ANOVA test criteria. Four clusters are determined and named based on their characteristics of the descriptive statistics. The results are demonstrated in the next section.

4. Results and Discussion

This section is divided into three parts. First, the results of the cross-tabulation analysis are demonstrated to present the relationship between age and income of wageworkers. Second, one-way ANOVA results are presented (H1, H2, H3, H3, and H5). Third, the results from cluster analysis are demonstrated and discussed.

4.1 Cross-tabulation Analysis

The results from the cross-tabulation analysis were expressed to demonstrate the associations among different variables (age, income, education, gender, marital status, and retirement preparedness) in a more meaningful manner. Table 2 reveals the cross-tabulation analysis of age VS income, and Table 3 One-way demonstrates the findings from one-way ANOVA using age, income, education, gender, and marital status as independent variables while assigning perceived retirement preparedness as a dependent variable. According to Table 2, the majority of respondents are around 31 o 40 years old (n=208). However,10,000-20,000 is the income range with the most respondents (n=196). This table also indicates that workers aged below 50 years earn low income (approximately below 30,000 baht), but those above 50 years earn high wages (approximately above 30,000 baht).

Regarding Figure 3, the scatter plot reveals a rising trend between the age and income of wageworkers. However, considering the mean plot, the means of income (around 10,000 to 20,000) are scatted around the age ranges of (20-30 years), 2(31-40 years), and 3(41-50 years). This information demonstrates that the majority of respondents still have low income starting in their early career (age 20-30) up to the age of 50. This figure also implies that if they have to retire at the age of 60, these wage workers would only have ten remaining years to continue to work and earn wages of around 30,001-40,000 baht. Given the low-income level, it means they would have less ability to save for retirement before they retire at 60 years old.

Table 2: Cross-tabulation Analysis, Age VS Income

Income VS Age		Age (Years)					
		20-30	31-40	41-50	51-60	>60	Total
Income (Baht)	< 10,001	22	74	16	0	0	112
	10,001-20,000	30	118	40	8	0	196
	20,001-30,000	2	14	16	14	2	48
	30,001-40,000	0	2	2	22	4	30
	> 40,000	0	0	0	8	4	12
	Total	54	208	74	52	10	398
	Mean	1.63	1.73	2.05	3.58	4.2	-

Source: Data adapted from authors (2022)

Figure 3: Relationship Between Age and Income - Scatter Plot and Mean Plot
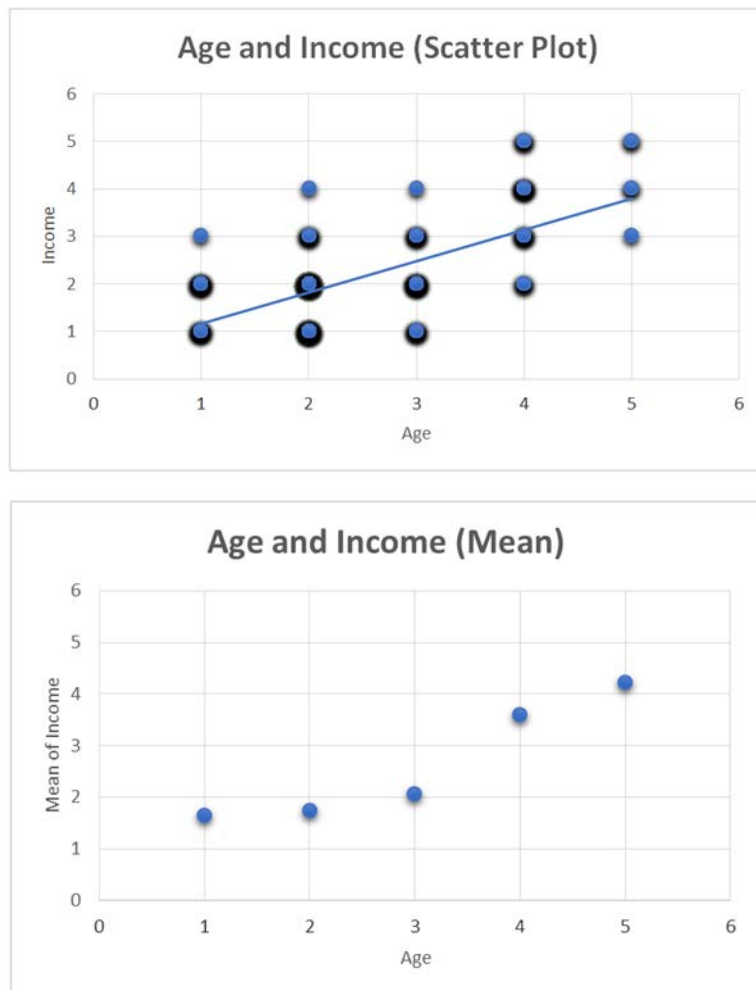
Source: Figures created by authors (2022)

4.1 One-way ANOVA Analysis

The one-way ANOVA is utilized to see whether there are any statistically significant variations between the means of two or more independent groups.

Table 3 demonstrates the results of one-way ANOVA using independent variables = age, income, education, gender, marital status, and dependent variable = perceived retirement preparedness. Explicitly, when the means of retirement preparedness scores are different given different levels of the categorical variables (age, income, education, gender, or marital status), we may also assume distinctive characteristics between them. According to Table 3, the one-way ANOVA results demonstrate that H1 (age, p-value<0.001), H2 (income, p-value<0.001), and H3 (education, p-value=0.002) are accepted, but H4 (gender, p-value=0.188), and H5 (marital status, p-value=0.056) are rejected. Therefore, we decided to omit gender and marital status variables from the consideration. Here, we discussed the rejected hypotheses (H4 and H5) first and followed by the accepted hypotheses (H1, H2, and H3).

Table 3: One-way Analysis of Variance; Independent Variables = Age, Income, Education, Gender, Marital Status; Dependent Variable = Perceived Retirement Preparedness

Demographic Variable	Categories	Perceived Retirement Preparedness (n)					Total (n)	Mean	F Test	p-value
		1	2	3	4	5				
H1: Age	20-30	6	22	24	0	2	54	2.44	7.86	<0.001 ***
	31-40	12	92	94	8	2	208	2.5		
	41-50	4	22	44	4	0	74	2.65		
	51-60	2	18	16	8	8	52	3.04		
	>60	4	4	2	0	0	10	1.8		
H2: Income	< 10,001	0	28	82	2	0	112	2.77	7.53	<0.001 ***
	10,001-20,000	12	114	56	10	4	196	2.39		
	20,001-30,000	12	6	26	2	2	48	2.5		
	30,001-40,000	0	8	16	4	2	30	3		
	> 40,000	4	2	0	2	4	12	3		
H3: Education	< Bachelor's degree	8	48	48	2	0	106	2.42	5.19	0.002 ***
	Bachelor's degree	14	90	102	10	4	220	2.55		
	Master's degree	4	18	30	6	6	64	2.88		
	Doctoral degree	2	2	0	2	2	8	3		
H4: Gender	Male	8	76	64	6	4	158	2.51	1.73	0.188
	Female	20	82	116	14	8	240	2.62		
H5: Marital Status	Single	15	78	93	4	3	193	2.49	3.669	0.056
	Married	13	80	87	16	9	205	2.65		

Source: Data adapted from authors (2022)

The results demonstrated that gender and marital status could not be used as a predictor of the workers' preparation for their retirement. Previous research articles related to retirement planning only suggested that gender might potentially influence an individual's financial literacy (Riitsalu and Põder, 2016; Potrich et al., 2015; Villagómez, 2016; Agnew and Cameron-Agnew, 2015; Arceo-Gómez and Villagómez, 2017), financial management capacity (Chen and Gavious, 2016), and financial risk tolerance (Almenberg and Dreber, 2015; Clarke and Kumar, 2015). Therefore, gender and retirement preparedness remain unrelated. Moreover, although previous studies indicate that single individuals tend to have relatively lower financial literacy ((Bucher-Koenen et al., 2016) and extensive borrowing (Nivorozhkina et al., 2016), those behaviors do not hold for Thai wage workers. As H5 is rejected, being single or married, male or female, is not related to retirement preparedness in the context of wageworkers in the Northeastern Region of Thailand.

Figure 4: Relationship Between Age and Retirement Preparedness - Scatter Plot and Mean Plot
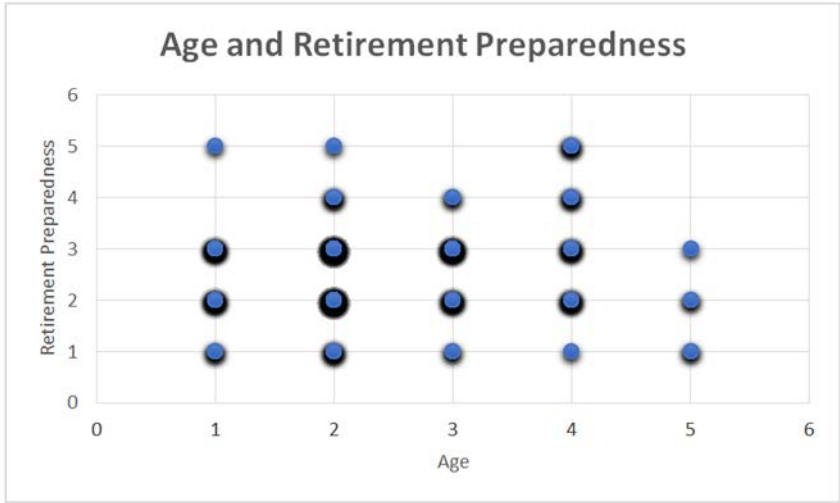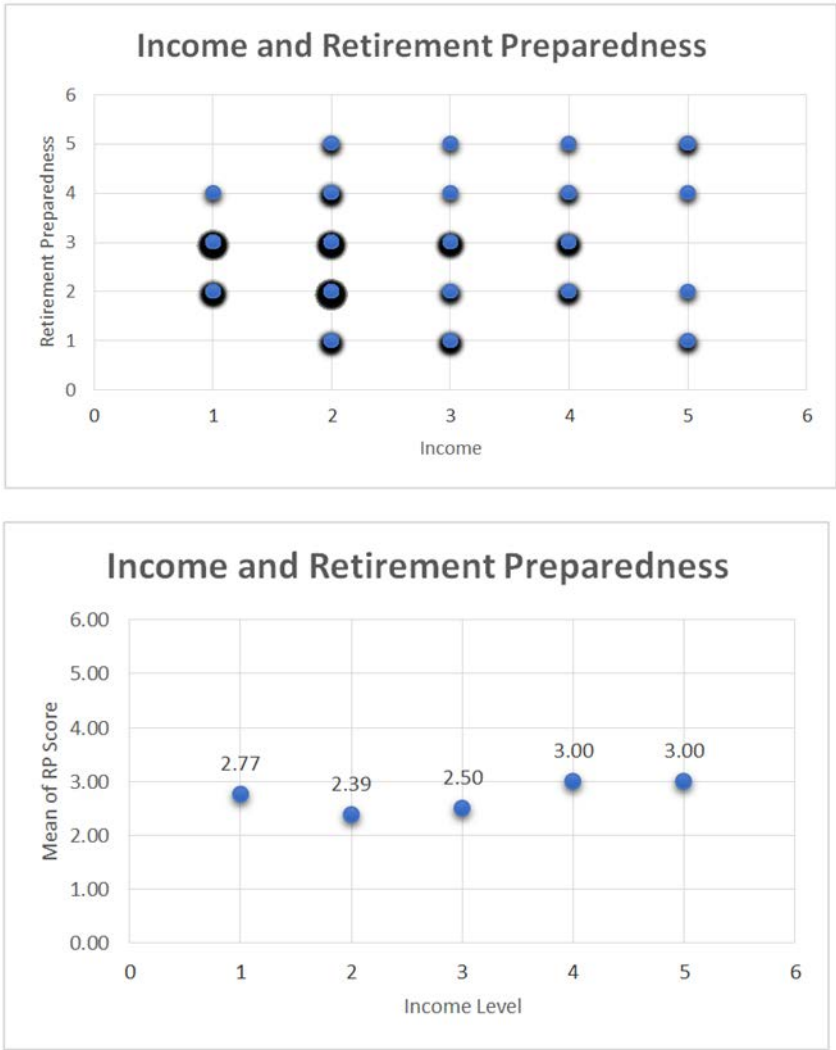

Source: Figures created by authors (2022)

The variable age presents a significant influence on the workers' preparation for their retirement. As revealed by previous studies, age might potentially affect only an individual's financial knowledge (Glidden and Brown, 2016; Zimmerman et al., 2016; Fabris and Luburic, 2016; Xiao, Chen, and Sun, 2015), investment decision (Santoso et al., 2016; Gamble et al., 2015), and retirement self-efficacy (Earl et al., 2015). The relationship between age and retirement self-efficacy is the closest to our established hypotheses. Therefore, this paper suggested the results consistent with Earl et al. (2015). According to Figure 4, the retirement preparedness scores are scattered through different age levels when considering the scatter plot. As for the means for retirement preparedness scores plot, the retirement preparedness means of wageworkers remain steady at the low to normal levels (2.44, 2.50, and 2.65) between the age of 20 and 50. The mean score becomes the highest for the age range of 50-60 years (3.04). However, 3.04 is considered a moderate level, indicating that although the wageworkers reach 50-60 years, they are still not confident in their retirement preparedness. Finally, the level of retirement preparedness drops sharply to between very low and low levels (1.80) for above-60-year workers. The results imply that these old wageworkers are not financially well-prepared for their retirement. This might explain why these workers are still working at old age.

This means Thai wageworkers in the Northeastern region below 50 are less worried about their retirement well-being, whereas those above 50 are more concerned. As for citizens above 50, increased age heightens their concerns about retirement. The majority of respondents may start to forecast their financial readiness after retirement and expect that they may not have sufficient income to take care of themselves during retirement age. Henceforward, these people may anticipate post-retirement financial support from their family, friends, or even the government on a continuous basis.

As for the relationship between income and retirement preparedness, Figure 5 reveals interesting results. Although the scatter plot could not identify any trend, the mean plot is crucial. The mean plot unveils that wageworkers with an income level below 30,000 baht demonstrate a low to moderate level of retirement preparedness (means = 2.77, 2.39, and 2.50 for 20-30, 31-40, and 41-50 years, respectively). As for an income level above 30,000, the wageworkers' retirement preparedness is moderate (means = 3.00 and 3.00 for 51-60 and >60 years, respectively). The results show that the wageworkers earning below 30,000 baht feel relatively unprepared. But, retirement preparedness would improve after they earn more than 30,000 baht, suggesting that as their income rose, their average retirement preparedness would increase accordingly. According to the interview, wageworkers with moderate to high income are more psychologically concerned about their financial status after retirement. In other words, they are worried about creating burdens for their children, relatives, or even the government after they retire. For this reason, these workers tend to save regularly for their retirement (Henager and Mauldin, 2015). However, wageworkers with low income, usually attaining low financial literacy, may not realize the need for financial retirement planning (Tuominen and Thompson, 2015).

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Figure 5: Relationship Between Income and Retirement Preparedness - Scatter Plot and Mean Plot

Source: Figures created by authors (2022)

This study revealed that the level of education impacted wageworkers' perceived retirement preparedness (accepting H3). As the level of education increases, wageworkers tend to be more prepared for their retirements. Figure 3.6 demonstrates a rising trend between education and retirement preparedness. Regardless of the level of education, most previous studies have demonstrated the relationship between an individual's financial literacy and financial behaviors involving one's retirement saving behavior (R. Clark, Lusardi, and Mitchell, 2017), financial inclusion (Vishvesh and Venkatraman, 2015; Santoso et al., 2016; Xiao and O'Neill, 2016), and portfolio investment behavior (R. Clark, Lusardi, and Mitchell, 2017; Chu et al., 2016). More specifically, De and Estache (2016) found that an individual's level of education is significantly correlated with retirement savings.

Figure 6: Relationship Between Education and Retirement Preparedness - Scatter Plot and Mean Plot
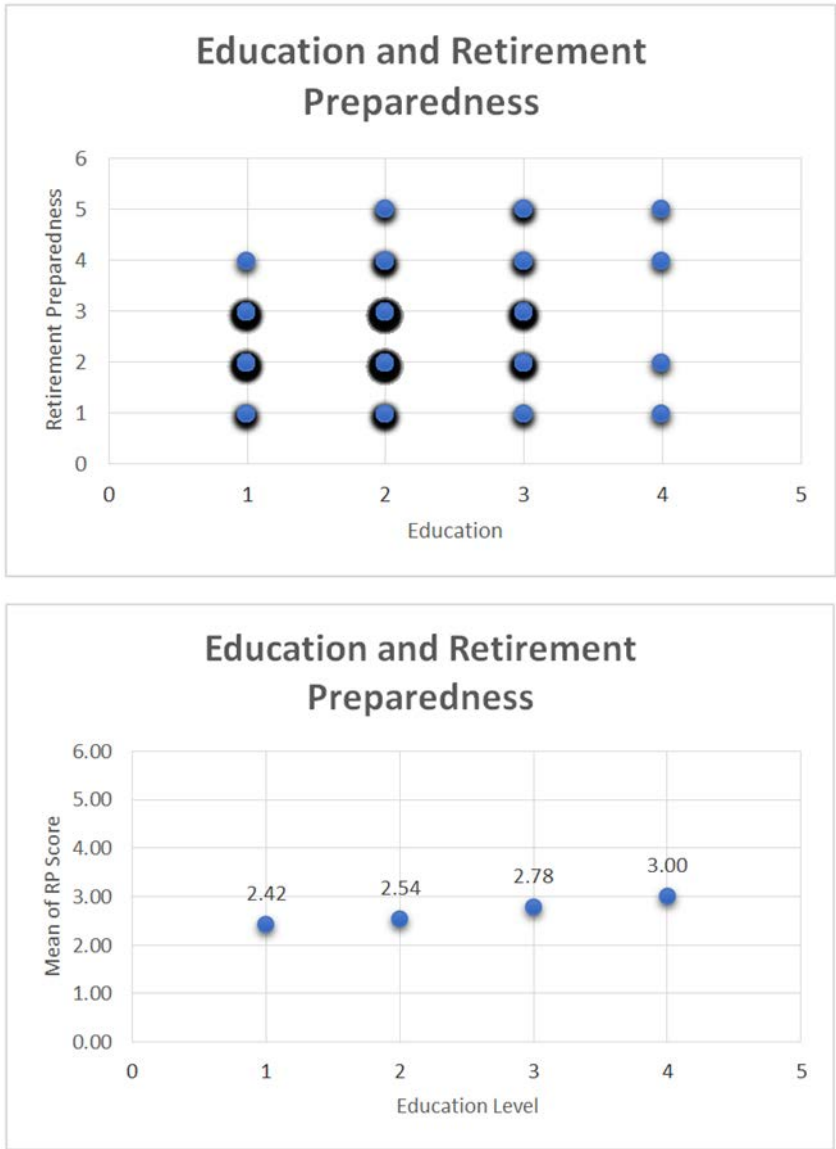
Source: Figures created by authors (2022)

4.2 Cluster Analysis Results

Based on the cross-tabulation and one-way ANOVA results in the previous section, the significant variables were used to perform cluster analysis. Those variables are age, income, education, and perceived retirement preparedness. Ward's hierarchical clustering approach was performed to classify wageworkers based on their demographic characteristics. The results are presented in Table 4.

Table 4: Results of Cluster Analysis

Cluster	Measures	Age	Income	Education	Perceived Retirement Preparedness
1 (n=104)	Mean	2.35 **(L)**	3.16 **(H)**	2.38 **(H)**	2.77 **(Indifferent)**
	Std. Deviation	0.863	0.903	0.97	0.736
2 (n=184)	Mean	2.27 **(L)**	2.45 **(L)**	1.73 **(L)**	2.50 **(Indifferent)**
	Std. Deviation	1.017	0.834	0.804	0.772
3 (n=73)	Mean	3.15 **(H)**	4.35 **(H)**	2.41 **(H)**	2.59 **(Indifferent)**
	Std. Deviation	1.19	2.607	1.169	0.853
4 (n=37)	Mean	3.45 **(H)**	2.78 **(L)**	1.73 **(L)**	2.50 **(Indifferent)**
	Std. Deviation	0.945	1.07	0.874	0.583
Total (n=398)	Mean	2.61	3.09	2.15	2.59
	Std. Deviation	1.057	1.405	1.008	0.767

Note: H = Relatively High, L = Relatively Low

The findings from cluster analysis reveal 4 demographic segments of the Thai wageworkers regarding their retirement preparedness. Segment 1 consists of 104 workers who are young but have high incomes and education. On the other hand, Segment 2 involves the majority of workers (n=184) who are young, earn a low income, and have a relatively low level of education. Segment 3 (n=73) consists of middle-aged workers who earn a high income and attain a relatively high level of education. Finally, Segment 4 is the smallest segment (n=37), consisting of the middle age to old workers. They earn a relatively low level of income and education.

According to the cluster analysis results, the most financially vulnerable workers are in Segments 2 and 4. With a low level of income and education, based on the one-way ANOVA results, these workers tend to have low retirement preparedness. Hence, further investigation is needed to explore the root cause of their financial behaviors and obstacles to suggest appropriate solutions.

3.5 Conclusion and Recommendations

This research aims to study the demographic characteristics of Thai wageworkers in relation to their perceived retirement preparedness. In this study, we utilized 398 wageworkers from the Northeastern Region of Thailand as a sample based on quota sampling. Our primary analysis employed the cross-tabulation and cluster analysis approach to capture the relationships between wageworkers' demographic characteristics and their retirement preparedness and classify their segments. The research revealed that age, income, and education demonstrate the relationships between retirement preparedness. It also found that the wageworkers can be divided into 4 segments: 1) young & high income, 2) young & low income, 3) old & high income, and 4) old & low income.

Such conclusions confirm the urgent requirements for devising effective actions to solve problems of both financial well-being and elderly care of retired wageworkers in the long term. Several parties - the Thai government, public and private institutions in the industrial sector, and the workers themselves - are expected to play a very crucial role in cooperatively alleviating these problems. As referred to the research results, we suggested the following three approaches: 1) Supporting after-retirement careers for retired wageworkers, 2) Enhancing the elderly's revenue assurance by encouraging the young to save for their retirement, and 3) Improving the quality of elderly care policy.

Firstly, both the government and private organizations should establish policies at the national and institutional levels to allow wageworkers to work until the age of 65 as long as the workers demonstrate their capabilities and good intentions. According to the research findings, old wageworkers with low education tend to demand after-retirement careers due to their anticipated financial insufficiency. Hence, they are required consideration from their employers. At many organizations in Thailand, skilled retired elderly are encouraged to continue working after retirement because their job experiences are valuable. However, we ask that equal job opportunities after retirement, not specifically requiring expertise or technical skills, should be offered to the low-skilled elderly as well as youths who might be vying for these jobs. This would allow the seniors to appreciate their values within themselves, thus decreasing financial burdens to their families and society. This would help fulfill potential shortages in the supply of skilled and low-skilled workers in the long run. Balancing the proportion of the young and old generations is expected to become a challenge for a successful organization in an aging society.

Secondly, retirement income assurance is also essential for the financial well-being of wageworkers after retirement. The research results express that individuals starting at the age of 40 are more worried about their financial security after retirement, which could burden their families financially in the future. In this regard, we suggest that wageworkers should establish retirement saving behaviors starting in their early careers when they are young and earn low income because they still have plenty of time to save for their future. As youths were found to have low financial literacy, sufficient financial literacy education should begin at school. At the beginning of the career, a governmental organization should also support retirement planning education, perhaps through the Department of Skill Development under the Ministry of Labor. In practice, there are several schemes for individuals to save for their retirement, for instance, Thailand's Social Security Fund, Government Provident Fund, State Enterprise Funds, Provident Funds, Retirement Mutual Funds (RMF), Long Term Equity Funds (LTF), and Saving Insurance Policies, all of which are deductible for the individual income tax privileges. Additionally, we propose that the government establish a law concerning personal income deductibles especially used for an individual's retirement saving to ensure Thai citizens' financial security after retirement.

3.6 Limitations

Lastly, with regard to research limitations, the contributions of this study are subject to the choice of variables and methodology. As this study was mainly based on a survey using cross-sectional data, the methodology establishes restrictions for addressing the issue of endogeneity. Additionally, the data were partly collected from the universities in the Northeastern Region of Thailand, involving respondents with exceptionally high education, which may not well represent the region or Thailand as a whole. Therefore, caution should be exercised when interpreting the research results.

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