Employment situation of older persons in Vietnam: Impact of COVID-19 and individual coping strategies

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สถานการณ์การทำงานของผู้สูงอายุในประเทศเวียดนาม: ผลกระทบจากโควิด-19
และกลยุทธ์การรับมือในระดับบุคคล

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ภายใต้บริบทการสูงวัยของประชากรอย่างรวดเร็วในประเทศเวียดนาม
โดยที่ประเทศเวียดนามยังคงอยู่ในกลุ่มประเทศรายได้ปานกลางในระดับต่ำและผู้สูงอายุส่วนใหญ่ยังคงมีสถานภาพทางเศรษฐกิจ
และสังคมในระดับต่ำนั้น การจัดเตรียมระบบการจ้างงานที่มั่นคงนับเป็นกลยุทธ์ที่ยั่งยืน
งานวิทยานิพนธ์นี้มีจุดมุ่งหมายเพื่อศึกษาสถานการณ์การจ้างงานผู้สูงอายุในประเทศเวียดนาม (โดยใช้ Vietnam
Housing and Living Standard Surveys ปีค.ศ. 2018 และ 2020) และผลกระทบของโควิด-19
ต่อการจ้างงานผู้สูงอายุและกลยุทธ์การรับมือผลกระทบในระดับบุคคลของผู้สูงอายุ (โดยใช้ Labor Force Survey
ปีค.ศ. 2021) ผลการศึกษาพบว่า ผู้สูงอายุที่มีบำนาญ ผู้สูงอายุที่ประสบปัญหาสุขภาพ
และผู้สูงอายุที่สำเร็จการศึกษาในระดับอุดมศึกษา มีโอกาสที่จะทำงานหลังวัยเกษียณน้อยกว่ากลุ่มที่ไม่มีบำนาญ
กลุ่มที่ไม่มีปัญหาสุขภาพ และกลุ่มที่ไม่ได้รับการศึกษา ตามลำดับ สำหรับปัจจัยระดับครัวเรือน
ผู้สูงอายุที่อาศัยอยู่ในครัวเรือนที่มีสมาชิกน้อยกว่าและอาศัยอยู่ในครัวเรือนที่มีรายได้สูงกว่า มีความน่าจะเป็นที่จะทำงานสูงขึ้น
ในขณะเดียวกัน ระดับการศึกษาที่สูงขึ้นมีความสัมพันธ์กับความน่าจะเป็นที่จะทำงานในภาคเกษตรกรรมที่ลดลง ในช่วงโควิด-
19
ผู้สูงอายุที่อาศัยอยู่ในพื้นที่ชนบทและทำงานในภาคเกษตรกรรมมีความเสี่ยงที่จะตกงานหรือเว้นจากการทำงานชั่วคราวน้อยกว่า
กลุ่มที่อยู่ในพื้นที่เมืองและกลุ่มที่ทำงานนอกภาคเกษตรกรรม ตามลำดับ ในทางกลับกัน
ผู้สูงอายุที่สำเร็จการศึกษาระดับอุดมศึกษาและผู้สูงอายุที่ใช้เทคโนโลยีสารสนเทศในที่ทำงาน
มีโอกาสสูงกว่าในการเปลี่ยนรูปแบบการทำงานเป็นการทำงานทางไกลในช่วงโควิด-19
และผู้สูงอายุกลุ่มนี้ยังมีโอกาสสูงกว่าที่จะมีแนวทางอื่นในการรับมือปัญหาที่เกี่ยวกับการจ้างงาน
ผลการวิจัยชี้ให้เห็นว่าการส่งเสริมสุขภาพและการสนับสนุนให้ระบบบำนาญมีความครอบคลุมมากขึ้น
เป็นปัจจัยสำคัญในการส่งเสริมพฤฒพลังในผู้สูงอายุ
ในขณะที่การส่งเสริมให้ประชากรทุกคนมีการศึกษาสูงขึ้นเป็นกลยุทธ์ระยะยาวในการสร้างความมั่นคงในการจ้างงานสำหรับกำ
ลังแรงงาน โดยเฉพาะอย่างยิ่งในกรณีที่เกิดสถานการณ์ที่ไม่คาดคิด

สาขาวิชา   ประชากรศาสตร์   ลายมือชื่อนิสิต ....

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Providing a secured employment system is a sustainable strategy given the context of a rapid population aging in Vietnam when the country is still in the lower-middle income group and a large part of older persons are living in low socioeconomic conditions. This work aims to investigate the situation of older persons' employment in Vietnam (employing the 2018 and 2020 Vietnam Housing and Living Standard Surveys) and the impact of COVID-19 on their employment and individual coping strategies to overcome employment difficulties (utilizing the 2021 Labour Force Survey). This study finds that older persons with retirement pension, facing health problems, and having a college degree were less likely to work after retirement age. At the household level, those living in households with fewer members and higher income are associated with higher probability of working. Meanwhile, higher level of education is associated with lower relative risk of working in agriculture for older persons. During COVID-19, older persons living in the rural area and working in agriculture are associated with lower relative risk of job loss or temporary absence. On the other hand, older persons with a university degree, using IT at work have higher relative risk of changing the working form to remote working during COVID-19. Those people are also have higher relative risk of having other solutions to cope with employment difficulties. The findings imply that improving health status and promoting pension coverage are the key factors to achieve active aging while enhancing educational level for all is a long term strategy to get employment security for the labour force, especially in case of unforeseen shocks.

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CHAPTER 1: INTRODUCTION

1.1. Background of the study

Vietnam has a sharp population aging:

Population aging is one of the four global demographic megatrends (Swiaczny, 2019) and Vietnam is entering this stage. In 2021, the population of Vietnam reached 98,506,200 people, in which the number of older persons (OPs) was 12,580,000, equivalent to 12.8% of the total population (GSO, 2021b). According to the United Nations (UN) population prospects 2022, Vietnam entered the aging population in 2013, with the share of OPs aged 60 and over accounting for 10.15% (9,159,000 OPs) of the total population. The country is predicted to enter the aged population in 2037, when the share of OPs aged 60 and over will account for 20.35% of the total population. On the other hand, the share of the working-age group (aged 15-60) peaked at about 66.48% of the total population in 2011 and slightly reduced to 63.98% in 2021 (UN, 2022b).

Figure 1: The percentage of OPs aged 60 and over in Vietnam between 2000 and 2050 (%)
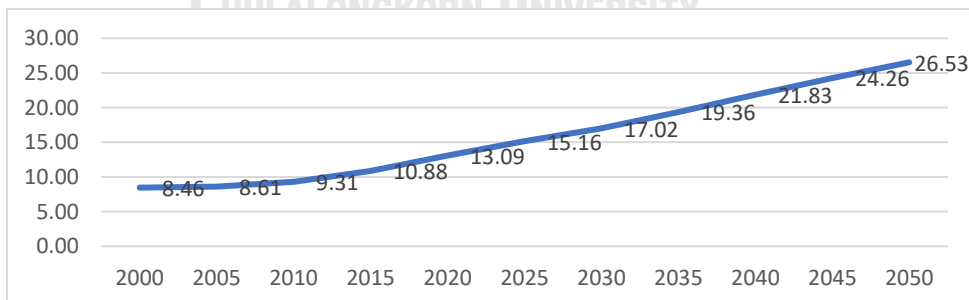
Source: United Nations, World Population Prospect 2022[1]

Based on the UN's prediction of Vietnam's population aging above, the country has only 24 years (from 2013 to 2037) to take advantage of the population dividend for the national economic development. The lesson learned from previous countries showed that if the Vietnamese government can take this opportunity well then the nation would achieve fast economic development, which will be the base for the aged population period (Mason, 2007; Ogawa et al., 2021).

Older persons were living in low conditions and now facing more difficulties due to COVID-19:

From living standard and income perspectives, by 2020, approximately 58% of Vietnamese OPs had no pension or any type of social security. At the same time, 64% of the total OPs were living in rural areas with low living conditions (GSO, 2021a). This is not to mention that a part of OPs was living under the poverty line (in 2020, 5.2% of the total OPs aged 60+ were living under the poverty line, this rate increased to 6.38% and 6.35% for those aged 70+ and living in the rural, respectively)[2].

According to the result of the 2011 Vietnam Aging Survey, children's financial support was the most important income source, which accounted for 32% of the total OPs' income, followed by income from working (29.1%) (Giang, 2012). Since COVID-19, about 75% of households faced income reduction and 31.8 million workers (more than half of the workforce) were negatively affected. The reduction in household income had a direct negative effect on the support for the elderly (HAI Vietnam, 2020). On the other hand, to direct resources towards COVID-19 responses, the Government had to

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[2] The author's calculation based on the 2020 VHLSS

postpone the plan to increase the base salary until July 2023 (which would have been implemented in 2020 if COVID-19 had not taken place). Thus, despite the high inflation rate, the pension/ social allowance or merit payments have remained unchanged. These factors would contribute to the low quality of life of OPs (HAI Vietnam, 2020).

Regarding health status, although life expectancy of OPs has been increasing, their health status is still problematic. By 2020, about 24.31% of OPs were reported to face at least one difficulty in performing activities of daily living (ADLs), and these figures increased to 60.64% among those aged 80 and over (of which, approximately 50% of them faced at least three difficulties in performing ADLs) (GSO, 2021c). Records of the outbreak of COVID-19 showed that OPs are facing more serious risks than the younger ages, in particular the risk of death (Dadras et al., 2022). For example, in the early stage of the pandemic, the COVID-19 death toll in Vietnam was 35, of which 63% were OPs (22 cases) (HAI Vietnam, 2020). They also faced disruption in health care when many hospitals reduced or stopped receiving patients to give priority to COVID cases or to reduce the spreading of COVID-19[3].

The population aging and its challenges made it necessary for the Vietnamese government to provide appropriate policies and integrate the relevant aging issues into the socio-economic processes at multi-levels, which is helpful for the economic recovery after the pandemic. On the other hand, these policies need to respond quickly in any case of shocks. Moreover, the government also needs to focus on investment in

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[3] Ministry of Health, the Telegraphy No. 1212/CĐ-BYT on strongly increasing the prevention and control of Covid-19 contraction in health examination and treatment facilities, special for high risk people, dated August 3, 2020. https://emohbackup.moh.gov.vn/publish/home?documentId=8042. Access at 12:00 4 may 2023

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human resource development policies to take advantage of the population dividend (Wongboonsin et al., 2005), as well as to avoid the risk of a population aging trap (getting old before getting rich) (Ziegenhain, 2021).

Providing an appropriate employment system for OPs is considered a good way to ensure active aging, as well as income security of OPs and the reduction of the burden on the national social protection system. From the perspective of society, such system will encourage OPs to continue their contribution to socioeconomic development. OPs are those who have accumulated a long experience during their working age and this experience can be valuable for the organizations. They are also expected to transfer this knowledge and experience to the younger labour force. From a personal perspective, continuing work will bring many benefits for the OPs such as maintaining their good physical and mental health, and ensuring income for their daily expenses (Fried, 2016) as many of them do not have any pension or social security after the retirement. In this way, the system will improve their quality of life and reduce the burden on the social protection system. As per the UN's recommendation, OPs should have opportunities to work or generate income in order to live independently (UN, 1991).

However, most older workers are unskilled workers with vulnerable employment. According to the results of the 2019 Population and Housing Census, 35.07% of total OPs continued working and the majority were own-account workers or family workers (60.9% and 23.8%, respectively) the percentage of employed workers only accounted for 12.87% (GSO, 2021a). According to the ILO definition, they are the more vulnerable workers (Gammarano, 2018). Given the strong relationship between working condition and the status in employment and living conditions of OPs,

improving OPs' employment, and working conditions, therefore, should be a priority of the government in the context of population aging.

The negative impact of Covid-19 on economic growth is recorded globally, including in Vietnam. Globally, the unemployment rate is predicted to remain higher than before the pandemic displayed, at least to the year 2023 (207 million (M) unemployed in 2022 compared with 186M in 2019). The rate of participation in the labour force in 2022 would be 1.2% lower than in 2019 (ILO, 2022c).

In Vietnam, due to the impact of COVID-19, the labour force participation rate has declined. As of the 2nd quarter of 2020, the rate was 72.3%, decreasing by 3.1% over the previous quarter and by 4.1% compared to the same period of the previous year. The labour force participation rate in the urban area was lower than that in the rural area in all age groups, of which, the largest difference belongs to the group aged 15-24 (urban: 45.3%; rural: 60.1%). As of Quarter IV year 2021, there were 24.7M people in the workforce who had been negatively affected by COVID-19, of which, 2.3M had lost their jobs; 12.4M had stopped working temporary; 8.8M had cut down working time and 16.9M had reduced income (GSO, 2022).

The impact of the pandemic on employment in Vietnam is varied and different depending on the worker characteristics:

The pandemic pushed millions of workers to become informal workers. According to the statistics of the General Statistics Office Vietnam (GSO), for the year 2020, the number of informal workers was 20.3 million, an increase of 119.1 thousand people, compared to the year 2019. While the number of formal workers was 15.8 million, a

decrease of 21.1 thousand people compared to the year 2019. The rate of informal jobs was 56.2% in 2020, 0.2% higher in comparison to the previous year. This situation was in contrast to its declining trend in recent years (i.e. between 2016-2019, the average annual decline of informal workers was about 3.6%) (GSO, 2020b).

From the industrial sector's perspective, the COVID-19 pandemic first affected service sectors such as transportation, hospitality, tourism, and entertainment sectors (Zieliński, 2022). In Vietnam, as of June 2020, the service sector was hardest hit by COVID-19, with 72.0% of the workers affected, followed by the Industry-Construction sector (67.8%) and the percentage of affected workers in the agriculture, forestry and fishery sector was lowest at 25.1% (GSO, 2020b).

Regarding the gender and age aspects, the female workforce has been affected more than their counterpart. In particular, in Quarter II 2020, the female workforce decreased by 4.4% against the previous quarter and by 5.4% over the same period last year (compared to a decline of 3.5 and 3.2% of the male workforce, respectively). Meanwhile, the percentage of the active older population aged 60+ decreased from 2019 to 2020 (from 52.9% to 52.3%) (GSO, 2019 and 2020). According to the GSO Vietnam, as of QII 2020, the female workforce aged 60+ recorded a decrease of 4.9% compared to QII, 2019. In contrast, the figure for the male workforce increased slightly, approximately 1.4% (GSO, 2020b) – Figure 2.

Figure 2: Increase/ decline in the labour force aged 60+ by sex (%)
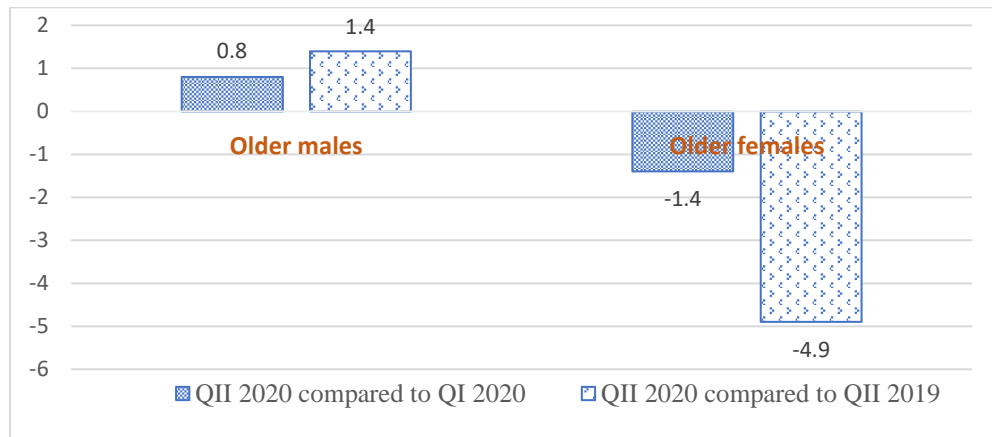
Source: GSO Vietnam, Report on the impact of COVID-19 on labour and employment situation in Vietnam

Employees with the vulnerable employment will easily lose their job and/or have lower income in any type of shock and the COVID-19 pandemic was a typical example (Acs & Karpman, 2020; Fletcher et al., 2022). The negative impact of the pandemic is especially severe on vulnerable workers such as informal workers (Lee et al., 2020), female workers (Dang & Nguyen, 2021), older adult workers (Li & Mutchler, 2020). This is an alarm for the government to guarantee a better status in employment and working condition for their workforce. By this way, employees can protect themselves from difficult circumstances and shocks.

Significance of this study:

Aging is a global tendency and a significant issue in the 21st century. It leads to a series of socio-economic development issues as well as challenges in ensuring the quality of life of OPs such as poverty, inequality, health care, etc. How to formulate effective policies for an aging society and improve the well-being of all is one of the policy priorities of the governments, especially in developing countries when they have less

time to prepare for the jump into an aged society (proportion of population aged 65 or over from 7 to 14%). For example, France, Sweden and the U.S had respectively 115 years, 85 years, and 72 years to change from an aging to aged society. Meanwhile, developing countries such as Thailand, and Indonesia are predicted to have 20 years and 25 years for the changes (Dhanaporn Chittinandana, 2017). Therefore, this will constitute a very stern test of the capacity of these societies to adapt, especially in countries with a rapidly declining fertility rate (Sigg, 2005). Vietnam is an appropriate example of this situation with a fast aging process when the country is predicted to have 24 years (from 2013-2037) to take advantage of a golden population for economic development. As of 2023, Vietnam has only 15 years left before becoming into an aged society. However, the country still has low labour productivity in term of the GDP per hour worked (GDP constant 2017 international $ at PPP) (ILO, 2023) and holds lower indicators for socioeconomic development compared to some other countries in East and Southeast Asia – Table 1.

Table 1: Some socioeconomic indicators of some East and Southeast Asia countries

Country	GDP per hour worked (*constant 2017 international $ at PPP*) in 2021[a]	GNI per capita (*constant 2015 US$*)[b]	Gross saving (*% GDP*) in 2021[b]	Education enrolment, at least upper secondary (%)[b]	Life expectancy at birth (years) in 2020[b]
Japan	39.6	37,219.0 (2021)	28	80.3 (2010)	85
South Korea	41.46	33,085.4 (2021)	37	76.4 (2015)	83
Singapore	74.15	51,848.7 (2015)	44	74.5 (2010)	84
Thailand	15.06	5,414.3 (2015)	28	35.3 (2019)	79
Indonesia	12.96	3,784.3 (2021)	33	38.1 (2020)	69
Vietnam	**10.22**	**3,227.6 (2021)**	**33**	**31.9 (2019)**	**75**

Sources: [a]Statistics on labour productivity - ILOSTAT; [b] https://data.worldbank.org/indicator

The results from Table 3 show the lower efficiency and quality of human capital and the low living standard of the population of some developing nations, especially Vietnam, compared to other developed countries in East and Southeast Asia. These factsheets show the difficulties during the preparation for the aged society of the developing nations. Therefore, encouraging later-life employment will ensure income security for OPs and so, reduce the burden on the social security system. In Vietnam, some researchers have worked on the employment situation and determinants of labour force participation of Vietnamese OPs (Giang et al., 2019; Giang & Nguyen, 2016). The authors mostly based the study on cross sectional data from the 2011 Vietnam National Aging Survey (VNAS) to investigate the determinants of the OPs' working decision at the individual perspective.

This thesis will use two waves of the VHLSS (2018 and 2020) employing pooled cross sectional data analysis to illustrate the determinants of the OPs' working decision and their type of work in the context of COVID-19. In addition, this thesis also employs the 2021 LFS data to examine the impact of COVID-19 on OPs' employment changes and their coping strategies. To the researcher's best knowledge, the issue has never been investigated before in Vietnam. This thesis, therefore, will contribute to developing knowledge in the area of labour-employment studies with a focus on the vulnerable groups (i.e. older persons) in urgent shocks (i.e. COVID-19), and examine the applicability of some relevant theories in the context of Vietnam. In summary, the contribution of this thesis is twofold. One is to understand the employment situation of OPs, especially in the urgent shock, and to suggest relevant policy implications to improve the OPs' employment security. The other is to apply relevant theories and

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concepts to the case of Vietnam and to compare to other studies though the literature review.

This thesis, first, aims to provide a picture of the OPs' employment situation and investigate the determinants of their working decision and type of work. The second goal focuses on exploring the impact of COVID-19 on OPs' employment, in particular investigating the factors of OPs' employment changes and their solutions to overcome the difficulties caused by the pandemic. Hence, the results will have implications for related policies for the future of OPs' employment. In this way, the findings will support policymakers to have a deep understanding of Vietnamese OPs' employment situation and its determinants, especially in the urgent shock.

1.2. Research questions

1) What were the situations of employment of OPs in Vietnam between 2018 and 2020?

2) Which factors were associated with (i) the OPs' probability to be employed and (ii) their type of job?

3) How did COVID-19 impact the employment situation of OPs? What were the factors associated with the impact of COVID-19 on the employment situation?

4) What were the coping strategies of older persons faced with employment difficulties caused by COVID-19? What were the personal characteristics associated with each coping strategy?

1.3. Aims of the study

This thesis aims to analyse the employment situation of older Vietnamese persons aged 60 and over with a focus on the determinants of the probability of being employed and type of job. This study also focuses on analysing the factors associated with their employment changes due to COVID-19 and their strategies to cope with the employment challenges. There are four specific objectives:

1) To describe the employment situation of older persons between 2018 and 2020 by using data from the 2018 and 2020 VHLSS.

2) To investigate the determinants of OPs' probability of being employed in Vietnam and their type of job based on data from the VHLSS.

3) To analyse the factors associated with OPs' employment changes due to COVID-19 based on data from the 2021 LFS.

4) To illustrate the factors associated with the responses of OPs in dealing with employment difficulties caused by the pandemic, using data from the 2021 LFS.

1.4. Definition of terms

1.4.1. Definition of older persons

*This thesis uses the term "older persons" regulated in the Vietnamese Law on Older persons: "Older persons are those aged 60 years and over". In fact, t*he definition of older age or OPs are varied due to different aims of studies and fields (Orimo et al., 2006). While the UN defines older persons as those aged 60 year or over (Sanderson, 2019; Sanderson & Scherbov, 2019), the OECD uses the threshold of 65 years and over (OECD, 2021). The age of 60 or 65 years, roughly equivalent to retirement age in most

developed countries, is said to be the beginning of old age (Peachey, 2001). This suggests that the Government sets the definition of old age by starting a retirement age. On the other hand, some researchers also suggested a new measure of population aging based on the concept of prospective age and expected remaining years of life (Sanderson & Scherbov, 2007).

1.4.2. Definitions of work, job, employment, labour force, employed persons.

- Work: According to the ILO, work comprises *any activity* performed by persons of any sex and age *to produce goods or to provide services* for use by others or own use. There are five forms of work as follow: (a) own-use production work; (b) employment work fit; (c) unpaid trainee work; (d) volunteer work; (e) other work activities (ILO, 2013).

- Job: The definition of job has been defined in the 19th ICLS as follow: A job or work activity is defined as a set of *tasks and duties performed* or meant to be performed, by one person for a single economic unit[4]. The term of job is *used in reference to employment*. *Persons may have one or several jobs*. Those in self-employment will have as many jobs as the economic units they own or co-own, irrespective of the number of clients served. In cases of multiple job-holding, the main job is that with the longest hours usually worked, as defined in the international statistical standards on working time (ILO, 2013).

- Employment: The ILO suggested that "Persons in employment are defined as all those of working age who, during a short reference period, were engaged in *any activity*

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[4] The kinds of economic units include market units, non-market units and household

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to produce goods or provide services for pay or profit". They comprise employed persons "at work", i.e. who worked in a job for at least one hour during the reference period (7 days prior to the survey); and employed persons "not at work" due to temporary absence from a job, or to working-time arrangements (such as shift work, flexi-time and compensatory leave for overtime) (ILO, 2013).

In the context of the 4.0 Innovation, technological changes, and hidden risks (i.e. COVID-19 pandemic shock), the term employment is not only limited to "at work" but also expanded to other types of jobs such as remote work or work from home (Ozimek, 2020). The world is witnessing the dramatic increase in GIG work (Umar et al., 2021), which breaks traditional work (ILO, 2022c) with digital labour platforms (Rani & Dhir, 2020). In fact, the distinction between the term's "work", "job", and "employment" is not clear sometimes. This study will use the term employment for the analysis.

- Labour force: The GSO Vietnam defines the labour force to include the employed persons aged 15 and over (working) and the unemployed persons, as defined in the reference period (7 days prior the time point observation) (GSO, 2021b).

- Employed population: According to the GSO's definition, employed population in the economy refers to the number of persons aged 15 and over, who are employed in the reference period (7 days prior the time point observation) (GSO, 2021b). This thesis only focuses on the employed population aged 60 and over.

The definition of employed population is based on the ICLS standard. This term was introduced first time at the ICLS13 (the 13th International Conference of Labour Statisticians, in 1982). Accordingly, employed population are those who engaged in any activity (not prohibited by the law) at least one hour to produce goods/ products or

services for the purpose of generating income for themselves or their family. At the 19th International Conference of Labour Statisticians (ICLS19, in 2013), the definition of employed population had been developed. Accordingly, employed population are those who engaged in any activity (not prohibited by the law) at least one hour to produce goods/ products or provide services for the purpose of being paid wage or salary or getting profit. The difference between the ICLS19 and ICLS13 standards is mainly related to producing the self-consumption product's activity. While the ICLS 13 considered this activity to be work, the ICLS19 did not.

1.4.3. Definition of strategy and coping strategy

- Strategy: The term "strategy" refers to a plan or roadmap designed to achieve a specific goal or objective. It involves making choices (goals) about what actions to take and how to allocate resources in order to achieve the desired outcome (Barad & Barad, 2018; Mintzberg, 1987). This term is originated from Greek in the 6th century, with a regard to an "art of the general" sense, it mentioned a high-level plan such as several subsets of skills including tactics, siege craft, logistics etc., to achieve one or more goals under conditions of uncertainty. Two major processes of a strategy include formulation and implementation (Barad & Barad, 2018). Subrat P. Mishra and Brajaraj Mohanty (2022) identified six distinct approaches to strategy formulation: (1) the planning approach, (2) fit approach, (3) emergent approach, (4) positioning approach, (5) resource-based approach and (6) stakeholders' approach. They showed that each approach contributed and played different roles at each point of time. However, in the last four decades, the positioning approach and resource-based approach are two most popular approaches (Mishra & Mohanty, 2022). In short, the term "strategy" intends

three main aspects, including: (1) setting goals, (2) taking actions and (3) mobilizing resources or means.

- Coping strategy: refers to the set of techniques, behaviours or thought process that an individual use to manage stress, anxiety or unpleasant feelings (Stephenson & DeLongis, 2020). Coping strategies are as numerous and varied depending on the individual and the situation that they are facing (S. Blum, 2012). Sharma (2023) suggested that the choice of coping strategy is associated with the quantity and quality of available resources that a person holds, such as knowledge, skills, attitudes, social resources, physical resources, material resources, and societal resources (Sharma, 2023). In this thesis, the concept of coping strategies refers to the associated responses of OPs to solve the employment difficulties caused by COVID-19.

1.5 Chapter's summary

This chapter introduces the rationale and objectives of this dissertation. Overall, Vietnam has a rapid population aging. According to the UN, Vietnam has only 24 years (from 2013 to 2037) to transfer from an aging to the aged society. This is inspired of the fact that, at the macro level, the country is still in the group of lower-middle income countries. At the micro level, OPs in Vietnam are living in low socioeconomic conditions with only a small proportion receiving pensions, while a large proportion are living in the rural area with poor economic conditions. Due to this fact, Ops must continue working to ensure their daily life; however, most of them working in the informal sector, specifically agriculture, with low or non-paid jobs. Moreover, OPs have low ability to compete in the labour market due to their limited capacity. The challenge has doubled since the outbreak of COVID-19 as they are at a higher risk of

withdrawal from the labour force compared to the other age groups. Therefore, creating and providing an appropriate employment system for OPs is a key strategy that the Vietnamese government needs to focus on given the context of population aging. These situations motivated me to investigate the OPs' employment situation in Vietnam with a focus on the context of COVID-19. By doing so, I hope to gain a thorough understanding of the situation of Ops' employment which would be useful for policy makers and relevant agents. In addition, policy implications will be provided based on the findings of the study.

This study firstly aims to provide the picture of OPs' employment situation in Vietnam and the analysis of the determinants of OPs' probability to be employed and their type of job by utilizing the Vietnam Housing and Living Standard Survey (the waves 2018 and 2020). Secondly, the study aims to analyse the impact of COVID-19 on OPs' employment, in particular investigating the factors associated with the change in OPs' employment and OPs' coping strategies to deal with employment difficulties due to COVID-19 based on the 2021 Labour Force Survey. Findings of this study are expected to support policymakers and readers to have a deep understanding of the Vietnamese OPs' employment situation and its determinants, especially in the urgent shock.

The next chapter will focus on the related theories and literature review, which will provide a foundation regarding the determinants of OPs' working decision, the type of job and the impact of COVID-19 on OPs' employment.

CHAPTER 2: LITERATURE REVIEW

2.1. Related theories

2.1.1 The STREAM framework on transitions in employment and work productivity

The STREAM framework is based on the Study on Transitions in Employment, Ability and Motivation (STREAM) regarding the determinants of sustainable employability among persons aged 45 to 64 years in Netherlands between October 2010 and December 2013 (Ybema et al., 2014). The term sustainable employability refers to transitions in employment status and work productivity. The authors suggested that transitions in employment status include the transition (1) from work to inactivity in the labour market and in contrast, (2) from inactivity to employment, and (3) the mobility on labour market. While the term work productivity refers to the quantity and/or quality of self-reported productivity, which includes sickness absence, presenteeism, and loss of productivity while at work. This framework aims to support the development of work-related interventions or regulations promoting sustainable employability among older workers.

Table 2: Framework to investigate the determinants of transitions in employment and work productivity.

Source: https://journaljammr.com/index.php/JAMMR/article/view/1823
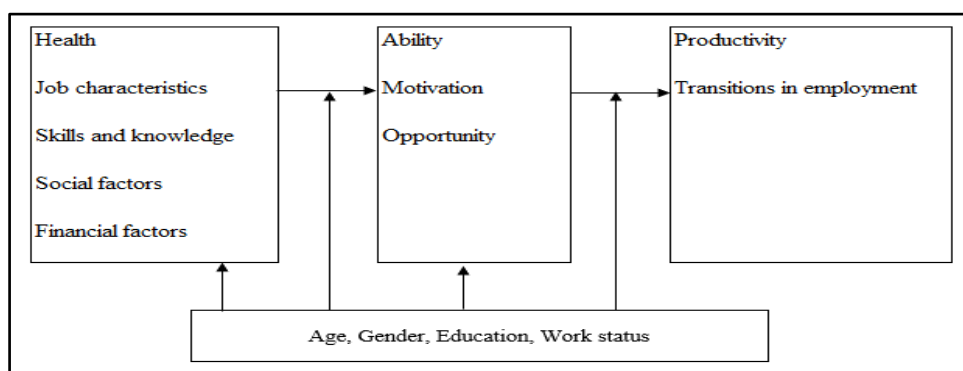
As shown in Table 2, five determinants of transitions in employment and work productivity include health, job characteristics, skills and knowledge, social factors and financial factors. Impacts of these determinants to transitions in employment and work productivity are reflected through the ability, motivation, and opportunity to work. The STREAM framework also emphasizes influences of moderating variables such as age, gender, education and employment status on all variables included and their interrelations (Ybema et al., 2014).
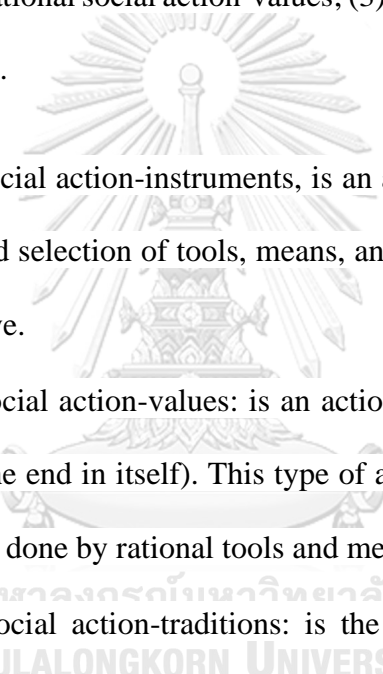
❖ *The STREAM framework helps explain the factors associated with the labour force participation and transitions in employment and work productivity of OPs and the pathways to sustainable employability. It also leads to the understanding of the role of the ability, motivation, and opportunity to work among OPs, which has implications on highly impressed developing work-related interventions and policies that promote sustainable employability among older workers from the macro level (national legislation) and middle level (interventions of employers) to the micro level (interventions empowering individuals). Due to the scope of this thesis, which only focus on analysing the determinants of the OPs' probability to be employed and their ability, motivation and opportunity to work among OPs at the micro level.*

2.1.2 Max Weber's Social Action Theory

Max Weber (1864–1921) was the father of sociology. His most well-known work is associated with the Social Action Theory. Accordingly, human beings adapt their actions according to social contexts and how these actions affect the behaviour of others. That was the first time the concept of "meaning" was introduced in order to explain human behaviour. For him, not all actions are social actions; only the acts that

are assigned a certain subjective meaning by their subject, directed at other individuals, and have the ability to interact with others in society are considered social actions. In other words, social action is a direct exchange between individuals as well as patterns of relationships that have been structured above social groups, organizations, and institutions.

Max Weber distinguished four categories of social actions, including (1) rational social action instruments; (2) rational social action-values; (3) rational social action-traditions, and (4) emotional action.

- The rational social action-instruments, is an action taken with consideration, calculation, and selection of tools, means, and purposes in such a way that it is most effective.

- The rational social action-values: is an action performed for the sake of the action itself (the end in itself). This type of action can be aimed at irrational purposes but is done by rational tools and means.

- The rational social action-traditions: is the act of complying with habits, rituals, customs and traditions that have been passed down from generation to generation.

- The emotional action: is an action caused by the emotional states of a person, without consideration and analysis of the relationship between the tools, means and purposes of the action.

These acts are related and affect others. In modern society, social action is always associated with the positive nature of individuals and is determined by a series of factors such as the needs, interests, and value orientations of the action subject.

❖ *Applying Max Weber's Social Action theory in this study helps explain in detail the reasons, motivation behind the OPs' choices to work or not work and the types of job (the values contribute to the OPs' working decision as their purposes, habits, tradition, etc.). Accordingly, the economic values are expected to be the variables of an OPs' working decision. On the other hand, this theory can also explain the types of work due to their human capital.*

2.1.3 The Conservation of Resource (COR) theory

The Conservation of Resources (COR) theory was developed by Hobfoll (1989) and applied widely, which is typical for the uncertain and disorder labour market recently. Accordingly, people always intend to plan their careers and build and maintain their resources. In that way, people try to reduce the loss of these resources before any type of shock (Hobfoll, 1989). On the other hand, based on those available resources, they can manage the career shocks well, develop resilience, and maintain a sustainable career.

From individual aspects, the COR framework emphasizes an individual's ability to cope with stress (i.e., career shocks) and explains how they can maximize their resources to obtain career success. In other words, the framework provides an explanation of how individual resources can impact their career resilience (Akkermans et al., 2018; De Vos et al., 2020) and what happens when individuals face stress (Hite & McDonald, 2020).

They argued that those who have better resources can better cope with stressful situations and convert these situations into resources. The personal resources include education, skills, experiences (Hobfoll, 1989), and attitudes and behaviours (Hite &

McDonald, 2020). Career shocks can be mitigated by utilizing all of one's personal resources.

I understand that "career shocks" refer to disruptive and extraordinary events that can have a negative or positive effect on a person's employment. For example, they can unexpectedly lose their job (a negative shock) or receive a work promotion (a positive shock). The concern is that a worker should manage career shocks proactively (Ali & Mehreen, 2021), resulting in better employability even if a negative shock occurs, such as a smooth transition from one job to another.

Outside factors (contextual factors) such as family support, the workplace, job characteristics, and institutions all contribute to the ability to be resilient after stress or career shocks.

COVID-19 is an urgent shock that impacts all aspects of people's lives, from their health to employment and income. It has a significant impact on all types of work, firms, industries, and so on; however, it is more severe for those who lack resources (e.g., material, human capital, social support) and protective factors (e.g., strong social support, a diverse set of skills), which, consequently, lead to a lower ability for resilience.

Ali and Mehreen (2021) summarized the framework of career shock management as presented in Table 2. Accordingly, career shocks occur in both negative and positive ways and impact the resources of individuals (i.e., perceived self-efficacy and employability). As a result, it directly impacts their proactive career behaviours

(employment resilience). To measure, I must also control for the demographic factors such as age, gender, education, and work experience.

Table 3: Framework of a career shock management
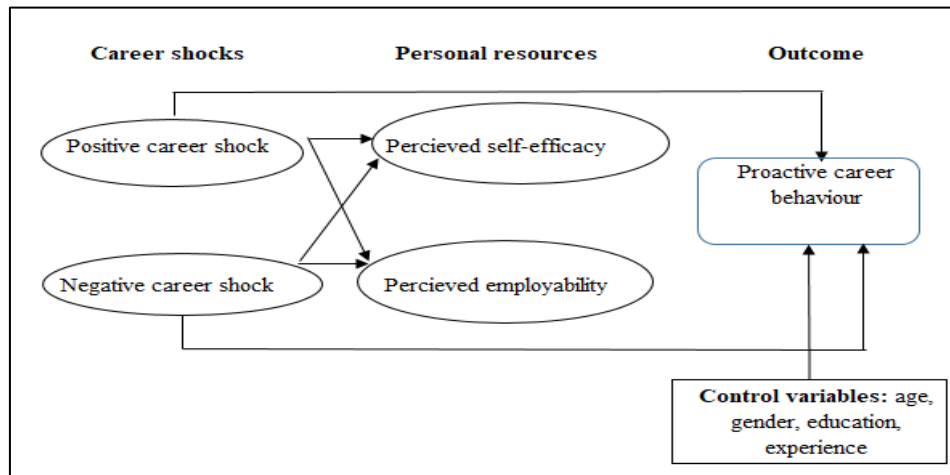
Accordingly, career shocks can be either positive or negative. Those with better personal resources (i.e., self-efficacy and employability) can reduce or recover better from negative career shocks. Both proactive and reactive career behaviour will be managed. It is also necessary to take into consideration demographic characteristics such as age, gender, education, and experience. Moreover, there is a two-way relationship between career shocks and personal resources.

❖ *The COR theory helps shed light on the intriguing topic of who will be more employable after COVID-19 and how people handle its shock. The consideration of various demographic factors is also crucial in this thesis.*

Regarding the career resilience, Mishra, P., & McDonald, K. (2017) pictured a network of career resilience, based on two main sides: personal factors and contextual factors – Table 3. According to the authors' point of view, the personal factors can be divided into five

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items: (1) individual characteristics; (2) attitudes; (3) career history; (4) skills; and (5) behaviours. Contextual factors are divided into three categories: (1) a supportive workplace; (2) a supportive family; and (3) job characteristics (Mishra & McDonald, 2017).

Table 4: Nomological network of Career Resilience
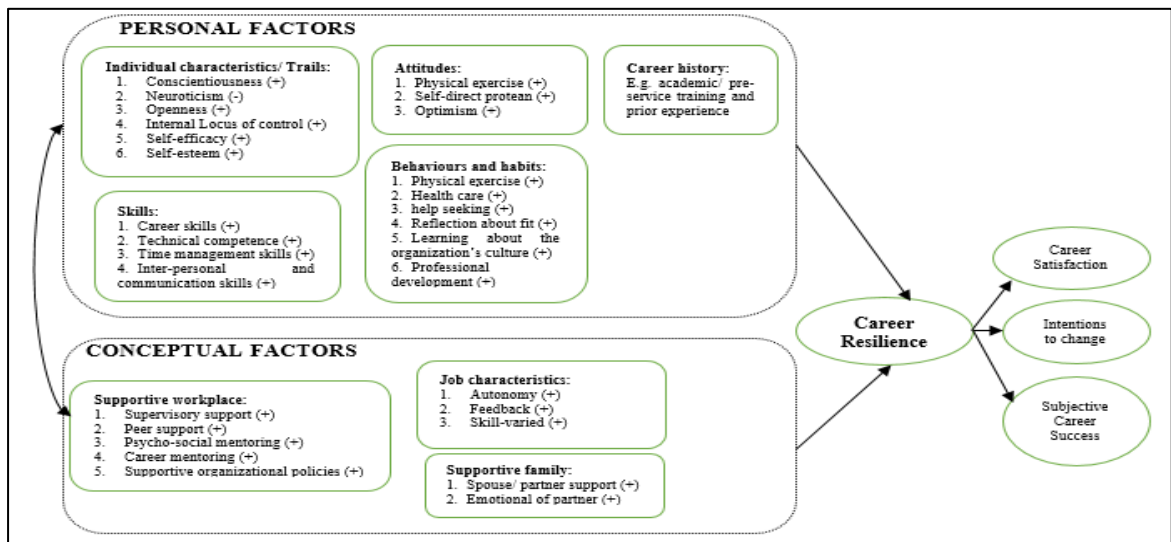
Each of the aspects includes different indicators, in which those presented in the minus sign mean a negative impact on career resilience and those indicated in the plus sign mean a positive impact on employees' career resilience. For example, in the skill groups (personal factors), there are four skills, including (1) career skills, (2) technical competition, (3) time management skills, and (4) inter-personal and communication skills, and all of them have a positive impact that increases career resilience – Table 4.

❖ *Due to the aim of this study and the limitations of the data information, this thesis will only focus on some aspects of individual factors and skills (the personal factors) and job characteristics as mentioned in Table 4. However, rather than the*

psychological approach presented in Mishra and McDonald's framework, the approach of this thesis will focus on the individual demographic characteristics.

2.1.4 Human-right based approach

The term "human rights" has been introduced in the Universal Declaration of Human Rights, adopted by the UN General Assembly in 1948[5]. It expresses strongly that all people in societies have equal and equitable rights relevant to themselves, with priority given to those who are vulnerable and at risk of being left behind. Actually, this approach is based on the framework of human development and encourages and protects human rights[6].

For OPs' right-based approach, first is implementing all human rights to ensure all OPs achieve and then enjoy their old age[7]. Some regulations for the implementation of human rights are:

- *Participation:* ensuring full, active, and free participation in their relevant rights. It also means that they need to be supplied with all information necessary for this participation. The elderly are one of the vulnerable groups due to some limitations in physical and mental health. As a result, friendly and appropriate policies are required, with OPs at the centre of these policies (older person-centred).

- *Non-discrimination and equality: require that all forms of discrimination in the exercise of rights be prohibited, prevented, and eliminated, with priority given to*

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[5] https://www.unfpa.org/human-rights-based-approach. Access at 17:00, 6 May 2022

[6] https://unsdg.un.org/2030-agenda/universal-values/human-rights-based-approach. Access at 17:30, 6 May 2022

[7] https://age-platform.eu/sites/default/files/HR-based_approach_ageing_27Nov.pdf. Access at 18:00, 6 May 2022

those in the most vulnerable situations. A rights-based approach seeks to identify the concrete changes that are necessary to address discriminatory patterns so that people, no matter their age, can live with dignity.

- *Accountability:* this requires effective monitoring of compliance with human rights standards and achievement of human rights goals, as well as effective remedies for human rights breaches. It, therefore, requires appropriate laws, policies, institutions, administrative procedures, and mechanisms to guarantee human rights.

Besides, individuals and societies need to be able to understand their rights and to participate fully in the development of policies and practices which affect their lives. On the other hand, it requires that the law recognizes human rights and freedoms as legally enforceable entitlements, and the law itself is consistent with human rights principles. In other words, a human right-based approach also seeks to reinforce the capacities of duty bearers (usually governments) to respect, protect and guarantee these rights[8].

❖ *In the context of a sharply aging society, setting up policies for Vietnamese OPs needs to be deeply considered, especially taking them to the centre of policies relevant to their issues and letting them participate in these processes. In detail, employment policies for OPs need to be followed by general laws (i.e., the Labour Code, the Law on Older Persons); however, these policies also need to be friendly to OPs, as well as some fundamental and special mechanisms to ensure their participation. The human*

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[8] https://www.unfpa.org/human-rights-based-approach

right base is also the way to achieve the basic goals of the 2030 Agenda of SDGs
"leaving no one behind." It is the basis for achieving decent work for all (MacNaughton
& Frey, 2015) regardless of gender, age, race, etc.

2.1.5 The framework on the relationship between population change and OPs' labour force participation

According to the demographers, population structure results from population processes (fertility, mortality, and migration), which directly impact a nation's socioeconomic development, including employment issues. The relationship between population structure and labour-employment is a two-ways interaction. At first, a population's size, structure, and distribution identify the working population's size, structure, and distribution. In turn, the labour-employment process helps increase the population's quality of life and better awareness and knowledge.

According to Week (2020), in order to have high labour productivity, a country needs to have either (i) high rate of working-age population or (ii) high-quality workforce, of which, the author emphasized the role of the high-quality workforce (Weeks, 2020). In other words, if a country can take advantage of the golden population[9] well, they might have the second population dividend. Otherwise, they might fall into the trap of the aged population (getting old before getting rich). In order to achieve the second population dividend, governments need to introduce appropriate employment policies which encourage the productivity of the workforce. According to the General Office

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[9] According to the UNFPA, Viet Nam started the period of a demographic window of opportunity since 2007 and will end until 2039 when having a large working age population (15-64) twice as high as the dependent age group (under 15 and 65 and older). https://vietnam.unfpa.org/en/node/15210. Access 16:15 19 November 2023.

For Population And Family Planning of Vietnam (GOPFP, 2015), the relationship between population structure and employment is as follows:

Table 5: Framework of the relationship between population structure and labour-employment
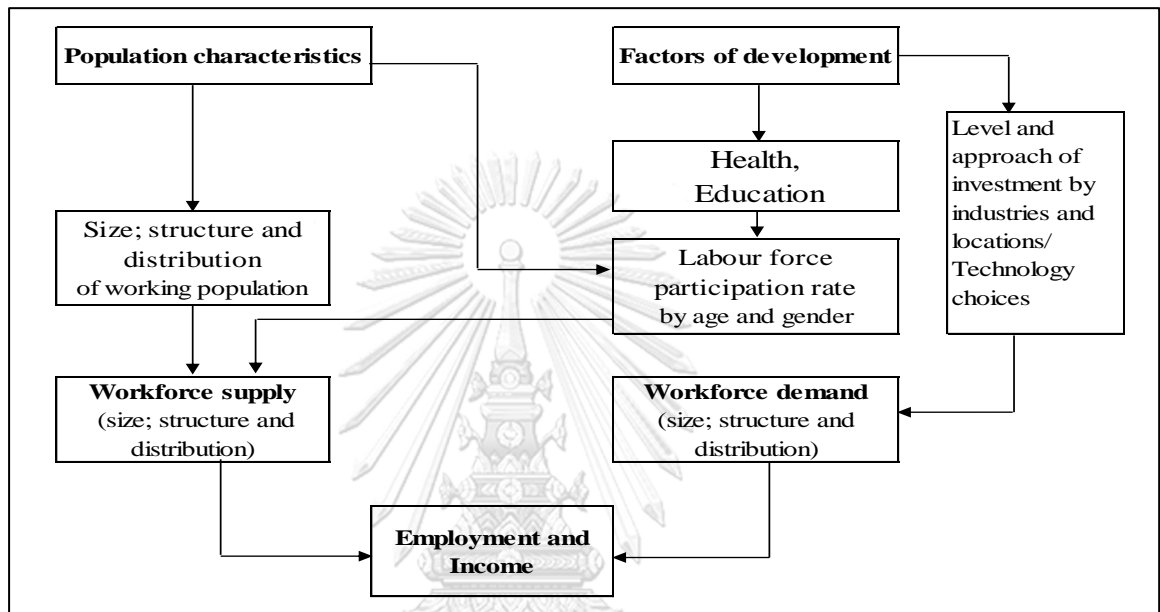
Source: General Office for Population And Family Planning, Ministry of Health Vietnam.

❖ *Understanding the framework of the relationship between population changes and OPs' employment would help explain why so many of them are working. With better health conditions and a longer life expectancy, OPs can continue to contribute even when they already entered the official retirement age. In an aging society, the share of the working-age group reduces, while the share of OPs is larger. Besides, OPs also live more independently. These conditions would be the reasons why the OPs still participate in the labour force after reaching retirement age.*

2.2 Literature review

The study of the OPs' labour force participation is an important and much needed topic in the context of the global aging that is taking place. The topic of OPs' labour force participation has been investigated by several researchers and the findings showed the different results among nations, depending on the country's socioeconomic development, culture, and lifestyles. Also, it is essential to consider the OPs' working decision not just in terms of age but also in terms of shocks. As a result, I comprehend the OPs' employment decision and the situation in various ways. The following three main contents are reviewed:

1) the determinants of labour force participation of OPs;

2) the impact of COVID-19 on OPs' employment and;

3) OPs' solutions to overcome employment difficulties caused by COVID-19.

The literature review aims to paint a multi-dimensional picture of the OPs' employment and provide a deep understanding of factors affecting the OPs' operational decisions and knowledge about how COVID-19 impacts on the OPS's employment and their associated responses.

Overall, OPs nowadays have better health and longer time to participate in the labour force (Schmidt & Sevak, 2009). Some studies showed that the rate of OPs in developing countries continue working after the retirement age is large due to low economic status, no savings, and a bad working history (CEPAL, 2018; Paweenawat & Liao, 2021; Rajan, 2010; Teerawichitchainan et al., 2019). For example, approximately 30 - 43%

of total OPs in Thailand, Vietnam and Myanmar still participated in economic activities (Teerawichitchainan et al., 2019).

Although the rate of labour force participation is high; the quality of OPs' employment is low in developing countries. Among those who are undertaking economic activities, most of them are self-employment in agriculture and have unpaid jobs, which are considered the low quality of work or unstable work (Chattopadhyay et al., 2022; Mohd et al.; Teerawichitchainan et al., 2019). For example, in India, about two-third of working OPs were in agriculture (Chattopadhyay et al., 2022). This is also the case for Vietnam, where the proportion of the Vietnamese OPs participating in the labour force remained at about 35% between 2009 and 2019 and the majority were working in Agriculture, Forestry and Fishery (GSO, 2021a). However, 84.7% of them worked as self-employed and family workers (GSO, 2021a). They are defined vulnerable workers based on the ILO definition (Gammarano, 2018); and so, are expected to earn low income or have unpaid jobs. This thesis will continue with the literature review the determinants of the OPs' labour force participation.

2.2.1 Determinants of the OPs' probability of being employed

This section will explore the factors associated with the probability of being employed for OPs and help to answer the question of why OPs decide to join the labour force after retirement age. Recently, research on the determinants of labour force participation of OPs has been concerned in the context of rapid population aging. There are many determinants of labour force participation, ranked from macro issues to personal issues and job satisfaction (Dietz & Walwei, 2011). These factors can push or pull OPs in or out of the labour market.

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Different researchers have different approaches to analyse the factors associated with OPs' working decisions. Notably, in Zitikyte's thesis "Labour Market Participation of Older Workers in Lithuania: Factors Affecting Employment in Old Age" (Zitikytė, 2021). There are four groups of factors that influence OPs' working decisions after retirement, namely (1) individual factors, (2) financial factors, (3) family factors, and (4) other factors:

- Individual factors include age, gender, health, education, occupation, work history, sector and region
- Financial factors include old age benefits, wages and wealth
- Family factors include marital status, spouse's employment and family context
- Other factors include retirement age and early retirement schemes, private pension schemes, socio-economic factors, pension deferment and unemployment benefits.

Besides, there are many different factors which affect the decision of labour force participation of OPs such as attitude, employer's point of view (Tuominen & Takala, 2006); age discrimination and inequality at work (Rowe & Nguyen, 2002); friendly insurance or tax policies; change of technology at work (Ahituv & Zeira, 2011); working conditions, environment (i.e. firm size, work classification, and expected workability) (Dittrich et al., 2011). Due to the scope of the thesis as well as data limitation, this thesis only focuses on the determinants of labour force participation of OPs at the personal and household levels.

Economic factors:

Economic factors refer to all aspects of the income of older persons (pension; saving; investment; financial support from others) and their household income. These factors directly affect the OPs' decision to participate in the labour force.

- Pension:

Pensions can be a contributory or non-contributory scheme. A contributory pension scheme means that eligibility is based on previous financial contributions to a scheme and benefits are paid for with contributions. In contrast, a non-contributory pension scheme aims that eligibility is based on residency/citizenship and possibly other criteria (such as income and assets) and benefits are funded by general government revenues (also known as "tax-financed"). There are three types of contributory pension schemes, including (1) fully funded scheme, (2) partial funding scheme and (3) Pay-as-you-go scheme. Meanwhile, there are three types of non-contributory pension schemes, including (1) universal pension, (2) a Means-tested and (3) Pensions-tested scheme (ILO, 2022b).

A pensioner is more likely to withdraw from the labour market after retirement age while those having no pension try to stay longer in the labour force (Giang & Pfau, 2009; Giang & Nguyen, 2016; Latt, 2018; Paweenawat & Liao, 2021). For example, Paweenawat and Liao (2021) showed the case of Thailand that OPs who received a pension were 36.4% less likely to participate in the labour force, compared to their counterpart (Paweenawat & Liao, 2021).

The labourers sometimes choose to be pensioners even before their official retirement age due to the advantaged policies such as early retirement, disabled or special

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unemployment benefits. This situation is more popular in European countries with the early retirement program introduced in the 1970s in most European pension systems (Börsch-Supan, 2000; Börsch-Supan et al., 2021; Bosch & Schief, 2007; Engelhardt, 2012) and considered a culture issue, regardless the regulation about mandatory retirement age (Bosch & Schief, 2007; Jansen, 2018). For example, there was about 65% of German men retired as early as age 57 under the disability benefits or special unemployment program before getting pension benefits in 1995 (Gruber & Wise, 2009). As a result, Bosch and Schief (2007) showed that in 15 countries in Europe, the labour force participation rate of the population aged 55 - 64 reduced from 50% in 1970 to 40% in 2000 (Bosch & Schief, 2007). That was the reason why the governments recently reformed the relevant programs such as benefit reduction of early retirement, increasing the age of early retirement, pension reform, etc., to restrict the situation and keep OPs in the labour market (Tuominen & Takala, 2006).

In Vietnam, the contributory pension scheme (retirement pension) is under the Pay-as-you-go plan[10]. As of December 2022, a total of 22% of labourer's monthly salary will be paid for. In which, the employer will contribute 14% and the other 8% in under the employees' contribution[11]. When they reach retirement age, they will start receiving a monthly payment that ranges from 45% to 75% of their monthly salary and is based on the number of years they contributed while they were working[12]. Studies conducted in

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[10] *Pay-as-you-go (PAYG):* is a benefit payment arrangement in which benefits are paid out of current scheme revenue as they become due, with no pre-funding of future benefit obligations. Schemes funded solely through PAYG rely entirely on future contributions from current and future generations to pay the pension of each current pensioner generation. ILO Policy Brief "Old-age pension models worldwide from an ILO perspective: What workers' organizations need to know". Access at 12:20, 1 May 2023.
[11] This rate is applied from October 1, 2022, according to the Decision No. 595/QĐ-BHXH dated April 14, 2017 and the revision No. 505/QĐ-BHXH dated March 27, 2020.
[12] For example, according to the Decision No. 505/QĐ-BHXH dated March 27, 2020: for male workers, if they have a 20-year contribution for social insurance, they will get a 45% of their monthly salary, and

Vietnam revealed that a pensioner was less likely to work than their counterparts (Giang & Pfau, 2009; Giang & Nguyen, 2016). On the other hand, the non-contributory pension scheme (social pension) is a Means-tested scheme, which aims for OPs facing a series of difficulties[13], ranging from economic to health problems. According to the Decision No. 20/2021-NDD-CP, the current subsidy amount is quite small (VND 350,000 per month, approx. USD 15.00[14]), equivalent to 23.3% of the national poverty line, meaning that it contributes very little to the well-being of older people, therefore, OPs still continue working to maintain their independence (ADB, 2012; ILO, 2019).

Regarding the meaning of each type of pensions, those receiving a contributory pension may ensure for their quality of life; in contrast, those receiving a social pension normally live in a difficult condition. Therefore, in this thesis, I aim to investigate whether having a contributory pension makes a difference in the probability of being employed and the type of job for OPs.

- Savings and financial support from children and relatives:

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for every 1-year contribution, they will get a 2% more. For female workers, if they have a 15-year contribution, they will get a monthly retirement pension equal to 45% of their salary before. For each additional year of contributions, the pension will increase by 3%. The total of this percentage will not exceed 75% of the monthly wage. For example, if a male has a 25-year contribution for social insurance, they will get an amount of a 55% of their salary when they retire.

[13] According to Decision No. 20/2021/NĐ-CP dated 15 March 2021 of the Government, there are 4 types of OPs are covered by the social pension scheme: (1) OPs in poor households, do not have people with obligations and rights to serve them or have people with obligations and rights to serve them but those people are receiving monthly social allowances; (2) OPs aged 75 to 80 in poor or near-poor households are living in communes and villages in ethnic minority areas and mountainous areas or have special difficulties; (3) OPs aged 80 years or older, who do not have a retirement pension, social insurance allowance or monthly social allowance; (4) OPs in poor households, have no people with obligations and rights to serve them, have no conditions to live in the community, and are eligible for admission to social assistance establishments but have someone who takes care of them in the community.

[14] Exchange rate: USD 1$=23,300 VND. (vietcombank.com.vn). Access at 12:00, 1 May 2023

Savings can be considered from two different levels, the national and personal levels. At a national level, the gross saving (% GDP) indicator are used to measure the country's saving. From the personal side, saving refers the amount of money a person has after a period of accumulation. Saving is vital for old age and is viewed as a foundation of wealth. The more affluent OPs will likely retire sooner or at the legal retirement age (Coile, 2016). As a common understanding, personal saving rate is represented as personal income minus personal consumption, and then divided by personal income (Marquis, 2002). Farmers are considered to lack sustainable finance due to limited savings or social allowances, therefore they must work as long as possible to cover daily expenses (Pang et al., 2004).

For the financial support from relatives, while OPs in developed countries depend on their pension, the OPs in developing countries mostly rely on their children's financial support due to the small proportion of OPs getting retirement benefits (Pang et al., 2004). For example, the proportion of OPs getting retirement benefits in Vietnam in 2019 was 12% of the total OPs (Kidd et al., 2019). While the percentage **of OPs (65+) receiving a pension** in Thailand, Malaysia, Philippines were 6%; 16.2% and 29% in 2018, respectively (HAI). On the other hand, children in Southeast Asian countries such as Thailand, Myanmar, and Vietnam are taught to respect and care for their parents and older family members. In some cases, the children are considered bad if their parents continue working after retirement age (Adhikari et al., 2011; Ananta & Arifin, 2009). In addition, the majority of OPs really reside in multigenerational households. For example, the proportion of Vietnamese OPs living in multigenerational households in 2020 were 58.88%, the figures for Thailand (in 2017), Philippines, Lao (in 2017) and Myanmar (in 2016) were 52.02%, 62.16%, 76.99% and 73.49%, respectively (UN,

2022a). Therefore, the OPs might receive additional help from their family members. Regarding the relationship between financial support from relatives and OPs' working decision, some studies in Vietnam found that OPs who receive financial assistance from their children are more likely to retire from their workplace than the rest (Giang et al., 2019).

- The economic status of the household:

Two perspectives on the related questions can be used to analyse the OPs' decision to enter the labour force. First, OPs continue working for household income and helps the household to have a better economic status. In other words, living in a lower economic household leads OPs to continue working. Second, living with a better household income leads OPs to the decision not to work. Fundamentally, the studies showed household gross financial assets as a reason for retirement decisions. Those who have more household gross financial assets tend to retire earlier (Legendre et al., 2018), and those living in poorer households intend to continue working after retirement age to maintain their income (Reddy, 2016; Visaria & Dommaraju, 2019), but this relationship is not significant (Tong et al., 2019). However, the findings of Adhikari et al., (2011) revealed contrasting outcomes for Thailand. In Thailand, OPs living in lower income household are less likely to participate in labour force than those living in a household with higher income (Odds = 0.54). In particular, the probabilities of participation in the labour force of OPs residing in a family with a total income of 10,000-29,999 Baht (per year) were 0.54 times lower than those living in a household with an income of 100,000 Baht or more (Adhikari et al., 2011).

The disputes are more intricate in Vietnam. Based on the 2006 VHLSS in Vietnam, Giang and Pfau (2009) showed that OPs living in households with higher incomes seem less likely to join the labour force (Giang & Pfau, 2009). However, it was not statistically significant when looking at the rural areas only. From a gender perspective and household economic conditions, Giang et al. emphasized that living in a non-poor household led to a higher proportion of older males entering the labour force, compared to those living in a poor household. In contrast, a woman in a poor household had a higher probability of participating in the labour force (Giang et al., 2019).

Hypothesis development: The existing literatures show the different point of view regarding the relationship between OPs' working decision and the economic factors. Therefore, this study will control for the retirement pension, household savings, household loans and household income quintiles for the investigation and hypothesize that: *"Having pension has a negative and significant relationship with the OPs' probability to be employed"* **(Hypothesis 1).**

Health status:

Along with economic factors, health status is a key factor that affects the OPs' labour force participation (Zitikytė, 2021). Theoretically, the older they get, the worse their health becomes. Thanks to medical achievements, nowadays, people are living longer with better health, and they can stay longer in the labour market.

A number of studies have been conducted to investigate the relationship between health status and OPs' participation in the labour force. They confirmed that poor-health people are less likely to participate in the labour force (Adhikari et al., 2011; Cai &

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Kalb, 2006). Likewise, those having chronic diseases or suffer from psychological symptoms tend to join the labour market less (Giang & Le, 2018; Schofield et al., 2008; Visaria & Dommaraju, 2019). For example, in Vietnam, OPs facing at least one chronic disease were less likely to work compared to those without, regardless of gender issue (OR=0.5) (Giang & Le, 2018).

Moreover, those with ADLs dependence are less likely to participate in the labour force (Giang & Nguyen, 2016; Visaria & Dommaraju, 2019). For instance, in Vietnam, Giang & Nguyen (2016) showed that OPs in better health were more likely to be employed than those in poorer health (68.24% vs. 44.11%). Additionally, the regression analysis revealed that the odds of being employed for those in poor health was lower than that of those in excellent health (OR=0.49). Admittedly, their rate of labour force involvement declined as they get older (Giang & Nguyen, 2016). This was also the case for China, however, from a gender perspective, it was more significant for males than their counterparts (Ling & Chi, 2008).

Due to the limitation of the VHLSS data, the only proxy of the health status is whether the respondent was sick such that he/she could not perform any work in the past 12 months, which takes only two values of "Yes" or "No". OPs who self-reported to be sick during the last 12 months, means that they have health problems and otherwise.

Hypothesis 2: Having had a health problem has a negative association with the OPs' probability of being employed".

Living arrangement:

In traditional societies, OPs used to live in multigenerational families. However, migration and integration, along with socioeconomic and labour market development, resulted in a diversification of the OPs' living arrangement. As a result, nowadays OPs tend to live separately from their children and grandchildren than before.

The living arrangement is one determinant of OPs' participation in labour force. It is said that those who are living alone or with a spouse only are more likely to continue working than those living with children. In other words, having children in the same household would have a direct effect on the OPs' decision to take part in productive activities (Adhikari et al., 2011; Giang & Nguyen, 2016; Visaria & Dommaraju, 2019). For example, in Thailand, OPs living with children were 31% less likely to continue working after the formal retirement age, compared to those not living with children (Adhikari et al., 2011).

However, there was a difference in the rate of participation in the labour force of OPs due to the children's characteristics such as their age, marital status, gender, etc. For example, in Hong Kong, Tong et al., (2019) demonstrated that living with children means a lower rate of participation in the labour force, compared with those living alone or living in a household with OPs only. But the percentage of those who worked varied depending on whether or not their children were married. Particularly, OPs living with unmarried children were more likely to join the labour force than those living with married children (Tong et al., 2019).

In Vietnam, according to the results from the 2019 Population and Housing Census, the tendency of OPs living separately (single or spouse only) increased. For example, the rate of OP living alone increased from 9.7% in 2009 to 13.7% in 2019 and (GSO, 2021a).

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Giang and Nguyen (2016) showed that OPs receiving more support from their children were less likely to join the labour force. They also argued that those living with children had a 10.6% reduction in joining the labour force, however those living with young children (aged under 15) had a higher probability to continue working compared to the rest (Giang & Nguyen, 2016).

Hypothesis 3: OPs living alone are more likely to continue working after the retirement age than others.

Household ownership:

Considering the housing status as a type of valuable asset, a proxy of wealth, then I wonder whether housing status can affect the OPs' probability of participating in the labour force. Indeed, Tong et al., (2019) showed that OPs living in a private or village housing or temporary, staff quarters or others were more likely to participate in the labour force than those living in public housing. In contrast, OPs living in subsidized housing or institutions were less likely to enter the labour force than those living in public housing (Tong et al., 2019). The facilities in the house were also seen as a proxy of the wealth of the house. Agree and Clark (1991) showed that the lack of facilities in the home also led OPs to a greater likelihood of being in the labour force. Meanwhile, home ownership had a positive and significant association with the labour force participation of older females but not for older males (Agree & Clark, 1991).

In Vietnam, according to the 2019 Population and Housing Census results, a total of 1,244 households were living without a house nationwide. On average, for every 100,000 households, there were about 4.63 households with no dwelling. On the other

hand, the majority of households in Vietnam (93.1%) lived in permanent or semi-permanent housing (GSO, 2020a). To the best of my knowledge, there are no research on the connection between household ownership and OPs' engagement in the labour force in Vietnam. So, when examining the factors influencing OPs' decision to work, this thesis will control for the family home ownership (i.e., the number of dwellings).

Personal characteristics such as age, gender, marital status, ethnicity, education level and living area:

- Age:

In the context of aging, the OPs' life expectancy is longer, and their health condition is better with longer years of good health, while the fertility rate is reducing, and the old-age dependent rate is increasing. On the other hand, the context of a labour market integration and development leads OPs to live separately and independently more than in the past. These factors lead to longer working life (Zitikytė, 2021) and the labour market is also aging (Woźniak et al., 2022). Previous studies have shown that age has a negative impact on the labour force participation rate. In other words, a higher age leads to a lower rate of participation in the labour force (Binti Pazim, 2019; Ling & Chi, 2008; Paweenawat & Liao, 2021; Reddy, 2016). For instance, Binti Pazim (2019) demonstrated that in Malaysia, approximately 30% of OPs aged 60-64 were still working, while only 10% of OPs aged 75 and above were employed (Binti Pazim, 2019).

- Gender:

Researchers argue that there is a gender gap in labour force participation in general, and in OPs in particular. The rate of males' participation in the labour force is higher than that of females in most countries, not only in the working age groups but also in the OP group (Ling & Chi, 2008; Morris & Mallier, 2003; Ryan & Sinning, 2010; Visaria & Dommaraju, 2019). The belief that female's primary responsibilities are domestic work and caring for children and family members, which contributes to a lower rate of female's labour-force participation. For example, in India, Visaria and Dommaraju (2019) found a gender-based difference in all measures of productive aging. Except for grand parenting, where a great proportion of women were involved, a lower rate of women than men participated in other aspects of productive activities (Visaria & Dommaraju, 2019).

- Marital status:

Marital status is considered a contribution to the probability of participation in the labour force of OPs. In some cases, it was found that widowed or divorced OPs were less likely to work (Adhikari et al., 2011; Giang & Nguyen, 2016). For example, Adhikari et.al (2011) employed the data from the 2007 Survey of Older Persons in Thailand and showed that the widowed or divorced OPs were less likely to enter the labour force than those who are married (OR = 0.85) (Adhikari et al., 2011). This situation is also consistent in the case of Vietnam, where the rate of participation of non-married OPs was much lower than the married elderly (29.69% vs 51.79%). The marginal effect was 0.129, indicating that married older people was 12.9% more likely to continue working than their counterpart (Giang & Nguyen, 2016). However, some

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other studies showed an insignificant relationship between marital status and the OPs'
decision on labour force participation (Giang & Le, 2018; Ling & Chi, 2008).

- Ethnicity

It's intriguing how the ethnicity of the OPs and their employment status are related.
According to certain studies, OPs belonging to the ethnic minority are more likely to
participate in the labour force than the ethnic majority group (Binti Pazim, 2019;
Connelly & Maurer-Fazio, 2015). For example, Connelly and Maurer-Fazio (2015)
discovered the impact of ethnic minority status on labour force participation in rural
China and showed that the disparities in the participation among ethnic groups were
significant enough for more detailed analysis on the minority groups rather than only
analysis between ethnic minority and majority (Han) groups. In Vietnam, there are
89.75% of OPs are major group (Kinh) and 10.25% are minority (GSO, 2021c).
Generally, the minority are living in lower economic conditions. Therefore, they are
expected to participate in the labour force more than their counterpart. This thesis will
control for the OPs' ethnicity in the regression of the OPs' working decision.

- Education level:

The role of education in the quality of employment and wages is acknowledged. The
causal effect of the relationship between education and labour market outcomes has
been introduced widely (Card, 1999). In other words, the higher level of education, the
better their chances and job quality. Initially, the Mincerian earnings function
adequately explained wage income as a function of education and experience (Mincer,
1974). Because of this, the human capital investment theory emphasized how important

education is and how it pays off in the work force (Becker, 2009; Oostendorp & Doan, 2013; Tien, 2014). So, this thesis will look into the link between the education level of Vietnamese OPs and the kind of work they do.

Educational level is also likely to play an important role in the probability of OPs' labour force participation. However, the tendency occurs in different pathways. First, the OPs with higher education are more likely to leave the labour market earlier or at the state retirement age and enjoy the property that they earned while working (Milligan & Schirle, 2018; Teerawichitchainan et al., 2019). Second, OPs with higher education may want to stay longer in the labour market (Humphrey et al., 2003; Ryan & Sinning, 2010; Tong et al., 2019). Third, due to the low level of high education among older people, the relationship between educational level and the OPs' labour force participation is not statistically significant (Giang & Nguyen, 2016; Teerawichitchainan et al., 2019).

Hypothesis 4: *OPs with lower education level are more likely to work in the agricultural sector.*

- Living area (rural and urban area):

The living area reflects the socioeconomic development level of the area, and it is also considered a variable associated with the labour force participation of OPs. Currently, there are different views on the labour force participation of OPs by living area.

On the one hand, some studies showed that living in urban created better opportunities for OPs to work longer as they had more job choices typical for advanced economies (i.e., European countries). For example, Grigoli et al. (2022) discovered that in 24 EU-

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countries, the odds of OPs aged 55+ being in the labour force were 1.04 times higher in urban OPs than in rural or countryside OPs (Grigoli et al., 2022). This was also the case for Thailand, where the odds of being in the labour force of the elderly in urban were 1.2 times higher than that in the rural area (Adhikari et al., 2011).

On the other hand, other studies found that OPs living in rural areas are more likely to participate in the labour force. This view seems more popular in the developing countries such as Malaysia (Binti Pazim, 2019), and India (Chattopadhyay et al., 2022). This opinion is also consistent in the case of Vietnam. Giang and Pfau (2009) utilizing the 2008 Vietnam Housing Living Standard Survey (VHLSS), showed that the percentage of the OPs' labour force participation in the urban area was much lower than in the rural area (28% vs. 50%) (Giang & Pfau, 2009). This opinion was one more time confirmed in the 2019 Population and Housing Census Report. The percentage of OPs' labour force participation in the urban area was about 21.78%. The figure for the rural area was about 41.56% (GSO, 2021a).

❖ *In order to investigate the relationship between independent variables and the OPs' probability of being employed and their type of job, the personal characteristics will be controlled in the regressions for the analysis (age, gender, marital status, ethnicity, educational level and area of living).*

2.2.2 Impact of COVID-19 pandemic on OPs' employment situation

The negative impact of COVID-19 has been recorded widely, including its impact on employment issue. This part will discuss how the COVID-19 pandemic impacts on the

OPs' employment. The expected results of this part are to understand the question who, among OPs, is the most affected by the pandemic.

Since COVID-19 occurred, a wide range of economic activities have been postponed, reduced, or cancelled due to social isolation policy. Consequently, workers have been faced with job loss and income reduction. They may also face saving reduction, age discrimination in the workplace, and lack of paid sick leave (Schramm, 2020).

COVID-19 made millions of people over the world lost their job. According to the ILO's prediction, the number of jobs in 2022 would be lower by 2%, approximately about 50 million full-time jobs worldwide, with about 207 million unemployed workers, 21 million people higher than in 2019 (ILO, 2022c). Consequently, the number of hours worked has fallen in the first quarter of 2022 and remained at 3.8% lower than that of in 2019, equivalent to a deficit of 112 million full-time jobs. In other words, this is indicating a significant setback in the recovery process (ILO, 2022a). The impact of COVID-19 on employment is different by demographic and employment features.

Demographic characteristics:

- Age

Older people have lower ability to compete in the labour market than younger people because of age discrimination (Encel & Studencki, 2004), changing working conditions, and their lower ability (i.e., IT use, training skill improvement) to contribute

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to their working tasks (Brewington & Nassar-McMillan, 2000). Since COVID-19 occurred, the situation became more difficult, meaning that OPs were more vulnerable in the labour market and now more likely to face job loss (Quinby et al., 2021). OPs were more likely to be affected more severely by any type of shock as shown from the previous crisis (Al-Mansour & Al-Ajmi, 2020).

Firstly, OPs are those who has the highest risk of job loss due to the COVID-19 pandemic (Gray et al., 2022; Nigg, 2020 August 11; Quinby et al., 2021) and older women are at an even greater risk of losing their jobs than older men (Jiskrova et al., 2021). Secondly, the pandemic led OPs to have lower rate of labour force participation. For example, Parinding et al., (2021) studied senior workers aged 60 and above in Palu city of Indonesia and revealed a 6.25% decline in labour force participation rate among OPs (42.5% before to COVID-19 period vs. 36.25% during COVID-19 time, from April to May 2020) (Parinding et al., 2021). Thirdly, OPs are those who found it more difficult to return the workforce (Morrow-Howell et al., 2020), despite the fact that the younger age group faced a harsher labour market than the older group (Sazmaz et al., 2021). During the COVID-19, OPs in the U.S were thought to be the first group that should be withdrawn from the labour force because they were specially told to maintain strict social distancing, especially those having health issues; they were also eligible to claim the social security and there was no need to work in the difficult circumstances (Quinby et al., 2021).

- Gender

Gender differences in labour force participation are widely recorded and also related to issues in the time of COVID-19, especially the risk of job loss. The lessons learned from

previous crises showed that women were at high risk of job loss (Al-Mansour & Al-Ajmi, 2020). Some studies showed that older women were more vulnerable and faced a higher probability of job loss (Jiskrova et al., 2021; Quinby et al., 2021). For example, Jiskrova et al., (2021) explored the impact of COVID-19 on the risk of job loss in 27 EU-countries, showed that the odds of losing job for a woman were 1.27 times higher than that of men. This situation was more serious for OPs. In particular, the odds of losing job for older females were 1.44 times higher than their male counterpart ($p<0.05$) (Jiskrova et al., 2021).

- Living area

The living area reflects the socioeconomic development level of a region; and therefore, is also associated with the impact of COVID-19 in that region. On the one hand, it is claimed that those who reside in poorer locations have been hit harder by the pandemic, with a higher risk of death, higher debt, and unsecured jobs (Blundell et al., 2020). More importantly, workers in less developed areas use less IT and face greater job loss as a result of the requirement of the change in working form to online work (Rahman et al., 2020).

On the other hand, some studies found that COVID-19 had a smaller impact in rural areas than in urban areas (Quandt et al., 2021). Different government rules and shutdowns (which may have become more stringent in urban areas as they spread) may also give rural areas an advantage. However, there was a difference in the nature of work between rural and urban areas, in which the tasks in the rural areas do not allow the worker to work from home as much as in the urban area (Brooks et al., 2021). With the different evidence above, the impacts of COVID-19 on OPs' employment in

different living areas are not clear and this thesis will investigate this issue in the context of Vietnam.

- Education level

Education is one of the first variables that affects the quality of workers' employment and the income of a worker; those with better qualifications have more opportunities for a decent work. It is also reflected by the type of work, occupation, working conditions, etc., that are secured in the case of shocks such as the COVID-19 pandemic. As a result, OPs with higher education qualifications were less likely to lose their jobs than the rest (Adams-Prassl et al., 2020; Goda et al., 2022; Gray et al., 2022; Jiskrova et al., 2021; Quinby et al., 2021). For example, Jiskrova et al., (2021) showed the case of 27 EU countries, the odds of job loss for OPs with secondary education were 1.6 times higher than those with tertiary education, and the figure for an individual with a primary education were 1.89 times (Jiskrova et al., 2021). While in the U.S., individuals with a university degree were 7.9% less likely to lose their jobs than their counterpart (Adams-Prassl et al., 2020). Besides, it is also important to understand that those with higher education can carry out their work activities from home, so they have a lower probability of job loss (Blundell et al., 2020).

In Vietnam, some studies have investigated the impact of COVID-19 on the employment situation. Most of them suggested that the pandemic caused a higher unemployment rate, lower quality of jobs, and lower household income (Dang et al., 2020; Dang & Nguyen, 2020; Tran et al., 2020). However, these authors analysed the situation in general or with other preferred groups, not the OPs. To the best of our knowledge, none of them was concerned about the impact of the pandemic on OPs'

employment or the coping strategies for resilience. In order to find out the impact of COVID-19 on OPs' employment, this thesis will control for some demographic factors mentioned above and try to find out how these factors explain these changes.

Employment features:

- Industries

The COVID-19 pandemic first affected the service sector, which includes transportation, tourism, and hospitality. Countries with higher GDP per capita were found to face a higher risk of job loss due to international and internal closure (Jiskrova et al., 2021; Sazmaz et al., 2021). For example, Jiskrova et al. (2021) showed that, on average, 19% of OPs in 27 European countries had lost their jobs due to the pandemic. France, Greece, Italy, Israel, Cyprus, and Luxembourg were the countries with more than 30% of the total OPs losing their job (Jiskrova et al., 2021). Consequently, the unemployment rate increased and led to a reduction of the annual global gross domestic products. Evidence suggested that people in the agricultural sector were less affected by the pandemic and the employment rate in the sector were almost the same as before the pandemic (Adamowicz, 2022).

- Type of job

Many studies show that own-account workers, unpaid family workers, lower skilled workers and unsecured paid jobs in the labour market are the most vulnerable in any urgent shocks including COVID-19 (Dockery & Bawa, 2020; Gray et al., 2022; Rahman et al., 2020; Sanchez et al., 2020). For instance, Dockery and Bawa (2020) showed that, in the case of Australia, between 2001-2018, managers (41%) and

professionals (41%) were the occupations with the highest proportion of home-based work and the percentage reduced to about 10% for those such as machine operators and drivers. They also mentioned the term "the nature of work" and concluded that workers in Agriculture, Forestry and Fishery were more likely to work from home, followed by those in education and training. While few jobs in the hospitality sector (accommodation and food services) could be done remotely. Consequently, the various social distancing restrictions have led to extensive job losses in this sector (Dockery & Bawa, 2020).

Hypothesis 5: *Working in the agricultural sector is associated with lower risk of job loss or temporary absence, compared to the industry-construction and service sectors.*

- Having social insurance

As shown from the previous crisis, unprotected workers such as the self-employed, those with no social protection or health insurance contribution, migrant workers, etc., are those most vulnerable to the loss of work (Al-Mansour & Al-Ajmi, 2020). On the other hand, having a labour contract is a variable which acts as a proxy of secured jobs and guarantees for a worker not to be laid off. Some studies showed that workers without a permanent contract were more likely to experience unemployment (Gray et al., 2022). For example, Gray et al. (2022) showed that in Australia, those with an atypical contract had a higher probability of losing their job than those with a fixed-term contract (12.1% vs. 7.7%). In Vietnam, according to the Labour Law, there are six different types of labour contracts: (1) indefinite term contract; (2) 1 to 3-year contract; (3) 3-months to under 1-year contract; (4) under 3-month contract; (5) lump sum contract; and (6) verbal agreement. Once the labour contract has been signed (types 1–4), employees will begin contributing to social insurance system immediately.

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According to the 2014 Law on Social Insurance, employees (aged 15 years to reaching retirement age) who are working under labour contracts of 1 month or more have to contribute to compulsory social insurance scheme. According to Article 169 of the 2019 Labour Code[15], as of 2021, the retirement age of employees in normal working conditions is 60 years and 3 months for male workers; 55 years and 4 months for female workers. As the result, a part of older workers who are working under labour contracts will contribute for compulsory social insurance. Besides, the Vietnamese government also provides a voluntary social insurance scheme for those without the compulsory scheme. By this way, the government ensures the well-being in old age for all. Therefore, this thesis will also focus on exploring the relationship between OPs' social insurance contribution and the employment change caused by the COVID-19 pandemic. The term "social insurance" in this thesis includes compulsory and voluntary social insurance.

Hypothesis 6: *OPs contributing for social insurance are less likely to lose their job than those without social insurance contribution.*

- Using IT at work

During COVID-19, many studies concerned themselves with the role of facilitating conditions for career resilience (i.e., IT use). Using information technology (IT) at work is considered as a factors leading to resilience because the pandemic requires a lot of change in working forms, including the application of technologies for remote work (Adamowicz, 2022).

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[15] https://boluatlaodong2019.molisa.gov.vn/lang_en/page/home/index. Access at 15:45, 5 May 2023.

IT provides vital tools for efficient work, collaboration, and meetings from anywhere (Ojo et al., 2021). In a positive way, the pandemic encourages the increase of digital work and the reduction of traditional jobs (Nagel, 2020). Those who are more familiar with IT can reduce work stress and develop resilience, which then reduces the risk of job loss (Ojo et al., 2021). However, it is more applicable to skilled workers with computer-based jobs. Many OPs are those whose jobs do not permit telework due to the nature of their duties, and many of them live in areas with poor broadband access, making remote work difficult or impossible (Eisenberg, 2020). They are also found to be more vulnerable in term of advanced technologies. So they are considered the least able to work from home (Farrell, 2020). These makes OPs more vulnerable to job loss and physical risk due to the pandemic spreading (Gould, 2020, March 31).

Using IT at work not only helps reduce the risk of job loss but also affects the change in working form, a strategy of employment resilience during and post-pandemic. The literature review showed a lack of concern about the relationship between IT use and the OPs' employment solution. Hence, this thesis will explore how IT use impacts an OPs' employment change and their solutions to overcome the employment difficulties.

Hypothesis development: Understanding the importance of IT usage at work during COVID-19, this study will focus on employing the relationship of using IT at work and the change in OPs' employment and their coping strategies to overcome the employment difficulties caused by the pandemic.

> *Hypothesis 7a: OPs using IT at work are less likely to lose their job than those who do not use IT at work.*

Hypothesis 7b: *OPs using IT at work are more likely to change the working form than those who do not use IT at work.*

Hypothesis 7c: *OPs using IT at work are more likely to find a new job than those who do not use IT at work.*

2.2.3 Strategies to overcome the employment difficulties

In order to respond to challenging situations such as dealing with the employment difficulties caused by the COVID-19 pandemic, many solutions have been applied at different levels, ranging from the governmental, organizational (employers), and personal levels.

- Support from the government and employers

These are solutions to support the workforce to deal with the employment challenges due to the pandemic, such as changing their working form, providing financial assistance to affected workers, etc. Pit et al. (2021) used cross-national data from 15 countries to show that changing working forms (i.e., working from home) was the more popular solution. Most countries also reported a financial benefit for their employees. Besides, some countries have introduced education and training for their labour force (Pit et al., 2021). However, I recognize that changing working forms is only applicable to a subset of occupations and workers with sufficient IT skills and appropriate jobs.

At the same time, the financial benefit package is normally covered for formal workers, but not for all. In fact, the majority of older people in rural areas work in the informal sector. They also have a lower level of education and IT skills to support their work.

Moreover, their nature of job cannot be done remotely. This situation is more serious in developing countries. That is why Pit et al. argued that Thailand, China, and Nigeria faced greater challenges (Pit et al., 2021). Consequently, the older workers became more vulnerable to the impact of COVID-19.

- OPs' capacity to cope with employment challenges

Human capital is the knowledge, skills, and health that people invest in and accumulate throughout their lives, allowing them to realise their full potential as productive members of society. Considering the human capital for a resilience is one interest of this thesis. As the term implies, "human capital" refers to the economic value of personal education and experience which contribute to increasing productivity and profitability at work.

Before COVID-19, there were some studies working on the relationship between human capital and career resilience, but they were mostly based on qualitative analysis with limited number of studies employing quantitative analysis. These studies focused on the relationship between experience, skills, and career resilience. Working experience allows employees to perform their daily tasks or find solutions when facing challenges at work. It is used from time to time and can be seen as personal skill. According to some studies, the more work experience employees have, the better their career resilience and adaptive capacities during crises (in this case, COVID-19) (Borg et al., 2022; Liu, 2003). Besides, employees with better career skills, such as time management skills, have better resilience at work (Akkermans et al., 2015).

The strategies or self-solutions of OPs demonstrate their active actions and capacity to cope with the employment difficulties caused by COVID-19. However, there is little research on the OPs' solutions at the present. One exception is Gray et al., (2022) which investigated the case of Malaysia. Accordingly, the authors showed that the majority of respondents (91%) still remain in the same job, with only 5.7% finding a new job and another 3.3% being unemployed (Gray et al., 2022). In general, employees who have better personal resources, with network support at the workplace and community, are found to recover better (Hite & McDonald, 2020; Ojo et al., 2021).

- Regarding demographic characteristics, there is a lack of studies on the relationship between demographic characteristics and career resilience, however, a few studies have mentioned the gender aspects of career resilience.

As the title suggests, the gender variable is always appealing to researchers worldwide in any research field, including gender-based human research. Arguments about gender differences in resilience persist to this day. Firstly, males are found to have better career resilience because of their willingness to take more risks, while females have been underrated for their potential and/or received fewer career development opportunities (Crawford et al., 2013). Secondly, in contrast, women are also considered to have more experience with workplace barriers and disruptions during the working process, so they can have a higher level of resilience (Woodd, 1999) (Borg et al., 2022). On the other hand, some studies found that gender presented no significant relationship with either type of resilience (Borg et al., 2022).

❖ *Generally, the literature review shows a lack of comprehensive study on how Vietnamese OPs' capacity explain their employment solutions. According to the study of*

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Ojo et al., (2021), self-efficacy (i.e., the degree of confidence) has the most significant impact on resilience, compared to family and friends' support, social support from a supervisor, and facilitating conditions (Ojo et al., 2021). There hasn't been any research in Vietnam to date that focuses on the OPs' coping strategies for the pandemic-related occupational challenges. This thesis will control for the demographic characteristics such as age group, gender, marital status, relationship with the household head, education level, living area, economic region in the regression for a measurement of the association with the OPs' solutions to deal with the employment difficulties caused by the pandemic.

2.3 Chapter' summary

Chapter 2 explains how some related theories can be applied for this thesis. The application of these theories is the direction of the association between various independent variables and the OPs' employment and their type of work, as well as the change in employment of OPs in Vietnam due to COVID-19 and their coping strategies.

This study also provides a general literature review regarding the OPs' working decision, the impact of COVID-19 on OPs' employment and the strategies to cope with employment difficulties. Basically, pension and health status are two most important factors associated with OPs' working decision. In detail, OPs having pension and higher incomes are more likely to withdraw from the labour force. Meanwhile, OPs facing with health problems are more likely to stop working than their counterpart. Besides, OPs' demographic characteristics such as age, living area, education also explain their working decision.

Regarding the impact of COVID-19 on employment, the literatures show that COVID-19 impact on workforce' employment differently based on their employment

characteristics such as industry and firm type. For example, those working in the service sector face higher risk of job loss than other jobs. For the demographic characteristics, gender, age, living area, and educational level also explain the impact of COVID-19.

Overall, while the related theories help to provide direction for the study's pathway, the literatures provide a primary picture regarding the OPs' working decision; impact of COVID-19 on employment and the strategies to cope employment difficulties due to the pandemic. As such, both support our investigation to achieve the research objectives.

CHAPTER 3: DATA AND METHODOLOGY

3.1. Data sources

In order to answer the research questions appropriately, two types of secondary data are utilised, namely the Vietnam Housing and Living Standard Survey (VHLSS) and the Labour Force Survey (LFS), as detailed below:

Firstly, the 2018 and 2020 VHLSS are used to analyse the OPs' employment situation and the determinants of OP's probability of being employed and their type of job. Two waves of the VHLSS are utilized, since the 2018 version was collected prior to the pandemic, while the 2020 version was collected during the epidemic. In this way, this thesis aims to explore the changes during the pandemic.

Secondly, the 2021 LFS is used to examine the specific effects of COVID-19 on the OP's employment change and their associated responses. The data helps to address the third and fourth research questions of this thesis.

While it is possible to answer the research questions of this thesis using only the LFS data, the ranges of independent variables in the LFS are fairly limited, with only some demographic variables (age, gender, marital status, education, and relationship with the head of the household). On the other hand, the VHLSS provides the OP's demographic characteristics, as well as many critical information related to the OP's socioeconomic characteristics (pension, health status, living arrangement), and household (HH) features (HH income, HH size, HH savings, HH loans, internet use). These variables are the most important factors to explain OP's labour force participation and their type of work. The VHLSS, however, does not contain information on employment changes and individual coping strategies during COVID-19. Therefore, this thesis will employ two separate databases (VHLSS and LFS) to answer all the research questions.

3.1.1 The VHLSS

The VHLSS is a national-level survey conducted every two years by GSO Vietnam (GSO, 2022). *The survey* aims to collect information on the population's living standard and determine the poverty level and the gap between the rich and the poor in the community. There are four types of questionnaires[16], however, this thesis will only concentrate on the household questionnaire (income and expenditure) for the analysis.

Information in the household questionnaire:

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[16] The four types of questionnaires include (1) household questionnaire (income issue); (2) household questionnaire (income and expenditure); (3) Commune questionnaire and (4) household re-examination questionnaire.

- Information about household income including incomes from (1) waged work, (2) agriculture - forestry - fishery activities, (3) self-employment in production, business and services (non-agriculture activities), and (4) other resources.

- Information about household spending: spending for food, housing, water, transportation, health care, culture, and other spending.

- Other information of household and household members to analyse the reasons and differences in the living standard: main demographic features (age, gender, marital status); education; health condition and medical services use; employment situation; assets; electricity; water; living conditions; participation in social activities.

The unit of the survey is the household level, and the subject of the survey is household and household members.

Sample size: Each survey (the year 2018 and 2020) was conducted nationwide with a sample size of 9,399 households. The surveys collected information directly from the household head and related members. There are two steps to reach the target group of this thesis:

Step 1: Filter out the HH with older persons (aged 60+) from the total sample size.

Step 2: Filter out only those aged 60+ based on the results from step 1. They are our target groups that serve for the following objectives of the study:

- ✓ To analyse the employment situations of OP

- ✓ To illustrate the determinants of the OP's probability of being employed and their type of job.

3.1.2 The 2021 LFS

This is the sample survey at the national level and is conducted quarterly and annually by GSO Vietnam with technical support from ILO Vietnam. The survey aims to collect information regarding labour market participation of those aged 15 and over living in Vietnam to provide national indicators relevant to labour, employment, and income of the workforce.

Unit of the survey is household level. In each household, the targeted interviewees are those aged 15 years old and over with regularly living in the household, including those serving in the military but living in the household.

The questionnaire has two main contents: (1) information about demographic features of household members and (2) information about labour and the employment of household members.

Technically, based on the general data set, this thesis will filter out the group aged 60+, who are the target group to serve for the following objectives of the study:

- ✓ To analyse factors associated with the OPs' employment due to the pandemic
- ✓ To investigate the factors associated with OPs' solutions to combat employment difficulties caused by the pandemic.

3.2 Outcomes and explanatory variables

3.2.1 OPs' probability of being employed and the type of job

Outcome 1: OPs' probability of being employed

The OPs' probability of being employed is defined in questions 1a, 1b, and 1c of Section 4 of the VHLSS. The time measurement of working status is defined during last 12 months prior the survey. In particular, question 1a is to find out who works for someone else, and question 1b is to find out who works for themselves in agriculture, forestry, or aquaculture. Question 1c is to identify who is engaged in production, business, and services outside of agriculture, forestry, and aquaculture. Each question will have optional answers that are "Yes" or "No". OPs who answer "Yes" is defined working, and "No" otherwise (Table 6).

➢ *The dependent variable is a binary variable (Yes/ No). Hence, a logit model is used for the analysis.*

➢ *As mentioned, this thesis will investigate the OPs' probability of being employed between 2018-2020 to analyse whether COVID-19 impacts their work or not. Therefore, a pooled-cross section with the dummy for the year 2020 will be generated to achieve this objective. Two separate regressions for each year will also be employed.*

Table 6: Identifying the decision to participate in labour force of OPs (the VHLSS)

Question	Content	Answer	Definition
Q.1a, section 4	Over the past 12 months, have you taken waged/ salaried employment?	1. Yes 2. No	If "Yes" => employed population

Q.1b, section 4	Over the past 12 months, have you been involved in production or services regarding production, husbandry, forestry and aquaculture for the HH?	1. Yes 2. No	If "Yes" => employed population
Q.1c, section 4	Over the past 12 months, have you been involved in the production, business, or services of the HH?	1. Yes 2. No	If "Yes" => employed population

Outcome 2: OPs' type of job

Based on the questions shown in Table 6, the OPs' type of job will be categorized in four types: (1) not working, (2) employed worker, (3) self-employed in agriculture, (4) self-engaged in non-agriculture.

> ➤ *The dependent variable is the OPs' type of job, which is discrete variable with four optional categories; hence, multinomial logit regression is appropriated to analyse the factors associated with OPs' type of job.*

Table 7**:** Description of dependent variables (outcome 1 and 2)

Variables	**Categories**	**Type of variable**
Probability of being employed *"No" is the base category*	0- No 1- Yes	Dummy
Type of job *"Not working" is the base category*	1- Not working 2- Self-employed in agriculture 3- Waged worker 4- Self-employed in non-agriculture	Discrete variable taking the values of 1 to 4

Explanatory variables of outcome 1 and 2

Independent variables in the VHLSS include:

- *OPs' demographic characteristics:* age, gender, marital status, ethnic, residential registration, education level, living area, economic region.

- *OPs' socio-economic status:* retirement pension, health problem, living arrangement.

- *Household features:* income quintile, savings, loans, number of houses, number of household members and internet use.

These independent variables are used to investigate the determinants of OPs' probability to be employed and its explanation for their type of job. The dependent and independent variables for outcomes 1 and 2 are summarized in the following table:

Table 8: Description of independent variables of outcome 1 and 2

Variables	Categories	Type of variable
Age	Actual age (in years)	Continuous
Gender *"Female" is the base category*	0 - Female 1 - Male	Dummy
Marital status *"Other" is the base category*	0 - Other 1- Married	Dummy
Ethnicity *"Minority" is the base category*	0 – Minority 1 – Majority (Kinh)	Dummy
Residential registration *"In the commune" is the base category*	1 – In the commune 2 – In province 3 – Other	For each category (except base), a dummy variable is created
Education level	1 – No qualification 2 - Elementary	For each category (except base), a

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Variables	Categories	Type of variable
"No qualification" is the base category	3 - Intermediate 4 – College and higher	dummy variable is created
Living area *"Rural" is the base category*	0 - Rural 1 - Urban	Dummy
Economic region[17] *Southeast is the base category*	1 - Southeast 2 - Red River Delta 3 - Northern Midlands and Mountains 4 - North Central and Central Coastal 5 - Highland 6 - Mekong River Delta	For each category (except base), a dummy variable is created
Pension *"No" is the base category*	0 - No 1 - Yes	Dummy
Health problem *"No" is the base category*	0 - No 1 - Yes	Dummy
OPs' living arrangement. *"Living alone" is the base category*	1 - Living alone 2 - Living with OPs only 3 - Living with at least a child (and grandchild, if any) 4 - Living with grandchildren only 5 - Living with others	For each category (except base), a dummy variable is created

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[17] The arrangement into six economic regions in this study is accompanied by the division of the General Statistics Office, including the Southeast, Red River Delta, Northern Midlands and Mountains, North Central and Central Coastal, Highland, and Mekong River Delta. According to the GSO statistics, in 2021, the Southeast had the highest level of income per capita (5.794 M. Dong/person/month), followed by the Red River Delta (5.026 M. Dong) and the Mekong River Delta (3.713 M. Dong). The figures for the North Central and Central Coastal, Highland and Northern Midlands and Mountains were 3.493M; 2.856M and 2.837M, respectively. https://www.gso.gov.vn/y-te-muc-song-dan-cu-van-hoa-the-thao-trat-tu-an-toan-xa-hoi-va-moi-truong/. Access 9:25, 23 November 2023.

Variables	Categories	Type of variable
HH income *Q1 is the base category*	1 - Q1 2 - Q2 3 - Q3 4 - Q4 5 - Q5	For each category (except base), a dummy variable is created
Household savings *"No"" is the base category*	0 – No 1 – Yes	Dummy
Household loans *"No" is the base category*	0 – No 1 – Yes	Dummy
Housing ownership	Number of houses that the household have (actual houses)	Continuous
Household size	Number of household members (actual HH members)	Continuous
Internet use *"No" is the base category*	0 - No 1 - Yes	Dummy

3.2.2 The OPs' employment change and their solutions

Outcome 3: The OPs' employment change

The 2021 LFS asked respondents the question "*Since the Covid-19 pandemic, how has the work of [NAME] been affected*"*?* and there are eight selected options for this question:

Table 9**:** The change in the OPs' employment due to COVID-19 pandemic (the 2021 LFS)

Question 62a	Category	Yes	No
Since the Covid-19 pandemic, how has the work of	1.Losing job		
	2.Temporary absence/Suspension of production and business activities		

[NAME] been affected?	3. Decreased working hour/Laid off/ Rotation break		
	4. Increased working hour		
	5. Change in working form (at home, Online…)		
	6. Lower income		
	7. Higher income		
	8. Other[18]		

Based on these answers (table 9), this study groups and separates all answers into two different modules: the first module is the OPs' employment change, and the second module is the OPs' income change. However, this study only concentrates on how the OPs' employment changed due to the pandemic and how he or she coped with these changes. The income change is not considered in the scope of this study.

Even though OPs may report that they faced more than one employment changes due to COVID (OPs can also report that they have more than one strategy to cope with employment difficulties as shown in Table 10), I categorized the employment changes based on the ranking of the severity of the impact and identified that job loss is the most serious risk, followed by other changes as shown in Table 10.

Table 10: OPs' employment changes due to COVID-19

Label categories	Label Description
Losing job	Including those who answered that they lost their job AND any other options
Temporary absence/ decreased working hour	Including those who answered they DID NOT lose job BUT had temporary absence or decreased working hour AND any other options

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[18] For the "other" answer, this thesis will clean the data (case by case) and re-arrange those who chose the "other" option into the correct category (if any).

Label categories	Label Description
Increase in working hour	Including those who answered they DID NOT lose job/ have temporary absence/ have decreased working hour BUT increased working hour AND any other options
Change in working form	Including those who answered they DID NOT lose job/ have temporary absence/ have decreased working hour/ have increased working hour BUT had a change in working form
No employment change	Including all older working people, who answered they DID NOT have any employment change

> *The dependent variable is the OPs' employment change, presented as unordered categories. A multinomial logit model is utilized in the analysis.*

Outcome 4: OPs' coping strategies

The 2021 LFS asked respondents the question "*How did [NAME] try to overcome the difficulties caused by COVID-19 epidemic?*" and there are seven options – Table 11.

Table 11: OPs' coping strategies to combat the employment difficulties.

Question	Answer	1. Yes	2. No
How did [NAME] try to overcome the difficulties caused by COVID-19 epidemic?	1. Move to waged work		
	2. Do additional waged work		
	3. Start new production and business activities (non-agriculture)		
	4. Work in agriculture, forestry and fishery for sale		
	5. Find another job		
	6. Improve educational /vocational qualifications		
	7. Other[19]		

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[19] For the "other" category, I have cleaned the data (case by case) and re-arranged those who chose the "other" option into the correct category (if any).

Based on the same idea as the severity of the impact in Table 9, OPs' coping strategies are ranked based on the answers in Table 11. Five categories are generated as presented in Table 12:

Table 12: Coping strategies with employment difficulties caused by the pandemic

Label categories	Label Description
Found another job	Including those who answered they found or moved to a wage work AND any other options.
Started a business	Including those who perceived that they DID NOT move to a waged work/ find a new job BUT had started a non-agriculture business AND any other options
Worked in agriculture	Including those who perceived that they DIDNOT move to a waged work/ find a new job/ start a non-agriculture business BUT had worked in agriculture AND any other options.
Other	Including those who perceived that they DID NOT move to a waged work/ find a new job/ start a non-agriculture business/ work in agriculture BUT had other solutions such as doing additional wage work or training AND any other options.
No solution	Including those DID NOT have any coping strategies with employment difficulties.

✓ *The dependent variable is the OPs' coping strategies, a discrete variable with five unordered categories, then, a multinomial logit model is applied for analysing its factors.*

Table 13: Description of dependent variables (outcomes 3 and 4)

Variables	Categories	Variable type
Employment change	1- No employment change	Discrete variable
	2- Losing job	taking the values
"No change" is the base category	3- Temporary absence/ decreasing working hour	of 1 to 5

	4- Increasing working hour	
	5- Changing working form	
Solutions	1- No solution	Discrete variable
"No solution" is the base category	2- Found a new job	taking the values
	3- Started a business	of 1 to 5
	4- Worked in agriculture	
	5- Other	

Explanatory variables of outcomes 3 and 4

To understand deeply who is the most affected and who has coping strategies for the resilience due to COVID-19, this thesis will control for some socio-demographic characteristics to illustrate their explanation for the OPs' employment changes and their solutions:

- *Personal demographic characteristics*: gender, age, marital status, education level, living area, economic region.
- *OPs' employment features*: industrial sector, type of firm, economic sector, current working duration, social insurance contribution, using IT at work before the pandemic.

Table 14**:** Description of independent variable of outcome 3 and 4

Variables	**Categories**	**Variable type**
Age	Actual age	Continuous
Gender *Female is the base category*	0 - Female 1 - Male	Dummy
Marital status	0 - Other 1 - Married	Dummy

Variables	Categories	Variable type
"Other" is the base category		
Education level *No qualification is the base category*	1- No qualification 2 - Elementary 3 - Intermediate 4 - College 5 - University and higher	For each category (except base), a dummy variable is created
The living area *Rural is the base category*	0 - Rural 1- Urban	Dummy
Economic region *Southeast is the base category*	1 - Southeast 2 - Red River Delta 3 - Northern Midlands and Mountains 4 - North Central and Central Coastal 5 - Highlands 6 - Mekong River Delta	For each category (except base), a dummy variable is created
Industrial sector *Agriculture/ forestry/ fishery is the base category*	1 - Agriculture/forestry/fishery 2 - Industry and construction 3 - Services	For each category (except base), a dummy variable is created
Type of firm *Own-account workers and family worker is the base category*	1 - Own-account workers/ family worker 2 - Private 3 - State 4 - FDI	For each category (except base), a dummy variable is created
Economic sector *Formal sector is the base category*	1- Formal 2 - Household 3 - Informal	For each category (except base), a dummy variable is created
Social insurance contribution	0 – No 1 – Yes	Dummy

Variables	Categories	Variable type
"No" is the base category		
IT use before the pandemic *"No" is the base category*	0 – No 1 – Yes	Dummy
Current working duration *"Under 1 year" is the base category*	1 – Under 1 year 2 – From 1 to under 3 years 3 – From 3 to under 9 years 4 – From 9 year and longer	For each category (except base), a dummy variable is created

3.3. Technical methods

Technically, two models are utilized: the logit model and the multinomial logit model. The logit model is to illustrate determinants of the OPs' probability of being employed. The multinomial logit model is to investigate (1) the factors associated with the OPs' type of job; (2) the OPs' employment change during the pandemic and (3) the OPs' solutions to overcome employment difficulties. To ensure for the correctness of outcomes, I checked the multicollinearity of independent variables before running regressions (VIF check) (Appendices 1 and 2). In addition, employing the Chow test to see if there are gender and living area (rural/ urban) differences in the OPs' probability of being employed and their type of job (Appendices 3, 4, 5, 6).

3.3.1 Logit model

Logistic regression, also called a logit model, is used to model dichotomous outcome variables. In the logit model, the log odds of the outcome are modelled as a linear combination of the predictor variables. The logit model is a binary response model,

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where an outcome is a number between 0 and 1. In binary response models, interest lies primarily in the response probability:

$$P(y = 1|x) = P(y = 1|x_1, x_2, \dots, x_k)$$

(1)

where x denotes the full set of explanatory variables. I assume that the response probability is linear in a set of parameters β_j. To avoid the limitations of the linear probability model, the binary response module is formed:

$$P(y = 1|x) = G(\beta_o + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k) = G(\beta_0 + x\boldsymbol{\beta}), \qquad (2)$$

where G is a logistic function taking in values between 1 and 0: $0 < G(z) < 1$, for all real numbers z. This ensures that the estimated response probabilities are strictly between 0 and 1 (consisting of $x\boldsymbol{\beta} = \beta_1 x_1 + \dots + \beta_k x_k$) (Wooldridge, 2015).

Using logit model to analyse determinants of the OPs' labour force participation: the first outcome of this study is the OPs' probability of working, a binary variable (Yes/No). Specifically, the outcome variable takes the value of 1 if the respondent answered "Yes" for question 1a or 1b or 1c of section 4, the VHLSS and 0 otherwise.

For each gender, the explanatory variables of the regression include OPs' demographic characteristics (age, marital status, living area, economic region, ethnicity, residential registration, education), OP's socioeconomic characteristics (pension, health status, living arrangement), and household characteristics (income, savings, loans, number of owned-house, household size and internet use). The effect of the explanatory variables is $x\boldsymbol{\beta}$.

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Firstly, the logit model is employed for each wave of the VHLSS data to examine how older males' and females' characteristics affect the probability of working for each year of the survey. Based on formula (2), I have:

$$P(working = 1|x) = G(\beta_0 + x\beta + \mu), \tag{3}$$

where: P is the probability of working

G is the cumulative distribution function for a standard logistic random variable

μ unobserved variables

β_0 is the constant

x donates the independent variables and β donates coefficients of x. In this study,

$$\begin{aligned} x\beta = {}& \beta_1 age + \beta_2 marital\ status\ + \beta_3 ethnicity + \beta_4 living\ area \\ & + \beta_5 economic\ region + \beta_6 residential\ registration \\ & + \beta_7 education + \beta_8 internet\ use + \beta_9 living\ arrangement \\ & + \beta_{10} pension + \beta_{11} health\ problem \\ & + \beta_{12} number\ of\ household\ houses \\ & + \beta_{13} number\ of\ houshold\ members \\ & + \beta_{14} household\ savings + \beta_{15} household\ loans \\ & + \beta_{16} household\ income\ quintiles \end{aligned}$$

The analysis is conducted separately for each gender. Then, a pooled cross-section with the year dummy is employed to investigate if there is any difference in the probability of working between the year 2018 and 2020. Based on the equation (3), I have:

$$P(y = 1|x) = G(\beta_0 + x\beta + year + \mu), \tag{4}$$

For the year variable, the year 2018 will be the baseline for the comparison. All the independent variables in equation (3) are controlled for in equation (4) to examine if there is any change in the probability of working for each gender in the year 2020.

3.3.2 Multinomial logit model

The multinomial logistic regression is used to model nominal outcome variables, in which the log odds of the outcomes are modelled as a linear combination of the predictor variables (Liao & Liao, 1994). When the dependent variable consists of several categories that are not ordinal, a maximum likelihood estimator such as multinomial logit should be used (Greene, 2012; Kwak & Clayton-Matthews, 2002). In each case, an individual chooses one alternative from the group of choices, and the labelling of the choices is arbitrary (Wooldridge, 2010).

$$P(y = j \mid x) = \exp(x\beta_j) \left/ \left[1 + \sum_{h=1}^{j} \exp(x\beta_h) \right], j = 1, \dots, j \right.$$

Since I have fully specified the density of y given x, estimation of the multinomial logit model is best carried out by maximum likelihood. For each i the conditional log-likelihood can be written as: $l_i(\beta) = \sum_{j=0}^{j} 1[y_j = j] \log[p_j(x_{i,} \beta)]$, where the indicator function selects out the appropriate response probability for each observation i.

The multinomial logit model will be used to:

1) *Analyse the factors associated with the OPs' type of work* (using the VHLSS). The outcome is the OPs' type of work, and the independent variables includes

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OPs' demographic characteristics (age, gender, ethnicity, residential registration, marital status, education, living area, economic region), their socioeconomic characteristics (pension, health, living arrangement) and their household features (HH size, HH income, savings, loans, number of owned-houses, internet usage).

2) ***Analyse the OP's employment change*** and ***their coping strategies*** to overcome the employment difficulties caused by COVID-19 (using the 2021 LFS). Two modules will be employed for the analysis the change in employment due to the OPs' demographic characteristics and employment features: the first module only controls for the OPs' demographic characteristics, including age, gender, marital status, education, living area, economic region. The second module includes all demographic characteristics in the first module and employment features (industrial sector, firm type, economic sector, current working duration, social insurance contribution and IT use).

3.3.3 Consideration of using the non-weighted data

The Vietnam Housing and Living Standards Survey and the Labour Force Survey are two national sample surveys. The General Statistics Office of Vietnam uses weights to generalize the survey sample for each dataset, which serve statistical goals at the national level.

There are some differences between the size, representative and the purpose of using the weighted and non-weighted data. The non-weighted the sample size is the size of the only sample selected, while the weighted sample size is the size of the population represented by the sample. This means that the non-weighted analysis reflects the situation based on the sample. A weighted analysis adjusts for the different probabilities

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of selection into the sample, as well as for response rate differences between subgroups of the sample.

Due to the study' purpose, I utilize the non-weighted data for the analysis regarding the factors associated with OPs' employment, who responded to the surveys (both VHLSS and LFS data). However, the weighted data analysis is also conducted in order to provide a picture of the situation of OPs' employment and associated factors at the national level. The results are provided in the Appendix "Weighted analysis" (Appendix 9).

3.4. Conceptual framework

3.4.1 Main conceptual framework

For a better understanding, the conceptual framework of this thesis will be divided into two sub-frameworks (Frameworks 1 and 2).

- o Framework 1 is the summary of OPs' probability of working and their type of work and associated factors between 2018-2020.

- o Framework 2 is a summary of OPs' employment changes and their coping strategies due to COVID-19 and associated factors.

Framework 1: Situation of OPs' employment in Vietnam between 2018-2020

Independent variables: *Outcome 1 and 2:*

1. Personal characteristics
- Age
- Gender
- Ethnicity
- Residential registration
- Marital status
- Educational level
- Living area
- Economic region

2. OPs' socio-economic characteristics
- OPs' pension
- OPs' health status
- OPs' living arrangement

3. OPs' household (HH) features:
- HH size
- HH income by quintiles
- HH ownership
- HH savings
- HH loans
- Internet use

Situation of employment of OPs in Vietnam between 2018-2020:

- OPs' probability to be employed (Hypothesis 1, 2, 3)

- OPs' type of job (Hypothesis 4)

As shown in Framework 1, the independent variables include a range of factors from

OPs' demographic characteristics, their socio-economic features, and their household

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features. These factors are expected to have the association with the OPs' probability

of working and their type of work between 2018-2020 in Vietnam.

Framework 2: Impact of COVID-19 on OPs' employment (the 2021 LFS)

Independent variables: *Outcome 3 and 4:*

1. Personal characteristics
- Age
- Gender
- Marital status
- Educational level
- Living area
- Economic regions

Impact of Covid-19 on the OPs' employment:

- OPs' employment changes (Hypothesis 5, 6, 7a, 7b)
- OPs' coping strategies (Hypothesis 7c)

2. Employment features
- Type of firm
- Industrial sector
- Economic sector
- Working duration
- IT use
- Social insurance contribution
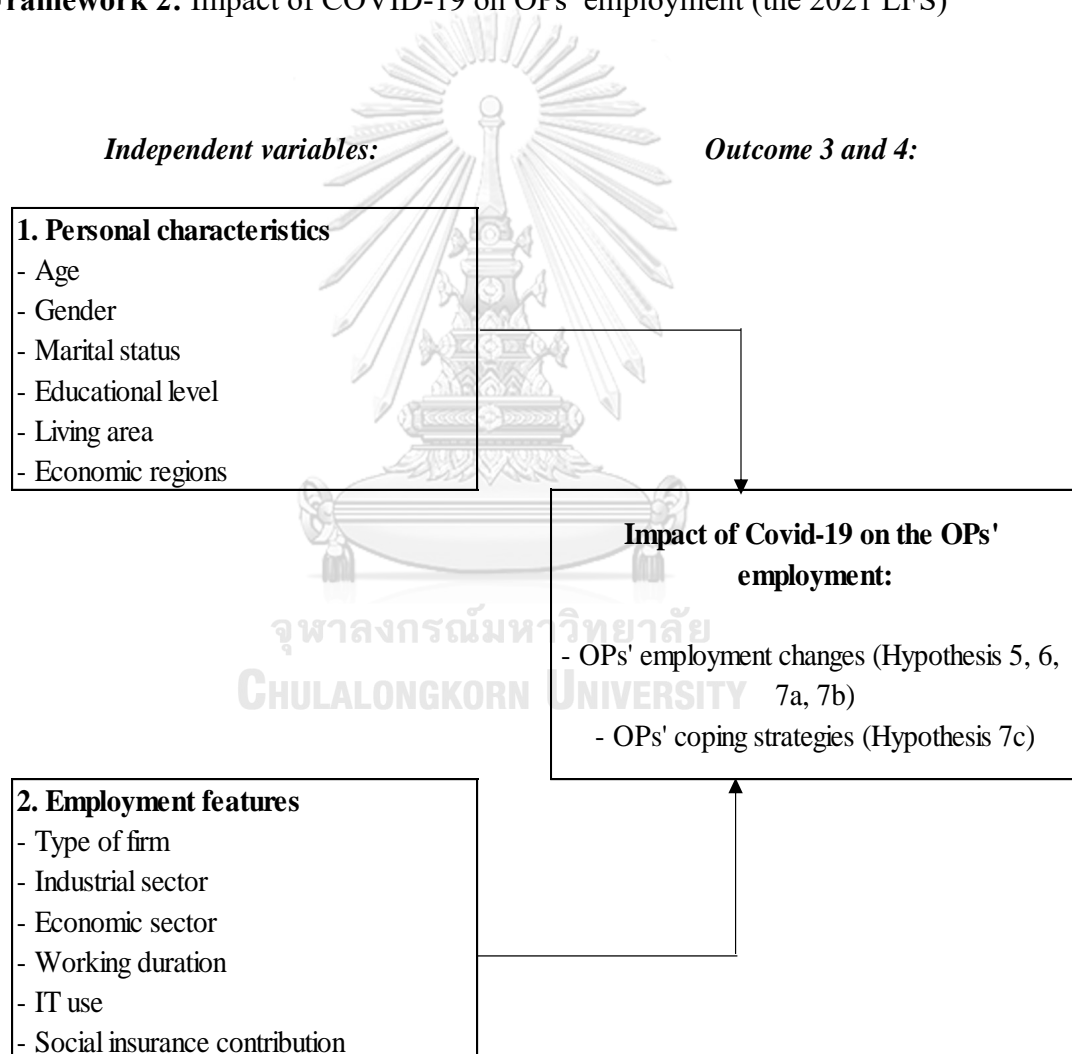
Framework 2 presents the association of the independent variables, including the OPs'

demographic characteristics and their employment features with the impact of COVID-

19 on (i) the change in employment and (ii) their coping strategies to deal with the employment difficulties.

3.4.2 Additional analysis on the use of IT

Since COVID-19, the requirement of IT use has become more popular in order to facilitate the remote work to reduce the spreading of the pandemic. This thesis, therefore, aims to investigate whether using IT brings benefits for OPs at work during the pandemic in comparison with other age groups. To do so, an interaction term of age group and IT use will be created for the whole workforce, based on the data from the 2021 LFS – Framework 3.

➤ The workforce will be arranged into four age groups:

- Group 1 are those aged 15 to 29. This group is the baseline comparison group.

- Group 2 are those aged 30 to 44

- Group 3 are those aged 45 to 59

- Group 4 are those aged 60 and over.

➤ The term "IT use" is presented in a dummy, where the value of 1 (Yes) means that the respondent has used IT for work before the pandemic and otherwise "No IT use" (that the respondent has not used IT).

➤ With the youngest age group (Group 1) being the baseline, I generate three interaction terms of age groups (group 2, group 3 and group 4) and one level term

for "IT use". Finally, a total of seven variables represent for 8 groups are created

for the analysis.

Framework 3: The association of the use of IT and the respondent's employment

change and their solutions

Independent variables: *Additional Outcome:*

1. Personal characteristics
- Gender
- Marital status
- Educational level
- Living area
- Economic regions

2. Employment features:
- Type of firm
- Industrial sector
- Economic sector
- Working duration
- Social insurance contribution

3. Interaction term of age group and IT use before the pandemic (Group 1 (aged 15-29) is base):
- *IT use*
- *Group 2 (aged 30-44):*
   Group 2
   Group 2 * IT use
- *Group 3 (aged 45-59):*
   Group 3
   Group 3 * IT use
- *Group 4 (aged 60+):*
   Group 4
   Group 4 * IT use

Impact of Covid-19 on the workers' employment:

- Workers' employment changes

- Workers' coping strategies

3.5 Chapter's summary

Chapter 3 discusses the data sources and the technical methods employed for this study.

Accordingly, to achieve the objectives of the study, two secondary data sources are

utilized: the Vietnam Housing and Living Standard (the waves 2018 and 2020) will

serve for the first and the second objectives, which aim to analyse the OPs' employment

situation and its determinants. Meanwhile, the 2021 Labour Force Survey will serve for the third and the fourth objectives which aim to investigate the impact of COVID-19 on OPs' employment and their coping strategies to overcome employment difficulties. Two technical methods are employed. The logit model is used to analyse the factors associated with OPs' probability of being employed, while the multinomial logit model is used to investigate the factors associated with OPs' type of job, the change in employment during COVID-19 and the solution to overcome employment difficulties. Moreover, to ensure the correctness of the results, this study employs the VIF test (test for multicollinearity of variables), with robust standard error for regressions. A Chow test for gender and living area is also provided to see whether there are any differences in gender and living area regarding the probability of working and type of job for OPs.
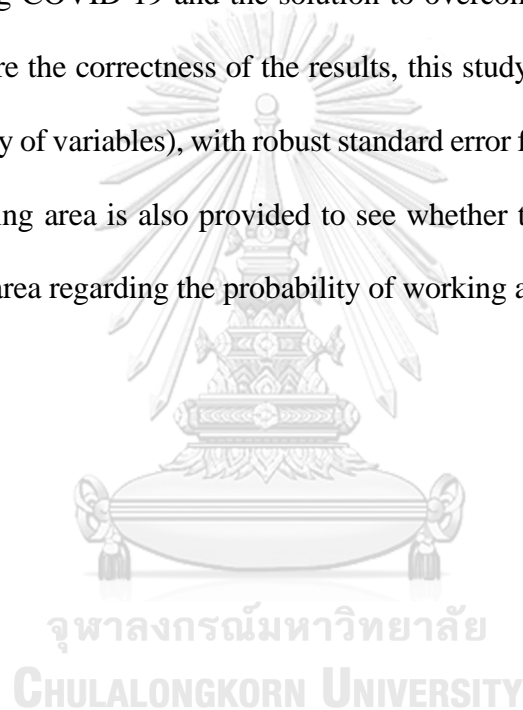
CHAPTER 4: PROBABILITY OF BEING EMPLOYED AND TYPE OF JOB OF OLDER PERSONS IN VIETNAM BETWEEN 2018 AND 2020

4.1 Sample size and some characteristics of older persons in the VHLSS survey.

To investigate the factors associated with the OPs' probability of being employed and the type of job of OPs in Vietnam, I employ the data from the 2018 and 2020 VHLSS. Overall, 5,055 older people aged 60 and over responded to the 2018 VHLSS; of those, 2,912 older females and 2,143 older males (equivalent to 57.6% and 42.4%, respectively). In 2020, 4,817 older people responded to the survey, consisting of 2,720 older females and 2,097 older males (equivalent to 56.5% and 43.5%, respectively) - Figure 3.

Figure 3: Study's sample size by gender
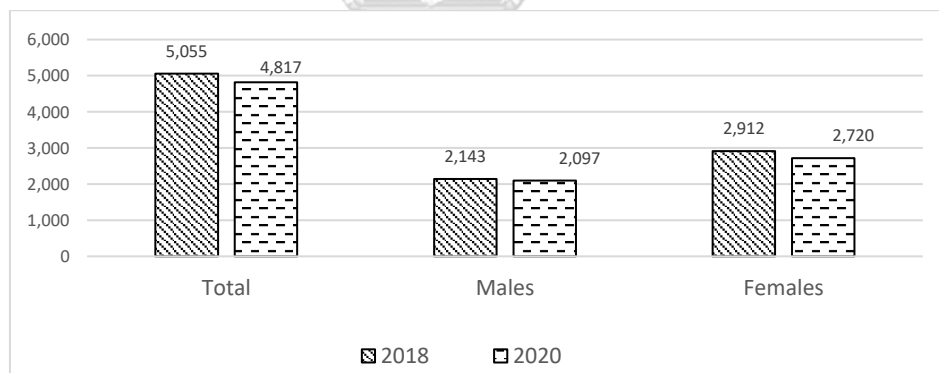
Source: Author's calculation based on the 2018-2020 VHLSS data

The results of the Chow test (Appendices 3 and 4) show gender differences in the probability of being employed and the type of job, while the Chow test for living area (rural/ urban areas, Appendices 5 and 6) shows that there were differences between the rural and urban areas in the probability of working and the type of job for the year 2018 but not for the year 2020. Therefore, this thesis only investigates the probability of

being employed and the type of job by gender. Table 15 details the demographic and socioeconomic characteristics of older females and males in 2018 and 2020 at their mean.

Ethnicity, marital status, living area and the economic region of OPs:

Most OPs belonged to the Kinh ethnic (about 86-87% for both genders in the two surveys), and the percentage of minority OPs was small (about 12-13%). The percentage of married older males was much higher than their counterparts in 2018 (86.5% vs. 49.5%) and 2020 (88.3% vs. 50.0%). In contrast, the percentage of older females with other marital statuses (single/ widowed/ divorced) was much larger than that of older males (50.5% vs. 13.5% in 2018 and 47.6% vs. 11.7% in 2020). About two-thirds of OPs lived in rural areas at the time of the surveys with the large numbers of OPs in the Red River Delta, Mekong River Delta, and North Central and Central Coastal, while the numbers of OPs in other economic regions was smaller – Table 15.

OPs' living arrangements, education, and health:

For the OPs' living arrangements, the results from Table 15 show that the percentage of OPs living with their children (and grandchildren) was the highest. Of which, the percentage of older males living with their children was higher than that of older females in both surveys (48.2% vs. 41.6% in 2020). The percentage of OPs living alone or with OPs only was high and tended to increase. For example, the percentage of older males living alone or with OPs only increased from 34.3% in 2018 to 27.3% in 2020; the corresponding figures for older females were 36.2% and 37.9%, respectively.

Noticeably, the rates of older females living alone was higher than that of older males (9.3% vs. 4.1% in 2020). On average, OPs lived in HHs with 3.7 members.

Regarding the level of education, overall, OPs have low educational level and older females had higher percentage of having no qualification than their counterpart. For example, over 90% of older females had no qualifications, 10-percent higher than that of older males. The percentage of OPs with a college degree was small and older males had a higher percentage having a college degree compared to older females (7.9% and 3.8% in 2020, respectively). Meanwhile, for health, the percentage of OPs answering that they had health problems was around 15-16% for both genders in 2018 and 2020 (Table 15).

The percentage of OPs using the internet increased rapidly between 2018 and 2020, reaching 20.9% and 33.9% (in 2020) for older females and males, respectively. In other words, the percentage of older males using the Internet was higher than their counterparts.

OPs' economic conditions:

The results from Table 15 show that the percentages of older females living in lower HH income Quintiles were higher than that of older males in both surveys. For example, in 2018, the percentage of older females living in HH income Quintile 1 and Quintile 2 was 45.4%, and the corresponding figure for older males was 39.6%. Likewise, the percentages of older females living in HHs with savings was lower than that of older males (34.6% vs.31.7% in 2020, respectively).

Together with the increase in the percentage of OPs living in HHs with savings is the decline in the percentage of OPs living in HHs with loans. For example, in 2018 the percentage of older females living in HHs with savings was 28.3% and increased to 34.6% in 2020. At the same time, the percentage of OPs living in HH with loans reduced from 11.9% in 2018 to 10.1% in 2020. The statistics implies that OPs' quality of life has improved. However, there was a gap in retirement pension between older males and females (21.3% vs. 13.3% in 2020).

Table 15: Characteristics of older females and males between 2018-2020 (%)

OPs' characteristics	2018 Females	2018 Males	2020 Females	2020 Males	OPs' characteristics	2018 Females	2018 Males	2020 Females	2020 Males
Age group					**Living arrangement**				
60-64	32.3	39.2	35.1	40.3	Living alone	9.9	3.5	0.0	4.1
65 - 69	22.7	21.2	22.3	24.0	Living with OP only	26.3	30.8	0.0	33.2
70 - 74	14.2	13.8	14.1	13.6	Living with children (and grandchildren)	41.0	49.4	0.0	48.2
75+	30.8	25.8	28.5	22.0	Living with grandchildren only	4.7	4.9	0.0	4.1
Marital status					Living with others	18.1	11.4	0.0	10.4
Other	50.5	13.5	47.6	11.7	**Number of HH members**				
Married	49.5	86.5	52.4	88.3	Single	9.9	3.5	9.3	4.1
Ethnicity					From 2-4 members	52.9	61.4	52.3	58.8
Minority	13.3	11.6	13.2	12.4	From 5-7 members	35.0	32.6	35.4	34.3
Kinh	86.7	88.4	86.8	87.6	From 8+	2.3	2.6	2.9	2.9
Living area					**Number of houses**				
Rural	68.4	67.4	67.1	66.4	Having 1 house	98.4	98.2	98.4	98.3
Urban	31.6	32.6	32.9	33.6	Having 2 houses +	1.6	1.8	1.6	1.7
Economic region					**Health problem**				
Southeast	10.1	10.2	0.0	7.7	No	83.8	84.4	85.1	84.9
Red River Delta	24.7	26.4	0.0	25.9	Yes	16.2	15.6	14.9	15.1

OPs' characteristics	2018 Females	2018 Males	2020 Females	2020 Males
Northern Midlands and Mountains	14.3	12.8	0.0	15.3
North Central and Coastal	22.6	23.1	0.0	23.8
Highlands	4.8	5.2	0.0	6.0
Mekong River Delta	23.5	22.4	0.0	21.4
Residential Registration				
In commune	98.5	98.3	0.0	97.8
In province	1.2	1.2	0.0	1.3
Other	0.3	0.5	0.0	1.0
Educational level				
No qualification	91.3	80.1	90.2	81.4
Elementary	1.6	3.8	1.5	3.5
Intermediate	4.4	8.0	4.4	7.2
College	2.7	8.1	3.8	7.9
Internet use				
No	90.2	80.4	0.0	66.1
Yes	9.8	19.6	0.0	33.9

OPs' characteristics	2018 Females	2018 Males	2020 Females	2020 Males
Pension				
No	87.3	77.7	86.7	78.7
Yes	12.7	22.3	13.3	21.3
Loans				
No	88.1	88.0	0.0	89.5
Yes	11.9	12.0	0.0	10.5
Savings				
No	71.7	67.5	65.4	62.9
Yes	28.3	32.5	34.6	37.1
HH income quintiles				
Q1	22.0	18.3	21.1	19.2
Q2	23.4	21.3	23.1	21.0
Q3	19.6	20.5	20.3	20.7
Q4	17.9	18.8	18.6	19.2
Q5	17.1	21.2	17.0	19.9

Source: Author's calculation based on the 2018-2020 VHLSS data.

4.2 The probability of being employed for older persons

4.2.1 Descriptive statistics

The statistic results from the VHLSS data (Table 16) show that in 2018, 50.4% reported working (during the last 12 months prior the survey). The figure increased to 52.1% for the year 2020. Besides the main jobs, in 2020, 37.3% of older workers reported additional jobs over the last 12 months, which was slightly lower than that of year 2018 (39.7%).

Compared to 2018, the number of working days per month and hours per day of OPs in 2020 was slightly higher. In 2018, the average working days per month was 20, and working hours per day was 5.2. The figures for the year 2020 were 20.4 days and 5.4 hours, respectively – Table 16.

Regarding the salary, only 12.9% and 14.1% of older workers reported receiving the salary for their jobs in 2018 and 2020, respectively. The average monthly income of OPs over the last 12 months was 3.0 million Dong in 2018 and increased to 3.86 million Dong in 2020.

Compared to the year 2018, the rate of OPs working under a labour contract, having a paid leave and contributing social insurance scheme increased and achieved 26.4%, 21.7% and 11.9%, respectively. The corresponding figures for the year 2018 were 21.6%, 19.5% and 10.3%, respectively – Table 16.

Table 16**:** Employment situation of OPs in Vietnam in 2018 and 2020

OPs' employment situation	2018	2020
Working rate (%)	50.4	52.1

OPs' employment situation	2018	2020
Number of working day (per month)	20	20.4
Number of working hours (per day)	5.2	5.4
Receiving salary (%)	12.9	14.1
Income per month (Million Dong)	3.0	3.86
Having labour contract (%)	21.6	26.4
Having paid leave (%)	19.5	21.7
Contributing social insurance scheme (%)	10.3	11.9

Source: Author's calculation based on the 2018 and 2020 VHLSS

Figure 4 shows the percentage of older females and males working in 2018 and 2020. In both surveys, the percentage of employed older males was higher than that of older females. For example, in 2020, 58.8% of older males were working, and the figure for females was 46.9%.

Figure 4**:** Employment rate of older persons by gender in 2018 and 2020 (%)
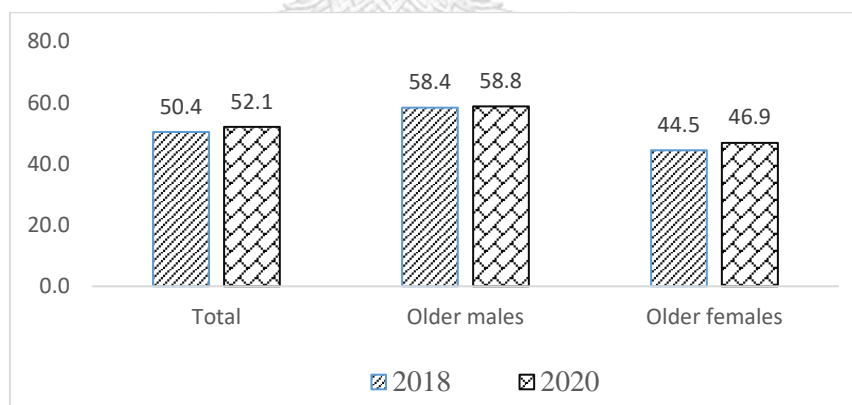
Source: Author's calculation based on the 2018 and 2020 VHLSS data.

Compared to 2018, the percentage of employed older males in 2020 remained the same, while the percentage of employed older females increased slightly (from 44.5% to 46.9%). Table 16 shows the employment rate of older females and males by their individual and household characteristics in 2018 and 2020.

Employment rate by individual characteristics:

As shown in Table 17, the percentage of employment of OPs in Vietnam was reduced by age. The older people get, the less likely they are to work. For example, in 2020, 77.8% of older males aged 60-64 were working; the figure for those aged 70-74 was 45.1%. The same situation occurred with their counterparts. Those who belongs to the minority group had a lower employment rate than the Kinh group.

Regarding marital status, the percentage of married people who were working was much higher than that of those with other marital statuses, especially for older males. In 2020, about 62.4% of married older males continued working, the figure is doubled that of older males with other marital statuses. The corresponding figures for females were 58.5% and 34.2%, respectively – Table 17.

Compared to older people in the urban area, those living in the rural area had a higher percentage of employment in both surveys. For example, the percentage of employed older females in the rural area was 53.32% in 2020, while the figure for the urban area was only 33.9%. On the other hand, there exists a gender difference in the employment rate by economic region. In detail, the percentage of employed older males was highest in the Northern Midlands and Mountains (66.4%), followed by the Highlands region (64.0%). The highest percentage for older females was in the Northern Midlands and Mountains (61.6%), followed by North Central and Central Coastal (50.92%). On the other hand, the lowest percentage was in the Mekong River Delta (41.8%), but the lowest percentage for older males was in the Southeast region (46.6%) – Table 17. Regarding residential registration, older males with the residential registration being "other" had the highest employment rate (in 2020). In contrast, the employment

90

percentage was lowest for older females with the residential registration being "other" (in both surveys).

Regarding the living arrangement, the results from Table 17 show that the percentage of employment was highest among those living with grandchildren only, followed by those living with children (and grandchildren) for both genders. For females, the percentage was lowest for those living with others. Meanwhile, the employment rate for older males was lowest for those living alone in both surveys. However, the employment rate for older males living alone increased significantly in 2018 and 2020, from 29.4% to 50.6%.

Regarding education, health problems and pensions, in general, increasing the level of education reduced the employment percentage for older males and females. For males, for example, 61.7% of those without qualifications worked in 2020, and the percentage reduced to 20.1% for those with a college degree or higher. For health status, the statistics show that the employment percentage is reduced once they have health problems. For females, the employment percentage was 49.9% for those who did not face health problems, and the figure for those having health problems reduced to 29.7% in 2020. The corresponding figures for older males were 62.4% and 38.8%, respectively – Table 17. At the individual level, having a retirement pension reduced the employment rate for both genders. For example, in 2020, almost 50% of older females without a retirement pension worked and the figure for older females with retirement pensions reduced to 27.4%.

Employment rate by household characteristics:

In general, the employment rate of older females and males was different by the economic condition of their household (HH), such as HH income level, loans or savings. The statistics show that the employment rate of OPs was higher for those living in HHs with lower incomes. For example, 65.9% of males in Quintile 1 were working in 2020; meanwhile, the figure for males in Quintile 5 reduced to 51.2%. Likewise, the employment rate of older females in Quintile 1 was 51.5% and reduced to 40.0% for females in Quintile 5 in 2020. Besides, the employment rate increased for those living in HHs with loans compared to HHs without loans and lower for those living in HHs with savings compared to their counterpart.

Table 17: Employment percentage by older males' and females' individual and household characteristics in 2018 and 2020 (%).

Variables	2018		2020		Variables	2018		2020	
	Female	Male	Female	Male		Female	Male	Female	Male
Age group					**Living area**				
60-64	65.9	76.2	70.1	77.8	Rural	50.9	66.6	53.3	67.5
65 - 69	56.0	69.0	52.9	66.3	Urban	30.6	41.5	33.9	41.6
70 - 74	41.2	55.9	47.4	45.1	**Living arrangement**				
75+	15.1	24.1	13.4	24.3	Living alone	50.5	29.3	49.6	50.6
Marital status					Living with OP only	47.1	52.3	50.1	52.8
Other	33.5	26.6	34.2	31.4	Living with children	50.7	63.6	52.5	63.2
Married	55.8	63.4	58.5	62.4	Living with grandchildren only	56.2	75.0	64.8	76.7
Ethnicity					Living with others	20.5	54.3	21.7	53.9
Minority	55.6	66.9	57.9	71.0	**Educational level**				
Kinh	42.8	57.3	45.2	57.1	No qualification	45.2	60.4	48.6	61.7
Health problems					Elementary	44.7	53.1	33.3	50.0
No	47.6	61.7	49.9	62.4	Intermediate	40.2	66.9	37.2	63.2
Yes	28.2	40.6	29.7	38.8	College	26.9	33.0	25.0	29.1
Pensions					**Economic region**				
No	46.8	63.0	49.9	65.4	Southeast	26.4	46.3	33.9	46.6

Variables	2018 Female	2018 Male	2020 Female	2020 Male
Yes	28.6	42.5	27.4	34.3
Loans				
No	43.8	56.5	46.2	57.2
Yes	49.7	72.9	53.7	72.7
Internet use				
No	44.2	58.5	45.9	57.9
Yes	47.2	58.0	50.8	60.6
Savings				
No	47.9	61.9	51.1	63.5
Yes	35.8	51.3	39.1	50.8
Household income Quintiles				
Q1	47.0	60.5	51.5	65.9
Q2	49.7	59.7	51.1	61.1
Q3	44.9	63.1	43.3	58.8
Q4	41.0	54.7	46.7	57.1
Q5	37.5	54.2	40.0	51.2
Total	**44.5**	**58.4**	**46.9**	**58.8**

Variables	2018 Female	2018 Male	2020 Female	2020 Male
Red River Delta	46.1	52.2	43.2	51.2
Northern Midlands and Mountains	57.7	68.3	61.6	66.4
North Central and Coastal	49.5	63.6	50.9	61.3
Highlands	44.0	63.4	47.5	64.0
Mekong River Delta	37.9	59.2	41.8	62.7
Residential Registration				
In commune	44.8	58.6	47.4	58.9
In province	25.7	46.2	25.7	51.9
Other	20.0	50.0	22.7	60.0
Number of family member				
Single	50.5	29.3	49.6	50.6
From 2-4 members	48.7	63.0	51.9	63.0
From 5-7 members	37.4	53.7	39.2	51.9
From 8+	31.3	49.1	43.0	66.7
Number of houses				
Having 1 house	44.5	58.3	46.8	58.9
Having 2 houses +	47.9	63.2	54.6	55.6

Source: Author's calculation based on the 2018 and 2020 VHLSS data.

4.2.2 Factors associated with the OPs' probability of being employed

Firstly, this study employs a VIF test for the collinearity of the variables. The results show no collinearity among variables used in the regression (Appendix 1). Secondly, I employ the Chow test to see whether there are any differences in the probability of working and OPs' type of work between older males and females. Significant differences exist in the probability of being employed (Appendix 3) and OPs' type of

job (Appendix 4); therefore, the analysis will be separated by gender. I also employ the robust standard error for the regressions.

4.2.2.1 Factors associated with the probability of being employed for older females.

Table 18 shows the results of the relationship between older females' probability of being employed and associated factors, employing the logit regression based on the 2018 and 2020 VHLSS data. The results are presented in odds ratio (OR).

At the individual level, the odds of being employed reduced by 0.87 in both surveys for those with a year increase in age. At the same time, married females were more likely to work than those with other marital statuses (OR=1.39 and 1.70 in 2018 and 2020, respectively). For ethnicity, the older Kinh had lower odds of being employed than minority people in 2018 (OR=0.76). For education, the results in 2020 also show that compared with an older female without any qualifications, holding a college degree or higher reduced the odds of being employed by 50% (p<0.5). At the same time, for older females using internet reduced the odds of being employed by 19.6% compared to those who did not use the internet – Table 18.

Living area, economic region and residential registration were associated with the odds of being employed for older females. Of which, living in the urban area was associated with lower odds of being employed for older females than in the rural area. In 2018, compared to living in a rural area, the odds of being employed for older females in the urban was 0.43. The corresponding figure for the year 2020 was 0.49 (p<0.01). Meanwhile, OPs in other economic regions had higher odds of being employed than those in the Southeast (except the Mekong River Delta). For example, in 2018, compared

to those living in the Southeast, the odds of being employed for those living in the Northern Midlands and Mountains were 6.51. The corresponding figure for the year 2020 was 4.36 (p<0.01). In addition, compared to older females with a residential registration in the commune, the odds of w being employed for those with a residential registration in the province and those with a residential registration being "other" were 0.47 and 0.26, respectively – Table 18.

For living arrangement, compared to those living alone, the odds of being employed for older females living with other HH members were 0.42. The corresponding figure for the year 2020 was 0.36 (p<0.01). Moreover, in 2020, the odds of being employed for those living with OPs only were lower than those living alone (OR=0.54). Meanwhile, the increase in the number of household members was associated with lower odds of being employed. In particular, with one member increase in OPs' households, the odds of being employed for older females reduced by 16.0% – Table 18.

Pensions and health status had a negative and significant relationship with the odds of being employed for older females. For health status, in 2018, compared to those without any health problems, the odds of being employed for OPs with health problems was 0.58 (in 2018). The corresponding figure for the year 2020 was 0.45. Likewise, compared to those without pensions, the odds of being employed for those with a retirement pension were 0.29 and 0.34 (in 2018 and 2020, respectively) – Table 18.

At the household level in 2018, compared to those living in HH income Quintile 1, the odds of being employed for those in Quintile 2 and Quintile 5 were 1.39 (for each category). In addition, the results from Table 18 also show that the increase in the number of houses that OPs' household owned was associated with higher odds of being

employed. In detail, with one more house that OPs' household owned in 2020, the odds of being employed were 2.69.

➢ *After investigating the probability of being employed for each year (2018 and 2020 separately), I generate a dummy variable for 2020 to see if there were any changes in the probability of working between 2018 and 2020 (pooled-cross section, as a proxy of the COVID-19 impact). The results (Table 18) show that there was no significant difference in the probability of being employed for older females in 2020 compared to the year 2018.*

4.2.2.2 Factors associated with the probability of being employed for older males

Table 18 shows the factors associated with the probability of being employed for older males in 2018 and 2020, employing the logit regression based on the 2018 and 2020 VHLSS data. The results are presented in odds ratio (OR).

At the individual level, the results from Table 18 show that age had a negative and significant relationship with the odds of being employed for older males in both surveys (OR = 0.88 and 0.87 in 2018 and 2020, respectively). At the same time, married males had higher odds of being employed than those with other marital statuses. For example, compared to those with other marital statuses, the odds of working for married males was 3.94 in 2018. For education, compared to those without qualifications, the odds of being employed for older males with an intermediate degree was 2.45 (in 2018); in contrast, the odds of being employed for those with a college degree or higher was 0.57 in 2018 – Table 18.

Living area and economic region were among the factors that explained the probability of being employed for older males. Older males living in the urban area had lower odds

of being employed than those in the rural area (OR = 0.29 in both surveys). Regarding economic region, compared to older males in the Southeast, those living in other economic regions (except the Red River Delta in both surveys and the Mekong River Delta in 2020) were more likely to work in later life. For example, compared to those living in the Southeast, the odds of being employed for older males living in the North Central and Central Coastal was 3.10 (in 2018). The corresponding figure for the year 2020 was 2.33.

Health status and retirement pensions had a negative and significant relationship with the probability of being employed for older males. In particular, in 2018, compared to those without health problems, the odds of being employed for OPs with health problems was 0.41. The corresponding figure for the year 2020 was 0.33 ($p<0.01$). Likewise, compared to those without pensions, the odds of being employed for older males with a retirement pension were 0.41 and 0.30 in 2018 and 2020, respectively.

The results also show that older males' living arrangement was associated with their probability of being employed in 2018 only. In specific, compared to those living alone, the odds of working for older males living with their children and living with grandchildren only were 2.16 and 2.78, respectively. Meanwhile, the increase in the number of HH members was associated with lower odds of being employed (OR=0.84 in 2018 and 0.79 in 2020).

At the household level, in 2018, older males' household income was associated with their probability of being employed in 2018 only. In specific, compared to being in Quintile 1, OPs in Quintile 4 and Quintile 5 were associated with higher odds of being employed (OR=1.41 and 1.98, respectively). The results also show that, in 2020, living

in HHs with loans was associated with higher odds of being employed (OR=1.48); in

contrast, living in HHs with savings reduced the odds of being employed for older males

(OR=0.75) – Table 18.

➤ *The results of the pooed-cross section (Table 18) show no significant difference in the probability of being employed for older males in 2020 compared to 2018.*

Table 18: Factors associated with the probability of being employed for OPs in Vietnam between 2018-2020

VARIABLES	2018		2020		Pooled cross section	
	Females	*Males*	*Females*	*Males*	*Females*	*Males*
Age	0.88***	0.88***	0.87***	0.87***	0.87***	0.87***
	(0.01)	(0.01)	(0.01)	(0.01)	0.00	(0.01)
Marital status: Married (Other is the base category)	1.39***	3.94***	1.70***	2.46***	1.51***	3.17***
	(0.17)	(0.80)	(0.22)	(0.56)	(0.14)	(0.47)
Ethnicity: Kinh (Minority is the base category)	0.76*	0.77	0.83	0.79	0.80*	0.79*
	(0.12)	(0.15)	(0.14)	(0.17)	(0.09)	(0.11)
Living area: Urban (Rural is the base category)	0.43***	0.29***	0.49***	0.29***	0.46***	0.30***
	(0.05)	(0.04)	(0.05)	(0.04)	(0.04)	(0.03)
Economic region (Southeast is the base category)						
Red River Delta	2.95***	1.29	1.64**	1.23	2.22***	1.28
	(0.55)	(0.27)	(0.32)	(0.28)	(0.30)	(0.19)
Northern Midlands and Mountains	6.51***	2.53***	4.36***	2.53***	5.34***	2.56***
	(1.45)	(0.63)	(1.00)	(0.68)	(0.85)	(0.47)
North Central and Central Coastal	3.87***	3.10***	2.63***	2.33***	3.20***	2.65***
	(0.73)	(0.66)	(0.51)	(0.54)	(0.43)	(0.41)
Highlands	2.28***	2.64***	1.69**	1.74*	2.00***	2.19***
	(0.60)	(0.80)	(0.45)	(0.53)	(0.37)	(0.47)
Mekong River Delta	1.24	1.62**	0.94	1.28	1.08	1.46**
	(0.23)	(0.34)	(0.18)	(0.29)	(0.14)	(0.22)
Residential registration (In commune is the base category)						
In province	0.69	0.51	0.47*	1.34	0.57*	0.87
	(0.32)	(0.25)	(0.21)	(0.64)	(0.18)	(0.30)
Other	0.58	2.63	0.25**	0.76	0.31**	1.19
	(0.53)	(2.03)	(0.14)	(0.43)	(0.15)	(0.56)
	0.84***	0.84***	0.84***	0.79***	0.85***	0.82***

VARIABLES	2018		2020		Pooled cross section	
	Females	*Males*	*Females*	*Males*	*Females*	*Males*
Number of HH members	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
Number of houses	1.19	1.44	2.69**	1.60	1.67*	1.59
	(0.41)	(0.61)	(1.06)	(0.73)	(0.43)	(0.49)
Living arrangement (Living alone is the base category)						
Living with OP only	0.76	1.39	0.54***	0.79	0.65***	0.95
	(0.15)	(0.52)	(0.12)	(0.27)	(0.10)	(0.24)
Living with children	1.03	2.16**	0.75	1.32	0.88	1.53*
	(0.21)	(0.84)	(0.16)	(0.47)	(0.13)	(0.39)
Living with grandchildren only	0.98	2.78**	0.96	1.32	0.96	1.76*
	(0.26)	(1.26)	(0.29)	(0.59)	(0.19)	(0.55)
Living with others	0.42***	1.47	0.36***	0.56	0.39***	0.84
	(0.09)	(0.57)	(0.09)	(0.20)	(0.06)	(0.22)
Educational level (No qualification is the base category)						
Elementary	1.39	1.00	0.55	0.84	0.92	0.92
	(0.51)	(0.29)	(0.23)	(0.26)	(0.25)	(0.19)
Intermediate	0.98	2.45***	0.70	2.43***	0.83	2.40***
	(0.25)	(0.56)	(0.18)	(0.61)	(0.15)	(0.40)
College+	0.65	0.57**	0.50**	0.53**	0.57***	0.55***
	(0.21)	(0.14)	(0.15)	(0.13)	(0.12)	(0.10)
Health problem: Yes (No is the base category)	0.58***	0.41***	0.45***	0.33***	0.52***	0.38***
	(0.08)	(0.06)	(0.07)	(0.05)	(0.05)	(0.04)
Pensions: Yes (No is the base category)	0.29***	0.41***	0.34***	0.30***	0.32***	0.36***
	(0.05)	(0.07)	(0.06)	(0.05)	(0.04)	(0.04)
Loans: Yes (No is the base category)	0.99	1.16	1.25	1.48*	1.10	1.28*
	(0.15)	(0.22)	(0.21)	(0.31)	(0.12)	(0.18)
Internet use: Yes (No is the base category)	1.04	0.87	0.80*	1.11	0.88	1.00
	(0.17)	(0.14)	(0.10)	(0.15)	(0.09)	(0.10)
Savings: Yes (No is the base category)	0.86	0.80	0.85	0.75**	0.85*	0.77***
	(0.11)	(0.11)	(0.10)	(0.11)	(0.07)	(0.08)
HH income quintile (Q1 is the base category)						
Q2	1.39**	1.07	1.17	0.86	1.26**	0.96
	(0.19)	(0.19)	(0.17)	(0.16)	(0.13)	(0.12)
Q3	1.26	1.24	1.11	1.03	1.17	1.15
	(0.19)	(0.23)	(0.18)	(0.20)	(0.13)	(0.15)
Q4	1.27	1.41*	1.50**	1.13	1.38***	1.25
	(0.21)	(0.29)	(0.26)	(0.24)	(0.16)	(0.18)
Q5	1.39*	1.98***	1.21	1.03	1.29**	1.43**
	(0.25)	(0.45)	(0.23)	(0.23)	(0.17)	(0.23)
					1.10	0.93

VARIABLES	2018		2020		Pooled cross section	
	Females	*Males*	*Females*	*Males*	*Females*	*Males*
Year: 2020 (year 2018 is the base category)					(0.07)	(0.07)
Constant	9,427.27***	2,816.82***	13,703.22***	38,955.76***	10,600.45***	9,296.69***
	(6187.51)	(2349.63)	(9747.10)	(35553.69)	(5117.26)	(5652.54)
Observations	*2,912*	*2,143*	*2,720*	*2,097*	*5,632*	*4,240*
Log-likelihood	*-1433.00*	*-1024.02*	*-1322.04*	*-976.66*	*-2766.95*	*-2016.16*
Chi-square	*1135.65*	*861.68*	*1116.25*	*888.47*	*2231.37*	*1719.26*
P-value	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*
Pseudo R^2	*0.2838*	*0.2961*	*0.2968*	*0.3126*	*0.2874*	*0.2989*
Standard err. in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Source: Author's calculation based on the 2018 and 2020 VHLSS data.

4.3 Older persons' type of job

4.3.1 Descriptive statistics

Figure 5 shows the percentage of OPs' type of job by gender. Overall, the percentage of OPs reporting that they did not work was highest in both surveys, followed by working in agriculture and the figures for having waged work and working in non-agriculture were smaller – Figure 5.

Figure 5**:** OPs' type of job by gender in 2018 and 2020 (%)
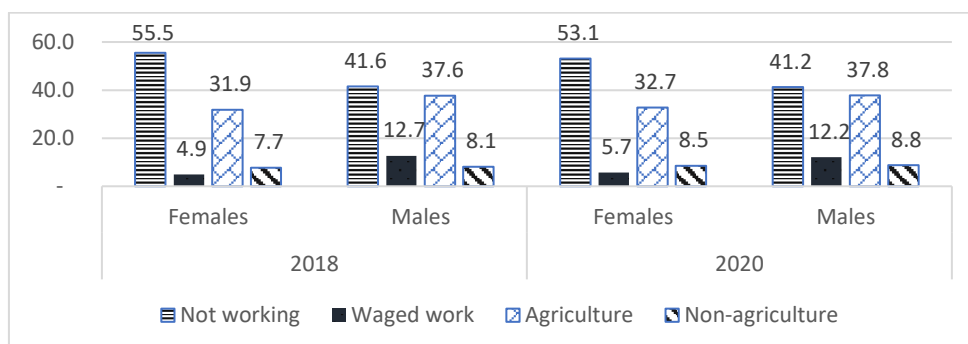
Source: Author's calculation based on the 2018 and 2020 VHLSS

Table 19 and Table 20 show the statistics regarding the OPs' type of job in Vietnam in 2018 and 2020.

No working:

The statistics from Table 19 and Table 20 show that the percentage not working increased by the OPs' age. OPs belonging the Kinh, in other marital statuses, living in the urban area and in the Southeast had higher percentage not working than others. In addition, the statistics also show that OPs having retirement pensions and health problems and those having a university degree had higher percentage not working than others. At the household level, OPs living in HHs with more members, having savings and higher income quintiles (i.e., Quintile 5) had higher percentage not working. For example, in 2020, 75.0% of older females with college degree did not work, and the figure reduced to 51.5% for those without any qualifications. The corresponding figures for older males were 70.9% and 38.3%, respectively – Table 20.

Waged work:

The statistics show that the percentage of having waged work was higher for those in the younger age group (i.e., 60-64 years old). OPs without pension or no health problems had higher percentage of having waged work than others. At the household level, those living in HHs with loans, without savings and in quintiles 2 and 3 had higher percentages of having waged work than others. For example, in 2018, 9.1% of older females aged 60-64 reported having waged work, and the figure reduced to 1.1% for those aged 70+ (in 2018). The corresponding figures for older males were 21.7% and 1.6%, respectively – Table 19.

Working in agriculture:

The percentage of working in agriculture reduced by OPs' age. The statistics from Table 19 and Table 20 also show that OPs living in the rural area, in the North Midlands and Mountains region and those living with grandchildren only, without pension and health problems and those with lower educational level had higher percentage of working in agriculture than other. For example, in 2018, 40.9% of older females living in the rural area worked in agriculture while 12.2% of those living in the urban area worked in this sector. The corresponding figure for older males were 49.4% and 13.3%. At the household level, OPs living in HHs with 2-4 members, without internet usage, having loans and without savings and those living in the lowest income quintile had higher percentage of working in agriculture than others. For example, 39.5% of older females living in Quintile 1 worked in waged work in 2018, reduced to 20.8% for those living in Quintile 5. The corresponding figures for older males were 51.3% and 24.5% - Table 19.

Working in non-agriculture:

The percentage of working in non-agriculture increased for those who were younger. OPs belonging to the Kinh, married and those living in the urban area had higher percentage of working in non-agriculture than others. For example, 13.9% of older females living in the urban area worked in non-agriculture in 2020, the figure reduced to 5.9% of those living in the rural area. The corresponding figures for older males was 15.0% and 5.6%, respectively. The statistics also show that OPs without pension or health problem had higher percentage of working in non-agriculture than others. At the household level, OPs living in HH with loans, savings and highest quintile had higher percentage of working in non-agriculture. For example, 15.6% of older females in

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Quintile 5 worked in non-agriculture in 2020 compared to 1.9% of those living in Quintile

1. The corresponding figures for older males were 13.9% and 2.2% - Table 20.

Table 19: Older females and males' type of job by demographic ad socioeconomic characteristics in 2018 (%)

Variables	Older females				Older males			
	Not working	*Waged work*	*Agriculture*	*Non-agriculture*	*Not working*	*Waged work*	*Agriculture*	*Non-agriculture*
Age group								
60-64	19.9	60.6	45.4	50.4	22.5	66.9	44.5	56.9
65 - 69	18.0	22.5	29.7	27.4	15.8	21.3	26.3	25.3
70 - 74	15.0	9.9	14.3	10.2	14.6	8.5	15.5	9.8
75+	47.1	7.0	10.6	12.0	47.1	3.3	13.7	8.1
Marital status								
Other	60.6	50.7	34.9	42.9	23.8	6.3	6.3	5.2
Married	39.4	49.3	65.1	57.1	76.2	93.8	93.7	94.8
Ethnicity								
Minority	10.6	11.3	20.3	4.9	9.2	9.2	17.0	2.3
Kinh	89.4	88.7	79.7	95.1	90.8	90.8	83.0	97.7
Living area								
Rural	60.5	64.8	87.9	47.4	54.1	67.7	88.5	37.4
Urban	39.5	35.2	12.1	52.7	45.9	32.4	11.5	62.6
Economic region								
Southeast	13.4	6.3	4.2	13.3	13.1	8.1	6.3	16.1
Red River Delta	24.0	24.7	27.7	17.3	30.3	30.9	21.5	21.8
Northern Midlands and Mountains	10.9	7.8	23.0	7.1	9.8	11.8	16.5	12.6
North Central and Coastal	20.6	22.5	25.8	24.3	20.2	18.4	27.4	24.7
Highlands	4.9	5.6	5.0	3.5	4.6	6.3	5.8	4.0
Mekong River Delta	26.2	33.1	14.4	34.5	22.0	24.6	22.5	20.7
Residential Registration								
In commune	97.9	100.0	99.6	96.9	97.9	99.3	98.6	97.7
In province	1.6	0.0	0.4	2.2	1.6	0.7	0.9	1.7
Other	0.5	0.0	0.0	0.9	0.6	0.0	0.5	0.6

Variables	Older females				Older males			
	Not working	*Waged work*	*Agriculture*	*Non-agriculture*	*Not working*	*Waged work*	*Agriculture*	*Non-agriculture*
Educational level								
No qualification	90.2	91.6	93.6	90.3	76.3	79.0	86.5	71.8
Elementary	1.6	0.7	1.8	1.3	4.3	4.0	2.5	6.9
Intermediate	4.7	5.6	3.6	4.4	6.4	11.0	7.6	13.8
College	3.5	2.1	1.0	4.0	13.0	5.9	3.5	7.5
Number of HH members								
Single	8.8	18.3	10.0	11.5	6.0	2.6	1.5	1.7
From 2-4 members	48.9	55.6	57.1	62.0	54.7	72.4	63.7	67.8
From 5-7 members	39.5	24.7	31.3	24.8	36.3	22.1	33.4	26.4
From 8+	2.9	1.4	1.6	1.8	3.1	2.9	1.5	4.0
Number of houses								
Having 1 house	98.5	100.0	98.1	97.8	98.4	99.3	97.9	97.1
Having 2 houses +	1.6	0.0	1.9	2.2	1.6	0.7	2.1	2.9
Living arrangement								
Living alone	8.8	18.3	10.0	11.5	6.0	2.6	1.5	1.7
Living with OP only	25.1	21.8	30.2	22.1	35.4	22.8	31.4	17.8
Living with children (and grandchildren)	36.4	50.0	44.5	53.5	43.2	52.9	52.5	60.9
Living with grandchildren only	3.7	6.3	5.7	6.6	2.9	7.7	5.5	7.5
Living with others	26.0	3.5	9.6	6.2	12.6	14.0	9.2	12.1
Health problem								
No	79.1	93.0	89.9	87.2	77.7	87.9	89.7	88.5
Yes	20.9	7.0	10.1	12.8	22.3	12.1	10.3	11.5
Pension								
No	83.6	95.1	91.4	91.6	69.1	83.8	84.4	81.0
Yes	16.4	4.9	8.6	8.4	30.9	16.2	15.6	19.0
Internet use								

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Variables	Older females				Older males			
	Not working	*Waged work*	*Agriculture*	*Non-agriculture*	*Not working*	*Waged work*	*Agriculture*	*Non-agriculture*
No	90.7	92.3	91.8	79.2	80.1	79.0	86.0	57.5
Yes	9.3	7.8	8.2	20.8	19.9	21.0	14.0	42.5
Loans								
No	89.2	85.2	86.3	89.4	92.1	84.2	84.5	88.5
Yes	10.8	14.8	13.7	10.6	7.9	15.8	15.5	11.5
Savings								
No	67.3	81.0	78.9	68.1	62.0	65.8	76.7	56.3
Yes	32.7	19.0	21.1	31.9	38.1	34.2	23.3	43.7
HH income quintiles								
Q1	21.0	21.1	27.3	8.0	17.4	10.3	24.9	4.6
Q2	21.2	28.2	27.4	19.5	20.7	20.2	24.7	10.3
Q3	19.4	21.8	19.6	19.0	18.2	24.6	21.3	21.8
Q4	19.1	16.2	14.6	24.8	20.4	21.0	15.3	23.0
Q5	19.3	12.7	11.2	28.8	23.3	23.9	13.8	40.2

Source: Author's calculation based on the 2018 VHLSS data

Table 20: Older females and males' type of job by demographic and socioeconomic characteristics in 2020 (%)

Variables	Older females				Older males			
	Not working	*Waged work*	*Agriculture*	*Non-agriculture*	*Not working*	*Waged work*	*Agriculture*	*Non-agriculture*
Age group								
60-64	19.8	62.3	49.6	56.9	21.8	69.8	47.1	57.6
65 - 69	19.8	24.0	24.8	27.2	19.7	20.8	29.7	24.5
70 - 74	14.0	10.4	15.6	11.6	18.2	5.5	12.0	10.9
75+	46.4	3.3	10.0	4.3	40.4	3.9	11.2	7.1
Marital status								
Other	59.0	41.6	31.7	41.4	19.4	7.1	5.5	8.2
Married	41.0	58.4	68.3	58.6	80.6	92.9	94.5	91.9
Ethnicity								
Minority	10.5	11.7	20.1	4.7	8.7	9.0	19.9	1.6
Kinh	89.5	88.3	79.9	95.3	91.3	91.0	80.1	98.4
Living area								
Rural	59.0	63.0	86.3	46.6	52.3	65.1	87.7	42.4
Urban	41.0	37.0	13.7	53.5	47.7	34.9	12.3	57.6
Economic region								

Variables	Older females				Older males			
	Not working	*Waged work*	*Agriculture*	*Non-agriculture*	*Not working*	*Waged work*	*Agriculture*	*Non-agriculture*
Southeast	11.4	11.7	3.2	16.4	10.0	9.8	3.2	13.6
Red River Delta	26.6	26.6	22.7	21.1	30.7	28.6	20.2	24.5
Northern Midlands and Mountains	11.0	11.7	24.9	6.5	12.5	9.0	22.4	6.5
North Central and Coastal	22.1	20.8	27.6	22.8	22.3	27.8	25.2	19.0
Highlands	5.1	2.0	5.8	5.2	5.2	5.9	6.8	6.0
Mekong River Delta	23.8	27.3	15.7	28.0	19.3	18.8	22.3	30.4
Residential Registration								
In commune	97.0	98.7	99.3	97.4	97.6	95.3	99.5	94.6
In province	1.8	0.7	0.2	2.6	1.5	1.6	0.4	3.8
Other	1.2	0.7	0.5	0.0	0.9	3.1	0.1	1.6
Educational level								
No qualification	87.4	95.5	93.7	90.5	75.7	79.2	88.3	81.0
Elementary	1.9	1.3	0.7	2.6	4.3	5.1	2.1	3.8
Intermediate	5.3	2.0	3.7	3.9	6.5	9.4	7.1	8.7
College	5.4	1.3	1.9	3.0	13.5	6.3	2.5	6.5
Number of HH members								
Single	8.9	16.2	9.0	9.1	4.9	5.1	2.6	4.9
From 2-4 members	47.4	65.6	56.9	56.5	52.8	66.7	61.0	66.3
From 5-7 members	40.6	14.3	31.8	31.5	40.1	26.3	32.5	26.6
From 8+	3.1	3.9	2.4	3.0	2.3	2.0	3.9	2.2
Number of houses								
Having 1 house	98.6	99.4	98.1	97.4	98.2	98.8	98.5	97.3
Having 2 houses +	1.4	0.7	1.9	2.6	1.9	1.2	1.5	2.7
Living arrangement								
Living alone	8.9	16.2	9.0	9.1	4.9	5.1	2.6	4.9
Living with OP only	26.9	25.3	33.3	23.7	38.1	25.9	33.0	21.7
Living with children (and grandchildren)	37.2	47.4	42.9	59.9	43.1	52.2	50.9	54.9
Living with grandchildren only	2.6	5.2	6.0	3.0	2.3	5.1	5.8	3.8
Living with others	24.5	5.8	8.9	4.3	11.7	11.8	7.7	14.7

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Variables	Older females				Older males			
	Not working	*Waged work*	*Agriculture*	*Non-agriculture*	*Not working*	*Waged work*	*Agriculture*	*Non-agriculture*
Health problem								
No	80.3	89.6	89.8	94.4	77.6	89.4	90.4	89.1
Yes	19.7	10.4	10.2	5.6	22.5	10.6	9.6	10.9
Pension								
No	81.8	95.5	91.8	91.8	66.1	87.5	87.5	88.0
Yes	18.2	4.6	8.2	8.2	33.9	12.6	12.5	12.0
Internet use								
No	80.6	72.1	80.8	67.7	67.6	49.0	75.1	44.0
Yes	19.4	27.9	19.2	32.3	32.4	51.0	24.9	56.0
Loans								
No	91.2	84.4	89.0	89.2	93.1	87.5	85.6	92.4
Yes	8.8	15.6	11.0	10.8	6.9	12.6	14.4	7.6
Savings								
No	60.3	77.3	74.0	56.0	55.7	58.4	75.2	50.0
Yes	39.8	22.7	26.0	44.0	44.3	41.6	24.8	50.0
HH income quintiles								
Q1	19.3	18.8	28.7	4.7	15.9	10.6	28.8	4.9
Q2	21.3	26.6	26.9	17.7	19.8	16.1	25.4	14.1
Q3	21.7	23.4	18.4	16.8	20.7	25.9	18.8	21.7
Q4	18.6	16.9	15.8	29.7	20.0	22.4	15.4	27.7
Q5	19.2	14.3	10.2	31.0	23.6	25.1	11.6	31.5

Source: Author's calculation based on the 2018 and 2020 VHLSS data

4.3.2 Factors associated with the OPs' type of job

The outcome of interest is the type of job, which is categorized into four groups: (i) Not working – which is the base category; (ii) waged work; (iii) agriculture; and (iv) non-agriculture. The following analysis will focus on the factors associated with waged work, agriculture and non-agriculture for each gender.

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4.3.2.1 Factors associated with older females' type of job

Table 21 shows the results of the multinomial logit analysis for the older females' type of job. The results are presented in Relative Risk Ratio (RRR):

The association between older females' characteristics and their type of job:

In both surveys, age had a negative and significant relationship with all types of job for older females. In general, for one year increase in the age of older females, the relative risks for preferring all types of job relative to not working would be expected to reduce by 20%. For the Kinh people relate to the minority group, the relative risk for preferring in agriculture decreased by 29% (in 2018). The results also show that for married older females relative to those in other marital statuses, the relative risk for preferring in waged work relative to no working would be expected to increase by 1.62 times in 2020.

The results from Table 21 also show that living in the urban was associated with lower relative risk for preferring in agriculture but higher relative risk for preferring in non-agriculture in both surveys, which were in line with the nature of economic development.

Besides, for those living in all other economic regions relative to the Southeast region, the relative risk for preferring in agriculture would be expected to increase in both surveys. In 2018, the relative risk for preferring in waged work relative to no working would be expected to increase (except the Highlands). The situation was different for the year 2020. In detail, the Highland (relative to the Southeast) was the only region which had a negative and significant difference in the relative risk for preferring in

waged work relative to no working (RRR=0.31). There were no significant difference in the relative risk of working in non-agriculture for older females in all other economic regions relative to those in the Southeast in 2020, even though in 2018, the relative risk for preferring in non-agriculture relative to no working for older females in the Northern Midlands and Mountains and the North Central and Central Coastal relative to those in the Southeast would be expected to increase by a factor of 2.28 and 2.24, respectively). In addition, in 2020, for older females with residential registration in the province relative to those who had residential registration in the commune, the relative risk for preferring in agriculture relative to no working would be expected to decrease by a factor of 0.26.

For living arrangement, living with other relatives relative to those living alone, the relative risk for preferring in all types of job would be expected to decrease. For example, relative to those living alone in 2018, the relative risk for preferring in non-agriculture relative to no working for those living with other relatives would be expected to reduce by 64.8%. The corresponding figure for the year 2020 was 70.4%. Besides, in 2020, for older females who lived with OPs only relative to those living alone, the relative risk for preferring in waged work or agriculture relative to no working would be expected to reduce by a factor of 0.34 and 0.55, respectively – Table 21.

The results from Table 21 show that older females with pensions and health problems were associated with lower relative risk for preferring in all types of job in both surveys. For example, compared to those without health problems, the relative risk for preferring in waged work relative to no working for those with health problems would be expected

to decrease by 0.4 times (in both surveys). Meanwhile, the relative risk for preferring waged work relative to no working for those with retirement pension relative to those without pension would be expected to decrease by a factor of 0.14 and 0.21 in 2018 and in 2020, respectively ($p < 0.01$).

Regarding education, for those with a college degree or higher relative to those without any qualification, the relative risk for preferring in agriculture would be expected to decrease by a factor of 0.42 in 2018 and 0.50 in 2021. Besides, the results also show that in 2018, the relative risk for preferring in waged work relative to no working would be expected to increase by 2.23 times for older females with an intermediate degree relative to those without any qualification (Table 21).

The association between household characteristics and older females' type of job:

The results from Table 21 show that older females living in higher income Quintiles were associated with higher relative risk of working in non-agriculture in both surveys. For example, for older females in Quintile 5 relative to those in Quintile 1, the relative risk for preferring in non-agriculture relative to no working would be expected to increase by a factor of 4.14 (in 2018). The corresponding figure for the year 2020 was 6.78 ($p < 0.01$). In 2020, the relative risk for preferring in waged work relative to no working would be expected to increase by 2.27 times for older females living in HHs with loans relative to those living in HHs without loans. In contrast, the relative risk for preferring in waged work relative to no working would be expected decrease by a factor of 0.59 for older females living in HHs with savings relative to those living in HHs without savings.

Besides, the results also show that the relative risk for preferring in non-agriculture relative to no working would be expected to reduce by a factor of 0.85 for one additional number in older females' household.

➢ *The results of the pooed-cross section (Table 21) show that the relative risk for preferring in waged work relative to no working would be expected to increase by 1.27 times for older females in 2020 relative to the year 2018; however, the result was only significant at a weak confidential level (p<0.1).*

Table 21: Factors associated with the older females' type of job in 2018 and 2020 (RRR)

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Age	0.82***	0.88***	0.89***	0.83***	0.88***	0.86***	0.82***	0.88***	0.87***
	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Marital status: Married	0.76	1.72***	1.18	1.61*	2.07***	1.16	1.08	1.86***	1.14
(Other is the base category)	(0.18)	(0.25)	(0.23)	(0.40)	(0.31)	(0.23)	(0.18)	(0.19)	(0.16)
Ethnicity: Kinh (Minority is	0.77	0.71*	1.63	0.80	0.79	1.72	0.80	0.76**	1.62*
the base category)	(0.26)	(0.12)	(0.58)	(0.26)	(0.14)	(0.63)	(0.18)	(0.10)	(0.41)
Living area: Urban (Rural is	1.05	0.20***	1.35*	1.11	0.25***	1.55**	1.06	0.23***	1.42***
the base category)	(0.23)	(0.03)	(0.23)	(0.23)	(0.03)	(0.27)	(0.16)	(0.02)	(0.17)
Economic region (Southeast is the base category)									
Red River Delta	3.34***	4.20***	1.28	1.20	3.14***	0.75	1.95***	3.62***	1.00
	(1.40)	(0.96)	(0.37)	(0.40)	(0.80)	(0.20)	(0.50)	(0.61)	(0.19)
Northern Midlands and Mountains	3.37**	9.73***	2.28**	1.53	9.68***	1.05	2.20**	9.67***	1.54*
	(1.76)	(2.51)	(0.85)	(0.63)	(2.74)	(0.40)	(0.70)	(1.83)	(0.41)
North Central and Central Coastal	3.80***	5.31***	2.24***	1.15	5.27***	1.35	2.04***	5.26***	1.74***
	(1.57)	(1.21)	(0.61)	(0.40)	(1.35)	(0.37)	(0.53)	(0.89)	(0.33)
Highlands	2.24	3.40***	1.00	0.31*	3.54***	1.00	0.91	3.50***	1.05
	(1.25)	(1.04)	(0.46)	(0.21)	(1.14)	(0.41)	(0.36)	(0.77)	(0.32)
Mekong River Delta	2.25**	1.14	1.48	0.72	1.47	0.80	1.21	1.29	1.09
	(0.91)	(0.26)	(0.39)	(0.24)	(0.38)	(0.21)	(0.30)	(0.22)	(0.20)

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Residential registration (In commune is the base category)									
In province	0.00	0.53	1.02	0.20	0.26*	0.69	0.15*	0.38**	0.87
	(0.00)	(0.34)	(0.58)	(0.21)	(0.20)	(0.37)	(0.15)	(0.19)	(0.34)
Other	0.00	0.00	2.19	0.34	0.42	0.00	0.32	0.30**	0.27*
	(0.00)	(0.00)	(2.16)	(0.36)	(0.27)	(0.00)	(0.34)	(0.18)	(0.21)
Number of HH members	0.85**	0.83***	0.85***	0.69***	0.85***	0.85***	0.77***	0.84***	0.87***
	(0.06)	(0.03)	(0.05)	(0.05)	(0.03)	(0.04)	(0.04)	(0.02)	(0.03)
Number of houses	0.00	1.38	1.19	1.40	2.54**	3.35**	0.29	1.68*	1.77
	(0.00)	(0.52)	(0.67)	(1.31)	(1.09)	(1.93)	(0.25)	(0.47)	(0.69)
Living arrangement (Living alone is the base category)									
Living with OP only	0.58	0.82	0.63	0.34***	0.55**	0.63	0.45***	0.68**	0.63*
	(0.22)	(0.19)	(0.21)	(0.13)	(0.13)	(0.23)	(0.12)	(0.11)	(0.15)
Living with children	0.74	1.13	0.94	0.73	0.71	1.11	0.76	0.90	1.01
	(0.27)	(0.26)	(0.31)	(0.28)	(0.17)	(0.39)	(0.20)	(0.15)	(0.24)
Living with grandchildren only	0.62	1.05	1.02	0.67	1.10	0.82	0.66	1.05	1.02
	(0.31)	(0.31)	(0.43)	(0.35)	(0.36)	(0.44)	(0.23)	(0.23)	(0.33)
Living with others	0.15***	0.51***	0.35**	0.33**	0.40***	0.30***	0.24***	0.45***	0.32***
	(0.09)	(0.13)	(0.14)	(0.16)	(0.10)	(0.14)	(0.09)	(0.08)	(0.10)
Educational level (No qualification is the base category)									
Elementary	0.72	1.62	1.15	0.86	0.37*	1.32	0.89	0.90	1.38
	(0.78)	(0.63)	(0.77)	(0.70)	(0.20)	(0.75)	(0.57)	(0.28)	(0.58)

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VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Intermediate	2.23*	0.76	1.22	0.47	0.73	0.75	1.14	0.75	0.96
	(1.07)	(0.22)	(0.51)	(0.31)	(0.20)	(0.33)	(0.42)	(0.15)	(0.29)
College+	1.17	0.42**	1.10	0.33	0.50**	0.55	0.64	0.47***	0.79
	(0.81)	(0.18)	(0.49)	(0.26)	(0.17)	(0.27)	(0.33)	(0.13)	(0.26)
Health problem: Yes (No is the base category)	0.40***	0.55***	0.74	0.44***	0.52***	0.22***	0.45***	0.54***	0.45***
	(0.14)	(0.08)	(0.17)	(0.13)	(0.08)	(0.07)	(0.10)	(0.06)	(0.08)
Pensions: Yes (No is the base category)	0.14***	0.48***	0.16***	0.21***	0.49***	0.17***	0.16***	0.49***	0.17***
	(0.07)	(0.10)	(0.05)	(0.10)	(0.10)	(0.06)	(0.05)	(0.07)	(0.04)
Loans: Yes (No is the base category)	1.15	0.98	0.97	2.27***	1.12	1.36	1.55**	1.04	1.12
	(0.32)	(0.16)	(0.25)	(0.64)	(0.21)	(0.37)	(0.30)	(0.12)	(0.21)
Internet use: Yes (No is the base category)	0.65	0.92	1.38	1.07	0.74**	0.82	0.95	0.80**	1.03
	(0.24)	(0.18)	(0.31)	(0.24)	(0.11)	(0.16)	(0.18)	(0.09)	(0.15)
Savings: Yes (No is the base category)	0.74	0.92	0.77	0.59**	0.91	0.87	0.65**	0.91	0.82
	(0.20)	(0.13)	(0.15)	(0.14)	(0.12)	(0.17)	(0.12)	(0.09)	(0.11)
HH income quintile (Q1 is the base category)									
Q2	1.44	1.32*	2.35***	1.23	1.08	3.01***	1.32	1.19	2.50***
	(0.40)	(0.20)	(0.71)	(0.35)	(0.17)	(1.10)	(0.26)	(0.13)	(0.58)
Q3	1.17	1.16	2.37***	1.36	0.98	3.00***	1.29	1.06	2.51***
	(0.35)	(0.19)	(0.73)	(0.41)	(0.17)	(1.12)	(0.27)	(0.12)	(0.59)
Q4	1.01	1.02	3.49***	1.14	1.21	6.69***	1.07	1.12	4.55***
	(0.34)	(0.19)	(1.09)	(0.37)	(0.23)	(2.44)	(0.25)	(0.14)	(1.07)

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VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Q5	1.03	1.06	4.14***	0.98	0.79	6.78***	1.01	0.90	5.20***
	(0.39)	(0.22)	(1.35)	(0.36)	(0.17)	(2.57)	(0.26)	(0.13)	(1.27)
Year: 2020 (year 2018 is the base category)							1.27*	1.07	1.14
							(0.17)	(0.08)	(0.13)
Constant	1.11E+12	3,700.49***	202.68***	254,132.97***	3,305.11***	826.55***	663,127.27***	3,479.28***	371.91***
	-1.21E+15	(2683.27)	(239.82)	(430705.95)	(2589.47)	(1075.69)	(865454.41)	(1849.56)	(321.18)
Observations	2,912			2,720			5,632		
Log-likelihood	-2245.20			-2142.89			-4437.18		
Chi-square	1548.56			1558.1			3012.97		
P-value	0.000			0.000			0.000		
Pseudo R²	0.2564			0.2666			0.2535		

Standard err. in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation based on the 2018 and 2020 VHLSS data

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4.3.2.2 Factors associated with older males' type of job

Table 22 shows the results of the multinomial logit regression to investigate the factors associated with older males' type of job in 2018 and 2020. All variables are the same as in Table 21. The results are presented in Relative Risk Ratio (RRR).

The association between older males' characteristics and their type of job:

Age had a negative and significant relationship with the relative risk of working in all types of work of older males. For example, the relative risk of having waged work compared to not working would be expected to decrease by a factor of 0.82 and 0.78 (in 2018 and 2020) with one-year increase in age ($p<0.01$). In both surveys, for Kinh older males relative to the minority group, the relative risk of working in non-agriculture compared to not working would be expected to increase by 4.37 and 3.78 times (in 2018 and 2020, respectively). Meanwhile, for married people relative to those in other marital statuses, the relative risk of working in all types of job relative to not working would be expected to increase (except for the case of waged work in 2020) - Table 22.

For education, the relative risk of working in agriculture compared to not working would be expected to decrease by a factor of 0.54 in 2018 and 0.48 in 2020 for older males with a college degree relative to those without qualifications. Meanwhile, the relative risk of working in all types of job relative to not working would be expected to increase for older males with an intermediate degree compared to those with no qualification in both surveys. The results show that in 2020, for older males who used the internet within the last three months relative to those without internet usage, the relative risk of having waged work relative to not working would be expected to

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increase by 1.54 times, which was in contrast with the year 2018 (RRR=0.62). One possible reason is that COVID-19 required waged workers to work online, therefore, the use of internet increased rapidly. Overall, the rate of older males using internet increased from 19.6% in 2018 to 33.9% in 2020. Specifically, in 2018, 23.4% of older males who had waged work used the internet and 21.3% did not use the internet; however, in 2020, the situation was much different. The rate of older males who had waged work using internet was 30.2% while the rate of those who did not use internet was 15.6% only. This study also finds that in 2020, the relative risk of working in non-agriculture relative to not working would be expected to increase by 1.67 times for those using internet relative to their counterpart.

The results from Table 22 also show that for older males in the urban area relative to their counterpart, the relative risk of working in waged work and agriculture relative to not working would be expected to decrease in both surveys. In contrast, the relative risk of working in non-agriculture relative to not working would be expected to increase for older males in the urban area relative to their counterpart in 2018 (RRR=1.4, p<0.1). For the economic region, for older males living in other economic regions of the country relative to those living in the Southeast, the relative risk of working in agriculture relative to not working would be expected to increase in both surveys. They were also associated with higher relative risk of working in waged work in 2018. In addition, in 2018, for older males living in the Northern Midlands and Mountains relative to those in the Southeast, the relative risk of working in non-agriculture relative to not working would be expected to increase by a factor of 2.14. In 2020, the relative risk of having waged work relative to not working for older males in the North Central and Central Coastal region to those in the Southeast would be expected to increase 2.12 times.

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Older males with a retirement pension and health problems had lower relative risk of working in all types of job relative to not working compared to their counterparts. For example, for older males with health problems relative to their counterpart, the relative risk of working in agriculture relative to not working would be expected to reduce by 62% and 72% in 2018 and 2020. The corresponding figures for older males with retirement pension were 43% and 53% (Table 22).

Regarding living arrangement, in 2018, for older males living with their children and those living with their grandchildren only, the relative risk of working in agriculture relative to not working would be expected to increase by 2.58 and 2.61 times compared to those living alone. At the same time, the relative risk of working in non-agriculture relative to not working would be expected to increase by 4.6 times for older males living with grandchildren only compared to those living alone.

The association between household characteristics and older males' type of job:

For household income, older males living in higher Quintiles had higher relative risk of working in waged work and non-agriculture relative to not working in both surveys. For example, for those in Quintile 5 relative to those in Quintile 1, the relative risk of working in non-agriculture relative to not working would be expected to increase by 8.50 and 3.57 times in 2018 and 2020. Moreover, in 2020, the relative risk of working in agriculture relative to not working would be expected to increase for those living in HHs with loans relative to their counterpart (RRR=1.6). In contrast, the relative risk of working in agriculture relative to not working would be expected to decrease for those living in HHs with savings relative to their counterpart (RRR=0.66).

The results also show that increasing number of household members was associated with lower relative risk for working in all types of job relative to not working. At the same time, increasing the number of houses that the older males' HH owned would be

expected to increase the relative risk of working in non-agriculture relative to not working in 2020 (RRR=3.2, p<0.1).

➢ *As the results of the pooed-cross section (Table 22) show, there was no significant difference in the relative risk of working in all types of job relative to not working for older males in 2020 relative to the year 2018.*

Table 22: Factors associated with the older males' type of job in 2018 and 2020 (RRR)

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Age	0.82***	0.89***	0.89***	0.78***	0.87***	0.89***	0.80***	0.88***	0.89***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Marital status: Married	3.75***	3.74***	4.98***	1.74	2.83***	1.76	2.78***	3.24***	2.97***
(Other is the base category)	(1.26)	(0.86)	(2.08)	(0.65)	(0.74)	(0.64)	(0.68)	(0.55)	(0.80)
Ethnicity: Kinh (Minority is	0.81	0.64**	4.37***	0.66	0.75	3.78***	0.78	0.71**	3.88***
the base category)	(0.25)	(0.14)	(2.50)	(0.21)	(0.17)	(2.37)	(0.17)	(0.11)	(1.61)
Living area: Urban (Rural is	0.47***	0.14***	1.44*	0.40***	0.16***	1.06	0.44***	0.15***	1.22
the base category)	(0.09)	(0.02)	(0.30)	(0.08)	(0.02)	(0.21)	(0.06)	(0.02)	(0.17)
Economic region (Southeast is the base category)									
Red River Delta	1.88**	1.44	0.72	1.12	1.90**	0.89	1.52*	1.59**	0.82
	(0.57)	(0.34)	(0.23)	(0.35)	(0.55)	(0.28)	(0.33)	(0.29)	(0.18)
Northern Midlands and Mountains	2.45**	2.86***	2.14**	1.03	4.92***	1.17	1.70**	3.66***	1.61*
	(0.90)	(0.80)	(0.82)	(0.41)	(1.60)	(0.51)	(0.46)	(0.76)	(0.46)
North Central and Central Coastal	2.63***	4.08***	1.61	2.12**	3.99***	1.26	2.39***	3.81***	1.41
	(0.85)	(0.99)	(0.51)	(0.68)	(1.17)	(0.42)	(0.54)	(0.70)	(0.32)
Highlands	3.43***	3.70***	0.85	0.99	3.06***	1.06	1.94**	3.29***	1.02
	(1.49)	(1.26)	(0.45)	(0.44)	(1.13)	(0.49)	(0.60)	(0.81)	(0.35)
Mekong River Delta	2.09**	1.99***	0.91	0.77	2.02**	1.36	1.34	1.94***	1.16
	(0.65)	(0.47)	(0.29)	(0.26)	(0.59)	(0.43)	(0.30)	(0.35)	(0.26)
Residential registration (In commune is the base category)									
In province	0.30	0.53	0.71	1.26	0.63	2.04	0.68	0.63	1.33

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Other	0.00	5.05**	1.74	1.63	0.13*	0.82	2.10	0.78	1.03
	(0.25)	(0.31)	(0.52)	(0.84)	(0.50)	(1.17)	(0.34)	(0.29)	(0.58)
Number of HH members	0.78***	0.85***	0.85**	0.71***	0.81***	0.74***	0.74***	0.84***	0.79***
	(0.05)	(0.04)	(0.06)	(0.04)	(0.03)	(0.05)	(0.03)	(0.02)	(0.04)
Number of houses	0.46	1.49	2.37	1.03	1.43	3.16*	0.76	1.57	2.77**
	(0.37)	(0.68)	(1.41)	(0.73)	(0.71)	(1.94)	(0.40)	(0.53)	(1.17)
Living arrangement (Living alone is the base category)									
Living with OP only	0.90	1.88	0.74	0.71	0.94	0.73	0.75	1.23	0.67
	(0.50)	(0.81)	(0.54)	(0.36)	(0.38)	(0.39)	(0.27)	(0.36)	(0.28)
Living with children	1.52	2.58**	1.68	1.28	1.44	1.73	1.31	1.76*	1.58
	(0.87)	(1.16)	(1.25)	(0.66)	(0.59)	(0.94)	(0.49)	(0.52)	(0.67)
Living with grandchildren only	2.78	2.61*	4.60*	1.47	1.39	1.67	1.97	1.77	2.56*
	(1.79)	(1.34)	(3.72)	(0.93)	(0.70)	(1.15)	(0.86)	(0.62)	(1.27)
Living with others	1.11	1.61	1.17	0.43	0.50	0.98	0.65	0.86	1.01
	(0.63)	(0.72)	(0.87)	(0.23)	(0.21)	(0.53)	(0.25)	(0.26)	(0.43)
Educational level (No qualification is the base category)									
Elementary	1.08	0.79	1.77	1.29	0.76	0.75	1.16	0.79	1.11
	(0.45)	(0.28)	(0.75)	(0.54)	(0.28)	(0.37)	(0.33)	(0.20)	(0.35)
Intermediate	3.15***	2.00***	3.54***	3.27***	2.25***	2.60**	3.14***	2.06***	3.08***
	(0.97)	(0.51)	(1.20)	(1.13)	(0.63)	(0.98)	(0.71)	(0.38)	(0.76)
College+	0.76	0.54**	0.61	0.68	0.48**	0.53	0.71	0.51***	0.57**

VARIABLES	2018			2020			Pooled cross section		
	Waged work	*Agriculture*	*Non-agriculture*	*Waged work*	*Agriculture*	*Non-agriculture*	*Waged work*	*Agriculture*	*Non-agriculture*
	(0.27)	(0.16)	(0.24)	(0.26)	(0.15)	(0.22)	(0.19)	(0.11)	(0.16)
Health problem: Yes (No is the base category)	0.50***	0.38***	0.45***	0.36***	0.28***	0.40***	0.46***	0.34***	0.45***
	(0.12)	(0.06)	(0.13)	(0.09)	(0.05)	(0.11)	(0.08)	(0.04)	(0.09)
Pensions: Yes (No is the base category)	0.32***	0.57***	0.19***	0.20***	0.47***	0.13***	0.26***	0.53***	0.16***
	(0.08)	(0.11)	(0.05)	(0.06)	(0.10)	(0.04)	(0.05)	(0.07)	(0.03)
Loans: Yes (No is the base category)	1.38	1.11	1.24	1.57	1.60**	0.97	1.42*	1.30*	1.05
	(0.34)	(0.22)	(0.38)	(0.45)	(0.35)	(0.34)	(0.26)	(0.19)	(0.24)
Internet use: Yes (No is the base category)	0.62**	0.77	1.36	1.54**	0.83	1.67**	1.06	0.79**	1.58***
	(0.14)	(0.14)	(0.31)	(0.29)	(0.13)	(0.34)	(0.15)	(0.09)	(0.24)
Savings: Yes (No is the base category)	0.94	0.82	0.61**	0.80	0.66***	0.95	0.85	0.74***	0.74*
	(0.18)	(0.13)	(0.13)	(0.16)	(0.10)	(0.20)	(0.12)	(0.08)	(0.11)
HH income quintile (Q1 is the base category)									
Q2	1.68*	1.01	1.65	1.01	0.81	1.72	1.34	0.92	1.69*
	(0.48)	(0.19)	(0.76)	(0.31)	(0.16)	(0.72)	(0.28)	(0.12)	(0.52)
Q3	2.11**	1.04	3.24***	1.91**	0.84	2.65**	2.03***	0.95	2.93***
	(0.62)	(0.21)	(1.43)	(0.58)	(0.17)	(1.09)	(0.43)	(0.13)	(0.87)
Q4	2.45***	1.09	4.39***	1.77*	0.87	3.73***	2.05***	0.97	3.92***
	(0.76)	(0.24)	(1.97)	(0.58)	(0.19)	(1.55)	(0.46)	(0.15)	(1.19)
Q5	3.20***	1.31	8.50***	1.57	0.71	3.57***	2.26***	0.98	5.32***
	(1.07)	(0.32)	(3.89)	(0.53)	(0.18)	(1.53)	(0.53)	(0.17)	(1.65)
							0.87	0.96	0.93

VARIABLES	2018			2020			Pooled cross section		
	Waged work	*Agriculture*	*Non-agriculture*	*Waged work*	*Agriculture*	*Non-agriculture*	*Waged work*	*Agriculture*	*Non-agriculture*
Year: 2020 (year 2018 is the base category)							(0.10)	(0.08)	(0.12)
Constant	197,845.54***	946.00***	5.01	18350550.56***	9,805.17***	36.57**	1,050,415.65***	2,682.01***	13.87**
	(309675.32)	(869.68)	(8.31)	(31201033.84)	(9944.55)	(58.71)	(1173961.90)	(1801.07)	(15.60)
Observations		2,143			2,097			4,240	
Log-likelihood		-1933.89			-1848.06			-3836.64	
Chi-square		1269.16			1348.34			2508.98	
P-value		0.000			0.000			0.000	
Pseudo R²		0.2471			0.2673			0.2464	
Standard err. in parentheses									
*** p<0.01, ** p<0.05, * p<0.1									

Source: Author's calculation based on the 2018 – 2020 VHLSS data

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4.4 Summary of Chapter 4

Based on the 2018 and 2020 VHLSS data, OPs' demographic and household characteristics are associated with the probability of being employed and the type of job of older females and males.

Regardless of gender, OPs with retirement pensions and health problems had lower odds of being employed than their counterparts. These results are in line with Hypothesis 1, "*Having pensions has a negative and significant relationship with the OPs' labour force participation*", and Hypothesis 2, "*Having had a health problem has a negative association with the OPs' labour force participation*". Moreover, these factors were also associated with lower relative risk of working in all types of job relative to not working.

Regarding living arrangement, for older females, the results show that older females living alone were more likely to participate in the labour force than those living with others in both surveys. They were also more likely to continue working than those living with OPs only (in 2018). The results agree with Hypothesis 3 of the study: "*OPs living alone are more likely to participate in the labour force than others*". In contrast, for older males, in 2018, those living alone were less likely to participate in the labour force than those living with their children and living with grandchildren only. Besides, this study also finds that, at the household level, the increase in the number of HH members was associated with lower odds of being employed and the lower relative risk of working in all types of job relative to not working in both surveys, regardless of gender.

Regardless of gender, OPs with a college degree or higher had lower relative risk of working in agriculture than those without qualifications in both surveys. Therefore, this agrees with Hypothesis 4 of the study: "OPs *with lower education level are more likely to work in the agricultural sector*".

OPs in higher quintiles were more likely to continue working after retirement (in 2018). They also had higher relative risk of working in non-agriculture relative to not working in both surveys, regardless of gender. In addition, older males in higher quintiles would be expected to have higher relative risk of working in waged work. This study also finds that older females living in HHs with loans would be expected to have higher relative risk of working in waged work relative to not working; in contrast, the relative risk of working in waged work would be expected to reduce when they lived in HHs with savings (in 2020). The situation was different for older males. Specifically, living in HHs with loans was associated with higher relative risk of working in agriculture; in contrast, the relative risk of working in agriculture would be expected to reduce when they lived in HHs with savings.

Based on the pooled cross-section data with the year dummy, this study aims to see whether the probability of working for OPs and their type of job changed in 2020 compared to 2018 (as a proxy of the COVID-19 impact). The results show no significant difference in the probability of working in 2020 for older males and females compared to 2018. For the older persons' type of job, the relative risk of working in waged work relative to not working would be expected to increase for older females in 2020 relative to the year 2018 (RRR=1.27). Meanwhile, there were no significant differences in the relative risk of working in other types of job (agriculture and non-agriculture) relative to

not working. For older males, there were no differences in the relative risk of being in all types of job in 2020 compared to 2018.

This study focuses on OPs aged 60 and over for the investigation. In order to have a further reference and a robustness check, I also limit the analysis to those aged 60-79 only (the young-old and middle old OPs) and exclude those aged 80 and over (the old-old OPs). The results are shown in Appendix 10 (Robustness check).

CHAPTER 5: IMPACT OF COVID-19 ON OLDER PERSONS'

EMPLOYMENT AND THEIR INDIVIDUAL COPING STRATEGIES

In this chapter, I focus on investigating (1) the impact of COVID-19 on the OPs' employment and (2) their coping strategies to deal with the employment difficulties caused by the pandemic based on the 2021 LFS data. This chapter also aims to understand how (1) OPs' demographic characteristics and (2) OPs' employment characteristics explain for the change in employment of OPs during COVID-19 and their solutions.

5.1 Sample size and older persons' characteristics

According to the 2021 LFS data, 119,587 older persons aged 60 and over responded to this survey. The details of the demographic and employment characteristics are shown in Table 23.

OPs' demographic characteristics:

According to the results from Table 23, among OPs who responded to this survey, there were 69,067 older females and 50,520 older males, equivalent to 57.8% and 42.3% of the total OPs, respectively. 67.3% of OPs are married and 32.7% have other marital statuses. More than half of OPs in this survey live in rural areas (56.2%) and mainly in Northern Midlands and Mountains (23.3%), North Central and Central Coastal (22.2%), while a smaller percentage living in Highlands (5.9%) and Southeast (9.4%). For education, over 85.5% of OPs do not have any qualifications, the percentage of OPs having a college degree or higher was small (1.5% and 4.6%, respectively) - Table 23.

OPs' employment characteristics:

As a result of the 2021 LFS data, 38,749 people were working (at least 1 hour during 7 days prior to the survey), equivalent to 32.4% of the total OPs aged 60 and over[20]; 0.29% were unemployment and 67.29% were out of the labour force and a small number was staying abroad at the survey time – Figure 6.

Figure 6: OPs' employment situation in 2021 (%)
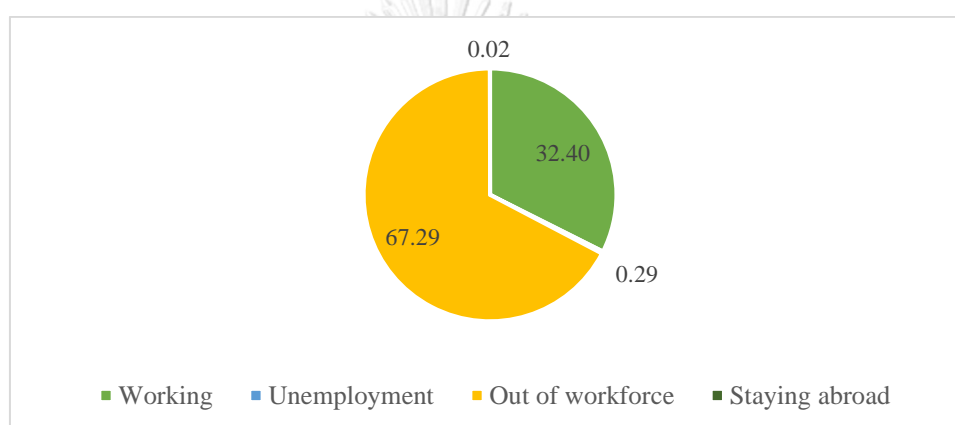
Source: Author's calculation based on the 2021 LFS data

The statistics show that among those working, 55.8% worked in the agriculture/ forestry/ fishery sector, and those working in the service and industry-construction sectors were 32.1% and 12.1%, respectively – Table 23. Over 93% of the employed population were own-account workers or family workers, while the percentage of older people working for Private, State or FDI firms was small – Table 23. On the other hand, almost all older workers worked in the informal (77.4%) and household (17.6%)

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[20] The definition of employment based on the ICLS19 standard, which legally applied from the 2021 LFS survey. Accordingly, **employed population are those who engaged in any activity (not prohibited by the law) at least one hour to produce goods/ products or provide services for the purpose of being paid wage or salary or getting profit.**

sectors; only about 5% worked in the formal sector in 2021. That is why only 2.6% of older workers reported that they were contributing to a social insurance scheme (either compulsory or voluntary scheme), and only 3.2% of older workers were using IT for work (before COVID-19).

Regarding the current working duration, 60.7% of employed OPs had at least nine years of experience working at the current job, followed by those have from 3 to under 9 years of experience (30.9%); only 2.3% reported that they had less than one year of experience – Table 23.

Table 23: Older persons' demographic and employment characteristics (%)

Variables	Percent	Variables	Percent
Demographic characteristic		**Employment characteristics**	
Age group		**Industrial sector**	
60-64	35.4	Agriculture/Forestry/Fishery	55.8
65-69	24.2	Industry-Construction	12.1
70-74	15.4	Service	32.1
75+	25.0	**Type of Firm**	
Sex		Own account/ family workers	93.2
Female	57.8	Private	3.3
Male	42.2	State	3.1
Living area		FDI	0.4
Rural	56.2	**Economic sector**	
Urban	43.8	Formal	4.9
Marital status		Household	17.6
Other	32.7	Informal	77.4
Married	67.3	**Working duration**	
Economic region		Under 1 year	2.3
Southeast	9.4	1-under 3 years	6.1
Red River Delta	19.5	3-under 9 years	30.9
Northern Midlands and Mountains	23.3	9 years +	60.7

Variables	Percent	Variables	Percent
Demographic characteristic		**Employment characteristics**	
North Central and Central Coastal	22.2	**Social insurance**	
Highlands	5.9	No	97.4
Mekong River Delta	19.7	Yes	2.6
Education level		**IT use before covid**	
No qualification	85.5	No	96.8
Elementary	2.4	Yes	3.2
Intermediate	5.9		
College	1.5		
University+	4.6		
Sample size	**119,587**		**38,749**

Source: Author's calculation based on the 2021 LFS data

5.2 Effect of COVID-19 on older persons' employment

Based on the 2021 LFS data, this section aims to (1) describe the change in OPs' employment due to COVID-19 and (2) analyse the determinants of OPs' employment change based on the 2021 LFS. Two aspects of the analysis include OPs' demographic characteristics and OPs' employment characteristics.

5.2.1 The change in employment of older persons due to COVID-19

This study focuses on the impact of COVID-19 on job loss, temporary absence/the reduction in working hours, the change in working form from office-based to home-based work, and the increase in working hours. Among employed older workers, 77.6% of them self-perceived that COVID-19 did not make any changes in their jobs. Meanwhile, almost 20% reported taking a temporary absence, and 2.2% reported losing their job. The percentages of older workers who had to increase the working hours or change their working form were small – Figure 7.

Figure 7: Effect of COVID-19 on OPs' employment in Vietnam in 2021 (%)

0.3   0.1
19.7
2.2
77.6

☐ No change
■ Losing job
▨ Temporary absence/ declining working hours
☐ Increasing working hours
Ⅲ Changing working form
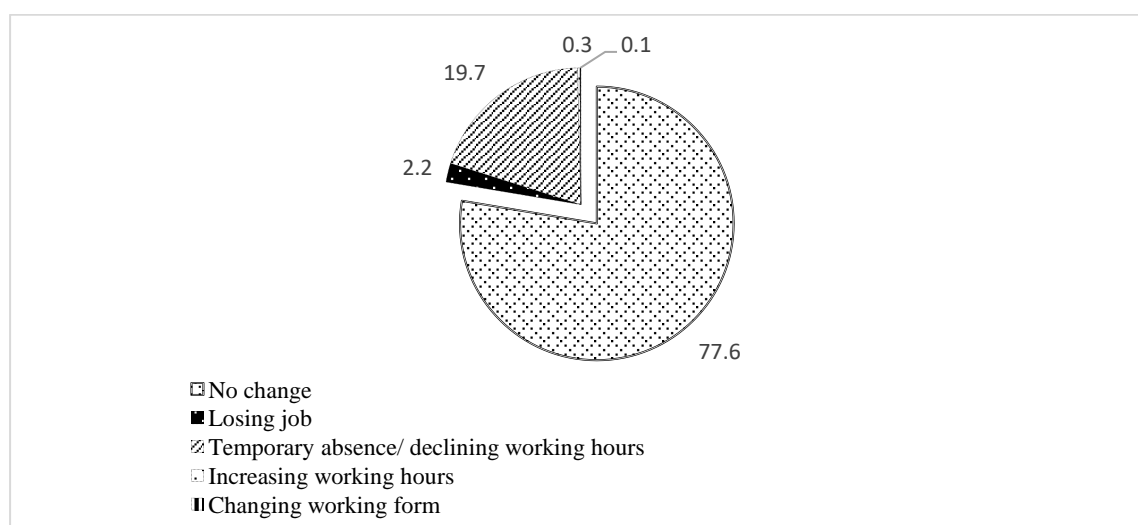
Source: Author's calculation based on the 2021 LFS data.

Table 24 shows the details of the change in OPs' employment by their demographic and employment characteristics.

No employment change:

The statistics from Table 24 show that the percentage reporting no employment change increased by OPs' age. OPs who were married, living in the rural area and in the Highlands and those without any qualifications had higher percentage reporting no employment change than others. In terms of employment characteristics, OPs working in the household sector, specifically in agriculture, as own-account/ family workers, with more than nine years of experience had higher percentage reporting no employment change. For example, 93.9% of those working in agriculture reported that their work was not affected by the pandemic and the figure reduced to 62.6% for those working in the service sector. In addition, those without social insurance contribution

and IT use at work had higher percentage reporting no employment change than their counterparts.

Job loss:

OPs living in the urban area had higher percentage of job loss during COVID-19 than their counterpart (3.5% vs. 1.5%). OPs residing in the Southeast region had highest percentage of job loss (7.5%), following by those living in the Mekong River Delta (3.9%), the percentage was smaller for OPs in the other economic regions. The statistics also show that OPs with a college or intermediate degrees had higher percentage of job loss than those with other educational levels – Table 24. Regarding the employment characteristics, OPs working in the service and industry sectors in the private firms had higher percentage of job loss during COVID-19 than others. In addition, those working in the informal sectors, with less than one year of experience had the highest percentage of job loss than others. For example, 5.5% of those working in the informal sector reported that they lost their job during COVID-19, the figure reduced to 1.8% for those working in the formal sector.

Temporary absence or the decline in working hours:

The statistics show that the percentage of taking temporary absence was higher for the younger age group (i.e., aged 60-64), in other marital statuses and those living in the urban area and in the Southeast. For example, 33.7% of OPs in the Southeast regions had temporary absence during COVID-19, the figure reduced to 8.7% for those living in the Highlands. From the educational perspective, OPs with an elementary level had the highest percentage of taking temporary absence (31.6%). Regarding the

employment characteristics, OPs working in the informal sector, specifically services, working for the private firms had higher percentage of taking temporary absence. For example, 34.2% of those working in the service sectors took temporary absence, the figure reduced to 5.7% for those working in agriculture. Moreover, OPs contributing to social insurance schemes and using IT at work had higher percentage of taking temporary absence than their counterparts. For example, 36.4% of those using IT at work took temporary absence, the figure for those without IT use was 17.2% - Table 24.

The increase in working hours and the change in working form:

The statistics show that OPs with a university degree, working for State and FDI establishments, contributing social insurance schemes and using IT at work had higher percentage of increasing working hours and changing working form to remote work during COVID-19. For example, 2.5% and 1.5% of those with a university degree reported increase working hours and changing their working form, respectively. The corresponding figures for those without any qualifications decreased to 0.2 and 0.1%, respectively – Table 24.

Table 24: The change in OPs' employment due to COVID-19 (%)

Characteristics	No change	Losing job	Temporary absence	Increasing working hours	Changing working form
Demographic characteristics					
Age group					
60-64	75.9	2.5	21.2	0.3	0.1
65-69	78.8	2.1	18.8	0.3	0.1
70-74	81.8	1.6	16.3	0.2	0.1
75+	80.6	2.3	17.0	0.1	0.1

Characteristics	No change	Losing job	Temporary absence	Increasing working hours	Changing working form
Demographic characteristics					
Sex					
Female	77.5	2.2	20.1	0.1	0.1
Male	77.8	2.3	19.4	0.4	0.1
Living area					
Rural	83.7	1.5	14.6	0.2	0.1
Urban	66.6	3.5	29.2	0.5	0.1
Marital status					
Other	74.4	3.1	22.4	0.1	0.1
Married	78.5	2.0	19.0	0.3	0.1
Economic region					
Southeast	57.8	7.5	33.7	0.8	0.1
Red River Delta	84.4	0.6	14.6	0.2	0.2
Northern Midlands and Mountains	76.3	0.9	22.2	0.4	0.1
North Central and Central Coastal	79.7	1.7	18.3	0.3	0.1
Highlands	91.0	0.3	8.7	0.1	0.0
Mekong River Delta	74.6	3.9	21.3	0.2	0.1
Education level					
No qualification	78.6	2.3	18.9	0.2	0.1
Elementary	63.3	3.6	31.6	1.4	0.1
Intermediate	75.8	1.0	22.1	0.9	0.2
College	69.2	3.7	25.9	1.3	0.0
University+	65.1	2.0	29.0	2.5	1.5
Employment characteristics					
Industrial sector					
Agriculture/Forestry/Fishery	93.9	0.4	5.7	0.1	0.0
Industry-Construction	67.0	2.3	30.5	0.0	0.1
Service	62.6	2.3	34.2	0.8	0.1
Type of Firm					

Characteristics	No change	Losing job	Temporary absence	Increasing working hours	Changing working form
Demographic characteristics					
Own account/ family worker	81.3	1.2	17.4	0.1	0.0
Private	64.4	1.8	33.0	0.7	0.2
State	78.8	0.5	13.2	6.5	1.0
FDI	66.7	0.6	27.2	4.3	1.2
Economic sector					
Formal	64.4	1.8	32.0	1.5	0.3
Household	94.1	0.3	5.5	0.1	0.0
Informal	57.4	5.5	36.9	0.1	0.2
Working duration					
Under 1 year	80.6	4.1	14.7	0.2	0.3
1-under 3 years	74.6	1.8	22.8	0.7	0.1
3-under 9 years	76.9	1.4	21.2	0.4	0.0
9 years +	83.1	1.0	15.7	0.2	0.1
Social insurance					
No	81.0	1.2	17.5	0.2	0.0
Yes	65.4	1.1	29.7	2.7	1.1
IT use before covid					
No	81.3	1.2	17.2	0.2	0.0
Yes	58.0	1.5	36.4	2.9	1.1

Source: Author's calculation based on the 2021 LFS data

5.2.2 Factors associated with the change in employment of older persons

Table 25 shows the factors associated with the change in OPs' employment due to the pandemic. Multinomial logit regression is used, where "no employment change" is the baseline. The OPs' employment change analysis focuses on job loss, temporary absence/ the reduction in working hours, the increase in working hours, and the change in working form. The independent variables included OPs' demographic and

employment characteristics. Two separate modules are analysed. While the first module focuses on the OPs' demographic characteristics and employment changes, the second module also includes the employment features. The results are reported using Relative Risk Ratio (RRR), which indicates how the risk of the outcome in the group of interest compared with that in the reference group changes with the variable in question, holding other variables fixed.

5.2.2.1 The factors associated with the probability of job loss

OPs' demographic characteristics and the probability of job loss

The results from Table 25 show that age, living area, marital status, economic region, and educational level were the factors associated with the relative risk job loss in the first module. However, when the employment features are included (second module), living area and educational level were not significantly associated with the relative risk of job loss; in contrast, gender had a significant relationship with the relative risk of job loss in the second module.

For age, with a year increase in age, the relative risk of job loss relative to no change would be expected to reduce by 2% (in both modules). Meanwhile, for married persons relative to those in other marital statuses, the relative risk of job loss relative to no change would be expected to decrease. For the education factor, for OPs with an elementary level relative to those without any qualifications, the relative risk of job loss would be expected to increase by a factor of 1.78; in contrast, the relative risk of job loss relative to no change would be expected to decrease by a factor 0.48 for those with an intermediate level relative to those without qualifications.

For OPs in the urban area relative to those in the rural are, the relative risk of job loss relative to no change would be expected to increase by 2.74 times. Moreover, the results from Table 24 also show that the relative risk of job loss relative to no change would be expected to be lower for OPs living in all other economic regions relative to those living in the Southeast. For example, the relative risk of job loss relative to no change would be expected to decrease by 88% for OPs in the Northern Midlands and Mountains region compared to those living in the Southeast region, holding all other demographic and employment characteristics fixed. In the second module, this study also finds that the relative risk of job loss relative to no change would be expected to increase for older males relative to their counterparts (RRR=1.48, p<0.01).

OPs' employment characteristics and the probability of job loss

The results from Table 25 (module 2) show that the industrial sector, economic sector, firm's type, and the length of the current work were the factors associated with the relative risk of job loss for OPs. OPs working in the industry-construction and service sectors relative to those working in agriculture had higher relative risk of job loss relative to no employment change. For example, for OPs working in the service sector relative to those working in agriculture, the relative risk of job loss relative to no change would be expected to increase by a factor of 1.76. For the type of firm, OPs working for Private/ State/ FDI establishments had lower relative risk for preferring job loss than those who were own-account workers or family workers. For example, the relative risk of job loss relative to no change would be expected to decrease by 38% for those working for Private firms relative to those who were own-account workers or family workers. Likewise, the relative risk of job loss relative to no change would be expected to decrease

by 82% for those working in the household sector relative to those working in the formal sector.

In addition, increasing the working duration was associated with lower relative risk of loss for OPs. For example, for those with nine years of experience and over relative to those with under one year of experience, the relative risk of job loss relative to no change would be expected to decrease by 62% – Table 25.

5.2.2.2 The factors associated with the probability of temporary absence

OPs' demographic characteristics and the probability of temporary absence

The results from Table 25 show that age, living area, marital status, economic region, and educational level were the factors associated with the relative risk of taking a temporary absence due to COVID-19 in both modules. At the same time, gender only had a significant relationship with the relative risk of taking a temporary absence in the second module (including the employment features).

Increasing one year of age reduced the relative risk of taking temporary absence relative to no employment change for OPs (RRR = 0.98, p<0.01, in both modules). Meanwhile, the relative risk of taking temporary absence relative to no change would be expected to decrease by 7% for older married persons relative to those in other marital statuses (second module) – Table 25.

From the education perspective, for OPs with an elementary or university degree relative to those without any qualifications, the relative risk of taking temporary absence relative to no change would be expected to increase in the first module. In the

second module, the results show that the relative risk of taking temporary absence relative to no change would be expected to increase for those with an elementary level (RRR=1.19) but decrease for those with an intermediate level (RRR=0.87) relative to those without any qualifications.

For OPs living in the urban area relative to their counterpart, the relative risk of taking temporary absence relative to no change would be expected to increase in both modules (RRR=2.44 and 1.33 for the first and second modules). For the economic region, the relative risk of taking temporary absence relative to no change would be expected to reduce for all economic regions of the country relative to those in the Southeast; however, the magnitudes in the second module. For example, for OPs living in the Highlands relative to those living in the Southeast, the relative risk of taking temporary absence would be expected to decrease by 83% in the 1st module and 69% in the 2nd module – Table 25.

OPs' employment features and the probability of temporary absence

The results from Table 25 show that all employment factors controlled for in the regression have a significant relationship with the relative risk of taking temporary absence for OPs in 2021. In detail, for OPs working in the industry-construction and service sectors relative to those working in agriculture, the relative risk of taking temporary absence relative to no change would be expected to be higher. For example, the relative risk of taking temporary absence relative to no change would be expected to increase by a factor of 3.81 for OPs working in the service sector relative to those working in agriculture. For the economic sector, for OPs working in the household and informal sectors relative to those working in the formal sector, the relative risk of taking

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temporary absence relative to no change would be expected to be higher. For example, for OPs working in the household sector relative to those working in the formal sector, the relative risk of taking temporary absence relative to no change would be expected to decrease by 59% (p<0.01). The results from Table 25 also show that the relative risk of taking temporary absence relative to no change would be expected to decrease for OPs working for Private/ State and FDI establishments. For example, for OPs working in FDI establishments relative to OPs workers as own-account workers or family workers, the relative risk of taking temporary absence relative to no change would be expected to decrease by a factor of 0.59.

Besides, the increase in the number of years of the current job was associated with the higher relative risk of taking temporary absence for OPs. For example, for those with one to under three years of experience relative to OPs with less than one year of experience, the relative risk of taking temporary absence relative to no change would be expected increase by a factor of 1.43. This study also finds that the relative risk of taking temporary absence relative to no change would be expected increase for OPs using IT at work relative to their counterpart (RRR=1.55, p<0.01).

5.2.2.3 The factors associated with the probability of increasing working hours

OPs' demographic characteristics and the probability of increasing working hours

The results from Module 1 (Table 25) show that gender, living area, marital status, economic region and education are the factors associated with the relative risk of having an increase in working hours for OPs during COVID-19. Of these, gender only had a significant relationship with the relative risk of having an increase in working hours in

the first module (RRR=1.74). When the employment features are included (Module 2), there was no significant difference between older males and females in the relative risk of having an increase in working hours.

For married people relative to those in other marital statuses, the relative risk of having an increase in working hours relative to no change would be expected to increase in both modules (RRR=2.75 and 2.6, respectively).

The results also show that the relative risk of having an increase in working hours relative to no change would be expected to increase for OPs in the urban area relative to their counterparts in both modules, but the relative risk was smaller in the second module (RRR=2.83 and 1.60, respectively). Regarding the economic region, for OPs in all other economic regions of the country relative to those in the Southeast, the relative risk of having an increase in working hours relative to no change would be expected to decrease in both modules. For example, for OPs in the Mekong River Delta relative to those living in the Southeast, the relative risk of having an increase in working hours relative to no change would be expected to decrease by 80% the 1st module and 66% in the 2nd module.

From the education perspective, in Module 1, OPs with higher education levels had a higher relative risk of increasing working hours. For example, for OPs with college and university+ degrees relative to those without qualifications, the relative risk of having an increase in working hours relative to no change would be expected to increase by 6.65 and 9.25 times, respectively. However, in the second module, this study finds that only OPs with an elementary level had higher relative risk of increasing working hours relative to no change compared to those without any qualifications (RRR=1.99).

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However, the results in the second module show that only for OPs with an elementary level relative to those without any qualifications, the relative risk of having an increase in working hours relative to no change would be expected to increase by 1.99 times – Table 25.

OPs' employment characteristics and the probability of increasing working hours

The relative risk of increasing working hours (relative to no change) was higher for OPs working in the industry and service sectors (relative to those working in agriculture) and those working for Private/ State/ FDI establishments (relative to those who were own-account workers or family workers). For example, for OPs working for FDI firms relative to those working as own-account workers or family workers, the relative risk of increasing working hours relative to no change would be expected to increase by 92.59 times – Table 25. The results also show that the relative risk of having an increase in working hours (relative to no change) would be expected to be higher for those using IT at work relative to their counterpart (RRR=2.84, p<0.01).

5.2.2.4 The factors associated with the probability of changing working form

OPs' demographic characteristics and the probability of changing working form

The results from Table 25 show that education was the only factor associated with the likelihood of changing working form during COVID-19. In particular, the relative risk of changing working form relative to no change would be expected to increase by 22.88 and 3.32 times for those having a university degree relative to those without any qualifications in the first and second modules.

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OPs' employment characteristics and the probability of changing working form

The results from Module 2, Table 25 show that the working duration and IT use are the two factors associated with the likelihood of changing working form. For the working duration, for OPs with longer working duration (relative to those with less than one year of experience), the relative risk of changing working form relative to no change would be expected to decrease (RRR=0.19 for those with nine years of experience and over). In contrast, the relative risk of changing working form relative to no change would be expected to increase by 11.04 times for OPs using IT at work relative to their counterpart (p<0.01).
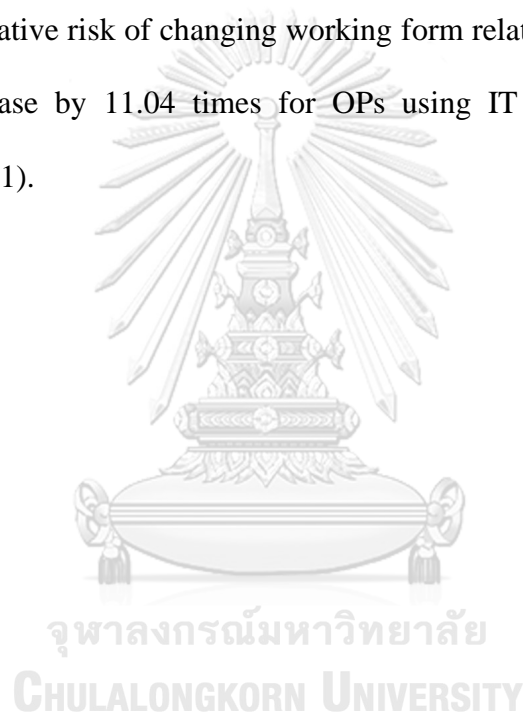
Table 25: Factors associated with the changes in OPs' employment in Vietnam due to COVID-19 (RRR)

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Losing job	*Temporary absence*	*Increasing working hours*	*Changing working form*	*Losing job*	*Temporary absence*	*Increasing working hours*	*Changing working form*
AGE	0.98***	0.98***	0.98	0.96	0.98**	0.98***	0.99	0.93
	(0.01)	(0.00)	(0.02)	(0.04)	(0.01)	(0.00)	(0.02)	(0.06)
GENDER: Male (Female is the base category)	1.08	0.97	1.74**	1.02	1.48***	1.14***	1.12	1.56
	(0.08)	(0.03)	(0.40)	(0.35)	(0.16)	(0.04)	(0.28)	(0.85)
LIVING AREA: Urban (Rural is the base category)	2.74***	2.44***	2.83***	1.09	1.14	1.35***	1.60**	0.93
	(0.19)	(0.06)	(0.58)	(0.37)	(0.12)	(0.04)	(0.36)	(0.44)
MARITAL STATUS: Married (Other is the base category)	0.64***	0.81***	2.75**	1.09	0.72***	0.93*	2.60**	2.75
	(0.05)	(0.03)	(1.20)	(0.52)	(0.09)	(0.04)	(1.17)	(2.92)
ECONOMIC REGION (Southeast is the base category)								
Red River Delta	0.06***	0.31***	0.16***	1.29	0.05***	0.38***	0.16***	0.50
	(0.01)	(0.02)	(0.06)	(0.74)	(0.01)	(0.02)	(0.06)	(0.39)
Northern Midlands and Mountains	0.11***	0.56***	0.43***	0.65	0.12***	0.61***	0.39***	0.64
	(0.01)	(0.03)	(0.11)	(0.40)	(0.02)	(0.03)	(0.11)	(0.46)
North Central and Central Coastal	0.19***	0.44***	0.25***	0.50	0.20***	0.57***	0.26***	0.45
	(0.02)	(0.02)	(0.07)	(0.31)	(0.03)	(0.03)	(0.08)	(0.34)
Highlands	0.02***	0.17***	0.05***	0.00	0.06***	0.31***	0.10***	0.00
	(0.01)	(0.01)	(0.04)	(0.00)	(0.02)	(0.03)	(0.08)	(0.00)
Mekong River Delta	0.46***	0.55***	0.20***	0.83	0.53***	0.73***	0.34***	1.17

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Losing job	Temporary absence	Increasing working hours	Changing working form	Losing job	Temporary absence	Increasing working hours	Changing working form
	(0.04)	(0.03)	(0.07)	(0.49)	(0.06)	(0.04)	(0.12)	(0.79)
EDUCATIONAL LEVEL (No qualification is the base category)								
Elementary	1.78***	1.73***	6.41***	1.36	0.72	1.19**	1.99**	1.00
	(0.30)	(0.12)	(1.90)	(1.41)	(0.22)	(0.09)	(0.62)	(1.12)
Intermediate	0.52**	1.08	4.46***	3.15**	0.64	0.87*	1.01	2.26
	(0.13)	(0.07)	(1.34)	(1.75)	(0.20)	(0.06)	(0.33)	(1.68)
College	1.55	1.20	6.65***	0.00	1.69	1.03	1.37	0.00
	(0.44)	(0.15)	(3.17)	(0.00)	(0.67)	(0.14)	(0.70)	(0.00)
University+	0.75	1.27***	9.25***	22.88***	1.09	0.91	1.13	3.32*
	(0.19)	(0.10)	(2.49)	(9.01)	(0.33)	(0.08)	(0.35)	(2.23)
INDUSTRIAL SECTOR (Agriculture/Forestry/Fishery is the base category)								
Industry-Construction					1.75*	3.18***	1.84E+05	1.39
					(0.55)	(0.44)	-1.22E+08	(1.78)
Service					1.76*	3.81***	1.47E+06	0.88
					(0.54)	(0.53)	-9.78E+08	(1.05)
ECONOMIC SECTOR (Formal is the base category)								
Household					0.18***	0.41***	2.69E+06	0.83
					(0.06)	(0.06)	-1.79E+09	(1.21)
Informal					1.04	0.86***	4.16**	0.80
					(0.14)	(0.04)	(2.94)	(0.77)

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Losing job	Temporary absence	Increasing working hours	Changing working form	Losing job	Temporary absence	Increasing working hours	Changing working form
TYPE OF FIRM (Own account/Family worker is the base category)								
Private					0.62*	0.65***	23.53***	0.80
					(0.17)	(0.05)	(19.06)	(0.93)
State					0.19***	0.22***	147.20***	5.01
					(0.09)	(0.02)	(110.28)	(4.91)
FDI					0.18*	0.59***	92.59***	10.44**
					(0.18)	(0.11)	(54.39)	(11.85)
CURRENT WORKING DURATION (Under 1 year is the base category)								
From 1-under 3 years					0.43***	1.52***	1.78	0.16**
					(0.10)	(0.17)	(1.37)	(0.15)
From 3- under 9 years					0.36***	1.43***	1.45	0.07***
					(0.07)	(0.15)	(1.07)	(0.06)
9 years+					0.38***	1.57***	1.41	0.19**
					(0.07)	(0.16)	(1.06)	(0.14)
SOCIAL INSURANCE CONTRIBUTION: Yes (No is the base category)					0.73	1.36***	0.85	1.72
					(0.26)	(0.12)	(0.23)	(1.09)
IT USE: Yes (No is the base category)					1.15	1.55***	2.84***	11.04***
					(0.29)	(0.11)	(0.71)	(6.40)
Constant	0.47	1.36	0.01***	0.02	0.81	0.75	0.00	0.12

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VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Losing job	*Temporary absence*	*Increasing working hours*	*Changing working form*	*Losing job*	*Temporary absence*	*Increasing working hours*	*Changing working form*
	(0.24)	(0.26)	(0.01)	(0.05)	(0.63)	(0.21)	0.00	(0.54)
Observations	40,222				38,749			
Log-likelihood	-23429.84				-17711.98			
Chi-square	3488.100				7726.800			
P-value	0.000				0.000			
Pseudo R²	0.069				0.179			

Standard err. in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation based on the 2021 LFS data

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5.3 OPs' strategies to overcome the employment difficulties during COVID-19

As shown in the above section, COVID-19 made the change in employment of OPs in Vietnam, from job loss to the change in working form. To overcome employment difficulties, OPs need to have their own coping strategies. This section aims to (1) analysize the solutions that OPs used and (2) the associated factors with those solutions. The following analysis will be included two aspects: the OPs' demographic characteristics and OPs' employment characteristics based on the 2021 LFS data.

5.3.1 OPs' solutions to overcome the employment difficulties.

The 2021 LFS asked respondents the solutions that they used to overcome with employment difficulties. The answers are arranged from "no solution" to "found a new job", "started a business", "worked in agriculture" and "had other solutions".

The statistics show that most OPs had no solution (89.8%), while 6.4% of OPs reported working in agriculture as the solution to overcome the employment difficulties due to COVID-19. The percentage of OPs who found a new job was 2.5%, and the percentage of OPs who reported that they started a business or had other solutions were small, at 0.7% and 0.6% - Figure 8.

Figure 8: OPs' solutions to overcome employment difficulties during COVID-19
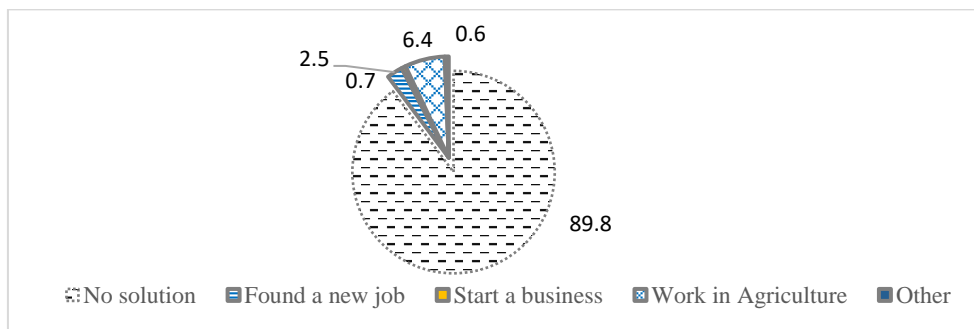
Source: Author's calculation based on the 2021 LFS data.

Among those with solutions, 53.3% worked in agriculture, 31.5% found a new job, almost 8% started a business, and 7.3% had other solutions (i.e., additional waged work or improving vocational training). Table 26 shows the details of OPs' solutions by the demographic and employment characteristics.

No solution:

The statistics from Table 26 show that the percentage of no solution was lower for those in the other marital statuses (88.5%) and older age, and those living in the rural area (88.1%), in the Red River Delta region (86.9%) than others. From the educational perspective, OPs without any qualification had the lowest percentage of having no solution (89.3%).

Regarding the employment characteristics, OPs working in the informal sector (85.3%), specifically in agriculture (90.9%), working as own account/family workers (92.0%) had lower percentage of having no solution than others. At the same time, OPs with less than one year of experience had the lowest percentage of having no solution (88.7%)

Finding a new job:

Overall, among those having solutions, the percentage finding a new job was higher for older age groups (3.5% for age group 75+). Meanwhile, OPs in other marital statuses had higher percentage finding a new job than their counterpart (3.4% vs. 2.3%). The statistics also show that OPs living in the Southeast region had higher percentage finding a new job (4.3%), followed by those in the Northern Midlands and Mountains (3.2%). From the educational level, OPs with the lower level of education have higher

percentage finding a new job (2.6% and 2.8% for those without any qualifications and elementary level) – Table 26.

Regarding the employment characteristics, OPs working in the industry sector (2.4%), working for private firms (1.8%) had the highest percentage finding a new job than others. At the same time, OPs with less than one year of experience had the highest percentage finding a new job (4.9%), reduced to 1.4% for those with nine years of experience and over. For the IT usage, 2.7% of those using IT at work found a new job, the corresponding figure for those without IT use was 1.7%.

Working in agriculture:

The percentage changing to work in agriculture was higher for older age groups (10.6% for age group 75+ and 5.7% for those aged 60-64). OPs in the rural area had higher percentage changing to work in agriculture than their counterpart (8.2% vs. 2.9%). From economic region aspect, OPs in the Red River Delta had the highest percentage changing to work in agriculture (10.4%), followed by the Mekong River Delta (8.4%), the percentage was lowest for those in the Southeast (2.1%). The statistics also show that OPs without any qualification had the highest percentage changing to work in agriculture (6.8%), followed by those with a college degree (3.5%), the percentage was smallest for those with a university degree (1.5%) – Table 26.

Regarding the employment characteristics, those who already performed in the informal sector, specifically in agriculture, as own account/ family workers had higher percentage changing to work in agriculture than others. For example, 7.3% of those

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working in the informal sector had to return to work in agriculture during COVID-19 as a solution, reduced to 1.2% for those working in the formal sector – Table 26.

The statistics also show that OPs with more than nine years of experience, without social insurance contribution or using IT at work had higher percentage changing to work in agriculture during the pandemic. For example, 5.0% of those contributing to social insurance schemes had to return to work in agriculture and the corresponding figure for their counterpart was 1.5% only.

Starting a business and having other solutions:

The rate of OPs starting a business or having other solutions were very small. Overall, OPs in the Southeast region had higher percentage starting a business or having other solutions than other regions (1.1% of them starting a business and 1.2% having other solutions) – Table 26. In terms of education, OPs with an elementary had higher percentage starting a business (1.0%) while OPs with a college degree had higher percentage having other solutions (2.1%) than others.

Regarding the employment characteristics, OPs working in the informal sector, specifically in service, with less than one year of experience, using IT at work had higher percentage starting a business as a solution to overcome the employment difficulties caused by COVID-19. For example, 1.3% of those working in the informal sectors started a business, the figure for those working in the formal sector was 0.7%. For other solutions, OPs working in the industrial sector, working for FDI firms and those contributing to social insurance scheme and using IT at work had higher percentage

having other solutions than other. For example, 3.7% of OPs working for FDI had other solutions, the figure reduced to 0.5% for those who were own account/ family workers.

Table 26**:** OPs' solutions by their demographic and employment characteristics (%)

Variables	No solution	Found a new job	Started a business	Worked in agriculture	Other
Demographic characteristics					
Age group					
60-64	90.5	2.5	0.7	5.7	0.7
65-69	90.0	2.4	0.7	6.3	0.6
70-74	88.6	2.7	0.7	7.7	0.4
75+	84.9	3.5	0.8	10.6	0.2
Sex					
Female	89.2	2.7	0.7	6.9	0.5
Male	90.3	2.4	0.6	6.0	0.7
Living area					
Rural	88.1	2.5	0.7	8.2	0.5
Urban	92.9	2.5	0.7	2.9	0.9
Marital status					
Other	88.5	3.4	0.8	6.8	0.6
Married	90.1	2.3	0.7	6.3	0.6
Economic region					
Southeast	91.3	4.3	1.1	2.1	1.2
Red River Delta	86.9	1.6	0.6	10.4	0.4
Northern Midlands and Mountains	91.1	3.2	0.6	4.3	0.8
North Central and Central Coastal	91.9	2.1	0.6	4.7	0.6
Highlands	91.7	0.5	0.6	6.9	0.4
Mekong River Delta	87.2	3.1	0.8	8.4	0.5
Education level					

Variables	No solution	Found a new job	Started a business	Worked in agriculture	Other
No qualification	89.3	2.6	0.7	6.8	0.6
Elementary	92.5	2.8	1.0	1.9	1.9
Intermediate	93.8	1.4	0.9	3.3	0.7
College	92.8	1.6	0.0	3.5	2.1
University+	94.9	1.3	0.7	1.5	1.6
Employment characteristics					
Industrial sector					
Agriculture/Forestry/ Fishery	90.9	1.4	0.3	7.2	0.2
Industry-Construction	92.4	2.4	0.8	2.8	1.6
Service	94.6	2.0	1.0	1.6	0.9
Type of Firm					
Own account/ family worker	92.0	1.7	0.6	5.2	0.5
Private	94.8	1.8	0.6	1.1	1.8
State	98.6	0.3	0.2	0.3	0.7
FDI	93.2	1.2	0.0	1.9	3.7
Economic sector					
Formal	95.3	1.6	0.7	1.2	1.2
Household	90.9	1.3	0.3	7.3	0.2
Informal	85.3	5.0	1.3	7.3	1.1
Working duration					
Under 1year	88.7	4.9	1.1	4.3	0.9
1-under 3years	91.4	2.3	0.7	4.5	1.1
3-under 9years	92.4	1.8	0.8	4.1	0.9
9 years+	92.4	1.4	0.4	5.3	0.4
Social insurance					
No	92.2	1.7	0.6	5.0	0.5
Yes	93.7	1.5	0.6	1.5	2.7

Variables	No solution	Found a new job	Started a business	Worked in agriculture	Other
IT use before covid					
No	92.3	1.7	0.6	4.9	0.5
Yes	91.2	2.7	1.1	3.2	1.9

Source: Author's calculation based on the 2021 LFS data

5.3.2 Factors associated with OPs' solutions

Table 27 shows the results of multinomial logit model of OPs' solutions and associated factors. Where "no solution" is the baseline, the analysis focuses on "finding a new job" "starting a business", "working in agriculture" and "other solutions". The independent variables are the same as in Table 26. Two separate modules are analysed. While Module 1 show the association between OPs' solutions and the demographic characteristics, Module 2 also includes the employment characteristics. The results are reported using Relative Risk Ratio (RRR), which indicates how the risk of the outcome in the group of interest compared with that in the reference group changes with the variable in question, holding other variables fixed.

5.3.2.1 Factors associated with the probability of finding a new job

OPs' demographic characteristics and the probability of finding a new job

The results from the first module of Table 27 show that age, marital status, economic region, and education were associated with the relative risk of finding a new job for OPs. However, when the employment characteristics were included (Module 2), age became insignificant; in contrast, living area had a significant relationship with the likelihood of finding a new job (which was not significant in the first module). In detail,

for married OPs relative to those in other marital statuses, the relative risk of having a new job relative to no solution would be expected to reduce by 21% in the second module. Meanwhile, the relative risk of having a new job relative to no solution would be expected to be lower for OPs with an intermediate or university degrees relative to those without any qualifications. For example, in the second module, the relative risk of having a new job relative to no solution would be expected to decrease by a factor of 0.42 for OPs with a university degree relative to those without any qualifications - Table 27.

For the living area, in the second module, for OPs in the urban area relative to their counterpart, the relative risk of having a new job relative to no solution would be expected to be decrease by 18%. Regarding the economic region, in the first module, the relative risk of having a new job relative to no solution would be expected to be lower for OPs in all other economic regions relative to those in the Southeast. For example, for OPs in the Highlands relative to those in the Southeast, the relative risk of having a new job relative to no solution would be expected decrease by a factor of 0.11 (p<0.01). In the second module, the results show that relative risk of having a new job relative to no solution would be expected be lower for OPs in the Red River Delta, the North Central and Central Coastal and the Highlands but higher for OPs in the Northern Midlands and Mountains relative to those in the Southeast (RRR=1.3, p<0.1), holding other factors fixed.

OPs' employment characteristics and the probability of finding a new job

The results from Module 2, Table 27 show that for OPs working in the industry-construction and service sectors relative to those working in agriculture, the relative

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risk of having a new job relative to no solution would be expected to decrease by a factor of 0.64 and 0.63, respectively, but the confidential level is weak (p<0.1). For the economic sector, for OPs working in the household sector relative to those working in the formal sector, the relative risk of having a new job relative to no solution would be expected to decrease by 53%. The results also show that the relative risk of having a new job relative to no solution would be expected to be lower for OPs working for Private and State establishments relative to those working as own-account workers or family workers (RRR=0.58 and 0.13, respectively) – Table 27.

Increasing the length of the current work was also associated with lower relative risk of having a new job for OPs. For example, for those with nine years of experience and over relative to those with under one year of experience, the relative risk of having a new job relative to no solution would be expected to decrease by a factor of 0.3. At the same time, the relative risk of having a new job relative to no solution would be expected to increase by 2.38 times for OPs using IT at work relative to their counterpart, holding other factors fixed – Table 27.

5.3.2.2 Factors associated with the probability of starting a business

OPs' demographic characteristics and the probability of starting a business

The results of Module 1 Table 27 show that the economic region was the only factor associated with the likelihood of starting a business for OPs in the first module. In particular, the relative risk of starting a business relative to no solution would be expected to be lower for OPs in other economic regions relative to those in the Southeast (except the Mekong River Delta). For example, for OPs living in the Red

River Delta relative to living in the Southeast, the relative risk of starting a business relative to no solution would be expected to decrease by 44%, holding other factors constant.

After controlling for the employment characteristics (the second module), the results show that the relative risk of starting a business relative to no solution would be expected to decrease by a factor of 0.58 for OPs living in the urban area relative to their counterpart. For the economic region, the relative risk of starting a business relative to no solution would be expected to decrease by 39% for OPs living in the Northern Midlands and Mountains relative to those in the Southeast, with the weakness of confidential level ($p<0.1$), while there was no significant difference between other economic regions and the base group in the likelihood of starting a business.

OPs' employment characteristics and the probability of starting a business

The results show that the relative risk of starting a business relative to no solution would be expected to increase for OPs working in the service sector relative to those working in agriculture (RRR=6.66). Meanwhile, for OPs working for State establishments relative to those working as own-account workers or family workers, the relative risk of starting a business relative to no solution would be expected to decrease by a factor of 0.12. This study also finds that the increase in years of experience was associated with lower relative risk of starting a business. For example, for OPs with nine years of experience and over relative to those with less than one year of experience, the relative risk of starting a business relative to no solution would be expected to decrease by 54% ($p<0.05$). At the same time, the relative risk of starting a business relative to no solution would be expected to increase by 2.02 times for OPs using IT at work relative to their counterpart.

5.3.2.3 Factors associated with the probability of changing to work in agriculture

OPs' demographic characteristics and the probability of working in agriculture

The results from Table 27 show that age and gender had a significant relationship with the relative risk of changing to work in agriculture in the first module but did not in the second module. In detail, with a year increase in age, the relative risk of changing to work in agriculture relative to no solution would be expected to increase by a factor of 1.04. Meanwhile, for older males relative to their counterpart, the relative risk of changing to work in agriculture relative to no solution would be expected to decrease 13%. The results also show that for OPs with a higher educational level relative to those without any qualification, the relative risk of changing to work in agriculture relative to no solution would be expected to be lower. For example, the relative risk of changing to work in agriculture relative to no solution would be expected to decrease by a factor of 0.36 (in the first module) and 0.31 (in the second module) for OPs with a university degree or higher relative to those without any qualifications – Table 27.

Regarding the living area, for OPs in the urban relative to their counterpart, the relative risk of changing to work in agriculture relative to no solution would be expected to reduce 63% and 37% in the first and second modules, respectively. At the same time, the relative risk of changing to work in agriculture relative to no solution would be expected to increase for OPs in all other economic regions relative to those in the Southeast region. For example, the relative risk of changing to work in agriculture relative to no solution would be expected to increase by a factor of 3.64 (in the first module) and 3.06 (in the second module) for OPs living in the Mekong River Delta relative to those in the Southeast – Table 27.

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OPs' employment characteristics and the probability of working in agriculture

This study finds that the relative risk of changing to work in agriculture relative to no solution would be expected to be lower for OPs working in the industry - construction and service sectors relative to those already in agriculture (RRR= 0.61 and 0.4, respectively). Likewise, the relative risk of changing to work in agriculture relative to no solution would be expected to be lower for OPs working for State firms relative to those who were own-account workers or family workers (RRR=0.17).

On the other hand, the relative risk of changing to work in agriculture relative to no solution would be expected to increase for those who working in the household and informal sectors relative to those in the formal sector (RRR= 1.64 and 1.35) – Table 27.

This study also finds that for OPs using IT at work relative to their counterpart, the relative risk of changing to work in agriculture relative to no solution would be expected to increase by 2.23 times. A reasonable explanation is that OPs who worked in agriculture mostly did not use IT for their work and those using IT at work mostly worked in the service or industry sectors. Due to COVID-19, their job has been affected harder than those in agriculture (either losing job or taking temporary absence). As such, they might return to work in agriculture as a current solution.

5.3.2.4 Factors associated with the probability of having other solutions

OPs' demographic characteristics and the probability of having other solutions

Age and education were associated with the likelihood of having other solutions in both modules. In contrast, gender, living area and economic region had a significant relationship with the relative risk of having other solutions in the first module only. In detail, with one year increase in the age of OPs, the relative risk of having other solutions relative to no solution would be expected to reduce 4% in both surveys – Table 27. Meanwhile, for older males and those living in the urban area relative to their counterparts, the relative risk of having other solutions relative to no solution would be expected to be higher in the first module (RRR=1.37 and 1.68, respectively). From the economic region, for OPs in all other economic regions relative to those in the Southeast, the relative risk of having other solutions relative to no solution would be expected to be lower (except the Northern Midlands and Mountains). For example, for OPs living in the Mekong River Delta relative to those living in the Southeast, the relative risk of having other solutions relative to no solution would be expected to decrease by a factor of 0.5 in the first module, holding other factors constant.

This study also finds that OPs with higher level of education had higher likelihood of having other solutions to overcome the employment difficulties during COVID-19. For example, for those with a college degree relative to those without qualifications, the relative risk of having other solutions relative to no solution would be expected to increase by a factor of 3.16 (in the first module) and 2.22 (in the second module) – Table 27.

OPs' employment characteristics and the probability of having other solutions

The results from Table 27 show that the relative risk of having other solutions relative to no solution would be expected to increase for OPs working in the industry-

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construction sector relative to those working in agriculture (RRR=3.56), although the significant level was weak (p<0.1). At the same time, for OPs working for Private and State establishments relative to those working as own-account workers or family workers, the relative risk of having other solutions relative to no solution would be expected to decrease by a factor of 0.52 and 0.26, respectively.

This study finds that the increase in the year of experience was associated with lower likelihood of having other solutions. For example, for OPs with nine years of experience and over relative to those with less than one year of experience, the relative risk of having other solutions relative to no solution would be expected to decrease by 51% (p<0.1). Besides, for OPs contributing to the social insurance scheme and using IT at work relative to their counterparts, the relative risk of having other solutions relative to no solution would be expected to increase by 3.18 and 1.66 times, respectively.

Table 27: OPs' solutions to overcome with the employment difficulties (RRR)

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Found a new job	*Started a business*	*Worked in agriculture*	*Other*	*Found a new job*	*Started a business*	*Worked in agriculture*	*Other*
AGE	1.02***	1.01	1.04***	0.96***	0.99	0.99	1.00	0.96**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.02)
GENDER: Male (Female is the base category)	0.99	0.84	0.87***	1.37**	1.19**	0.99	0.96	1.27
	(0.07)	(0.11)	(0.04)	(0.20)	(0.11)	(0.15)	(0.05)	(0.20)
LIVING AREA: Urban (Rural is the base category)	0.99	0.89	0.37***	1.68***	0.82**	0.58***	0.63***	1.16
	(0.07)	(0.12)	(0.02)	(0.22)	(0.08)	(0.09)	(0.04)	(0.17)
MARITAL STATUS: Married (Other is the base category)	0.73***	0.88	1.04	0.80	0.79**	1.10	1.12	1.03
	(0.06)	(0.14)	(0.06)	(0.14)	(0.08)	(0.20)	(0.07)	(0.20)
ECONOMIC REGION (Southeast is the base category)								
Red River Delta	0.41***	0.56**	4.86***	0.36***	0.61***	1.11	2.78***	0.68
	(0.05)	(0.13)	(0.65)	(0.09)	(0.11)	(0.31)	(0.43)	(0.19)
Northern Midlands and Mountains	0.76**	0.48***	1.82***	0.76	1.30*	0.61*	1.71***	1.07
	(0.08)	(0.11)	(0.25)	(0.16)	(0.19)	(0.17)	(0.27)	(0.25)
North Central and Central Coastal	0.48***	0.53***	1.90***	0.61**	0.45***	0.93	1.84***	0.93
	(0.05)	(0.11)	(0.26)	(0.13)	(0.08)	(0.24)	(0.28)	(0.22)
Highlands	0.11***	0.49**	3.02***	0.37***	0.26***	0.96	2.43***	0.79
	(0.03)	(0.14)	(0.44)	(0.12)	(0.07)	(0.34)	(0.39)	(0.29)
Mekong River Delta	0.74***	0.74	3.64***	0.50***	1.05	1.23	3.06***	0.79
	(0.08)	(0.15)	(0.48)	(0.11)	(0.15)	(0.31)	(0.45)	(0.19)

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VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Found a new job	Started a business	Worked in agriculture	Other	Found a new job	Started a business	Worked in agriculture	Other
EDUCATIONAL LEVEL (No qualification is the base category)								
Elementary	1.10	1.60	0.38***	2.54***	0.88	1.37	0.57**	1.97***
	(0.21)	(0.51)	(0.09)	(0.61)	(0.22)	(0.47)	(0.14)	(0.50)
Intermediate	0.57***	1.48	0.58***	1.02	0.51**	1.28	0.70**	0.79
	(0.12)	(0.40)	(0.08)	(0.32)	(0.14)	(0.39)	(0.12)	(0.28)
College	0.62	0.00	0.70	3.16***	0.49	0.00	0.79	2.22*
	(0.26)	(0.00)	(0.20)	(1.16)	(0.29)	(0.00)	(0.27)	(0.95)
University+	0.48**	1.11	0.36***	1.96**	0.42**	1.15	0.31***	1.41
	(0.15)	(0.47)	(0.10)	(0.56)	(0.17)	(0.51)	(0.13)	(0.45)
INDUSTRIAL SECTOR (Agriculture/Forestry/Fishery is the base category)								
Industry-Construction					0.64*	4.98	0.61**	3.56*
					(0.16)	(5.06)	(0.13)	(2.57)
Service					0.63*	6.66*	0.40***	2.15
					(0.16)	(6.72)	(0.08)	(1.55)
ECONOMIC SECTOR (Formal is the base category)								
Household					0.47***	2.05	1.64**	0.56
					(0.13)	(2.11)	(0.39)	(0.41)
Informal					1.10	1.30	1.35*	0.89
					(0.16)	(0.28)	(0.21)	(0.18)
TYPE OF FIRM (Own account/Family worker is the base category)								
Private					0.58**	0.49	0.58*	0.52**

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VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Found a new job	Started a business	Worked in agriculture	Other	Found a new job	Started a business	Worked in agriculture	Other
					(0.16)	(0.23)	(0.18)	(0.17)
State					0.13***	0.12***	0.17***	0.26***
					(0.07)	(0.09)	(0.10)	(0.11)
FDI					0.38	0.00	0.96	1.07
					(0.28)	(0.00)	(0.58)	(0.53)
CURRENT WORKING DURATION (Under 1 year is the base category)								
From 1-under 3 years					0.45***	0.62	1.21	1.06
					(0.09)	(0.25)	(0.24)	(0.43)
From 3- under 9 years					0.35***	0.67	0.99	0.83
					(0.06)	(0.23)	(0.17)	(0.31)
9 years+					0.30***	0.46**	0.97	0.49*
					(0.05)	(0.15)	(0.17)	(0.19)
SOCIAL INSURANCE CONTRIBUTION: Yes (No is the base category)					1.44	1.61	1.24	3.18***
					(0.44)	(0.80)	(0.36)	(0.94)
IT USE: Yes (No is the base category)					2.38***	2.02**	2.23***	1.66**
					(0.47)	(0.63)	(0.39)	(0.43)
Constant	0.02***	0.01***	0.00***	0.14*	0.30*	0.01***	0.02***	0.07*
	(0.01)	(0.01)	0.00	(0.14)	(0.20)	(0.01)	(0.01)	(0.10)
Observations	39,833				38,749			

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Found a new job	*Started a business*	*Worked in agriculture*	*Other*	*Found a new job*	*Started a business*	*Worked in agriculture*	*Other*
Log-likelihood		-16489.15				-12777.29		
Chi-square		1423.720				1583.600		
P-value		0.000				0.000		
Pseudo R^2		0.041				0.058		

Standard err. in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation based on the 2021 LFS data

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5.4 Additional analysis

During COVID-19, to restrict the spread of the pandemic while still maintain the economic activities, many firms required their employees to work remotely. Using IT for work is considered an advantage for employees to maintain their job; in the other word, reduce the risk of job lost or taking temporary absence during the pandemic. Relying on this idea, this study aims to illustrate whether using IT at work bring benefits for OPs compared to the other age group. Therefore, in this part, I employ the interaction term of age group and IT use to investigate whether using IT at work benefits OPs during the pandemic.

To achieve this objective, this study expands the research sample size to the whole labour force aged 15 and over, using the 2021 LFS. There were 624,462 people aged 15 and over who responded to the 2021 LFS. They are arranged into four age groups: (1) Group 1 includes those aged 15 to 29; (2) Group 2 includes those aged 30 to 44; (3) Group 3 includes those aged 45 to 59; and (4) Group 4 includes those aged 60 and over, as detailed in Figure 9.

Figure 9: The share of individuals aged 15 and over by age group (%)
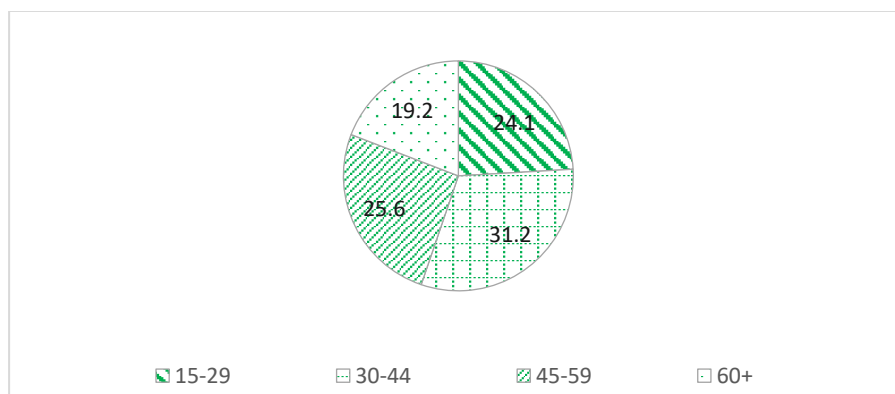
Source: Author's calculation based on the 2021 LFS data

According to the 2021 LFS data, there were 409,532 people were working (equivalent to 65.5% of total sample). Of which, the percentage of the age group 30-44 was highest, accounted for 41.0%, followed by the age group 45-59 (29.7%); 19.8% were those in the group aged 15-29, and 9.5% in group aged 60 and over – Figure 10.

Figure 10: The percentage of employed population by age group (%)
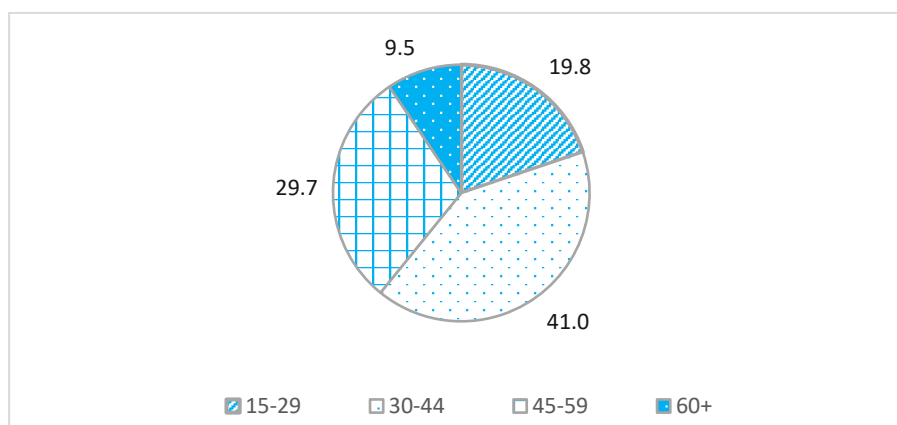
Source: Author's calculation based on the 2021 LFS data

➢ The term "IT use" is a binary dummy, taking two values of 1- "Yes" or 0- "No", showing the probability of using IT at work of the workforce. To employ the interaction term of age group and IT use, the youngest age group (Group 1) is chosen as the baseline. Three interaction terms of age groups (group 2, group 3 and group 4) and one level term for "IT use" are generated. Three level terms representing three age groups are also employed. Finally, a total of seven variables representing for eight groups created for the analysis. In this section, I also control for all demographic and employment characteristics as mentioned in Section 5.2 and Section 5.3.

5.4.1 The use of IT and the change in employees' employment during COVID-19

Table 28 shows the results of the multinomial logit analysis regarding the change in the workforce' employment due to COVID-19 in Vietnam, based on the 2021 LFS data. The results are presented in Relative Risk Ratio (RRR). After controlling for all demographic and employment characteristics, the results are as follows:

The use of IT and the probability of job loss and taking temporary absence:

The results show that for OPs who did not apply IT at work relative to the baseline group (group aged 15-29 without IT), the relative risk of job loss relative to no change would be expected to decrease 42%, while there was no significant difference in the relative risk of job loss relative to no change for OPs who applied IT for work relative to those who did not. For the temporary absence, for OPs without IT use at work relative to those the youngest age group (15-29) without IT use, the relative risk of job loss relative to no change would be expected to reduce by a factor of 0.69. Among OPs, the relative risk of job loss would be expected to increase by 1.25 times for those using IT at work relative to their counterpart.

The use of IT and the probability of increasing working hours: The results show that for OPs using IT at work relative to their counterpart, the relative risk of job loss relative to no change would be expected to increase by a factor of 1.54.

The use of IT and the change in the working form: The results of Table 28 show that the relative risk of job loss relative to no change would be expected to decrease by 61% for OPs without IT use at work relative to the baseline group (age group 15-29 without IT use). Among OPs, the relative risk of job loss relative to no change would be expected

to increase by 3.54 times for those using IT at work relative to their counterpart. In other words, using IT brought benefits for OPs to change the working form during the pandemic.

Table 28: Factors associated with the change in workforce's employment (RRR)

VARIABLES	Losing job	Temporary absence	Increasing working hours	Changing working form
GENDER: Male (Female is the	1.09***	0.95***	1.53***	0.75***
base category)	(0.03)	(0.01)	(0.06)	(0.04)
LIVING AREA: Urban (Rural is	1.46***	1.33***	1.16***	0.95
the base category)	(0.03)	(0.01)	(0.05)	(0.05)
MARITAL STATUS: Married	0.93**	1.00	0.95	0.83***
(Other is the base category)	(0.03)	(0.01)	(0.06)	(0.06)
ECONOMIC REGION (Southeast is the base category)				
Red River Delta	0.11***	0.46***	0.32***	0.34***
	(0.01)	(0.01)	(0.02)	(0.03)
Northern Midlands and Mountains	0.25***	0.77***	0.58***	0.81***
	(0.01)	(0.01)	(0.04)	(0.06)
North Central and Central Coastal	0.41***	0.69***	0.40***	0.42***
	(0.01)	(0.01)	(0.03)	(0.04)
Highlands	0.14***	0.35***	0.18***	0.40***
	(0.01)	(0.01)	(0.02)	(0.04)
Mekong River Delta	0.76***	0.72***	0.43***	0.61***
	(0.02)	(0.01)	(0.03)	(0.05)
EDUCATIONAL LEVEL (No qualification is the base category)				
Elementary	1.38***	1.31***	0.75**	1.31*
	(0.06)	(0.02)	(0.08)	(0.21)
Intermediate	0.99	0.94***	1.43***	1.15
	(0.06)	(0.02)	(0.11)	(0.17)
College	1.06	1.09***	1.15	2.23***
	(0.07)	(0.02)	(0.10)	(0.27)
University+	0.87***	0.99	0.66***	3.66***
	(0.05)	(0.02)	(0.05)	(0.37)
INDUSTRIAL SECTOR (Agriculture/Forestry/Fishery is the base category)				
Industry-Construction	1.99***	2.16***	3.18**	1.41
	(0.17)	(0.07)	(1.45)	(0.42)

VARIABLES	Losing job	Temporary absence	Increasing working hours	Changing working form
Service	1.87***	2.36***	17.88***	1.82**
	(0.16)	(0.07)	(8.06)	(0.54)
ECONOMIC SECTOR (Formal is the base category)				
Household	0.54***	0.31***	3.14**	1.07
	(0.05)	(0.01)	(1.56)	(0.37)
Informal	1.04	0.83***	0.83	1.19
	(0.03)	(0.01)	(0.14)	(0.20)
TYPE OF FIRM (Own account/Family worker is the base category)				
Private	0.81***	0.86***	4.69***	1.52**
	(0.04)	(0.02)	(0.74)	(0.28)
State	0.21***	0.46***	18.49***	1.86***
	(0.02)	(0.01)	(2.89)	(0.34)
FDI	1.23***	1.11***	10.60***	1.88***
	(0.08)	(0.03)	(1.95)	(0.39)
CURRENT WORKING DURATION (Under 1 year is the base category				
From 1-under 3 years	0.45***	1.33***	1.04	1.21
	(0.02)	(0.03)	(0.13)	(0.18)
From 3- under 9 years	0.30***	1.31***	1.03	1.09
	(0.01)	(0.02)	(0.12)	(0.16)
9 years+	0.26***	1.31***	1.08	1.55***
	(0.01)	(0.02)	(0.13)	(0.23)
Social insurance contribution: Yes (No is the base category)	0.73***	1.19***	1.71***	2.19***
	(0.04)	(0.02)	(0.15)	(0.31)
Interaction term of age group and IT use (age group 15-29 without IT use is the base category)				
IT USE	1.10	1.15***	2.01***	4.22***
	(0.06)	(0.02)	(0.20)	(0.59)
Age group 2 (30-44)	1.10***	1.02*	1.12	1.11
	(0.04)	(0.01)	(0.11)	(0.16)
Age group 3 (45-59)	0.88***	0.90***	0.91	1.01
	(0.03)	(0.01)	(0.10)	(0.16)
Age group 4 (60 and over)	0.58***	0.69***	1.09	0.39***
	(0.03)	(0.01)	(0.17)	(0.13)
Interaction 2 (Age group 2*IT use)	0.97	1.04*	0.74***	0.93
	(0.07)	(0.02)	(0.08)	(0.14)

VARIABLES	Losing job	Temporary absence	Increasing working hours	Changing working form
Interaction 3 (Age group 3*IT use)	1.22**	1.15***	0.83	1.16
	(0.11)	(0.03)	(0.11)	(0.20)
Interaction 4 (Age group 4*IT use)	1.13	1.25***	1.54*	3.54***
	(0.28)	(0.08)	(0.36)	(1.49)
Constant	0.16***	0.35***	0.00***	0.00***
	(0.02)	(0.01)	0.00	0.00
Observations	409,532			
Log-likelihood	-271411.05			
Chi-square	88762.910			
P-value	0.000			
Pseudo R²	0.141			
Standard err. in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Source: Author's calculation based on the 2021 LFS data.

5.4.2 The use of IT and employees' solutions to overcome the employment difficulties during COVID-19

Table 29 shows the results of multinomial logit analysis of the employees' solutions to overcome employment difficulties during COVID-19 in Vietnam, based on the 2021 LFS data. The results are presented in Relative Risk Ratio (RRR). After controlling for all demographic and employment characteristics, the results are as follows:

The use of IT and the probability of finding a new job: For OPs without IT at work relative to the group aged 15-29 without IT, the relative risk of finding a new job relative to no solution would be expected to reduce by 23%, while there was no significant difference in the relative risk of finding a new job relative to no solution for OPs using IT at work relative to those who did not use IT at work.

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The use of IT and the probability of starting a business: The results from Table 29 show that for OPs without IT at work relative to those aged 15-29 without IT, the relative risk of starting a business relative to no solution would be expected to increase by 1.23 times. Meanwhile, there was no significant difference in the relative risk for preferring a business relative to no solution for OPs using IT at work relative to their counterpart.

The use of IT and the probability of working in agriculture: For OPs without IT use at work relative to those aged 15-29 without IT use, the relative risk of changing to work in agriculture relative to no change would be expected to increase by 1.1 times. Moreover, the relative risk of changing to work in agriculture relative to no change would be expected to increase 1.43 times ($p<0.1$) for OPs using IT at work relative to their counterpart.

The use of IT and the probability of having other solutions: The results of multinomial logit model show that the relative risk of having other solutions relative to no solution would be expected to be lower for OPs who did not apply IT for work relative to the baseline group (age group 15-29 without IT use) (RRR=0.61). Meanwhile, there was no significant difference in the relative risk of having other solutions relative to no solution for OPs with IT use relative to their counterpart – Table 29.

Table 29: The use of IT and employees' solutions to overcome employment difficulties during COVID-19

VARIABLES	Found a new job	Started a business	Worked in agriculture	Other solutions
GENDER: Male (Female is the base category)	1.09*** (0.02)	0.90*** (0.04)	1.03* (0.02)	1.10*** (0.03)
LIVING AREA: Urban (Rural is the base category)	0.96* (0.02)	0.71*** (0.03)	0.41*** (0.01)	1.00 (0.03)

VARIABLES	Found a new job	Started a business	Worked in agriculture	Other solutions
MARITAL STATUS: Married	0.98	1.43***	1.20***	0.87***
(Other is the base category)	(0.03)	(0.08)	(0.03)	(0.03)
ECONOMIC REGION (Southeast is the base category)				
Red River Delta	0.66***	1.10	4.30***	0.89***
	(0.02)	(0.08)	(0.21)	(0.04)
Northern Midlands and				
Mountains	0.64***	0.75***	1.89***	0.96
	(0.02)	(0.05)	(0.10)	(0.04)
North Central and Central Coastal	0.74***	0.99	2.58***	0.77***
	(0.02)	(0.07)	(0.13)	(0.03)
Highlands	0.57***	0.86	3.94***	0.80***
	(0.03)	(0.08)	(0.20)	(0.05)
Mekong River Delta	1.04	1.26***	3.66***	0.74***
	(0.03)	(0.08)	(0.18)	(0.03)
EDUCATIONAL LEVEL (No qualification is the base category)				
Elementary	1.09**	1.53***	0.97	1.26***
	(0.04)	(0.10)	(0.04)	(0.06)
Intermediate	0.81***	1.31***	0.68***	0.99
	(0.05)	(0.11)	(0.04)	(0.06)
College	0.78***	1.55***	0.64***	1.28***
	(0.05)	(0.14)	(0.05)	(0.07)
University+	0.55***	0.85*	0.36***	1.33***
	(0.03)	(0.08)	(0.02)	(0.06)
INDUSTRIAL SECTOR (Agriculture/Forestry/Fishery is the base category)				
Industry-Construction	0.78***	1.53**	0.48***	1.21*
	(0.05)	(0.28)	(0.02)	(0.13)
Service	0.69***	2.60***	0.32***	1.19*
	(0.04)	(0.46)	(0.02)	(0.12)
ECONOMIC SECTOR (Formal is the base category)				
Household	0.45***	0.62**	0.94	0.19***
	(0.03)	(0.12)	(0.05)	(0.02)
Informal	1.13***	1.12**	1.22***	0.70***
	(0.03)	(0.06)	(0.05)	(0.03)
TYPE OF FIRM (Own-account/Family worker is the base category)				
Private	0.80***	0.37***	0.83***	0.74***
	(0.04)	(0.04)	(0.05)	(0.04)
State	0.30***	0.14***	1.07	0.61***

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VARIABLES	Found a new job	Started a business	Worked in agriculture	Other solutions
	(0.02)	(0.02)	(0.08)	(0.04)
FDI	0.57***	0.31***	0.81***	0.80***
	(0.04)	(0.05)	(0.06)	(0.06)
CURRENT WORKING DURATION (Under 1 year is the base category)				
From 1-under 3 years	0.40***	0.54***	0.93*	1.13**
	(0.01)	(0.04)	(0.04)	(0.07)
From 3- under 9 years	0.26***	0.43***	0.76***	1.16***
	(0.01)	(0.03)	(0.03)	(0.07)
9 years+	0.18***	0.35***	0.64***	0.89*
	(0.01)	(0.03)	(0.02)	(0.06)
Social insurance contribution:	0.78***	1.05	0.84***	1.37***
Yes (No is the base category)	(0.04)	(0.10)	(0.05)	(0.07)
Interaction term of age group and IT use (age group 15-29 without IT use is the base category)				
IT USE	1.50***	1.93***	1.27***	1.41***
	(0.08)	(0.20)	(0.09)	(0.08)
Age group 2 (30-44)	1.14***	1.41***	1.24***	1.05
	(0.04)	(0.10)	(0.03)	(0.04)
Age group 3 (45-59)	0.93**	1.45***	1.10***	0.92*
	(0.03)	(0.11)	(0.03)	(0.04)
Age group 4 (60 and over)	0.77***	1.23**	1.10***	0.61***
	(0.04)	(0.12)	(0.04)	(0.05)
Interaction 2 (Age group 2*IT use)	0.94	0.93	0.84**	0.99
	(0.06)	(0.11)	(0.07)	(0.06)
Interaction 3 (Age group 3*IT use)	1.03	1.02	1.05	1.24***
	(0.09)	(0.14)	(0.10)	(0.09)
Interaction 4 (Age group 4*IT use)	1.25	0.97	1.43*	1.23
	(0.24)	(0.30)	(0.26)	(0.28)
Constant	0.21***	0.01***	0.03***	0.02***
	(0.02)	0.00	0.00	0.00
Observations	*409,532*			
Log-likelihood	*-155313.27*			
Chi-square	*25096.100*			
P-value	*0.000*			
Pseudo R^2	*0.075*			

VARIABLES	Found a new job	Started a business	Worked in agriculture	Other solutions
Standard err. in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Source: Author's calculation based on the 2021 LFS data.

5.5 Summary of Chapter 5

Chapter 5 focuses on analysing the impact of COVID-19 on OPs' employment. The results show the differences in the change in employment and OPs' solutions by demographic and employment characteristics. This study finds that OPs working in the industry-construction and service industries (relative to those in agriculture) had a higher relative risk of job loss or taking a temporary absence (relative to no change). The result aligns with Hypothesis 5 of the study that "*Working in the agricultural sector is associated with lower risk of job loss or temporary absence, compared to the industry-construction and service sectors*".

 Regarding the social insurance contribution factor, the results show no significant difference between OPs with or without social insurance contribution in the relative risk of job loss. Therefore, Hypothesis 6 of this study failed when I hypothesised that "*OPs contributing for social insurance are less likely to lose their job than the rest*". Under demographic characteristics presented in Table 22, contributors to social insurance scheme account for a small proportion of the sample data (only 3% of OPs contributed for social insurance scheme in 2021, while 97% did not[21]). This can be one reason explaining this finding.

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[21] According to the 2019 Labour Code, the official retirement age had been increased to 62 for older males and 60 for older females. Older persons who continue working do not need to participate in the social insurance scheme. However, according to the 2009 Law on Older persons, older persons are those who aged 60 and over. Therefore, there exists amount of older persons who aged 60, still contribute to

For the use of IT, this study finds no significant difference in the relative risk of job loss (relative to no change) for OPs with and without IT use at work. Therefore, Hypothesis 7a of this study failed when I hypothesised that "*OPs using IT at work are less likely to lose their job than the rest*". Under demographic characteristics presented in Table 22, the number of OPs who used IT at work accounts for a small proportion of the sample data (only 3% of OPs used IT at work, while 97% did not). This can be one reason explaining this finding. However, the results do not mean that OPs do not need to improve their IT skills or to be trained in IT. Because from the results of the 2021 LFS, most OPs without IT worked in the informal and household sectors, in particular, those worked in agriculture and having lower education, which usually go with lower pay and unsecured employment. On the other hand, there was a significant difference in the relative risk of changing working form (relative to no change) for OPs with IT use at work (relative to their counterpart). These results agree with Hypothesis 7b of the study: "*OPs using IT at work are more likely to change the working form than the rest*".

The results of multinomial logit analysis about the factors associated with the OPs' solutions to overcome employment difficulties show a significant difference in the relative risk of finding a new job (relative to no solution) for OPs with IT at work (relative to their counterpart). The result is in line with Hypothesis 7c of the study: "*OPs using IT at work are more likely to find a new job than the rest*".

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the compulsory social insurance scheme and some others contribute to the voluntary social insurance scheme.

Furthermore, by employing the interaction of IT use and age factor, the results of the multinomial logit module show that using IT brought significant benefits for OPs (relative to those without IT use) in term of changing the working form (relative to no change) during the pandemic (RRR=3.54).

CHAPTER 6: CONCLUSION, DISCUSSION AND POLICY IMPLICATIONS

6.1 Conclusion and Discussion

This study contributes to the understanding of the determinants of OPs' participation in the labour force and their type of work as well as investigates the factors associated

with the change in OPs' employment during COVID-19 and their individual coping strategies to overcome the employment difficulties.

The probability of working of older persons and their type of work

Statistics from the 2018 and 2020 VHLSS data show that over one half of OPs aged 60+ in Vietnam were working; of which, the employment rate of older males was higher than that of older females. While the percentage of not working was higher for the older age group, the percentage of working in all types of job was higher for the younger age. A similar situation between older males and females regarding the type of job. Married OPs had higher rate of being employed, regardless of gender in 2018 and 2020. They also had higher percentage of working in all types of job.

Regarding the living area, OPs living in the rural area and in the lower level of economic development region had higher percentage of working in agriculture but lower percentage of working in non-agriculture than their counterpart. A similar situation is found for the case of the Kinh people (compared to those belonging the minority group).

OPs without qualifications, retirement pensions and health problems had higher percentage being employed. From living arrangement perspective, OPs in the skipped generation families (OPs living with their grandchildren only) had higher percentage being employed and they also had highest rate working in agriculture and non-agriculture than those in other living arrangements, while OPs living alone had higher percentage of waged work.

OPs in HHs with lower income, with loans and without savings had higher percentage being employed. In addition, those living in HH with loans had higher percentage of

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waged work but lower percentage of working in non-agriculture. For older females, living in HHs without savings had higher percentage of having waged work, which was in contrast for the case of working in non-agriculture. For older males, living in HH without savings had lower percentage of working in waged work and non-agriculture than those in HH with savings. Overall, OPs living in HHs with lower income, with loans and without savings had higher percentage of working in agriculture, regardless of gender. In addition, the percentage of working in agriculture was higher for OPs without IT use than their counterpart.

As expected, the results of logit model show that OPs with retirement pension, facing health problems, and having a college degree were less likely to work after retirement age; and so, had lower relative risk of working for all types of job (relative to no working). These findings are in line with previous studies such as Giang and Le (2018), Paweenawat and Liao (2021). More importantly, this study finds that OPs who finished college (relative to those without any qualifications) have a lower probability of working and lower relative risk of working in agriculture (relative to no working). A reasonable explanation is that most of them have retirement pension (83.3%), while only 8% of those without qualifications have such pension[22]. As a result, they tend to enjoy their retirement life without the financial burden. On the other hand, those who finished and continued working after the retirement age had lower relative risk of working in agriculture (relative to no working). This findings on the one hand, directly emphasize the returns on education to OPs' income and employment; on the other hand, are in line with Mincer's theory on the role of human capital in the labour market.

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[22] Author's calculation based on the 2021 LFS data.

In this study, OPs' living arrangement is associated with the probability of being employed for older males and females differently. For older females, those living alone were more likely to participate in the labour force than those living with other relatives or with OPs only. Meanwhile, for older males, those living with children or grandchildren only were more likely to continue working after retirement age than those living alone (in 2018). The findings regarding the association between living arrangement and the probability of being employed for older males in Vietnam are inconsistent with Chattopadhyay et al. (2022) and Tong et al. (2019) which confirmed that OPs living with children had lower probability of working compared to those living alone. A reasonable explanation is that the percentage of older males who are older who lived alone is larger than older males who are younger. In detail, for older males living alone, the statistics of the 2018 VHLSS show that 50.7% aged 75 years and over, while only 17.3% were aged 60-64. The increase in the age is associated with lower probability of working. On the other hand, for older males living with children, 46.9% aged 60-64 and the figure for those aged 75+ reduced to 16.5%. This is one possible explanation why the probability of working was higher for older males living with children or with grandchildren only compared to those living alone.

Living area and economic region are strongly associated with the probability of being employed and OPs' type of job. Those living in the rural area and economic regions with lower level of development were more likely to continue working after retirement. In addition, OPs in the rural area relative to those in the urban area had a lower relative risk of working in waged work or non-agriculture but higher relative risk of working in agriculture (relative to no working). During COVID-19, living in the rural area (relative to those in the urban are) and regions with lower level of development (relative to the

Southeast) were associated with lower relative risk of job loss or temporary absence (relative to no change).

In 2020, for older females, those using the internet (relative to their counterpart) were less likely to continue working after the retirement age than those without internet access. They also had lower likelihood of working in agriculture (relative to no working). The 2020 VHLSS statistics show that 17.3% of OPs without pension used internet, the figure increased to 44.8% for those with pensions. Moreover, only 17.4% of OPs without qualifications used the internet and the figure increased to 66.4% for those with a college degree. This is an appropriate reason why older females using the internet (relative to the rest) were less likely to continue working and the lower relative risk for preferring in agriculture relative to not working. For older males, in 2020, OPs using the internet (relative to the rest) increased the relative risk of having waged work and working in non-agriculture (relative to not working). It may be because, during COVID-19, they had to use the internet to maintain their work (i.e., the change in working form from on-site to online work). As the VHLSS statistics show, the use of internet increased rapidly between 2018 and 2020 for both genders. For example, for older males, the rate of using the internet increased from 19.6% in 2018 to 33.9% in 2020. From the type of work aspect, in 2018, 23.4% of older males who had waged work and used internet, while 21.3% who had waged work and did not use the internet. The corresponding figures for the year 2020 were 30.2% and 15.6%.

At the household level, the increase in the number of HH members was associated with lower likelihood of being employed after the retirement age. Moreover, those in higher income quintiles were more likely to participate in the labour force and higher

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likelihood of working in non-agriculture, regardless of gender, and having waged work relative to not working (for older males). In addition, in 2020, older females in HHs with loans had higher relative risk of having waged work, which was in contrast with those living in HHs with savings. The situation is different for older males. In particular, living in HHs with loans (relative to the rest) increased the relative risk of working in agriculture (relative to no working), in contrast to living in HHs with savings. The findings are in line with Adhikari et al. (2011) regarding the labour force participation of older persons in Thailand. In particular, the probability of participation in the labour force of OPs residing in a family with a total income of 10,000-29,999 Baht (per year) were 0.54 times lower than those living in a household with an income of 100,000 Baht or more (Adhikari et al., 2011). According to Ling and Chi (2008), earning higher incomes may be an economic incentive to continue working. Previously, the results of Giang and Le (2018) also find that in Vietnam, older females living in non-poor HHs had higher odds of working than those living in poor HHs (OR=1.8, p<0.05).

This study also finds that OPs in higher Quintiles had higher likelihood of working in non-agriculture, regardless of gender. In addition, HH loans and savings were also associated with the OPs' probability of being employed and their type of job, in particular for older females. The findings suggest that older females are more vulnerable than older males, especially older females living alone and in lower-income households or with loans. They had to continue working for the daily expenses instead of enjoying old age.

Based on the pooled-cross section analysis, this study finds there was no significant difference in the probability of working for OPs in 2018 and 2020, even under the

impact of COVID-19. This is probably because COVID-19 affected first and harder (1) the urban area – with more offices and migrants, (2) the service sector such as trade, transportation, and hospitality industries while most of OPs in Vietnam were living in rural areas and working in agriculture – which were less affected by the pandemic. In Vietnam, as of June 2020, the service sector was hardest hit by COVID-19, with 72.0% of the workers affected, followed by the Industry-Construction sector, at 67.8% and the percentage of affected workers in the agriculture, forestry and fishery sector was lowest at 25.1% (GSO, 2020b). According to Dang and Nguyen (2020), Vietnamese older people were less affected by the pandemic than the middle-aged group (Dang et al., 2020). To the best of my knowledge, most of the employed older persons in Vietnam worked in the agriculture sector, which faced fewer challenges regarding job loss or temporary absence during COVID-19. As such, COVID-19 did not significantly affect OPs' participation in the labour force. Based on the pooled-cross section analysis, this study also finds that older females had a higher relative risk of working in waged work (relative to no working) in 2020 relative to the year 2018. Ando et al., (2022) also found that for European countries in 2020, the employment of OPs even went up while the youth employment fell down by almost 6%, compared to a 1.3% decline in total employment (Ando et al., 2022).

On the other hand, the results of the pooled cross-section analysis also show that older females had a higher probability of working in waged work in 2020 than in 2018, even with the effect of COVID-19. This is probably because, in 2020, a large proportion of older females who had waged work were low-skill labourers (64.3%) such as cleaners and domestic helps, low-skilled labourers in agriculture, forestry and fishery.

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Regarding the factors associated with the OPs' probability of being employed and their type of job, the study' results support the Hypotheses 1, 2, 3, 4; emphasizing that OPs with retirement pension (Hypothesis 1), facing health problems (Hypothesis 2) had a negative and statistically significant association with the probability of being employed. Meanwhile, OPs living alone were more likely to continue working after the retirement age than others (Hypothesis 3). And the hypothesis 4 emphasizes that OPs with lower education are more likely to work in agriculture.

Overall, OPs who continued working after the retirement age were those in the rural area and regions with the lower level of economic development; and most of them worked in agriculture. Due to difficult circumstances and the bad working history, participation in the labour force and working in agriculture could be more of a "necessity" rather than their "choice" (Newton et al., 2019). As mentioned in Chapter 2 – the Max Weber's theory on social action, OPs' participation in the labour force is "the rational social action-traditions", which complies with habits, traditions, and their working history. In this study, OPs working in agriculture is not a choice but a limitation of tools, means to have or change to other types of work. To the best of my knowledge, there has been no previous study which focuses on examining the applicability of Max Weber's theory on OPs' type of work. This study, therefore, explores a new area of the social action theory and its application into the OPs' working status in Vietnam. In addition, according to the STREAM framework, I understand the effect of COVID-19 on OPs' employment and their individual strategies to deal with employment difficulties. On the one hand, the research's results also provide support for the STREAM framework, which aims to explain the association between demographic and employment characteristics and the change and transition in employment. Hence, this

study provides an understanding of the influence of demographic characteristics such as age, gender, living area as well as OPs' motivation and ability to work such as financial issue or health status on OPs' probability of being employed.

Effect of COVID-19 on OPs' employment

The statistics from the 2021 LFS data show that 22.4% of OPs who worked reported that their employment had been affected by COVID-19. Among affected people, most of them took temporary absence or reduced working hours (88.2%), followed by those who lost their jobs (10.0%), and about 1.3% and 0.5% increasing working hours and changing working form, respectively.

For job loss, the statistics show that older males, with other marital statuses (other than being married), living in the urban area and in the Southeast had the higher percentage reporting job loss. At the same time, OPs with college degree, working in the informal sector, with less than one year of experience had higher percentage experiencing job loss.

For temporary absence, older persons who were female, in other marital statuses, living in the urban area, living in the Southeast, holding an elementary level and those working in the informal sector, specifically in services, working for private firms, with one to three years of experience, with social insurance contribution or IT use had higher percentage of taking temporary absence.

For the increase in working hours, the statistics show that OPs who were male, married, living in the urban area, in the Southeast and those with a university degree, working in the formal sector, for State firms, with one to three years of experience, contributing to

the social insurance scheme and using IT at work had higher percentage of increasing working hours.

For the change in the working form, the statistics show that OPs with a university degree, working for FDI establishments, having less than one year of experience, contributing to the social insurance scheme and using IT at work had the higher percentage of changing working form.

Older persons' coping strategies to overcome employment difficulties during COVID-19

Even when OPs' employment was affected by the pandemic, only 10.2% of them had solutions to overcome the employment difficulties. Among those having solutions, a major returned to work in agriculture as a solution (53.3%); followed by finding a new job (32.5%). The percentage of those who reported starting a business and having other solutions were small (7.9% and 7.3%, respectively).

For finding a new job, the statistics show that OPs who were female, in the oldest age group (75+), with other marital status (other than being married), living in the Southeast had higher percentage of finding a new job. Meanwhile, OPs with an elementary level of education, working in industry-construction, in the informal sector and those working for Private firms, with less than one year of experience, and using IT at work had higher percentage of finding a new job.

For starting a business and changing to work in agriculture, OPs living in the Southeast, with an elementary level, working in the service industry, in the informal sector and those with less than one year of experience, using IT at work had higher percentage of

starting a business than other groups. Meanwhile, OPs who were female, in the higher age group, living in the rural area and in the Highlands, without qualifications and those working in agriculture, and those working as own-account workers or family workers, with more than nine years of experience, without social insurance contribution or IT use had higher percentage of returning to work in agriculture.

For other solutions, OPs who were male, in the youngest age group (60-64), living in the urban area and in the Southeast had the higher percentage of having other solutions. At the same time, OPs with a college degree, working in industry-construction field, in the formal sector and those working for FDI firms, with one to three years of experience, contributing to the social insurance scheme and using IT at work had higher percentage of being other solutions.

Multinomial logit modules show that during COVID-19, OPs' demographic and employment characteristics were associated with the change in OPs' employment. In terms demographic characteristics, the findings show that older males (relative to the rest) had a higher relative risk of job loss and temporary absence (relative to no change). This finding is inconsistent with the works of Jiskrova and his team in 27 EU countries (Jiskrova et al., 2021). One possible reason is because older females were more likely to work in the household and informal sectors than older males, and COVID-19 had less impact on these sectors than in the formal sector.

Between 2020 and 2021, Vietnam had gone through three waves of COVID-19 and the pandemic had hit harder in the urban and southern areas of the country. The central and local governments launched several closure policies to control the spread of the pandemic, especially in cities. This situation explains why OPs residing in these areas

and those who worked in the formal sector, especially in industry and construction and service sectors, had a higher likelihood of job loss or temporary absence. These findings are consistent with those of the study of Quandt et al., in Latin American countries (Quandt et al., 2021). More interestingly, in Vietnam, the economic region also had a significant relationship with the change in employment of OPs during COVID-19 and their solutions as well. This issue can be an area of research for future studies. Besides, understanding the socioeconomic condition of each region and the nature of work that OPs hold will help the government to launch appropriate policies for different age groups for better resilience.

In terms of the employment characteristics, OPs working in the industry-construction and service sectors (relative to working in agriculture) reduced the relative risk of job loss (relative to no change). Likewise, OPs working in the household or informal sectors (relative to those working for the formal sector) had the lower relative risk of job loss or temporary absence (relative to no change). Moreover, working for Private/ State/ FDI (relative to those working as own-account workers or family workers) was associated with lower relative risk of job loss and temporary absence (relative to no change). Longer time in the current employment also led to a lower relative risk of job loss but a higher relative risk of taking a temporary absence (relative to no change).

Those using IT at work (relative to the rest) had a higher relative risk of changing working form (relative to no change) and finding a new job (relative to no solution). In addition, OPs without IT use at work (relative to the group aged 15-24 without IT use) had lower relative risk of job loss or temporary absence and changing working form (relative to no change) during the pandemic. They also had a lower relative risk of

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finding a new job or having other solutions (relative to no solution), such as having additional jobs or improving training skills. In contrast, they had a higher relative risk of starting a business or returning to work in agriculture (relative to no solution) during COVID-19.

These results provide support for Hypothesis 5 (Working in the agricultural sector is associated with lower risk of job loss or temporary absence compared to the industry-construction and service sectors), 7b (OPs using IT at work are more likely to change the working form than those without IT use) and 7c (OPs using IT at work are more likely to find a new job than those without IT use), but not for Hypothesis 6 (OPs contributing to social insurance are less likely to lose their job than those without social insurance contribution) and 7a (OPs using IT at work are less likely to lose their job than those without IT use).

The research's results support for the Conservation of Resource theory, emphasizing that human resources such as OPs' education, IT skill and the better employment led to better abilities to adapt and recovery during the pandemic, in this study - the ability to change working form, find a new job, start a business or have other solutions (i.e. additional waged work or improving training skills) to overcome the employment difficulties. As such, they navigate through the pandemic with a proactive career behaviour (Ali & Mehreen, 2021) and convert these situation become the human resource. For example, OPs using IT at work was not only ensure for their job and their health; moreover, by doing so they improve their IT skill for their work.

6.2 Policy implication

In the context of population aging, the proportion of the older workforce is expected to increase because of the low birth rate and high life expectancy. As the labor force of a country is the main driver of the economy, the older workforce plays an important role in the economic development of Vietnam.

Providing an appropriate employment system to encourage those in need to continue working

It is necessary for the government to provide and support an appropriate employment system for employed older persons in this context. Regarding OPs' employment, the 2019 Labour Code (Article 148 and 149) regulates the recruitment and employment of older workers. Besides, the National Action Program on Older persons period 2021-2030 sets out a number of targets on job creation, job introduction and vocational training for OPs[23], etc. To be best of my knowledge, even though related laws and regulations were launched, the implementation has not received enough concern (News, 2023). Doan & Ngo (2020) based on the results of survey data in three provinces/cities in Vietnam (Hanoi, Thaibinh, Ninhbinh, with n=39 companies and 428 elderly workers) and found that even for senior workers, the workplace policies show passivity for OPs, with only a small proportion favoured employment security or employment flexibility for senior older workers. For example, only 8% of sample firms reported to have aiding flexible

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[23] According to the National Action Program on OPs period 2021-2030, between 2022-2025, at least 50% of OPs who have the need and ability to work have jobs; at least 20,000 OPs will receive career guidance and career change training at vocational education establishments, social assistance establishments, and employment service centers; at least 10,000 households with OPs are in need and eligible for loans to start a business, develop production and business at preferential interest rates. https://thuvienphapluat.vn/van-ban/Van-hoa-Xa-hoi/Quyet-dinh-2156-QD-TTg-2021-phe-duyet-Chuong-trinh-hanh-dong-quoc-gia-nguoi-cao-tuoi-498264.aspx. Access 10:00, 15 September 15, 2023

retirement, even when older workers who are willing to work longer, they have to work with lower wage and are demoted. At the same time, around one-fifth use flexible pay for older workers (Doan & Ngo, 2020). Meanwhile, most employed OPs in Vietnam have lower qualifications, mainly work in agriculture, limited IT use, etc., which lead to limited competitiveness in the labour market.

According to the human right based approach, during the policy making processes on employment, OPs need to participate in and be at the centre of those laws or policies that are directly related to them as the subjects and beneficiaries. Regarding to the employment, OPs have the rights to work and the rights to decide their working hours, working form under a labour contract during the employment. At the same time, they need to be provided a friendly working condition and environment, without discrimination in the workplace.

Improving OPs' health and increasing the rate of pensioners by formalizing the current labour force to achieve well-being at old age

Pensions and health are two most important factors determine the labour force participation of OPs in labour market. As mentioned above, OPs without health problems were more likely to continue working after the retirement age than otherwise. Thanks to the medical achievement, OPs are living longer with better health, and so OPs are expected to contribute longer to the labour market as to make up for the shrinking of the working age group. This is especially appropriate for a developing with a rapid population aging as Vietnam. These findings, therefore, imply that health care for OPs is one of the critical strategies that the Vietnamese government needs to be concerned to ensure active ageing and encourage OPs to continue working in late life.

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More importantly, having a retirement pension will ensure the quality of life, help OPs enjoy their old age without the economic burden. Therefore, increasing the percentage of pensioners is the target that needs to be achieved in the coming time.

Investing and enhancing education (including training skills) for all generations, especially the young generation need to be considered as a long-term strategy to achieve a future of high labour productivity. Doing so will ensure employment security for all in the context of unforeseen circumstances or shocks.

According to Mincer's human capital theory (Mincer, 1984), education is one of the most important factors explaining income. The results also suggest that OPs with a college degree were less likely to continue working after the retirement as they had the contributory pensions. Moreover, they also had lower relative risk of working in agriculture than those without qualifications. In other words, a better education brings better opportunities of stable jobs, which will be more secured in urgent shocks such as COVID-19. Therefore, investing and enhancing education is a long-term strategy will lead to better future employment for the workforce and active aging for society. More importantly, in the context of a disordered environment such as climate change, nature disasters and human made disasters, the urgent shocks, including career shocks may happen in the future. Better education and training, therefore, would help to reduce the risks and lead to faster recovery. This suggests that enhancing education and training for all generations, especially the young generation is key to the achievement of effective aging in the future.

COVID-19 hits harder in the industry and construction and service sectors and negatively impacted the income of those working in these sectors. However, these

findings also show that OPs with better education and jobs have higher probability of changing their work form to online or remote work. For example, OPs working for State, Private, or FDI establishments are associated with a lower risk of job loss than those working as own-account workers and family workers; they also had higher odds of changing working form. To the best of my knowledge, home-based work can be more prevalent in the future; therefore, OPs should obtain relevant education and training to adapt to new circumstances.

Integrating age and gender issues into relevant policies, including the employment policy for older persons

From the gender perspective, the proportion of pensioners is lower in the case of older females compared to older males (13.3% vs. 21.3% in 2020). More importantly, this study finds that among employed older persons, older females were likely to work in agriculture. These findings indicate that older females were more vulnerable than older males, particularly older females who lived alone, in low-income households, or lived in HHs with loans. Instead of enjoying old age, they had to continue working to cover their daily costs. It means that the policy makers must incorporate the gender issue into relevant policies, including the employment policy for OPs.

Although COVID-19 impacted less on those living in rural areas and working in household or informal sectors and agriculture, it did not mean that these older workers faced fewer negative impacts than others. In contrast, the majority of them were vulnerable workers, who usually had low- or non-paying jobs and had insecure work even when there was no urgent shock. For example, Bell and Rutherford (2013) showed that, in the UK, those who were self-employed were more likely to be drawn from the

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tails of the income distribution (Bell & Rutherford, 2013). This fact will be an obstacle in the preparation for the aging society of the country in the following decades. Understanding this situation, the Vietnamese Government must support older workers in the labour market by means such as launching policies to stop age and gender discrimination at work.

6.3 Limitations and direction for future studies

Due to the scope of this study, which only focused on analyzing the factors associated with the OPs' probability of working and their type of work at the individual and household levels. Likewise, I only investigated the factors affecting the OP's employment changes and their coping strategies based on the individual aspect. The results only reflected the situation at the time of data collection, as the dataset is cross-sectional. More insights could be obtained from longitudinal data. Collecting medium or macro-level data is also equally important to complement my investigation.

Regarding the target group of this thesis, which only focused on older person aged 60 and over for the analysis. It is also important to pay attention to the working age group for the analysis of their employment situation and the determinants, especially considering the effect of COVID-19 on their employment, and some studies have already investigated this issue (Dang et al., 2020; Dang & Nguyen, 2021). More importantly, in the context of an aging society, the share of OPs in society is increasing and their role in the economic development is becoming more important. Furthermore, they are the vulnerable group in the labour market, especially in the urgent shocks. That is the reason why I chose OPs as the target group of the study. I also analyzed the factors

associated with OP's employment changes due to COVID-19 and their coping strategies in a comparison with other working age groups.

It is important to note that the results of this study do not imply that contributing to the social insurance scheme is ineffective; it only suggests that the sample data did not provide strong evidence of its effectiveness. Future studies can consider examining the association between the social insurance contribution with the change in employment of other age groups overall, as well as in comparison with the older workforce. In addition, the results presented in Appendix 11 show that older employees who worked under a labour contract had lower risk of job loss than their counterpart, which implies a secured job for OPs especially in the case of urgent shocks. As such, this is an interesting topic. While this study focuses on older employees, future research can investigate the issue for the working-age group.

Finally, the results show that there were strong differences in the probability of being employed for OPs between economic regions of the country. More importantly, COVID-19 had different effects among OPs in these regions regarding the risk of job loss, changing working form or having solutions. This opens opportunities for the future study and for those interested in relevant topics.

APPENDIX

Appendix 1: VIF test the collinearity of variables by gender between the 2018 and 2020, based on the VHLSS

VARIABLE	2018				2020			
	Female	1/VIF	Male	1/VIF	Female	1/VIF	Male	1/VIF
PENSION	1.66	0.60	1.67	0.60	1.69	0.59	1.68	0.60
EDUCATION	1.54	0.65	1.64	0.61	1.60	0.62	1.66	0.60
HH INCOME QUINTILE	1.51	0.66	1.63	0.61	1.47	0.68	1.57	0.64
LIVING ARRANGEMENT	1.47	0.68	1.14	0.87	1.41	0.71	1.12	0.89
NUMBER OF HH MEMBERS	1.45	0.69	1.16	0.86	1.40	0.72	1.17	0.85
SAVINGS	1.39	0.72	1.42	0.70	1.43	0.70	1.47	0.68
MARITAL STATUS	1.30	0.77	1.15	0.87	1.34	0.75	1.14	0.88
LIVING AREA	1.27	0.79	1.25	0.80	1.21	0.83	1.23	0.81
AGE	1.24	0.81	1.25	0.80	1.30	0.77	1.31	0.76
INTERNET USE	1.17	0.85	1.32	0.76	1.27	0.79	1.34	0.75
ETHNICITY	1.14	0.87	1.12	0.90	1.13	0.88	1.14	0.88
ECONOMIC REGION	1.07	0.93	1.08	0.93	1.08	0.93	1.09	0.92
LOANS	1.06	0.94	1.06	0.94	1.06	0.95	1.05	0.95
HEALTH PROBLEM	1.03	0.97	1.03	0.97	1.03	0.97	1.03	0.97
RESIDENTIAL REGISTRATION	1.01	0.99	1.02	0.98	1.03	0.98	1.02	0.98
NUMBER OF HOUSES	1.01	0.99	1.01	0.99	1.01	0.99	1.02	0.98
Mean VIF	**1.27**		**1.25**		**1.28**		**1.25**	

Source: Author's calculation based on the 2018 and 2020 VHLSS data.

Appendix 2: VIF test the collinearity of variables based on the 2021 LFS

VARIBALES	VIF	1/VIF
TYPE OF FIRM	1.74	0.57
INDUSTRIES	1.58	0.63
ECONOMIC SECTOR	1.44	0.70
SOCIAL INSURANCE CONTRIBUTION	1.3	0.77
LIVING AREA	1.25	0.80
EDUCATION	1.21	0.82
GENDER	1.18	0.85
MARITAL STATUS	1.18	0.85
IT USE	1.16	0.87
CURRENT WORKING DURATION	1.06	0.94
AGE	1.04	0.97
ECONOMIC REGION	1.02	0.98
Mean VIF	**1.26**	

Source: Author's calculation based on the 2021 LFS data.

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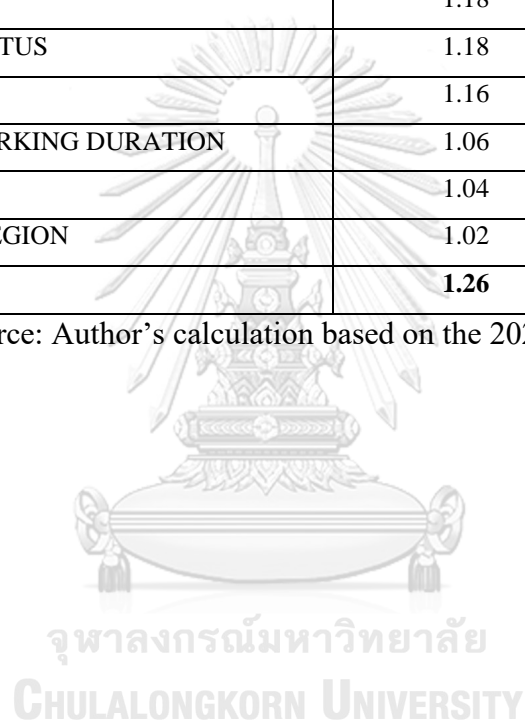
Appendix 3: Chow test for the probability to be employed by gender in 2018 and 2020 VHLSS

2018

Source	SS	df	MS		
				Number of obs	= 5,055
Model	409.86	30.00	13.66	$F_{(30, 5024)}$	= 80.390
Residual	853.81	5024.00	0.17	Prob > F	= 0.000
				R-squared	= 0.324
				Adj R-squared	= 0.320
Total	1263.67	5054.00	0.25	Root MSE	= 0.412

(1) D0 = 0

F(1, 5024) = 20.27

Prob > F = 0.0000

===

* Structural Change Test: Y = X + D0 *

===

Ho: no Structural Change

- N1: 1st Period Obs = 2912

- N2: 2nd Period Obs = 2143

- Chow Test = 20.2674 P-Value > F(1, 5024) 0.0000

2020

Source	SS	df	MS		
				Number of obs	= 4,817
Model	410.12	30.00	13.67	$F_{(30, 4786)}$	= 82.610
Residual	792.04	4786.00	0.17	Prob > F	= 0.000
				R-squared	= 0.341
				Adj R-squared	= 0.337
Total	1202.15	4816.00	0.25	Root MSE	= 0.407

(1) D0 = 0

F(1, 4786) = 5.55

Prob > F = 0.0185

===

* Structural Change Test: Y = X + D0 *

===

Ho: no Structural Change

- N1: 1st Period Obs = 2720

- N2: 2nd Period Obs = 2097

- Chow Test = 5.5497 P-Value > F(1, 4786) 0.0185

Source: Author's calculation based on the 2018 and 2020 VHLSS data.

Appendix 4: Chow test for type of job by gender in 2018 and 2020 VHLSS

2018

Source	SS	df	MS	Number of obs	=	5,055
				F(30, 5024)	=	58.590
Model	1513.85	30.00	50.46	Prob > F	=	0.000
Residual	4327.01	5024.00	0.86	R-squared	=	0.259
				Adj R-squared	=	0.255
Total	5840.86	5054.00	1.16	Root MSE	=	0.928

(1) D0 = 0

F(1, 5024) = 17.62

Prob > F = 0.0000

==

* Structural Change Test: Y = X + D0 *

==

- N1: 1st Period Obs   = 2912
- N2: 2nd Period Obs   = 2143
- Chow Test   = 17.6168   P-Value > F(1 , 5024) 0.0000

2020

Source	SS	df	MS	Number of obs	=	4,817
				F(30, 4786)	=	58.950
Model	1523.73	30.00	50.790	Prob > F	=	0.000
Residual	4123.29	4786.00	0.860	R-squared	=	0.270
				Adj R-squared	=	0.265
Total	5647.02	4816.00	1.170	Root MSE	=	0.928

(1) D0 = 0

F(1, 4786) = 6.61

Prob > F = 0.0101

==

* Structural Change Test: Y = X + D0 *

==

- N1: 1st Period Obs   = 2720
- N2: 2nd Period Obs   = 2097
- Chow Test   = 6.6144   P-Value > F(1 , 4786) 0.0101

Source: Author's calculation based on the 2018 and 2020 VHLSS data.

Appendix 5: Chow test for the probability to be employed by living area (rural/ urban) in 2018 and 2020 VHLSS

2018

Source	SS	df	MS		Number of obs	=	5,055
					$F(30, 5024)$	=	79.59
Model	407.1025	30	13.57008		Prob > F	=	0.000
Residual	856.5644	5,024	0.170494		R-squared	=	0.322
					Adj R-squared	=	0.318
Total	1263.667	5,054	0.250033		Root MSE	=	0.413

(1) D0 = 0

$F(1, 5024) = 4.02$

Prob > F = 0.0450

* Structural Change Test: Y = X + D0 *

Ho: no Structural Change

- N1: 1st Period Obs   = 3437
- N2: 2nd Period Obs   = 1618
- Chow Test   = 4.0222   P-Value > F(1 , 5024) 0.0450

2020

Source	SS	df	MS		Number of obs	=	4,817
					$F(30, 4786)$	=	82.44
Model	409.5857	30	13.65286		Prob > F	=	0.000
Residual	792.5675	4,786	0.165601		R-squared	=	0.341
					Adj R-squared	=	0.337
Total	1202.153	4,816	0.249617		Root MSE	=	0.407

(1) D0 = 0

$F(1, 4786) = 2.35$

Prob > F = 0.1251

* Structural Change Test: Y = X + D0 *

Ho: no Structural Change

- N1: 1st Period Obs   = 3217
- N2: 2nd Period Obs   = 1600
- Chow Test   = 2.3530   P-Value > F(1 , 4786) 0.1251

Source: Author's calculation based on the 2018 and 2020 VHLSS data

Appendix 6: Chow test for type of job by living area (rural/ urban) in 2018 and 2020 VHLSS

2018

Source	SS	df	MS		Number of obs	=	5,055
					F(30, 5024)	=	58.01
Model	1502.65	30	50.088		Prob > F	=	0.000
Residual	4338.20	5,024	0.863		R-squared	=	0.257
					Adj R-squared	=	0.253
Total	5840.86	5,054	1.156		Root MSE	=	0.929

(1) D0 = 0

F(1 , 5024) = 4.61
Prob > F = 0.0319

* Structural Change Test: Y = X + D0 *

Ho: no Structural Change

- N1: 1st Period Obs   = 3437
- N2: 2nd Period Obs   = 1618
- Chow Test   = 4.6061   P-Value > F(1 , 5024) 0.0319

2020

Source	SS	df	MS		Number of obs	=	4,817
					F(30, 4786)	=	58.71
Model	1519.13	30	50.638		Prob > F	=	0.000
Residual	4127.88	4,786	0.862		R-squared	=	0.269
					Adj R-squared	=	0.264
Total	5647.02	4,816	1.173		Root MSE	=	0.929

(1) D0 = 0

F(1 , 4786) = 1.28
Prob > F = 0.2577

* Structural Change Test: Y = X + D0 *

Ho: no Structural Change

- N1: 1st Period Obs   = 3217
- N2: 2nd Period Obs   = 1600
- Chow Test   = 1.2816   P-Value > F(1 , 4786) 0.2577

Source: Author's calculation based on the 2018 and 2020 VHLSS data

Appendix 7: The VHLSS Questionnaires about **here**

| PROVIDED INFORMATION IS KEPT CONFIDENTIAL | **GENERAL STATISTICS OFFICE** | Questionaire No. 1B/KSMS20-HO |

VIETNAM HOUSEHOLD LIVING STANDARD SURVEY IN 2020

Quest. No.
/

HOUSEHOLD QUESTIONAIRE
ON INCOMES AND EXPENDITURES

2020

Province/ City...
Rural district/ urban district / (provincial) town.............................
Rural commune/ urban ward/ (district) township............................
Enumeration area..
Area: ... (URBAN:........1; RURAL:.......2)..
Full name of household head (IN BLOCK CAPITAL LETTERS).......... Household No ·
Ethnicity of household head..
Address..
Landline phone number (INCLUDE PROVINCE CODE):...................Mobile:......
INTERPRETER EMPLOYED? (YES:..........1; NO:...........2)..............
Enumerator's full name.. Code
Full name of team leader..Code

Date   month   year 2020
Team leader
(Sign)

Date   month   year 2020
Enumerator
(Sign)

Appendix 8: The 2021 LFS Questionnaire about **here**

MINISTRY OF PLANNING AND INVESTMENT

GENERAL STATISTICS OFFICE

QUESTIONNAIR OF LABOUR FORCE SURVEY 2021

	Name of Census 2019	*Code of Census 2019*	*Name of LFS 2021*	*Code of LFS 2021*
PROVINCE/ CITY:				
DISTRICT/TOWN/CITY BELONGING TO THE PROVINCE				
COMMUNE/WARD:				
VILLAGE/HAMMED:				
AREA OF SURVEY:				
URBAN/ RURAL(URBAN=1; RURAL=2):				
HOUSEHOLD NUMBER:				
FULL NAME OF THE HOUSEHOLD'S HEAD:				
HOUSEHOLD ADDRESS:				

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Appendix 9: Weighted analysis

While Chapter 4 and Chapter 5 analyse the regression results based on non-weighted data, this section aims to analyse OPs' employment and their type of work (using the 2018 and 2020 VHLSS data) and the change in employment during COVID-19 as well as their solutions to overcome employment difficulties (using the 2021 LFS data) based on weighted data. The weights are provided in the datasets, and I employ normalized weight to keep the number of observations the same as in the non-weighted analysis.

Normalization of the weight

Before using weighted data for the analysis, I normalize the weight to a common scale, between 0 and 100 (%), without distorting differences in the ranges of values (Lakshmanan, 2019). Normalization is required when there are big differences in the ranges of different features and useful when the data set does not contain outliers. After normalization, the standard deviations of the weights are smaller (Ali et al., 2014).

Mathematical method: To normalize the weights, I first shift the scale so that it starts at 0, and then compress it so that it ends at 100 (%). Simply, I first subtract the minimum value and then divide by the new maximum value (which is the old maximum value minus the old minimum value) (Sundell, 2020). I have:

$$W\_normalized = \frac{W - W\_min}{W\_max - W\_min}$$

where:

W is the original weights

W_normalized is the normalized weight

W_min is the minimum value in the dataset

W_max is the maximum value in the dataset

Factors associated with older persons' employment

This section will show the results of the factors associated with OPs' employment and their type of work in 2018 and 2020, based on the 2018 and 2020 VHLSS weight data. The results are presented in Odds Ratio (OR) – Table 9.1. Most results are similar for non-weighted data and weighted data. The differences are as follows:

Regardless of gender, OPs residing in the other registration types were associated with lower probability of working compared to those residing in the commune for the weight data, which was only affected to older females' probability of working in 2020 in the non-weighted data.

The results of the weighted data also show that the increase in the number of houses was associated with lower probability of working for OPs (except older females in 2018). Meanwhile, for non-weight data, the number of houses was only statistically significant with older females' probability of working in 2020.

For the living arrangement factor, for older females, in 2018, those living alone had higher odds of working compared to those living with OPs only or those living with others. In 2020, those living alone had higher odds of working than other living arrangements (except for those living with grandchildren only). For older males, in 2018, compared to those living alone, all other living arrangements had higher odds of working; however, in 2020, older males living with their children and those living with

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grandchildren only had higher odds of working; in contrast, those living with OPs only or living with others had lower odds of working compared to those living alone (which were not statistically significant in non-weighted data).

OPs living in HHs with loans had higher odds of working (except for older females in 2018); in contrast, living in HHs with saving had lower odds of working compared to their counterparts. Meanwhile, for non-weight data, the number of houses was only statistically significant with older females' employment in 2020; however, it had a negative and significant association with the probability of working.

OPs living in HHs at higher Quintiles had higher odds of working than those at Quintile 1 (except for older males at Quintile 2 in 2020). Meanwhile, the results of non-weighted data show that for older females, those at Quintile 2 and Quintile 5 were associated with lower probability of working than those at Quintile 1.

Employing pooled cross-section analysis, compared to the year 2018, the probability of working was higher for older females in 2020. There was no significant difference in the probability of working for older females in 2020 compared to the year 2020 in non-weighted data.

Table 9.1 Factors associated with OPs' employment (employing the 2018 and 2020 VHLSS weighted data) (OR)

VARIABLES	2018		2020		Pooled cross section	
	Females	*Males*	*Females*	*Males*	*Females*	*Males*
Age	0.87***	0.88***	0.87***	0.87***	0.87***	0.88***
	0.00	0.00	0.00	0.00	0.00	0.00
Marital status:	1.34***	3.83***	1.55***	2.38***	1.42***	2.96***
Married (Other is	(0.05)	(0.22)	(0.05)	(0.14)	(0.03)	(0.12)

VARIABLES	2018		2020		Pooled cross section	
	Females	*Males*	*Females*	*Males*	*Females*	*Males*
the base category)						
Ethnicity: Kinh (Minority is the base category)	0.83***	0.97	0.92*	0.77***	0.87***	0.89***
	(0.04)	(0.05)	(0.04)	(0.04)	(0.03)	(0.03)
Living area: Urban (Rural is the base category)	0.39***	0.27***	0.50***	0.30***	0.45***	0.30***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Economic region (Southeast is the base category)						
Red River Delta	3.18***	1.15***	1.65***	1.30***	2.17***	1.25***
	(0.15)	(0.06)	(0.07)	(0.06)	(0.07)	(0.04)
Northern Midlands and Mountains	8.03***	2.90***	4.53***	3.12***	5.74***	3.03***
	(0.49)	(0.20)	(0.25)	(0.20)	(0.23)	(0.14)
North Central and Central Coastal	5.59***	3.39***	3.02***	2.36***	3.94***	2.75***
	(0.27)	(0.19)	(0.13)	(0.12)	(0.13)	(0.10)
Highlands	2.82***	2.23***	1.85***	1.89***	2.19***	2.05***
	(0.20)	(0.18)	(0.12)	(0.14)	(0.10)	(0.11)
Mekong River Delta	1.55***	1.54***	1.02	1.18***	1.21***	1.34***
	(0.08)	(0.09)	(0.04)	(0.06)	(0.04)	(0.05)
Residential registration (In commune is the base category)						
In province	0.82*	0.64***	0.28***	2.20***	0.44***	1.53***
	(0.10)	(0.08)	(0.03)	(0.20)	(0.04)	(0.11)
Other	0.63*	3.62***	0.31***	1.45***	0.37***	2.08***
	(0.15)	(0.61)	(0.04)	(0.20)	(0.04)	(0.23)
Number of HH members	0.87***	0.86***	0.88***	0.79***	0.88***	0.83***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Number of houses	0.94	1.57***	2.65***	1.87***	1.56***	1.78***
	(0.09)	(0.18)	(0.25)	(0.19)	(0.11)	(0.14)
Living arrangement (Living alone is the base category)						
Living with OP only	0.75***	1.69***	0.59***	0.69***	0.66***	0.90*
	(0.04)	(0.18)	(0.03)	(0.06)	(0.02)	(0.06)
Living with children	0.94	2.73***	0.74***	1.19*	0.82***	1.50***

VARIABLES	2018		2020		Pooled cross section	
	Females	*Males*	*Females*	*Males*	*Females*	*Males*
	(0.05)	(0.29)	(0.04)	(0.11)	(0.03)	(0.10)
Living with grandchildren only	0.99	3.71***	1.00	1.55***	0.97	1.99***
	(0.07)	(0.47)	(0.08)	(0.18)	(0.05)	(0.17)
Living with others	0.41***	1.75***	0.38***	0.54***	0.39***	0.81***
	(0.03)	(0.19)	(0.02)	(0.05)	(0.02)	(0.05)
Educational level (No qualification is the base category)						
Elementary	1.37***	1.08	0.50***	0.82***	0.91	0.93
	(0.12)	(0.08)	(0.06)	(0.06)	(0.06)	(0.05)
Intermediate	0.66***	2.50***	0.70***	2.80***	0.69***	2.59***
	(0.04)	(0.15)	(0.04)	(0.17)	(0.03)	(0.11)
College+	0.51***	0.56***	0.43***	0.59***	0.47***	0.58***
	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.02)
Health problem: Yes (No is the base category)	0.55***	0.40***	0.42***	0.34***	0.48***	0.38***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Pensions: Yes (No is the base category)	0.33***	0.32***	0.33***	0.24***	0.33***	0.28***
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Loans: Yes (No is the base category)	1.06	1.35***	1.21***	1.65***	1.13***	1.47***
	(0.05)	(0.07)	(0.05)	(0.09)	(0.03)	(0.06)
Internet use: Yes (No is the base category)	1.07	0.83***	0.83***	1.09**	0.90***	0.99
	(0.05)	(0.04)	(0.03)	(0.04)	(0.02)	(0.03)
Savings: Yes (No is the base category)	0.91***	0.78***	0.68***	0.63***	0.77***	0.68***
	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
HH income quintile (Q1 is the base category)						
Q2	1.33***	0.90**	1.29***	0.98	1.28***	0.94*
	(0.05)	(0.04)	(0.05)	(0.05)	(0.03)	(0.03)
Q3	1.24***	1.12**	1.13***	1.23***	1.18***	1.21***
	(0.05)	(0.06)	(0.05)	(0.06)	(0.03)	(0.04)
Q4	1.41***	1.44***	1.77***	1.47***	1.60***	1.42***
	(0.06)	(0.08)	(0.08)	(0.08)	(0.05)	(0.05)
Q5	1.21***	1.91***	1.30***	1.28***	1.26***	1.51***
	(0.06)	(0.12)	(0.06)	(0.07)	(0.04)	(0.06)
Year: 2020 (year 2018 is the base category)					1.07***	1.00
					(0.02)	(0.02)
Constant	9,719.43***	1,326.99***	12,244.00***	25,513.89***	10,412.48***	5,756.91***

VARIABLES	2018		2020		Pooled cross section	
	Females	*Males*	*Females*	*Males*	*Females*	*Males*
	(1736.74)	(301.06)	(2128.90)	(5651.36)	(1299.82)	(893.82)
Observations	*2,911*	*2,143*	*2,720*	*2,096*	*5,631*	*4,239*
Log-likelihood	*-19607.99*	*-14230.86*	*-21884.00*	*-16266.00*	*-41731.77*	*-30802.69*
Chi-square	*16999.59*	*13574.23*	*19086.5*	*15894.21*	*35621.48*	*28870.82*
P-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R²	*0.3024*	*0.3229*	*0.3037*	*0.3282*	*0.2991*	*0.3191*
Standard err. in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Source: Author's calculation based on the 2018 and 2020 VHLSS weighted data.

Factors associated with older persons' type of job

This section shows the factors associated with older persons' type of work employing multinomial logit model with the weighted data. The outcome of interest is the type of work, which is categorized into four groups: (i) Not working – which is the baseline category; (ii) waged work; (iii) agriculture; and (iv) non-agriculture. The following analysis focuses on the factors associated with waged work, agriculture, and non-agriculture for each gender. The results are presented in Relative Risk Ratio (RRR). Compared to the results of the non-weighted analysis, there are some differences in the results of the weighted analysis. The details are as follows:

From the living arrangement perspective, for older females, those living alone had higher likelihood of working in waged work than other types of living arrangements, which was no significant difference in the non-weight data (except for those living with others in both surveys and those living with OPs only in 2020). For older males, the results of the non-weighted data show that older males' living arrangement was not statistically significant in the probability of working in all types of work for older males in 2020; in contrast, living arrangement was statistically significant the weighted data

(except for those living with OPs only worked in agriculture and those living with children or those with grandchildren (only) worked in non-agriculture).

There was no significant difference between HH income quintile and the probability of working in waged work and agriculture in 2020 for older females in the non-weight data. However, HH income quintile was associated with the probability of working in these fields (except for those at Quintile 3 in the case of agriculture) in the weighted data. Besides, the results of the weighted analysis show that older males living in HH with loans had higher likelihood of working in all types of work, except the non-agriculture in 2020. The difference was not found in the non-weighted data.

For older females, the results of Table 9.2 show that the Kinh people had lower odds of working in waged work and agriculture but higher odds of working in non-agriculture compared to their counterpart. There was no significant difference in the of non-weighted data (except for agriculture in 2018). The results also show that the increase in the number of houses was associated with higher likelihood of working in agriculture and non-agriculture but lower likelihood of having waged work, which was not statistically significant in the non-weight data (except for non-agriculture activities in 2020).

For older males, the results of the weighted data (Table 9.3) show that the economic region was significantly associated with the probability of working in non-agriculture in 2020, which was not found the results of the non-weighted data. At the same time, married older males had higher likelihood of working in all types of work; meanwhile, for the non-weighted data, those who were married had higher likelihood of working in agriculture in 2020 than those in other marital statuses. In addition, older males using the

internet had lower likelihood of working in agriculture but higher likelihood of working in non-agriculture, while there was no statistically significant difference in the non-weighted data (except non-agriculture in 2020).

Based on the pooled cross section analysis, the results show that for older females, the likelihood of working in waged work and non-agriculture was higher in 2020 compared to the year 2018 (for the non-weighted data, the likelihood of working in waged work was higher in 2020 than in 2018). For older males, the likelihood of working in agriculture in 2020 was lower than in 2018 with a weak confidential level (p<0.1), while there was no statistically significant difference in the non-weighted data.
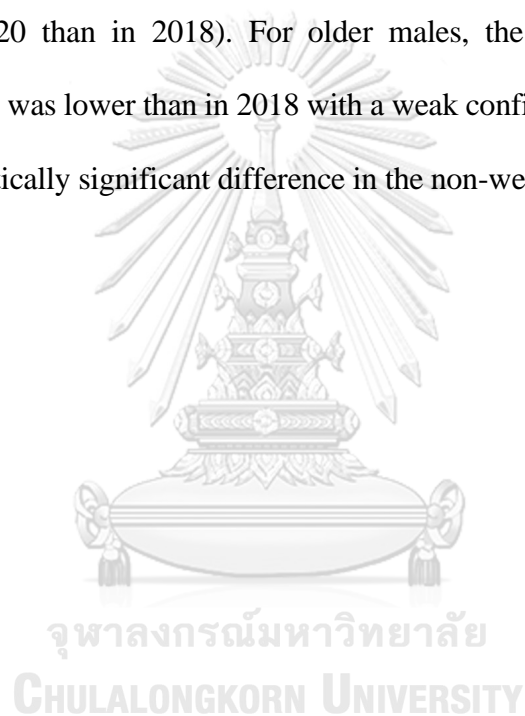
Table 9.2 Factors associated with older females' type of work, employing the 2018 and 2020 VHLSS weighted data (RRR)

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Age	0.82***	0.88***	0.89***	0.82***	0.87***	0.86***	0.82***	0.88***	0.87***
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marital status: Married (Other is the base category)	0.88*	1.64***	1.11*	1.40***	2.02***	1.02	1.13***	1.81***	1.02
	(0.06)	(0.07)	(0.06)	(0.08)	(0.08)	(0.05)	(0.05)	(0.05)	(0.04)
Ethnicity: Kinh (Minority is the base category)	0.69***	0.77***	1.73***	0.72***	0.89**	1.85***	0.72***	0.85***	1.66***
	(0.06)	(0.04)	(0.17)	(0.06)	(0.04)	(0.17)	(0.04)	(0.03)	(0.11)
Living area: Urban (Rural is the base category)	0.88**	0.19***	1.29***	1.28***	0.24***	1.37***	1.09**	0.22***	1.29***
	(0.05)	(0.01)	(0.06)	(0.06)	(0.01)	(0.06)	(0.04)	(0.01)	(0.04)
Economic region (Southeast is the base category)									
Red River Delta	3.86***	5.23***	1.37***	1.04	3.77***	0.88**	1.64***	4.31***	1.08*
	(0.41)	(0.32)	(0.10)	(0.07)	(0.22)	(0.05)	(0.09)	(0.18)	(0.05)
Northern Midlands and Mountains	3.31***	14.61***	2.15***	1.16	12.58***	1.08	1.64***	13.35***	1.46***
	(0.49)	(1.07)	(0.24)	(0.12)	(0.88)	(0.11)	(0.14)	(0.67)	(0.11)
North Central and Central Coastal	3.61***	10.01***	2.11***	1.01	7.68***	1.48***	1.58***	8.68***	1.75***
	(0.40)	(0.62)	(0.15)	(0.08)	(0.46)	(0.10)	(0.10)	(0.37)	(0.08)
Highlands	2.63***	4.83***	1.29**	0.22***	4.91***	1.08	0.71***	4.87***	1.21**
	(0.40)	(0.42)	(0.16)	(0.04)	(0.39)	(0.12)	(0.07)	(0.28)	(0.10)
Mekong River Delta	2.95***	1.62***	1.70***	0.63***	1.91***	1.00	1.11*	1.75***	1.27***
	(0.31)	(0.11)	(0.12)	(0.05)	(0.12)	(0.06)	(0.06)	(0.08)	(0.06)
Residential registration (In commune is the base category)									
In province	0.00	0.62***	1.24	0.12***	0.15***	0.39***	0.12***	0.33***	0.65***
	0.00	(0.11)	(0.19)	(0.03)	(0.03)	(0.05)	(0.03)	(0.04)	(0.06)

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VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Other	0.00	0.00	2.03***	0.67**	0.41***	0.00	0.72*	0.31***	0.23***
	0.00	0.00	(0.52)	(0.12)	(0.07)	0.00	(0.12)	(0.05)	(0.05)
Number of HH members	0.88***	0.86***	0.89***	0.75***	0.89***	0.87***	0.81***	0.88***	0.89***
	(0.05)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Number of houses	0.00	1.07	1.06	0.93	2.50***	3.42***	0.23***	1.54***	1.89***
	(0.00)	(0.11)	(0.17)	(0.22)	(0.26)	(0.44)	(0.05)	(0.11)	(0.18)
Living arrangement (Living alone is the base category)									
Living with OP only	0.49***	0.81***	0.62***	0.36***	0.59***	0.84*	0.41***	0.68***	0.73***
	(0.05)	(0.05)	(0.06)	(0.03)	(0.04)	(0.07)	(0.03)	(0.03)	(0.05)
Living with children	0.78**	1.01	0.83**	0.61***	0.73***	1.26***	0.66***	0.83***	1.00
	(0.08)	(0.06)	(0.07)	(0.05)	(0.04)	(0.11)	(0.04)	(0.04)	(0.06)
Living with grandchildren only	0.59***	1.05	1.11	0.58***	1.18**	0.94	0.58***	1.08	1.14
	(0.09)	(0.09)	(0.13)	(0.08)	(0.10)	(0.13)	(0.06)	(0.06)	(0.10)
Living with others	0.20***	0.48***	0.34***	0.33***	0.44***	0.39***	0.26***	0.45***	0.34***
	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.04)	(0.02)	(0.02)	(0.03)
Educational level (No qualification is the base category)									
Elementary	1.38*	1.52***	1.12	0.50***	0.38***	1.10	0.96	0.91	1.19
	(0.25)	(0.15)	(0.18)	(0.13)	(0.06)	(0.17)	(0.14)	(0.07)	(0.13)
Intermediate	0.72**	0.64***	0.69***	0.49***	0.87**	0.46***	0.58***	0.77***	0.58***
	(0.11)	(0.05)	(0.08)	(0.08)	(0.06)	(0.05)	(0.06)	(0.04)	(0.05)
College+	0.71*	0.40***	0.73**	0.22***	0.56***	0.28***	0.40***	0.49***	0.47***
	(0.13)	(0.04)	(0.09)	(0.05)	(0.05)	(0.04)	(0.05)	(0.03)	(0.04)
Health problem: Yes (No is the base category)	0.39***	0.54***	0.72***	0.39***	0.52***	0.15***	0.44***	0.53***	0.34***
	(0.04)	(0.02)	(0.04)	(0.03)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Pensions: Yes (No is the base category)	0.29***	0.47***	0.19***	0.22***	0.41***	0.25***	0.24***	0.44***	0.23***
	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Loans: Yes (No is the base category)	1.18**	1.06	1.07	1.95***	1.11**	1.21***	1.52***	1.09**	1.13**
	(0.10)	(0.05)	(0.08)	(0.14)	(0.05)	(0.08)	(0.08)	(0.04)	(0.06)
Internet use: Yes (No is the base category)	0.66***	0.95	1.41***	1.13**	0.75***	0.83***	1.03	0.80***	1.00
	(0.06)	(0.05)	(0.09)	(0.06)	(0.03)	(0.04)	(0.05)	(0.02)	(0.04)
Savings: Yes (No is the base category)	0.70***	1.00	0.76***	0.34***	0.77***	0.75***	0.44***	0.86***	0.76***
	(0.05)	(0.04)	(0.04)	(0.02)	(0.03)	(0.04)	(0.02)	(0.02)	(0.03)
HH income quintile (Q1 is the base category)									
Q2	1.18**	1.28***	2.53***	1.38***	1.22***	2.71***	1.25***	1.23***	2.54***
	(0.09)	(0.05)	(0.22)	(0.10)	(0.05)	(0.26)	(0.07)	(0.04)	(0.16)
Q3	0.98	1.19***	2.43***	1.35***	1.01	3.00***	1.23***	1.09***	2.60***
	(0.09)	(0.05)	(0.22)	(0.10)	(0.04)	(0.28)	(0.07)	(0.03)	(0.17)
Q4	1.19*	1.12**	4.04***	1.51***	1.49***	6.52***	1.40***	1.32***	4.98***
	(0.11)	(0.06)	(0.37)	(0.12)	(0.07)	(0.61)	(0.08)	(0.05)	(0.32)
Q5	1.01	0.93	3.63***	1.28***	0.78***	6.59***	1.18**	0.84***	5.08***
	(0.10)	(0.05)	(0.34)	(0.11)	(0.04)	(0.63)	(0.08)	(0.03)	(0.34)
Year: 2020 (year 2018 is the base category)							1.39***	0.99	1.18***
							(0.05)	(0.02)	(0.03)
Constant	7.11E+12	3,935.31***	151.57***	615,365,365.86***	1,950.22***	748.05***	974,368.71***	2,752.58***	314.55***
	(-5.16E+15)	(782.96)	(49.38)	(-2.59E+05)	(379.98)	(235.56)	(327096.60)	(383.16)	(69.92)
Observations	*2,911*			*2,720*			*5,631*		
Log-likelihood	*-30167.40*			*-34849.89*			*-65872.17*		

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VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Chi-square		16999.59			26986.82			47946.01	
P-value		0.000			0.000			0.000	
Pseudo R²		0.3024			0.2791			0.2668	

Standard err. in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation based on the 2018 and 2020 VHLSS

Table 9.3 Factors associated with older males' type of work, employing the 2018 and 2020 VHLSS weighted data (RRR)

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Age	0.82***	0.89***	0.89***	0.79***	0.87***	0.90***	0.81***	0.89***	0.90***
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marital status: Married (Other is the base category)	4.11***	3.50***	5.57***	1.44***	2.88***	1.94***	2.52***	3.08***	2.93***
	(0.41)	(0.22)	(0.67)	(0.14)	(0.20)	(0.17)	(0.17)	(0.14)	(0.20)
Ethnicity: Kinh (Minority is the base category)	1.32***	0.75***	4.95***	0.69***	0.71***	3.92***	1.07	0.75***	4.09***
	(0.12)	(0.04)	(0.73)	(0.06)	(0.04)	(0.67)	(0.07)	(0.03)	(0.45)
Living area: Urban (Rural is the base category)	0.40***	0.13***	1.38***	0.34***	0.16***	0.95	0.37***	0.15***	1.12***
	(0.02)	(0.01)	(0.08)	(0.02)	(0.01)	(0.04)	(0.01)	(0.01)	(0.04)
Economic region (Southeast is the base category)									
Red River Delta	1.67***	1.35***	0.68***	1.19***	2.09***	1.16**	1.37***	1.72***	0.96
	(0.13)	(0.08)	(0.05)	(0.08)	(0.13)	(0.07)	(0.07)	(0.08)	(0.05)

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VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Northern Midlands and Mountains	3.18*** (0.32)	3.54*** (0.28)	1.98*** (0.21)	1.28** (0.13)	6.80*** (0.54)	1.38*** (0.16)	1.99*** (0.14)	5.08*** (0.28)	1.65*** (0.13)
North Central and Central Coastal	2.63*** (0.22)	4.81*** (0.31)	1.74*** (0.14)	2.22*** (0.15)	4.48*** (0.30)	1.25*** (0.09)	2.30*** (0.12)	4.60*** (0.21)	1.43*** (0.08)
Highlands	3.37*** (0.40)	3.21*** (0.30)	0.75** (0.11)	1.16 (0.12)	3.64*** (0.33)	1.24* (0.14)	1.83*** (0.14)	3.45*** (0.22)	1.06 (0.09)
Mekong River Delta	2.23*** (0.19)	2.06*** (0.13)	0.78*** (0.07)	0.75*** (0.06)	2.03*** (0.14)	1.38*** (0.10)	1.21*** (0.06)	2.03*** (0.09)	1.12** (0.06)
Residential registration (In commune is the base category)									
In province	0.55*** (0.10)	0.62*** (0.10)	0.86 (0.17)	2.23*** (0.27)	0.48*** (0.10)	3.82*** (0.41)	1.47*** (0.15)	0.68*** (0.08)	2.47*** (0.22)
Other	0.00 (0.00)	3.07*** (0.69)	9.10*** (1.88)	3.10*** (0.48)	0.12*** (0.04)	1.75*** (0.28)	3.51*** (0.46)	0.61*** (0.11)	3.00*** (0.39)
Number of HH members	0.75*** (0.01)	0.87*** (0.01)	0.92*** (0.02)	0.71*** (0.01)	0.82*** (0.01)	0.75*** (0.01)	0.73*** (0.01)	0.85*** (0.01)	0.83*** (0.01)
Number of houses	0.53*** (0.12)	1.90*** (0.23)	1.51** (0.26)	0.82 (0.13)	1.88*** (0.21)	3.36*** (0.45)	0.80* (0.10)	1.96*** (0.16)	2.54*** (0.27)
Living arrangement (Living alone is the base category)									
Living with OP only	0.86 (0.13)	2.38*** (0.29)	0.99 (0.23)	0.78* (0.10)	0.92 (0.10)	0.49*** (0.06)	0.76*** (0.07)	1.32*** (0.10)	0.53*** (0.05)
Living with children	1.69*** (0.27)	3.35*** (0.43)	2.25*** (0.52)	1.44*** (0.19)	1.42*** (0.15)	1.19 (0.15)	1.45*** (0.14)	1.91*** (0.15)	1.25** (0.13)
Living with grandchildren only	3.01*** (0.55)	3.56*** (0.52)	6.63*** (1.65)	2.12*** (0.35)	1.90*** (0.25)	1.28 (0.22)	2.38*** (0.28)	2.32*** (0.22)	2.10*** (0.26)
Living with others	0.95 (0.12)	2.03*** (0.23)	1.67**	0.47*** (0.13)	0.51*** (0.21)	0.81* (0.10)	0.61***	0.90	0.91

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
	(0.15)	(0.26)	(0.38)	(0.06)	(0.06)	(0.10)	(0.06)	(0.07)	(0.09)
Educational level (No qualification is the base category)									
Elementary	1.01 (0.11)	0.86* (0.08)	2.15*** (0.23)	1.40*** (0.14)	0.67*** (0.07)	0.63*** (0.08)	1.22*** (0.09)	0.76*** (0.05)	1.08 (0.08)
Intermediate	3.20*** (0.26)	2.03*** (0.13)	3.59*** (0.32)	4.17*** (0.33)	2.40*** (0.16)	2.91*** (0.25)	3.62*** (0.20)	2.14*** (0.10)	3.19*** (0.19)
College+	0.73*** (0.07)	0.61*** (0.05)	0.50*** (0.06)	0.92 (0.08)	0.49*** (0.04)	0.50*** (0.05)	0.83*** (0.05)	0.55*** (0.03)	0.52*** (0.04)
Health problem: Yes (No is base category)	0.49*** (0.03)	0.35*** (0.02)	0.55*** (0.04)	0.37*** (0.02)	0.27*** (0.01)	0.47*** (0.03)	0.45*** (0.02)	0.32*** (0.01)	0.52*** (0.02)
Pensions: Yes (No is base category)	0.27*** (0.02)	0.48*** (0.02)	0.12*** (0.01)	0.16*** (0.01)	0.38*** (0.02)	0.12*** (0.01)	0.21*** (0.01)	0.43*** (0.02)	0.13*** (0.01)
Loans: Yes (No is base category)	1.65*** (0.12)	1.30*** (0.08)	1.25** (0.11)	2.01*** (0.14)	1.81*** (0.11)	0.83** (0.08)	1.76*** (0.09)	1.54*** (0.06)	0.96 (0.06)
Internet use: Yes (No is base)	0.56*** (0.03)	0.78*** (0.04)	1.17** (0.07)	1.53*** (0.07)	0.81*** (0.03)	1.42*** (0.07)	1.08*** (0.04)	0.78*** (0.02)	1.37*** (0.05)
Savings: Yes (No is base category)	0.99 (0.05)	0.82*** (0.03)	0.51*** (0.03)	0.68*** (0.03)	0.61*** (0.02)	0.65*** (0.03)	0.77*** (0.03)	0.69*** (0.02)	0.57*** (0.02)
HH income quintile (Q1 is the base category)									
Q2	1.43*** (0.12)	0.86*** (0.04)	1.52*** (0.20)	1.00 (0.08)	0.92* (0.05)	2.76*** (0.31)	1.20*** (0.07)	0.90*** (0.03)	2.20*** (0.19)
Q3	1.84*** (0.15)	0.95 (0.05)	3.04*** (0.39)	2.49*** (0.19)	0.92 (0.05)	4.30*** (0.48)	2.18*** (0.12)	0.96 (0.04)	3.97*** (0.33)
Q4	2.61***	1.03	5.50***	2.54***	1.02	6.52***	2.46***	1.02	5.88***

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
	(0.22)	(0.06)	(0.70)	(0.21)	(0.06)	(0.74)	(0.15)	(0.04)	(0.49)
Q5	2.70***	1.19**	10.69***	2.14***	0.79***	6.32***	2.37***	0.95	7.72***
	(0.25)	(0.08)	(1.38)	(0.18)	(0.05)	(0.73)	(0.15)	(0.04)	(0.65)
Year: 2020 (year 2018 is the base category)							1.04	0.96*	1.04
							(0.03)	(0.02)	(0.03)
Constant	109,866.19***	353.86***	5.33***	10728533.52***	5,444.58***	13.67***	712,597.61***	1,352.19***	8.28***
	-4.75E+04	(88.57)	(2.49)	-4.36E+06	(1372.67)	(5.18)	(203922.77)	(236.20)	(2.31)
Observations	*2,143*			*2,096*			*4,239*		
Log-likelihood	*-26016.52*			*-30697.81*			*-57774.42*		
Chi-square	*19795.52*			*24322.20*			*42076.66*		
P-value	*0.000*			*0.000*			*0.000*		
Pseudo R²	*0.2756*			*0.284*			*0.267*		

Standard err. in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation based on the 2018 and 2020 VHLSS

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The change in older persons' employment and their coping strategies

This section shows the factors associated with the change in OPs' employment during COVID-19 and their solutions to overcome employment difficulties, employing the 2021 LFS weighted data.

Factors associated with the change in employment of older persons during COVID-19

Table 9.4 shows the factors associated with the change in OPs' employment in Vietnam employing the 2021 LFS weighted data. The results show that there are some differences in comparison with the results of the non-weighted data. The details are as follows:

Married OPs had higher likelihood of changing working form, which was not shown in the non-weighted data. The results also showed that OPs in the Red River Delta and Northern Midlands and Mountains and the North Central and Central Coastal had lower likelihood of changing working form compared to those in the Southeast relative to no change, while there was no significant difference in the non-weighted analysis. For education, OPs with a university degree had higher likelihood of job loss but lower likelihood of taking temporary absence and increasing working hours compared to those without qualifications relative to no change, while there was not statistically significant in the non-weighted analysis.

Regarding employment characteristics, OPs working in industry-construction sector were associated with higher likelihood of changing working form compared to those working in agriculture, relative to no change, while there was no significant difference in the non-weighted analysis. Besides, in the non-weighted data, those working in the

informal sector had higher likelihood of increasing working hours compared to those working in the formal sector, relative to no change, but the association was not significant in the weighted analysis. At the same time, OPs working for State firms had higher likelihood of changing working form than those working as own-account workers or family workers, relative to no change, which was not statistically significant in the non-weighted analysis.

In addition, OPs with longer working duration had higher likelihood of increasing working hours compared to those with less than one year of experience relative to no change; however, in the non-weighted analysis, the working duration was not associated with the probability of increasing working hours.

Regarding the social insurance contribution and the use of IT at work, the results show that OPs contributing to social insurance scheme was associated with lower likelihood of job loss compared to their counterpart, relative to no change, while the association was not statistically significant in the non-weighted analysis. The results of the weighted data supported Hypothesis 6 of the study. Meanwhile, OPs using IT at work had higher likelihood of job loss compared to their counterpart, relative to no change, although there was no significant difference in the non-weighted analysis.

Table 9.4 Factors associated with the change in employment of older persons, employing the 2021 LFS weighted data (RRR)

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Losing job	Temporary absence	Increasing working hours	Changing working form	Losing job	Temporary absence	Increasing working hours	Changing working form
AGE	0.97***	0.98***	0.99	0.90***	0.98***	0.98***	1.00	0.77***
	0.00	0.00	(0.01)	(0.02)	0.00	0.00	(0.01)	(0.03)
GENDER: Male (Female is the base category)	1.14***	1.02	1.61***	1.08	1.44***	1.15***	0.88	1.09
	(0.04)	(0.01)	(0.18)	(0.19)	(0.07)	(0.02)	(0.11)	(0.24)
LIVING AREA: Urban (Rural is the base category)	3.26***	2.59***	4.31***	1.22	1.18***	1.42***	1.74***	0.85
	(0.11)	(0.04)	(0.46)	(0.21)	(0.06)	(0.02)	(0.20)	(0.20)
MARITAL STATUS: Married (Other is the base category)	0.65***	0.79***	1.78***	2.03**	0.74***	0.91***	1.72***	6.47***
	(0.03)	(0.01)	(0.31)	(0.61)	(0.04)	(0.02)	(0.33)	(4.10)
ECONOMIC REGION (Southeast is the base category)								
Red River Delta	0.04***	0.26***	0.17***	0.57*	0.05***	0.41***	0.22***	0.25***
	0.00	(0.01)	(0.04)	(0.18)	(0.01)	(0.01)	(0.05)	(0.10)
Northern Midlands and Mountains	0.10***	0.57***	0.53***	0.49***	0.14***	0.67***	0.55***	0.43***
	(0.01)	(0.01)	(0.06)	(0.13)	(0.01)	(0.02)	(0.07)	(0.12)
North Central and Central Coastal	0.12***	0.35***	0.17***	0.46***	0.13***	0.50***	0.20***	0.12***
	(0.01)	(0.01)	(0.03)	(0.12)	(0.01)	(0.01)	(0.03)	(0.05)
Highlands	0.01***	0.17***	0.08***	0.00	0.03***	0.34***	0.19***	0.00
	(0.01)	(0.01)	(0.03)	0.00	(0.01)	(0.02)	(0.08)	0.00
Mekong River Delta	0.41***	0.49***	0.20***	1.20	0.57***	0.72***	0.35***	1.39
	(0.02)	(0.01)	(0.03)	(0.28)	(0.03)	(0.02)	(0.06)	(0.38)

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Losing job	Temporary absence	Increasing working hours	Changing working form	Losing job	Temporary absence	Increasing working hours	Changing working form
EDUCATIONAL LEVEL (No qualification is the base category)								
Elementary	1.27***	1.56***	7.43***	0.05	0.67***	1.10**	2.40***	0.03
	(0.12)	(0.06)	(1.01)	(0.15)	(0.10)	(0.04)	(0.35)	(0.10)
Intermediate	0.49***	1.03	2.48***	3.56***	0.62***	0.79***	0.42***	2.30**
	(0.06)	(0.03)	(0.47)	(1.13)	(0.10)	(0.03)	(0.09)	(0.86)
College	1.47***	1.07	5.63***	0.00	1.55**	0.91	1.02	0.00
	(0.20)	(0.07)	(1.38)	(0.00)	(0.31)	(0.06)	(0.27)	(0.00)
University+	0.85	1.19***	7.25***	33.48***	1.55***	0.83***	0.58***	9.36***
	(0.09)	(0.05)	(0.98)	(6.17)	(0.19)	(0.04)	(0.09)	(2.89)
INDUSTRIAL SECTOR (Agriculture/Forestry/Fishery is the base category)								
Industry-Construction					1.34**	3.47***	6.89E+05	150.88*
					(0.18)	(0.25)	-5.41E+08	(450.93)
Service					1.26*	3.97***	9.33E+06	44.15
					(0.17)	(0.28)	-7.32E+09	(131.60)
ECONOMIC SECTOR (Formal is the base category)								
Household					0.15***	0.46***	5.25E+06	101.10
					(0.02)	(0.03)	-4.12E+09	(306.10)
Informal					1.10	0.85***	1.69	0.73
					(0.07)	(0.02)	(0.57)	(0.42)
TYPE OF FIRM (Own account/Family worker is the base category)								
Private					0.47***	0.64***	17.33**	1.08
					(0.06)	(0.03)	(6.21)	(0.66)

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VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Losing job	Temporary absence	Increasing working hours	Changing working form	Losing job	Temporary absence	Increasing working hours	Changing working form
State					0.25***	0.25***	86.14***	12.05***
					(0.05)	(0.01)	(29.28)	(7.08)
FDI					0.10***	0.56***	61.26***	7.28***
					(0.06)	(0.05)	(20.56)	(4.59)
CURRENT WORKING DURATION (Under 1 year is the base category)								
From 1- under 3 years					0.50***	1.52***	2.62**	0.62
					(0.05)	(0.08)	(1.21)	(0.19)
From 3- under 9 years					0.34***	1.34***	2.23*	0.07***
					(0.03)	(0.07)	(0.99)	(0.02)
9 years+					0.34***	1.55***	2.22*	0.12***
					(0.03)	(0.08)	(1.00)	(0.04)
Social insurance contribution: Yes (No is the base category)					0.66***	1.31***	1.20	1.31
					(0.11)	(0.06)	(0.15)	(0.39)
IT USE: Yes (No is the base category)					1.29**	1.57***	4.79***	4.64***
					(0.14)	(0.06)	(0.58)	(1.13)
Constant	0.66*	1.81***	0.00***	0.63	1.17	0.73*	0.00	198.44
	(0.16)	(0.17)	(0.00)	(0.93)	(0.42)	(0.10)	(0.00)	(784.95)
Observations	40,222				38,749			
Log-likelihood	-95847.08				-73650.15			
Chi-square	17973.470				32949.250			
P-value	0.000				0.000			

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Losing job	Temporary absence	Increasing working hours	Changing working form	Losing job	Temporary absence	Increasing working hours	Changing working form
Pseudo R²	0.086				0.183			

Standard err. in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation based on the 2021 LFS weighted data

OPs' solutions to overcome employment difficulties

Table 9.5 shows the factors associated with OPs' solution to overcome employment difficulties based on the 2021 LFS weighted data. The results are presented in Relative Risk Ratio (RRR). Overall, there were some differences in the results of the weighted and non-weighted data. The details are as follows:

The increase in the year of OPs' age was associated with lower likelihood of finding a new job relative to having no solution. Besides, married OPs had higher likelihood of changing to work in agriculture and having other solutions relative to having no solution, compared to their counterpart. These results were not found in the non-weighted analysis. Meanwhile, OPs in other economic regions had lower likelihood of starting a business and having other solutions relative to having no solution compared to those in the Southeast (except the North Central and Central Coastal), which was not significant in the non-weighted analysis (except for the Northern Midlands and Mountains in the case of starting a business).

Regarding the employment characteristics, OPs working in the service sector had higher likelihood of having other solutions compared to those working in agriculture, relative to having no solution, while the association was not found in the non-weighted analysis. The results of the weighted data also show that OPs working in the household or informal sectors had higher likelihood of starting a business compared to those working in the formal sector, relative to having no solution, while the result was not found in the non-weighted analysis. Moreover, OPs working for FDI firms had lower likelihood of finding a new job but higher likelihood of having other solutions to overcome employment difficulties during COVID-19, relative to having no solution,

compared to own-account/family workers. The association was not significant in the non-weighted data.

Regarding the length of working time, in the non-weighted analysis, the length of the current work was not associated with the probability of changing to work in agriculture; however, in the weighted data, those with longer years of experience at the current work had higher likelihood of changing to work in agriculture compared to having no solution. Rather than that, OPs with one to three years of experience had higher likelihood of having other solutions, relative to having no solution, than those with less than one year of experience. These results were not statistically significant in the non-weighted analysis – Table 9.5.

The results also show that OPs contributing social insurance scheme was associated with higher likelihood of finding a new job (RRR=1.33), relative to having no solution, while the result was not found in the non-weighted analysis.

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Table 9.5 Factors associated with OPs' solution to overcome employment difficulties during COVID-19, employing the 2021 LFS weighted data (RRR)

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Found a new job	*Started a business*	*Worked in agriculture*	*Other*	*Found a new job*	*Started a business*	*Worked in agriculture*	*Other*
AGE	1.02***	1.01*	1.03***	0.95***	0.98***	0.99	1.00	0.95***
	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)	0.00	(0.01)
GENDER: Male (Female is the base category)	0.98	0.83***	0.90***	1.11	1.13***	0.99	0.99	0.99
	(0.03)	(0.05)	(0.02)	(0.07)	(0.04)	(0.07)	(0.02)	(0.07)
LIVING AREA: Urban (Rural is the base category)	0.88***	0.75***	0.35***	1.42***	0.67***	0.47***	0.57***	1.04
	(0.03)	(0.05)	(0.01)	(0.09)	(0.03)	(0.04)	(0.02)	(0.08)
MARITAL STATUS: Married (Other is the base category)	0.72***	0.88*	1.06**	1.05	0.75***	1.01	1.11***	1.37***
	(0.03)	(0.06)	(0.03)	(0.09)	(0.03)	(0.08)	(0.04)	(0.13)
ECONOMIC REGION (Southeast is the category)								
Red River Delta	0.27***	0.22***	4.07***	0.22***	0.49***	0.49***	2.90***	0.44***
	(0.02)	(0.03)	(0.26)	(0.03)	(0.04)	(0.07)	(0.21)	(0.07)
Northern Midlands and Mountains	0.76***	0.34***	2.20***	0.48***	1.28***	0.45***	2.00***	0.71***
	(0.03)	(0.03)	(0.14)	(0.04)	(0.08)	(0.05)	(0.14)	(0.07)
North Central and Central Coastal	0.37***	0.40***	2.19***	0.61***	0.33***	0.72***	2.00***	0.97
	(0.02)	(0.04)	(0.14)	(0.05)	(0.03)	(0.07)	(0.14)	(0.10)
Highlands	0.07***	0.36***	2.84***	0.25***	0.16***	0.70**	2.26***	0.56***
	(0.01)	(0.05)	(0.20)	(0.05)	(0.03)	(0.12)	(0.18)	(0.11)
Mekong River Delta	0.64***	0.48***	3.39***	0.27***	0.98	0.79**	2.81***	0.43***

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Found a new job	*Started a business*	*Worked in agriculture*	*Other*	*Found a new job*	*Started a business*	*Worked in agriculture*	*Other*
	(0.03)	(0.04)	(0.21)	(0.03)	(0.06)	(0.08)	(0.20)	(0.05)
EDUCATIONAL LEVEL (No qualification is the base category)								
Elementary	0.98	0.76	0.34***	3.02***	0.89	0.55**	0.50***	2.68***
	(0.09)	(0.16)	(0.04)	(0.33)	(0.11)	(0.14)	(0.07)	(0.31)
Intermediate	0.39***	1.23	0.72***	0.96	0.28***	0.88	0.88	0.82
	(0.05)	(0.19)	(0.05)	(0.16)	(0.05)	(0.17)	(0.07)	(0.15)
College	0.34***	0.00	0.89	3.02***	0.27***	0.00	0.89	1.85***
	(0.09)	(0.00)	(0.12)	(0.55)	(0.10)	(0.00)	(0.14)	(0.44)
University+	0.35***	1.20	0.33***	1.31	0.38***	1.14	0.33***	1.01
	(0.06)	(0.23)	(0.05)	(0.22)	(0.08)	(0.23)	(0.07)	(0.18)
INDUSTRIAL SECTOR (Agriculture/Forestry/Fishery is the base category)								
Industry-Construction					0.62***	8.84***	0.85	3.03***
					(0.08)	(5.80)	(0.10)	(1.03)
Service					0.61***	13.59***	0.58***	1.83*
					(0.07)	(8.88)	(0.07)	(0.62)
ECONOMIC SECTOR (Formal is the base category)								
Household					0.63***	4.07**	1.97***	0.73
					(0.08)	(2.69)	(0.26)	(0.26)
Informal					1.22***	1.23*	1.24***	1.08
					(0.09)	(0.13)	(0.10)	(0.12)
TYPE OF FIRM (Own account/Family worker is the base category)								
Private					0.93	0.60**	0.50***	0.45***
					(0.11)	(0.13)	(0.08)	(0.08)

VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Found a new job	Started a business	Worked in agriculture	Other	Found a new job	Started a business	Worked in agriculture	Other
State					0.14***	0.24***	0.12***	0.21***
					(0.04)	(0.07)	(0.04)	(0.05)
FDI					0.45**	0.00	0.95	1.83***
					(0.15)	(0.00)	(0.27)	(0.37)
CURRENT WORKING DURATION (Under 1 year is the base category)								
From 1-under 3 years					0.65***	0.39***	1.40***	1.59**
					(0.06)	(0.06)	(0.15)	(0.33)
From 3- under 9 years					0.42***	0.47***	1.22**	1.08
					(0.04)	(0.06)	(0.12)	(0.21)
9 years+					0.40***	0.28***	1.37***	0.61**
					(0.03)	(0.04)	(0.13)	(0.12)
Social insurance contribution: Yes (No is the base category)					1.33**	1.30	1.05	4.34***
					(0.18)	(0.29)	(0.16)	(0.61)
IT USE: Yes (No is the base category)					2.19***	2.50***	2.33***	1.55***
					(0.21)	(0.35)	(0.19)	(0.21)
Constant	0.03***	0.01***	0.00***	0.25***	0.60	0.01***	0.01***	0.17**
	(0.01)	(0.00)	(0.00)	(0.12)	(0.19)	(0.01)	(0.00)	(0.12)
Observations	39,833				38,749			
Log-likelihood	-71041.7				-56248.99			
Chi-square	5585.920				7143.250			
P-value	0.000				0.000			
Pseudo R²	0.038				0.060			

Standard err. in parentheses

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VARIABLES	Module 1: Demographic characteristics				Module 2: Demographic and employment characteristics			
	Found a new job	Started a business	Worked in agriculture	Other	Found a new job	Started a business	Worked in agriculture	Other

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation based on the 2021 LFS weighted data

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The use of IT at work and the change in employees' employment and their solutions

Table 9.6 and Table 9.7 show the results of the weighted data for the factors associated with the change in workforce's employment and their solutions to overcome employment difficulties during the pandemic, respectively. Compared to the non-weighted analysis, the results of the weighted data show some differences as follows:

For the probability of the change in workforce's employment, the results show that among those not using IT, OPs had higher likelihood of taking temporary absence than those aged 15-29, relative to no change, which was in contrast with the results of the non-weighted analysis (the result showed lower likelihood). Regarding the probability of increasing working hour, in the weighted data, OPs had higher likelihood of increasing working hours, relative to no change, compared to the baseline group (age group 15-29), which was not found in the non-weighted data. Regarding the probability of changing working form, the results of the weighted data show that there was no significant difference in the probability of changing working form between OPs with or without IT use at work (Table 9.6). Meanwhile, in the non-weighted data, using IT at work brought benefits for OPs to change their working form during the pandemic compared to OPs did not use IT at work.

For the probability of workforce' solution, the results show that, among OPs, those using IT at work had higher likelihood of starting a business and having other solutions, relative to having no solution, compared to those without IT use, while the association was not found in the non-weighted analysis – Table 9.7.

Table 9.6: The factors associated with the change in employees' employment in 2021,

employing the 2021 LFS weighted data (RRR)

VARIABLES	Losing job	Temporary absence	Increasing working hours	Changing working form
GENDER: Male (Female is the base category)	1.08***	0.87***	1.04***	1.09***
	(0.01)	(0.02)	(0.01)	(0.01)
LIVING AREA: Urban (Rural is the base category)	1.01	0.65***	0.36***	1.05***
	(0.01)	(0.01)	(0.01)	(0.01)
MARITAL STATUS: Married (Other is the base category)	0.99	1.41***	1.11***	0.82***
	(0.01)	(0.04)	(0.01)	(0.01)
ECONOMIC REGION (Southeast is the base category)				
Red River Delta	0.46***	0.99	3.92***	0.97
	(0.01)	(0.04)	(0.09)	(0.02)
Northern Midlands and Mountains	0.63***	0.81***	2.05***	0.83***
	(0.01)	(0.02)	(0.05)	(0.01)
North Central and Central Coastal	0.59***	1.21***	2.87***	0.91***
	(0.01)	(0.04)	(0.06)	(0.02)
Highlands	0.44***	0.90**	3.23***	0.64***
	(0.01)	(0.05)	(0.08)	(0.02)
Mekong River Delta	0.95***	1.30***	3.20***	0.58***
	(0.01)	(0.04)	(0.07)	(0.01)
EDUCATIONAL LEVEL (No qualification is the base category)				
Elementary	1.00	1.50***	0.97	1.24***
	(0.02)	(0.05)	(0.02)	(0.03)
Intermediate	0.74***	1.37***	0.72***	1.07**
	(0.02)	(0.06)	(0.02)	(0.03)
College	0.72***	1.41***	0.63***	1.33***
	(0.02)	(0.07)	(0.02)	(0.03)
University+	0.49***	0.73***	0.35***	1.32***
	(0.01)	(0.03)	(0.01)	(0.03)
INDUSTRIAL SECTOR (Agriculture/Forestry/Fishery is the base category)				
Industry-Construction	0.79***	1.36***	0.46***	1.23***
	(0.02)	(0.11)	(0.01)	(0.06)
Service	0.66***	2.32***	0.28***	1.14**
	(0.02)	(0.19)	(0.01)	(0.06)
ECONOMIC SECTOR (Formal is the base category)				
Household	0.54***	0.57***	0.76***	0.24***

VARIABLES	Losing job	Temporary absence	Increasing working hours	Changing working form
	(0.02)	(0.05)	(0.02)	(0.01)
Informal	1.11***	1.09***	1.06***	0.69***
	(0.02)	(0.03)	(0.02)	(0.01)
TYPE OF FIRM (Own account/Family worker is the base category)				
Private	0.83***	0.36***	0.69***	0.64***
	(0.02)	(0.02)	(0.02)	(0.02)
State	0.33***	0.17***	1.08**	0.62***
	(0.01)	(0.01)	(0.04)	(0.02)
FDI	0.71***	0.29***	0.79***	0.84***
	(0.02)	(0.02)	(0.03)	(0.03)
CURRENT WORKING DURATION (Under 1 year is the base category)				
From 1-under 3 years	0.37***	0.53***	0.85***	1.14***
	(0.01)	(0.02)	(0.02)	(0.03)
From 3- under 9 years	0.25***	0.43***	0.73***	1.28***
	0.00	(0.01)	(0.01)	(0.03)
9 years+	0.20***	0.33***	0.65***	1.04
	0.00	(0.01)	(0.01)	(0.03)
SOCIAL INSURANCE CONTRIBUTION: Yes (No is the base category)	0.81***	1.14***	0.78***	1.44***
	(0.02)	(0.05)	(0.02)	(0.04)
Interaction term of age group and IT use (age group 15-29 without IT use is the base category)				
IT USE	1.63***	1.91***	1.38***	1.35***
	(0.04)	(0.10)	(0.05)	(0.03)
Age group 2 (30-44)	1.13***	1.42***	1.26***	1.02
	(0.02)	(0.05)	(0.02)	(0.02)
Age group 3 (45-59)	0.97**	1.42***	1.12***	0.90***
	(0.02)	(0.05)	(0.02)	(0.02)
Age group 4 (60 and over)	0.86***	1.31***	1.08***	0.58***
	(0.02)	(0.06)	(0.02)	(0.02)
Interaction 2 (Age group 2*IT use)	1.03	1.00	0.82***	1.06**
	(0.03)	(0.06)	(0.03)	(0.03)
Interaction 3 (Age group 3*IT use)	0.99	1.02	1.02	1.22***
	(0.04)	(0.07)	(0.05)	(0.04)
Interaction 4 (Age group 4*IT use)	1.03	1.27*	1.37***	1.11
	(0.09)	(0.17)	(0.12)	(0.13)
Constant	0.24***	0.01***	0.05***	0.02***

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VARIABLES	Losing job	Temporary absence	Increasing working hours	Changing working form
	(0.01)	0.00	0.00	0.00
Observations	409,532			
Log-likelihood	*-1161634.3*			
Chi-square	*385549.590*			
P-value	*0.000*			
Pseudo R^2	*0.142*			
Standard err. in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Source: Author's calculation based on the 2021 LFS weighted data

Table 9.7 The factors associated with the employees' solution to overcome employment difficulties during COVID-19, employment the 2021 LFS weighted data (RRR)

VARIABLES	Found a new job	Started a business	Worked in agriculture	Other solutions
GENDER: Male (Female is the	1.08***	0.95***	1.44***	0.80***
base category)	(0.01)	0.00	(0.03)	(0.02)
LIVING AREA: Urban (Rural is	1.58***	1.38***	1.08***	0.99
the base category)	(0.02)	(0.01)	(0.02)	(0.03)
MARITAL STATUS: Married	0.94***	1.01*	0.89***	0.78***
(Other is the base category)	(0.01)	0.00	(0.02)	(0.02)
ECONOMIC REGION (Southeast is the base category)				
Red River Delta	0.10***	0.46***	0.36***	0.37***
	0.00	0.00	(0.01)	(0.02)
Northern Midlands and Mountains	0.28***	0.78***	0.61***	0.77***
	0.00	0.00	(0.02)	(0.02)
North Central and Central Coastal	0.32***	0.61***	0.39***	0.41***
	(0.01)	0.00	(0.01)	(0.02)
Highlands	0.13***	0.34***	0.20***	0.46***
	(0.01)	0.00	(0.01)	(0.03)
Mekong River Delta	0.78***	0.68***	0.41***	0.59***
	(0.01)	0.00	(0.02)	(0.03)
EDUCATIONAL LEVEL (No qualification is the base category)				
Elementary	1.32***	1.29***	0.72***	1.04
	(0.03)	(0.01)	(0.04)	(0.09)

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VARIABLES	Found a new job	Started a business	Worked in agriculture	Other solutions
Intermediate	1.08***	0.95***	1.03	1.14*
	(0.03)	(0.01)	(0.04)	(0.09)
College	1.04	1.05***	0.92**	2.25***
	(0.03)	(0.01)	(0.04)	(0.13)
University+	0.86***	0.96***	0.49***	4.16***
	(0.02)	(0.01)	(0.02)	(0.19)
INDUSTRIAL SECTOR (Agriculture/Forestry/Fishery is the base category)				
Industry-Construction	1.90***	2.29***	4.86***	1.43**
	(0.08)	(0.04)	(1.49)	(0.24)
Service	1.62***	2.33***	30.33***	1.97***
	(0.07)	(0.04)	(9.23)	(0.32)
ECONOMIC SECTOR (Formal is the base category)				
Household	0.53***	0.34***	3.62***	1.63***
	(0.02)	(0.01)	(1.18)	(0.30)
Informal	1.05***	0.83***	0.66***	1.33***
	(0.02)	0.00	(0.06)	(0.11)
TYPE OF FIRM (Own account/Family worker is the base category)				
Private	0.82***	0.85***	4.92***	2.14***
	(0.02)	(0.01)	(0.38)	(0.19)
State	0.26***	0.47***	15.77***	2.37***
	(0.01)	(0.01)	(1.20)	(0.22)
FDI	1.03	1.08***	5.86***	2.01***
	(0.03)	(0.01)	(0.54)	(0.21)
CURRENT WORKING DURATION (Under 1 year is the base category)				
From 1-under 3 years	0.42***	1.32***	1.08	1.47***
	(0.01)	(0.01)	(0.06)	(0.10)
From 3- under 9 years	0.29***	1.28***	0.99	0.99
	0.00	(0.01)	(0.05)	(0.06)
9 years+	0.25***	1.32***	1.08	1.37***
	0.00	(0.01)	(0.06)	(0.09)
Social insurance contribution: Yes	0.81***	1.23***	2.19***	1.90***
(No is the base category)	(0.02)	(0.01)	(0.09)	(0.12)
Interaction term of age group and IT use (age group 15-29 without IT use is the base category)				
IT USE	0.95**	1.08***	2.63***	3.94***
	(0.02)	(0.01)	(0.13)	(0.25)
Age group 2 (30-44)	1.12***	1.01**	1.22***	1.07

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VARIABLES	Found a new job	Started a business	Worked in agriculture	Other solutions
	(0.02)	(0.01)	(0.06)	(0.07)
Age group 3 (45-59)	0.92***	0.87***	0.99	1.08
	(0.02)	(0.01)	(0.06)	(0.08)
Age group 4 (60 and over)	0.64***	0.67***	1.18**	0.62***
	(0.02)	(0.01)	(0.09)	(0.08)
Interaction 2 (Age group 2*IT use)	0.98	1.04***	0.64***	1.09
	(0.03)	(0.01)	(0.04)	(0.08)
Interaction 3 (Age group 3*IT use)	1.24***	1.18***	0.81***	1.20**
	(0.05)	(0.02)	(0.05)	(0.10)
Interaction 4 (Age group 4*IT use)	1.13	1.30***	1.77***	2.24***
	(0.13)	(0.04)	(0.20)	(0.43)
Constant	0.19***	0.36***	0.00***	0.00***
	(0.01)	(0.01)	0.00	0.00
Observations	409,532			
Log-likelihood	-674011.91			
Chi-square	104584.680			
P-value	0.000			
Pseudo R^2	0.072			
Standard err. in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Source: Author's calculation based on the 2021 LFS weighted data

Appendix 10: Robustness check

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Appendix 10 shows the results of robustness check. For the main results, the analysis focuses on the sample of older persons aged 60 and over. In Appendix 10, I limit the study to older persons aged 60 to 79 (the young-old and middle-old) and exclude those age 80+ (old-old) (Forman et al., 1992). Basically, the association between independent variables and the outcome variables remain similar to the main results. Some differences are as below:

The probability of being employed and type of job for OPs aged 60-79

Factors associated with the probability of being employed for OPs aged 60-79

- For the whole sample analysis, older males in the Highlands had higher odds of being employed compared to those in the Southeast, however, the difference was not statistically significant when we limit the analysis to those aged 60-79 (in 2020).

- For the whole sample analysis, older females using internet had lower probability of being employed in 2020 compared to their counterpart, which was not statistically significant when we limit the analysis to those aged 60-79 (in 2020).

- For the whole sample analysis, there was not statistically significant difference in the probability of being employed in 2018 between older males living in HH with or without savings. However, after limiting the analysis to those aged 60-79, the odds of being employed decreased by a factor of 0.78 (p<0.1) for older males living in HH with savings compared to those in HHs without savings.

- For the whole sample analysis, there was not statistically significant difference in the probability of being employed in 2018 between older females in Quintiles 3 and 4 compared to those in Quintile 1. However, after limiting the analysis to those aged 60-

79, compared to older females in Quintile 1, for those living Quintiles 3 and 4, the odds of being employed increased by 34% and 35% respectively.

Table 10.1: Factors associated with the probability of being employed for OPs aged 60-79 (OR)

VARIABLES	2018		2020		Pool cross section	
	Females	*Males*	*Females*	*Males*	*Females*	*Males*
Age	0.90***	0.91***	0.88***	0.87***	0.89***	0.89***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Marital status: Married (Other is the base category)	1.35**	3.75***	1.61***	2.19***	1.45***	3.00***
	(0.18)	(0.81)	(0.22)	(0.54)	(0.13)	(0.48)
Living area: Urban (Rural is the base category)	0.41***	0.29***	0.46***	0.28***	0.44***	0.29***
	(0.05)	(0.04)	(0.05)	(0.04)	(0.04)	(0.03)
Ethnicity: Kinh (Minority is the base category)	0.72*	0.74	0.85	0.73	0.79*	0.75*
	(0.12)	(0.16)	(0.15)	(0.16)	(0.10)	(0.11)
Residential registration: In commune is the base category						
In province	0.69	0.53	0.51	1.41	0.60	0.91
	(0.32)	(0.26)	(0.24)	(0.69)	(0.20)	(0.31)
Other	0.59	2.77	0.27**	0.84	0.32**	1.35
	(0.54)	(2.31)	(0.15)	(0.50)	(0.15)	(0.66)
Economic region: Southeast is the base category						
Red River Delta	2.98***	1.38	1.60**	1.21	2.20***	1.33*
	(0.57)	(0.29)	(0.32)	(0.28)	(0.30)	(0.21)
Northern Midlands and Mountains	6.21***	2.71***	4.45***	2.59***	5.29***	2.70***
	(1.43)	(0.70)	(1.07)	(0.73)	(0.87)	(0.51)
North Central and Central Coastal	3.98***	3.16***	2.46***	2.19***	3.14***	2.65***
	(0.76)	(0.70)	(0.50)	(0.53)	(0.44)	(0.43)
Highlands	2.43***	2.82***	1.70*	1.52	2.07***	2.12***
	(0.66)	(0.90)	(0.47)	(0.48)	(0.40)	(0.47)
Mekong River Delta	1.24	1.69**	0.89	1.18	1.05	1.45**
	(0.23)	(0.36)	(0.18)	(0.28)	(0.14)	(0.23)
Living arrangement: Living alone is the base category						

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VARIABLES	2018		2020		Pool cross section	
	Females	*Males*	*Females*	*Males*	*Females*	*Males*
Living with OP only	0.82	1.29	0.57**	0.72	0.69**	0.85
	(0.18)	(0.54)	(0.13)	(0.27)	(0.11)	(0.23)
Living with children	1.14	2.29*	0.77	1.29	0.94	1.50
	(0.25)	(0.98)	(0.18)	(0.49)	(0.15)	(0.42)
Living with grandchildren only	1.00	2.58*	1.02	1.46	0.98	1.68
	(0.27)	(1.27)	(0.33)	(0.71)	(0.20)	(0.57)
Living with others	0.47***	1.72	0.32***	0.59	0.39***	0.89
	(0.11)	(0.74)	(0.09)	(0.23)	(0.07)	(0.25)
Educational level: No qualification is the base category						
Elementary	1.38	1.00	0.59	0.80	0.96	0.90
	(0.50)	(0.30)	(0.25)	(0.25)	(0.26)	(0.19)
Intermediate	0.92	2.20***	0.75	2.44***	0.83	2.27***
	(0.23)	(0.52)	(0.19)	(0.64)	(0.15)	(0.40)
College+	0.63	0.58**	0.55**	0.47***	0.59**	0.52***
	(0.21)	(0.14)	(0.16)	(0.12)	(0.13)	(0.09)
Number of houses	1.59	2.44	2.60**	1.51	1.91**	1.98*
	(0.62)	(1.38)	(1.18)	(0.75)	(0.57)	(0.72)
Number of HH members	0.84***	0.84***	0.86***	0.80***	0.85***	0.82***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
Health problem: Yes (No is the base category)	0.55***	0.43***	0.44***	0.29***	0.50***	0.37***
	(0.08)	(0.07)	(0.07)	(0.05)	(0.05)	(0.04)
Pensions: Yes (No is the base category)	0.28***	0.36***	0.30***	0.26***	0.29***	0.32***
	(0.05)	(0.06)	(0.06)	(0.05)	(0.04)	(0.04)
Internet use: Yes (No is the base category)	1.12	0.90	0.81	1.20	0.92	1.06
	(0.18)	(0.15)	(0.11)	(0.17)	(0.09)	(0.11)
Loans: Yes (No is the base category)	1.07	1.11	1.31	1.61**	1.16	1.30*
	(0.16)	(0.21)	(0.23)	(0.35)	(0.13)	(0.19)
Savings: Yes (No is the base category)	0.89	0.78*	0.89	0.74**	0.88	0.75***
	(0.11)	(0.11)	(0.11)	(0.11)	(0.08)	(0.08)
HH income quintile: Quintile 1 is the base category						
Q2	1.42**	1.05	1.11	0.93	1.24**	0.99

VARIABLES	2018		2020		Pool cross section	
	Females	*Males*	*Females*	*Males*	*Females*	*Males*
	(0.21)	(0.20)	(0.18)	(0.19)	(0.13)	(0.14)
Q3	1.34*	1.36	1.11	1.14	1.21*	1.25
	(0.21)	(0.28)	(0.19)	(0.23)	(0.14)	(0.18)
Q4	1.35*	1.44*	1.44**	1.23	1.40***	1.32*
	(0.23)	(0.32)	(0.26)	(0.27)	(0.17)	(0.20)
Q5	1.44*	2.14***	1.16	1.23	1.30*	1.63***
	(0.27)	(0.51)	(0.23)	(0.29)	(0.18)	(0.27)
Year: 2020 (year 2018 is the base category)					1.08	0.91
					(0.08)	(0.08)
Constant	1,127.41***	225.21***	6,554.00***	25,633.96***	2,389.47***	1,893.18***
	(928.66)	(242.77)	(5919.33)	(28577.50)	(1449.53)	(1428.24)
Observations	*2,337*	*1,824*	*2,196*	*1,825*	*4,533*	*3,649*
Log-likelihood	*-1291.91*	*-916.72*	*-1181.29*	*-876.38*	*-2485.48*	*-1810.85*
Chi-square	*644.010*	*491.330*	*650.850*	*600.680*	*1272.830*	*1057.020*
P-value	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Pseudo R^2	*0.200*	*0.211*	*0.216*	*0.255*	*0.204*	*0.226*
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Source: Author's calculation based on the 2018 and 2020 VHLSS data

Factors associated with the type of job for older females aged 60-79

- For the whole sample analysis, compared to older females living in the rural area, those living in the urban area were more likely to work in non-agriculture relative to not working in 2018, while the association was not statistically significant for those aged 60-79.

- For the whole sample analysis, compared to older females without qualification, those with a college degree had lower probability of working in agriculture relative to no working (RRR=0.5, p<0.1) in 2020, while the association was not statistically significant for those aged 60-79.

- For the whole sample analysis, there was no statistically significant difference in the likelihood of working in non-agriculture relative to not working between those with and without health problem in 2018. After limiting the analysis to those aged 60-79, the likelihood of working in non-agriculture relative to not working between those with and without health problem in 2018 was reduced by a factor of 0.64 ($p<0.1$).

- For the whole sample analysis, there was not statistically significant difference in the likelihood of working in non-agriculture relative to not working between those with and without internet use in 2018. When the analysis was limited to those aged 60-79, the probability of working in non-agriculture relative to not working increased 46% for older females using internet compared to their counterpart ($p<0.1$).

- For the whole sample analysis, for older females in 2020 relative to the year 2018, the probability of being in waged work relative to not working increased by a factor of 1.27 ($p<0.1$), however, the association was not statistically significant after limiting the analysis to those aged 60-79.

Table 10.2: Factors associated with the type of job for older females in 2018 and 2020 (RRR)

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Age	0.85***	0.91***	0.90***	0.83***	0.88***	0.88***	0.84***	0.90***	0.89***
	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Marital status: Married	0.75	1.68***	1.18	1.55*	1.96***	1.15	1.05	1.78***	1.13
(Other is the base category)	(0.18)	(0.25)	(0.24)	(0.38)	(0.31)	(0.23)	(0.18)	(0.19)	(0.16)
Living area: Urban (Rural is	1.02	0.19***	1.27	1.02	0.23***	1.48**	1.00	0.21***	1.36**
the base category)	(0.22)	(0.03)	(0.23)	(0.21)	(0.03)	(0.26)	(0.15)	(0.02)	(0.17)
Ethnicity: Kinh (Minority is	0.74	0.68**	1.42	0.86	0.79	1.75	0.81	0.75**	1.54*
the base category)	(0.25)	(0.13)	(0.51)	(0.29)	(0.15)	(0.64)	(0.19)	(0.10)	(0.39)
Residential registration: In commune is the base category									
In province	0.00	0.53	1.05	0.21	0.29	0.74	0.15*	0.42*	0.91
	(0.00)	(0.34)	(0.60)	(0.23)	(0.22)	(0.39)	(0.16)	(0.20)	(0.35)
Other	0.00	0.00	2.34	0.36	0.46	0.00	0.34	0.32*	0.27*
	(0.00)	(0.00)	(2.33)	(0.39)	(0.30)	(0.00)	(0.36)	(0.20)	(0.21)
Economic region: Southeast is the base category									
Red River Delta	3.29***	4.07***	1.41	1.20	3.14***	0.76	1.94***	3.55***	1.03
	(1.37)	(0.94)	(0.42)	(0.40)	(0.83)	(0.21)	(0.50)	(0.61)	(0.20)
Northern Midlands and Mountains	3.17**	9.15***	2.05*	1.64	10.34***	1.12	2.23**	9.71***	1.49
	(1.65)	(2.43)	(0.80)	(0.69)	(3.06)	(0.43)	(0.72)	(1.90)	(0.40)
North Central and Central Coastal	3.80***	5.30***	2.37***	1.07	5.11***	1.31	1.97***	5.17***	1.74***
	(1.57)	(1.23)	(0.67)	(0.38)	(1.36)	(0.36)	(0.51)	(0.90)	(0.34)
Highlands	2.29	3.51***	1.15	0.32*	3.64***	1.03	0.94	3.61***	1.11
	(1.28)	(1.11)	(0.53)	(0.22)	(1.21)	(0.43)	(0.38)	(0.82)	(0.34)
Mekong River Delta	2.20**	1.10	1.54	0.69	1.44	0.77	1.17	1.25	1.08
	(0.88)	(0.26)	(0.41)	(0.23)	(0.38)	(0.20)	(0.29)	(0.22)	(0.20)
Living arrangement: Living alone is the base category									
Living with OP only	0.61	0.88	0.75	0.35***	0.61*	0.67	0.48***	0.74*	0.72
	(0.24)	(0.22)	(0.26)	(0.14)	(0.16)	(0.25)	(0.13)	(0.13)	(0.18)
Living with children	0.80	1.27	1.12	0.75	0.74	1.14	0.80	0.97	1.13

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Living with grandchildren only	0.64	1.09	1.13	0.71	1.17	0.88	0.68	1.08	1.10
	(0.30)	(0.31)	(0.39)	(0.29)	(0.19)	(0.41)	(0.21)	(0.17)	(0.28)
Living with others	0.17***	0.58**	0.48*	0.29**	0.36***	0.31**	0.23***	0.46***	0.38***
	(0.10)	(0.16)	(0.20)	(0.15)	(0.11)	(0.15)	(0.09)	(0.09)	(0.12)
Educational level: No qualification is the base category									
Elementary	0.68	1.61	1.13	0.88	0.40*	1.36	0.89	0.95	1.37
	(0.73)	(0.63)	(0.76)	(0.71)	(0.22)	(0.77)	(0.57)	(0.29)	(0.57)
Intermediate	2.12	0.69	1.14	0.49	0.82	0.76	1.12	0.76	0.93
	(1.01)	(0.20)	(0.47)	(0.32)	(0.24)	(0.33)	(0.42)	(0.15)	(0.28)
College+	1.16	0.45*	0.91	0.35	0.57	0.58	0.65	0.52**	0.73
	(0.81)	(0.19)	(0.42)	(0.28)	(0.20)	(0.28)	(0.33)	(0.14)	(0.24)
Number of houses	0.00	2.04	1.46	1.37	2.34*	3.52**	0.33	1.95**	2.04*
	(0.00)	(0.89)	(0.85)	(1.33)	(1.14)	(2.15)	(0.28)	(0.62)	(0.84)
Number of HH members	0.85***	0.83***	0.85***	0.70***	0.87***	0.86***	0.77***	0.86***	0.87***
	(0.06)	(0.03)	(0.05)	(0.05)	(0.03)	(0.05)	(0.04)	(0.02)	(0.03)
Health problem: Yes (No is the base category)	0.39***	0.54***	0.64*	0.45***	0.51***	0.22***	0.45***	0.53***	0.42***
	(0.14)	(0.09)	(0.16)	(0.13)	(0.09)	(0.07)	(0.10)	(0.06)	(0.08)
Pensions: Yes (No is the base category)	0.13***	0.45***	0.17***	0.20***	0.43***	0.17***	0.16***	0.44***	0.17***
	(0.06)	(0.10)	(0.05)	(0.10)	(0.09)	(0.05)	(0.05)	(0.07)	(0.04)
Internet use: Yes (No is the base category)	0.68	1.01	1.46*	1.08	0.74**	0.85	0.99	0.84	1.06
	(0.25)	(0.20)	(0.33)	(0.25)	(0.11)	(0.16)	(0.19)	(0.10)	(0.15)
Loans: Yes (No is the base category)	1.22	1.06	1.05	2.34***	1.17	1.35	1.62**	1.10	1.16
	(0.34)	(0.18)	(0.27)	(0.67)	(0.23)	(0.37)	(0.32)	(0.14)	(0.22)
Savings: Yes (No is the base category)	0.75	0.94	0.80	0.61**	0.98	0.90	0.67**	0.95	0.85
	(0.20)	(0.13)	(0.16)	(0.15)	(0.14)	(0.17)	(0.12)	(0.09)	(0.11)
HH income quintile: Quintile 1 is the baseline group									
Q2	1.45	1.34*	2.65***	1.07	1.01	2.77***	1.23	1.17	2.60***
	(0.40)	(0.21)	(0.86)	(0.31)	(0.17)	(1.02)	(0.25)	(0.13)	(0.63)
Q3	1.21	1.26	2.62***	1.32	0.95	2.91***	1.29	1.10	2.66***

VARIABLES	2018			2020			Pooled cross section		
	Waged work	*Agriculture*	*Non-agriculture*	*Waged work*	*Agriculture*	*Non-agriculture*	*Waged work*	*Agriculture*	*Non-agriculture*
	(0.36)	(0.22)	(0.87)	(0.40)	(0.18)	(1.09)	(0.27)	(0.14)	(0.66)
Q4	1.06	1.09	4.07***	1.05	1.13	6.22***	1.06	1.13	4.87***
	(0.35)	(0.21)	(1.36)	(0.35)	(0.22)	(2.29)	(0.25)	(0.15)	(1.19)
Q5	1.06	1.07	4.84***	0.91	0.72	6.42***	0.99	0.88	5.57***
	(0.40)	(0.23)	(1.68)	(0.33)	(0.16)	(2.45)	(0.26)	(0.13)	(1.41)
Year: 2020 (year 2018 is the base category)							1.23	1.04	1.17
							(0.17)	(0.08)	(0.13)
Constant	7.06E+10	293.59***	39.65***	201,714.42***	1,844.85***	141.91***	168,014.41***	714.99***	68.34***
	-6.56E+13	(270.38)	(55.91)	(389662.65)	(1842.38)	(212.54)	(237533.09)	(480.56)	(69.27)
Observations	*2,337*			*2,196*			*4,533*		
Log-likelihood	*-2083.67*			*-1980.26*			*-4111.22*		
Chi-square	*1039.970*			*1085.620*			*2035.280*		
P-value	*0.000*			*0.000*			*0.000*		
Pseudo R^2	*0.200*			*0.215*			*0.198*		

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Author's calculation based on the 2018 and 2020 VHLSS data

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Factors associated with the type of job for older males aged 60-79

- After limiting the analysis to those aged 60-79, for older males living in the Red River Delta relative to those in the Southeast, the probability of working in agriculture increased by 1.53 times (p<0.1), relative to no working, in 2018. The association was not statistically significant in the main analysis without the age limitation.

- For the whole sample analysis, for older males living with grandchildren only, relative to those living alone, the relative risk of working in agriculture relative to not working increased by a factor of 2.61 (p<0.1). The association was not statistically significant in the case of the sample of those aged 60-79.

- After limiting the analysis to those aged 60-79, the relative risk of working in non-agriculture relative to not working reduced by 47% for older males with a college degree relative to those without qualifications (p<0.05) in 2020, while the association was not significant in the case of the whole sample analysis.

- After limiting the analysis to those aged 60-79, the relative risk of working in agriculture and non-agriculture relative to not working increased by a factor of 2.85 and 2.37 for those whose HH have more than one houses relative to those whole HH have one house only (p<0.1) in 2018. The association was not significant in the main analysis employing the whole sample.

- For the whole sample analysis, for older males living in Quintile 2 relative to those in Quintile 1, the probability of working in waged work relative to not working increased 1.68 times (p<0.1) in 2018, which was not statistically significant when the analysis was limited to those aged 60-79. On the other hand, after limiting the analysis to those aged

60-79, the relative risk of working in waged work relative to not working increased by a factor of 1.79 for those in Quintile 5 relative to those in Quintile 1 (p<0.1) in 2020, which was not significant in the model employing the whole sample.

Table 10.3 Factors associated with the type of job for older males in 2018 and 2020 (RRR)

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Age	0.84***	0.92***	0.93***	0.79***	0.89***	0.90***	0.83***	0.91***	0.92***
	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Marital status: Married (Other is the base category)	3.61***	3.65***	4.58***	1.62	2.60***	1.48	2.68***	3.14***	2.66***
	(1.22)	(0.89)	(1.94)	(0.61)	(0.73)	(0.56)	(0.66)	(0.58)	(0.73)
Living area: Urban (Rural is the base category)	0.48***	0.13***	1.46*	0.40***	0.15***	1.06	0.44***	0.15***	1.23
	(0.09)	(0.02)	(0.31)	(0.08)	(0.02)	(0.21)	(0.06)	(0.02)	(0.18)
Ethnicity: Kinh (Minority is the base category)	0.79	0.61**	4.18**	0.63	0.70	3.61**	0.75	0.67**	3.74***
	(0.24)	(0.14)	(2.40)	(0.20)	(0.16)	(2.26)	(0.17)	(0.11)	(1.56)
Residential registration: In commune is the base category									
In province	0.32	0.56	0.74	1.31	0.67	2.17	0.71	0.66	1.39
	(0.26)	(0.33)	(0.55)	(0.87)	(0.53)	(1.25)	(0.36)	(0.31)	(0.61)
Other	0.00	5.57*	2.06	1.69	0.15*	0.87	2.30	0.94	1.14
	(0.00)	(4.91)	(2.69)	(1.12)	(0.17)	(0.67)	(1.32)	(0.60)	(0.77)
Economic region: Southeast is the base category									
Red River Delta	1.94**	1.53*	0.78	1.11	1.82**	0.91	1.55***	1.64***	0.87
	(0.59)	(0.38)	(0.25)	(0.35)	(0.55)	(0.30)	(0.34)	(0.31)	(0.20)
Northern Midlands and Mountains	2.58**	3.03***	2.38**	1.09	5.01***	1.29	1.79**	3.87***	1.77**
	(0.96)	(0.88)	(0.93)	(0.44)	(1.70)	(0.58)	(0.49)	(0.84)	(0.51)
North Central and Central Coastal	2.69***	4.25***	1.68	2.05**	3.65***	1.27	2.41***	3.83***	1.46
	(0.87)	(1.08)	(0.55)	(0.67)	(1.12)	(0.44)	(0.55)	(0.74)	(0.34)
Highlands	3.63***	3.99***	0.97	0.91	2.70***	0.90	1.91**	3.25***	0.98

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VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
	(1.60)	(1.44)	(0.52)	(0.41)	(1.02)	(0.43)	(0.59)	(0.83)	(0.35)
Mekong River Delta	2.12**	2.08***	0.93	0.74	1.80*	1.35	1.33	1.93***	1.19
	(0.66)	(0.51)	(0.30)	(0.25)	(0.55)	(0.44)	(0.30)	(0.36)	(0.27)
Living arrangement: Living alone is the base category									
Living with OP only	0.83	1.85	0.64	0.68	0.87	0.73	0.69	1.14	0.62
	(0.47)	(0.90)	(0.48)	(0.35)	(0.38)	(0.40)	(0.26)	(0.36)	(0.27)
Living with children	1.56	2.85**	1.77	1.30	1.45	1.74	1.31	1.80*	1.59
	(0.92)	(1.42)	(1.34)	(0.69)	(0.65)	(0.97)	(0.50)	(0.59)	(0.70)
Living with grandchild only	2.52	2.39	4.27*	1.62	1.56	1.89	1.90	1.72	2.55*
	(1.65)	(1.35)	(3.52)	(1.06)	(0.85)	(1.34)	(0.85)	(0.66)	(1.30)
Living with others	1.25	2.04	1.31	0.46	0.54	1.09	0.71	0.98	1.10
	(0.73)	(1.02)	(1.00)	(0.25)	(0.25)	(0.60)	(0.27)	(0.32)	(0.48)
Educational level: No qualification is the base category									
Elementary	1.07	0.84	1.59	1.23	0.71	0.70	1.13	0.79	1.01
	(0.45)	(0.30)	(0.69)	(0.51)	(0.27)	(0.35)	(0.33)	(0.20)	(0.32)
Intermediate	2.76***	1.73**	3.27***	3.19***	2.27***	2.34**	2.90***	1.93***	2.84***
	(0.86)	(0.47)	(1.12)	(1.12)	(0.67)	(0.91)	(0.67)	(0.38)	(0.72)
College+	0.77	0.53**	0.62	0.64	0.42***	0.43*	0.69	0.47***	0.52**
	(0.28)	(0.16)	(0.24)	(0.24)	(0.14)	(0.18)	(0.18)	(0.10)	(0.15)
Number of houses	0.75	2.85*	3.88*	1.00	1.31	3.45*	0.95	2.05*	3.56***
	(0.67)	(1.72)	(2.71)	(0.74)	(0.71)	(2.24)	(0.52)	(0.81)	(1.65)
Number of HH members	0.78***	0.86***	0.82***	0.72***	0.82***	0.75***	0.75***	0.85***	0.79***
	(0.05)	(0.04)	(0.06)	(0.05)	(0.03)	(0.05)	(0.03)	(0.03)	(0.04)

VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Health problem: Yes (No is the base category)	0.52***	0.39***	0.46***	0.33***	0.24***	0.37***	0.45***	0.32***	0.44***
	(0.12)	(0.07)	(0.13)	(0.09)	(0.05)	(0.11)	(0.08)	(0.04)	(0.09)
Pensions: Yes (No is the base category)	0.29***	0.51***	0.17***	0.18***	0.41***	0.12***	0.24***	0.47***	0.15***
	(0.08)	(0.10)	(0.05)	(0.05)	(0.09)	(0.04)	(0.04)	(0.07)	(0.03)
Internet use: Yes (No is the base category)	0.65*	0.81	1.40	1.62**	0.88	1.83***	1.10	0.83	1.68***
	(0.14)	(0.15)	(0.33)	(0.31)	(0.14)	(0.38)	(0.16)	(0.10)	(0.26)
Loans: Yes (No is the base category)	1.31	1.03	1.20	1.68*	1.75**	1.06	1.43*	1.31*	1.08
	(0.33)	(0.21)	(0.38)	(0.49)	(0.41)	(0.38)	(0.27)	(0.20)	(0.25)
Savings: Yes (No is the base category)	0.92	0.79	0.60**	0.79	0.66**	0.91	0.84	0.72***	0.72**
	(0.18)	(0.13)	(0.14)	(0.16)	(0.11)	(0.20)	(0.12)	(0.08)	(0.11)
HH income quintile: Quintile 1 is the baseline group									
Q2	1.61	0.99	1.45	1.07	0.90	1.61	1.35	0.96	1.54
	(0.47)	(0.20)	(0.68)	(0.34)	(0.19)	(0.69)	(0.29)	(0.14)	(0.48)
Q3	2.24***	1.14	3.28***	2.02**	0.92	2.68**	2.13***	1.03	2.92***
	(0.67)	(0.25)	(1.46)	(0.62)	(0.20)	(1.11)	(0.45)	(0.16)	(0.88)
Q4	2.45***	1.10	4.10***	1.88*	0.94	3.70***	2.11***	1.02	3.74***
	(0.78)	(0.26)	(1.87)	(0.62)	(0.23)	(1.56)	(0.48)	(0.17)	(1.15)
Q5	3.34***	1.41	8.33***	1.79*	0.86	3.99***	2.46***	1.11	5.51***
	(1.14)	(0.37)	(3.88)	(0.61)	(0.22)	(1.74)	(0.59)	(0.20)	(1.73)
Year: year 2018 is the baseline group							0.85	0.93	0.90
							(0.10)	(0.09)	(0.12)
Constant	15,826.20***	46.48***	0.36	6,063,546.88***	4,373.83***	13.79	159,767.34***	356.32***	2.29
	(27023.19)	(55.51)	(0.68)	(-1.10E+07)	(5462.83)	(25.52)	(192155.27)	(299.96)	(2.93)

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VARIABLES	2018			2020			Pooled cross section		
	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture	Waged work	Agriculture	Non-agriculture
Observations	1,824			1,825				3,649	
Log-likelihood	-1809.82			-1736.22				-3602.71	
Chi-square	887.170			1037.250				1812.260	
P-value	0.000			0.000				0.000	
Pseudo R²	0.197			0.230				0.201	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation based on the 2018 and 2020 VHLSS data

The change in employment of OPs aged 60-79 and their solutions to overcome employment difficulties during COVID-19

The results from Tables 10.4 and 10.5 show the analysis of the factors associated with the change in employment of OPs aged 60-79 and the solution to overcome employment difficulties of OPs aged 60-79 during COVID-19. The results are presented in Relative Risk Ratio.

There were no differences in the results of these modules with the modules employing for OPs aged 60 and over (the whole sample).

Table 10.4: Factors associated with the change in employment of older persons aged 60-79 during COVID-19 (RRR)

VARIABLES	Demographic characteristics				Demographic and employment characteristics			
	Job loss	Temporary absence	Increasing working hours	Changing working form	Job loss	Temporary absence	Increasing working hours	Changing working form
AGE	0.97***	0.97***	0.98	0.96	0.98*	0.97***	0.99	0.93
	(0.01)	(0.00)	(0.02)	(0.04)	(0.01)	(0.00)	(0.03)	(0.06)
GENDER: Male (Female is the base category)	1.09	0.97	1.73**	1.02	1.48***	1.15***	1.11	1.56
	(0.08)	(0.03)	(0.40)	(0.35)	(0.16)	(0.04)	(0.28)	(0.85)
LIVING AREA: Urban (Rural is the base category)	2.76***	2.45***	2.81***	1.09	1.13	1.35***	1.57**	0.93
	(0.20)	(0.07)	(0.58)	(0.37)	(0.12)	(0.04)	(0.35)	(0.44)
MARITAL STATUS: Married (Other is the baseline category)	0.66***	0.82***	2.73**	1.09	0.72***	0.94	2.60**	2.75
	(0.06)	(0.03)	(1.19)	(0.52)	(0.09)	(0.04)	(1.17)	(2.92)
ECONOMIC REGION (Southeast is the base category)								
Red River Delta	0.06***	0.31***	0.16***	1.28	0.05***	0.38***	0.16***	0.50
	(0.01)	(0.02)	(0.05)	(0.73)	(0.02)	(0.02)	(0.06)	(0.39)
Northern Midlands and Mountains	0.11***	0.56***	0.42***	0.64	0.13***	0.61***	0.37***	0.64

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VARIABLES	Demographic characteristics				Demographic and employment characteristics			
	Job loss	Temporary absence	Increasing working hours	Changing working form	Job loss	Temporary absence	Increasing working hours	Changing working form
	(0.01)	(0.03)	(0.11)	(0.40)	(0.02)	(0.03)	(0.11)	(0.46)
North Central and Central Coastal	0.19***	0.44***	0.25***	0.49	0.20***	0.57***	0.26***	0.45
	(0.02)	(0.02)	(0.07)	(0.31)	(0.03)	(0.03)	(0.08)	(0.34)
Highlands	0.02***	0.16***	0.05***	0.00	0.06***	0.30***	0.10***	0.00
	(0.01)	(0.01)	(0.04)	(0.00)	(0.02)	(0.03)	(0.08)	(0.00)
Mekong River Delta	0.46***	0.55***	0.20***	0.82	0.53***	0.73***	0.33***	1.16
	(0.04)	(0.03)	(0.07)	(0.49)	(0.06)	(0.04)	(0.12)	(0.79)
EDUCATIONAL LEVEL (No qualification is the base category)								
Elementary	1.73***	1.71***	6.36***	1.36	0.72	1.18**	1.97**	1.00
	(0.30)	(0.12)	(1.88)	(1.40)	(0.22)	(0.09)	(0.62)	(1.11)
Intermediate	0.53**	1.09	4.49***	3.15**	0.65	0.88*	1.02	2.27
	(0.14)	(0.07)	(1.35)	(1.75)	(0.20)	(0.06)	(0.33)	(1.69)
College	1.58	1.23*	6.74***	0.00	1.71	1.04	1.40	0.00
	(0.45)	(0.15)	(3.22)	(0.00)	(0.68)	(0.14)	(0.71)	(0.00)
University+	0.75	1.27***	8.89***	22.87***	1.11	0.92	1.09	3.33*
	(0.19)	(0.10)	(2.43)	(9.01)	(0.34)	(0.08)	(0.35)	(2.23)
INDUSTRIAL SECTOR (Agriculture/Forestry/Fishery is the base category)								
Industry-Construction					1.75*	3.15***	3.68E+05	1.40
					(0.55)	(0.44)	-3.44E+08	(1.80)
Service					1.75*	3.76***	2.94E+06	0.88
					(0.54)	(0.52)	-2.75E+09	(1.05)
TYPE OF FIRM (Own account/Family worker is the base category)								
Private					0.62*	0.64***	24.17***	0.80

VARIABLES	Demographic characteristics				Demographic and employment characteristics			
	Job loss	Temporary absence	Increasing working hours	Changing working form	Job loss	Temporary absence	Increasing working hours	Changing working form
					(0.17)	(0.05)	(19.63)	(0.93)
State					0.19***	0.22***	149.49***	5.00
					(0.09)	(0.02)	(112.27)	(4.90)
FDI					0.18*	0.59***	94.16***	10.37**
					(0.18)	(0.11)	(55.49)	(11.78)
ECONOMIC SECTOR (Formal is the base category)								
Household					0.18***	0.40***	5.33E+06	0.83
					(0.06)	(0.06)	-4.98E+09	(1.21)
Informal					1.05	0.86***	4.19**	0.80
					(0.15)	(0.04)	(2.96)	(0.77)
CURRENT WORKING DURATION (Under 1 year is the base category)								
From 1-under 3 years					0.44***	1.52***	1.79	0.16**
					(0.11)	(0.18)	(1.37)	(0.15)
From 3- under 9 years					0.36***	1.43***	1.43	0.07***
					(0.07)	(0.15)	(1.06)	(0.06)
9 years+					0.39***	1.56***	1.45	0.19**
					(0.08)	(0.16)	(1.09)	(0.14)
Social insurance contribution: Yes (No is the base category)					0.73	1.35***	0.83	1.74
					(0.26)	(0.12)	(0.23)	(1.10)
IT use: Yes (No is the base category)					1.16	1.56***	2.78***	11.07***
					(0.29)	(0.11)	(0.70)	(6.41)
Constant	0.75	2.26***	0.01***	0.01*	0.84	0.82	0.00	0.09
	(0.42)	(0.48)	(0.01)	(0.03)	(0.72)	(0.24)	(0.00)	(0.41)

VARIABLES	Demographic characteristics				Demographic and employment characteristics			
	Job loss	Temporary absence	Increasing working hours	Changing working form	Job loss	Temporary absence	Increasing working hours	Changing working form
Observations	39,438				38,043			
Log-likelihood	-				-			
	22973.81				17469.32			
Chi-square	3474.690				7601.150			
P-value	0.000				0.000			
Pseudo R^2	0.070				0.179			

Standard err. in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation based on the 2021 LFS data

Table 10.5 Factors associated with the solution to overcome employment difficulties of older persons aged 60-79 (RRR)

VARIABLES	Demographic characteristics				Demographic and Employment characteristics			
	Found a new job	Started a business	Worked in agriculture	Other solutions	Found a new job	Started a business	Worked in agriculture	Other solutions
AGE	1.01	1.02	1.03***	0.97**	1.00	1.01	1.00	0.97*
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)
GENDER: Male (Female is the base category)	1.01	0.84	0.89***	1.37**	1.19*	0.99	0.96	1.27
	(0.07)	(0.11)	(0.04)	(0.20)	(0.10)	(0.15)	(0.05)	(0.20)
	1.01	0.88	0.38***	1.69***	0.81**	0.58***	0.63***	1.17

VARIABLES	Demographic characteristics				Demographic and Employment characteristics			
	Found a new job	*Started a business*	*Worked in agriculture*	*Other solutions*	*Found a new job*	*Started a business*	*Worked in agriculture*	*Other solutions*
LIVING AREA: Urban (Rural is the base category)	(0.07)	(0.12)	(0.02)	(0.22)	(0.08)	(0.09)	(0.04)	(0.17)
MARITAL STATUS: Married (Other is the baseline category)	0.76***	0.90	1.06	0.79	0.80**	1.09	1.09	1.03
	(0.06)	(0.14)	(0.06)	(0.14)	(0.08)	(0.20)	(0.07)	(0.20)
ECONOMIC REGION (Southeast is the base category)								
Red River Delta	0.41***	0.58**	4.76***	0.36***	0.61***	1.11	2.78***	0.68
	(0.05)	(0.14)	(0.64)	(0.09)	(0.11)	(0.31)	(0.43)	(0.19)
Northern Midlands and Mountains	0.76**	0.48***	1.81***	0.76	1.31*	0.61*	1.72***	1.07
	(0.08)	(0.11)	(0.25)	(0.16)	(0.19)	(0.17)	(0.27)	(0.25)
North Central and Central Coastal	0.46***	0.55***	1.89***	0.61**	0.45***	0.93	1.78***	0.93
	(0.05)	(0.12)	(0.26)	(0.13)	(0.08)	(0.24)	(0.27)	(0.22)
Highlands	0.11***	0.48**	3.02***	0.37***	0.26***	0.96	2.42***	0.79
	(0.03)	(0.14)	(0.44)	(0.12)	(0.07)	(0.34)	(0.39)	(0.29)
Mekong River Delta	0.74***	0.75	3.61***	0.50***	1.04	1.22	3.05***	0.78
	(0.08)	(0.16)	(0.48)	(0.11)	(0.15)	(0.31)	(0.45)	(0.19)
EDUCATIONAL LEVEL (No qualification is the base category)								
Elementary	1.10	1.60	0.39***	2.53***	0.88	1.37	0.58**	1.96***
	(0.21)	(0.51)	(0.09)	(0.61)	(0.22)	(0.46)	(0.14)	(0.50)
Intermediate	0.58***	1.49	0.59***	1.02	0.51**	1.26	0.71**	0.79
	(0.12)	(0.40)	(0.08)	(0.32)	(0.14)	(0.39)	(0.12)	(0.28)
College	0.63	0.00	0.66	3.17***	0.49	0.00	0.81	2.22*
	(0.26)	(0.00)	(0.20)	(1.17)	(0.29)	(0.00)	(0.28)	(0.96)
University+	0.48**	1.12	0.37***	1.96**	0.42**	1.15	0.31***	1.41
	(0.15)	(0.47)	(0.10)	(0.56)	(0.17)	(0.51)	(0.13)	(0.45)

VARIABLES	Demographic characteristics				Demographic and Employment characteristics			
	Found a new job	*Started a business*	*Worked in agriculture*	*Other solutions*	*Found a new job*	*Started a business*	*Worked in agriculture*	*Other solutions*
INDUSTRIAL SECTOR (Agriculture/Forestry/Fishery is the base category)								
Industry-Construction					0.64*	5.02	0.61**	3.57*
					(0.16)	(5.11)	(0.13)	(2.58)
Service					0.63*	6.71*	0.39***	2.15
					(0.16)	(6.76)	(0.08)	(1.55)
TYPE OF FIRM (Own account/Family worker is the base category)								
Private					0.58**	0.49	0.58*	0.52**
					(0.16)	(0.23)	(0.19)	(0.17)
State					0.13***	0.12***	0.17***	0.26***
					(0.07)	(0.09)	(0.10)	(0.11)
FDI					0.37	0.00	0.97	1.06
					(0.27)	(0.00)	(0.59)	(0.53)
ECONOMIC SECTOR (Formal is the base category)								
Household					0.46***	2.06	1.61**	0.56
					(0.13)	(2.12)	(0.39)	(0.41)
Informal					1.10	1.30	1.35*	0.89
					(0.16)	(0.28)	(0.21)	(0.18)
CURRENT WORKING DURATION (Under 1 year is the base category)								
From 1-under 3 years					0.46***	0.62	1.22	1.06
					(0.10)	(0.25)	(0.24)	(0.43)
From 3- under 9 years					0.35***	0.67	0.98	0.83
					(0.06)	(0.22)	(0.17)	(0.31)
9 years+					0.31***	0.45**	0.95	0.49*
					(0.05)	(0.15)	(0.16)	(0.18)

VARIABLES	Demographic characteristics				Demographic and Employment characteristics			
	Found a new job	Started a business	Worked in agriculture	Other solutions	Found a new job	Started a business	Worked in agriculture	Other solutions
Social insurance contribution: Yes (No is the base category)					1.46	1.64	1.16	3.22***
					(0.45)	(0.81)	(0.35)	(0.95)
IT use: Yes (No is the base category)					2.38***	2.03**	2.19***	1.67**
					(0.47)	(0.64)	(0.39)	(0.43)
Constant	0.04***	0.01***	0.01***	0.08**	0.19**	0.00***	0.03***	0.04**
	(0.02)	(0.01)	(0.00)	(0.08)	(0.14)	(0.00)	(0.01)	(0.06)
Observations	39,007				38,043			
Log-likelihood	-15986.87				-12592.52			
Chi-square	1272.150				1552.430			
P-value	0.000				0.000			
Pseudo R²	0.038				0.058			
Standard err. in parentheses *** p<0.01, ** p<0.05, * p<0.1								

Source: Author's calculation based on the 2021 LFS data

REFERENCES

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Acs, G., & Karpman, M. (2020). Employment, income, and unemployment insurance during the Covid-19 Pandemic. *Urban Institute*, 1-11. https://www.urban.org/research/publication/employment-income-and-unemployment-insurance-during-covid-19-pandemic

Adamowicz, M. (2022). COVID-19 Pandemic as a Change Factor in the Labour Market in Poland. *Sustainability*, *14*(15), 9197. https://doi.org/10.3390/su14159197

Adams-Prassl, A., Boneva, T., Golin, M., & Rauh, C. (2020). Inequality in the impact of the coronavirus shock: Evidence from real time surveys. *Journal of public economics*, *189*, 104245. https://doi.org/10.1016/j.jpubeco.2020.104245

ADB. (2012). Social Pensions in Viet Nam: Status and Recommendations for

Policy Responses. In G. T. L. a. D. Wesumperuma (Ed.), *Social Protection for Older Persons: Social Pensions in Asia* (Vol. No. BKK124774). Asian Development Bank.

http://hdl.handle.net/11540/100

Adhikari, R., Soonthorndhada, K., & Haseen, F. (2011). Labor force participation in later life: Evidence from a cross-sectional study in Thailand. *BMC geriatrics*, *11*(1), 1-8. https://doi.org/10.1186/1471-2318-11-15

Agree, E. M., & Clark, R. L. (1991). Labor force participation at older ages in the Western Pacific: A microeconomic analysis. *Journal of Cross-Cultural Gerontology*, *6*(4), 413-429. https://doi.org/10.1007/BF00120069

Ahituv, A., & Zeira, J. (2011). Technical progress and early retirement. *The Economic Journal*, *121*(551), 171-193. https://doi.org/10.1111/j.1468-0297.2010.02392.x

Akkermans, J., Brenninkmeijer, V., Schaufeli, W. B., & Blonk, R. W. (2015). It's all about CareerSKILLS: Effectiveness of a career development intervention for young employees. *Human Resource Management*, *54*(4), 533-551. https://doi.org/10.1002/hrm.21633

258

Akkermans, J., Seibert, S. E., & Mol, S. T. (2018). Tales of the unexpected: Integrating career shocks in the contemporary careers literature. *SA Journal of Industrial Psychology*, *44*(1), 1-10. https://doi.org/10.4102/sajip.v44i0.1503

Al-Mansour, J. F., & Al-Ajmi, S. A. (2020). Coronavirus' COVID-19'-supply chain disruption and implications for strategy, economy, and management. *The Journal of Asian Finance, Economics and Business*, *7*(9), 659-672. https://doi.org/10.13106/jafeb.2020.vol7.no9.659

Ali, P. J. M., Faraj, R. H., Koya, E., Ali, P. J. M., & Faraj, R. H. (2014). Data normalization and standardization: a technical report. *Mach Learn Tech Rep*, *1*(1), 1-6. https://doi.org/10.13140/RG.2.2.28948.04489

Ali, Z., & Mehreen, A. (2021). Can you manage shocks? An investigation of career shocks on proactive career behavior: a COR theory perspective. *Journal of Managerial Psychology*. https://doi.org/10.1108/JMP-04-2020-0206

Ananta, A., & Arifin, E. N. (2009). OLDER PERSONS IN SOUTHEAST ASIA. *Older persons in Southeast Asia: an emerging asset*, 3.

Ando, M. S., Balakrishnan, M. R., Gruss, B., Hallaert, M. J.-J., Jirasavetakul, L.-B. F., Kirabaeva, K., Klein, N., Lariau, A., Liu, L. Q., & Malacrino, D. (2022). *European labor markets and the COVID-19 pandemic: Fallout and the path ahead*. International Monetary Fund. https://www.researchgate.net/profile/Jean-Jacques-Hallaert/publication/358986079_European_Labor_Market_and_the_COVID-19_Pandemic_-_Fallout_and_the_Path_Ahead/links/6220f4b3e474e407ea1fc90e/European-Labor-Market-and-the-COVID-19-Pandemic-Fallout-and-the-Path-Ahead.pdf

Barad, M., & Barad, M. (2018). Definitions of strategies. *Strategies and Techniques for Quality and Flexibility*, 3-4. https://doi.org/10.1007/978-3-319-68400-0_1

Becker, G. S. (2009). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago press.

https://www.academia.edu/35396287/HUMAN_CAPITAL_A_Theoretical_and_Empirical_Analysis_with_Special_Reference_to_Education_THIRD_EDITION

Bell, D. N., & Rutherford, A. C. (2013). Older workers and working time. *The journal of the economics of ageing*, *1*, 28-34. https://doi.org/10.1016/j.jeoa.2013.08.001

Binti Pazim, K. H. (2019). *The relationship between intergenerational transfers, co-residence and labour participation among older people in Malaysia* University of Southampton]. http://eprints.soton.ac.uk/id/eprint/438901

Blundell, R., Costa Dias, M., Joyce, R., & Xu, X. (2020). COVID-19 and Inequalities. *Fiscal studies*, *41*(2), 291-319. https://doi.org/10.1111/1475-5890.12232

Borg, N., Scott-Young, C. M., Naderpajouh, N., & Borg, J. (2022). Surviving adversity: personal and career resilience in the AEC industry during the COVID-19 pandemic. *Construction Management and Economics*, 1-18. https://doi.org/10.1080/01446193.2022.2096250

Börsch-Supan, A. (2000). Incentive effects of social security on labor force participation: evidence in Germany and across Europe. *Journal of public economics*, *78*(1-2), 25-49. https://doi.org/10.1016/S0047-2727(99)00110-3

Börsch-Supan, A., Hanemann, F., Beach, B., Halimi, D., Harding, S., van der Waal, M., Watanabe, D., & Staudinger, U. M. (2021). Older adults' integration in the labour market: A global view. *Ageing & Society*, *41*(4), 917-935. https://doi.org/10.1017/S0144686X19001454

Bosch, G., & Schief, S. (2007). Older employees in Europe between 'work line'and early retirement. *Transfer: European Review of Labour and Research*, *13*(4), 575-593. https://doi.org/10.1177/102425890701300405

Brewington, J. O., & Nassar-McMillan, S. (2000). Older adults: Work-related issues and implications for counseling. *The Career Development Quarterly*, *49*(1), 2-15. https://doi.org/10.1002/j.2161-0045.2000.tb00747.x

Brooks, M. M., Mueller, J. T., & Thiede, B. C. (2021). Rural-urban differences in the labor-force impacts of COVID-19 in the United States. *Socius*, *7*, 23780231211022094. https://doi.org/10.1177/23780231211022094

Cai, L., & Kalb, G. (2006). Health status and labour force participation: evidence from Australia. *Health economics*, *15*(3), 241-261. https://doi.org/10.1002/hec.1053

Card, D. (1999). The causal effect of education on earnings. *Handbook of labor economics*, *3*, 1801-1863. https://doi.org/10.1016/S1573-4463(99)03011-4

CEPAL, N. (2018). Employment Situation in Latin America and the Caribbean. Labour market participation of older persons: needs and options.

Chattopadhyay, A., Khan, J., Bloom, D. E., Sinha, D., Nayak, I., Gupta, S., Lee, J., & Perianayagam, A. (2022). Insights into Labor Force Participation among Older Adults: Evidence from the Longitudinal Ageing Study in India. *Journal of Population Ageing*, *15*(1), 39-59. https://doi.org/10.1007/s12062-022-09357-7

Coile, C. C. (2016). Economic determinants of workers' retirement decisions. *A Collection of Reviews on Savings and Wealth Accumulation*, 271-296. https://doi.org/10.1002/9781119158424.ch10

Connelly, R., & Maurer-Fazio, M. (2015). Cultural and Ethnic Differences in the Transitions from Work to'Retirement'of Rural Elders in China's Minority Regions. *IZA Discussion Paper*, *No. 9343*. https://doi.org/10.2139/ssrn.2663773

Crawford, L., French, E., & Lloyd-Walker, B. (2013). From outpost to outback: project career paths in Australia. *International Journal of Project Management*, *31*(8), 1175-1187. https://doi.org/10.1016/j.ijproman.2013.03.003

Dadras, O., SeyedAlinaghi, S., Karimi, A., Shamsabadi, A., Qaderi, K., Ramezani, M., Mirghaderi, S. P., Mahdiabadi, S., Vahedi, F., Saeidi, S., Shojaei, A., Mehrtak, M., Azar, S. A., Mehraeen, E., & Voltarelli, F. A. (2022). COVID-19 mortality and its predictors in the elderly: A systematic review. *Health Sci Rep*, *5*(3), e657. https://doi.org/10.1002/hsr2.657

Dang, A. K., Le, X. T. T., Le, H. T., Tran, B. X., Do, T. T. T., Phan, H. T. B., Nguyen, T. T., Pham, Q. T., Ta, N. T. K., & Nguyen, Q. T. (2020). Evidence of COVID-19 impacts on occupations during the first Vietnamese national Lockdown. *Annals of global health*, *86*(1), 112. https://doi.org/10.5334/aogh.2976

Dang, H.-A., & Nguyen, C. V. (2020). Did a Successful Fight against the COVID-19 Pandemic Come at a Cost? Impacts of the Outbreak on Employment Outcomes in Vietnam. *IZA Discussion Paper*, *No. 13958*. https://doi.org/10.2139/ssrn.3751851

Dang, H.-A. H., & Nguyen, C. V. (2021). Gender inequality during the COVID-19 pandemic: Income, expenditure, savings, and job loss. *World Development*, *140*, 105296. https://doi.org/10.1016/j.worlddev.2020.105296

De Vos, A., Van der Heijden, B. I., & Akkermans, J. (2020). Sustainable careers: Towards a conceptual model. *Journal of Vocational Behavior*, *117*, 103196. https://doi.org/10.1016/j.jvb.2018.06.011

Dhanaporn Chittinandana, N. K., Jaree Pinthong, Paphatsorn Sawaengsuksant. (2017). Aging Population: Global Perspectives. https://www.bot.or.th/Thai/ResearchAndPublications/DocLib_/AgingPopulation.pdf

Dietz, M., & Walwei, U. (2011). Germany—No country for old workers? *Zeitschrift für ArbeitsmarktForschung*, *44*(4), 363-376. https://doi.org/10.1007/s12651-011-0092-4

Dittrich, D., Büsch, V., & Micheel, F. (2011). Working beyond retirement age in Germany: The employee's perspective. *Older workers in a sustainable society*, 189-202.

Doan, T. M. H., & Ngo, Q. A. (2020). Flexibility and security policies for elderly workers: A case study in Vietnam. E3S Web of Conferences,

Dockery, M., & Bawa, S. (2020). Working from Home in the COVID-19 Lockdown. *BCEC*, *19*, 1-5.

Eisenberg, R. (2020, April 10, 2020). *Is Working From Home the Future of Work?* Next Avenu. Retrieved 2 December from https://www.nextavenue.org/future-of-work/

Encel, S., & Studencki, H. (2004). Older workers: can they succeed in the job market? *Australasian Journal on Ageing*, *23*(1), 33-37. https://doi.org/10.1111/j.1741-6612.2004.00006.x

Engelhardt, H. (2012). Late careers in Europe: Effects of individual and institutional factors. *European Sociological Review*, *28*(4), 550-563. https://doi.org/10.1093/esr/jcr024

Farrell, C. (2020). *How the Coronavirus Punishes Many Older Workers*. Retrieved 2 December from https://www.pbs.org/wnet/chasing-the-dream/stories/how-coronavirus-punishes-older-workers/

Fletcher, M., Prickett, K. C., & Chapple, S. (2022). Immediate employment and income impacts of COVID-19 in New Zealand: Evidence from a survey conducted during the Alert Level 4 lockdown. *New Zealand Economic Papers*, *56*(1), 73-80. https://doi.org/10.1080/00779954.2020.1870537

Forman, D. E., Berman, A. D., McCabe, C. H., Baim, D. S., & Wei, J. Y. (1992). PTCA in the elderly: the "young-old" versus the "old-old". *Journal of the American Geriatrics Society*, *40*(1), 19-22. https://doi.org/10.1111/j.1532-5415.1992.tb01823.x

Fried, L. P. (2016). Building a third demographic dividend: Strengthening intergenerational well-being in ways that deeply matter. *Public Policy & Aging Report*, *26*(3), 78-82. https://doi.org/10.1093/ppar/prw015

Gammarano, R. (2018). Paid employment vs vulnerable employment: a brief study of employment patterns by status in employment. *ILO STAT spotlight on work statistics*. http://hdl.voced.edu.au/10707/472494

Giang, L. T. (2012). Vietnam aging survey (VNAS) 2011: Key findings. *Research Gate*. https://doi.org/10.13140/RG.2.1.4839.4081

Giang, L. T., & Le, D. D. (2018). Working beyond the traditional retirement ages: How does chronic health condition influence older workers in Vietnam. *Ageing International*, *43*(2), 158-173. https://doi.org/10.1007/s12126-017-9301-y

Giang, L. T., & Pfau, W. D. (2009). A gender perspective on elderly work in Vietnam. *MPRA Paper*. https://mpra.ub.uni-muenchen.de/24946/

Giang, L. T., Pham, T. H. T., & Phi, P. M. (2019). Productive activities of the older people in Vietnam. *Social Science & Medicine*, *229*, 32-40. https://doi.org/10.1016/j.socscimed.2018.09.054

Giang, T. L., & Nguyen, T. H. D. (2016). Determinants of work decisions among older people in rural Vietnam. *Journal of Population Ageing*, *9*(4), 289-303. https://doi.org/10.1007/s12062-016-9143-5

Goda, G. S., Jackson, E., Nicholas, L. H., & Stith, S. S. (2022). The impact of Covid-19 on older workers' employment and Social Security spillovers. *Journal of Population Economics*, *36*(2), 1-34. https://doi.org/10.1007/s00148-022-00915-z

GOPFP. (2015). *Documentation: Population and Development (for training purpose)* (M. o. H. V. General Office For Population And Family Planning, Ed.). https://population.edu.vn/wp-content/uploads/2021/06/TL-DSPT.pdf

Gould, E. (2020, March 31). Older workers can't work from home and are at a higher risk for COVID-19. *Economic Policy Institute*. https://doi.org/https://www.epi.org/blog/older-workers-cant-work-from-home-and-at-high-risk-for-covid-19/

Gray, B. J., Kyle, R. G., Song, J., & Davies, A. R. (2022). Characteristics of those most vulnerable to employment changes during the COVID-19 pandemic: a nationally representative cross-sectional study in Wales. *J Epidemiol Community Health*, *76*(1), 8-15. https://doi.org/10.1136/jech-2020-216030

Greene, W. (2012). *Econometric Analysis*. Pearson Education Limited. https://www.researchgate.net/file.PostFileLoader.html?id=568181165cd9e37af18 b458f&assetKey=AS:311705391828994@1451327765378

Grigoli, F., Koczan, Z., & Topalova, P. (2022). Calling older workers back to work. *Applied Economics Letters*, *29*(6), 559-566. https://doi.org/10.1080/13504851.2021.1876205

Gruber, J., & Wise, D. A. (2009). *Social security programs and retirement around the world: Fiscal implications of reform*. University of Chicago Press.

GSO. (2019 and 2020). *Report on Labour Force Survey* https://www.gso.gov.vn/wp-content/uploads/2022/02/Bao-cao-lao-dong-viec-lam-2020_tieng-Anh.pdf

GSO. (2020a). *Completed results of the 2019 Vietnam Population and Housing Census*. https://www.gso.gov.vn/wp-content/uploads/2019/12/Ket-qua-toan-bo-Tong-dieu-tra-dan-so-va-nha-o-2019.pdf

GSO. (2020b). *Report on the impact of the Covid-19 on labour force and employment situation in Vietnam*. https://www.gso.gov.vn/en/data-and-statistics/2020/07/report-on-the-impact-of-the-covid-19-on-labour-and-employment-situation-in-viet-nam/

GSO. (2021a). *Population aging and Older persons in Vietnam*. https://www.gso.gov.vn/en/data-and-statistics/2021/08/population-ageing-and-older-persons-in-viet-nam/

GSO. (2021b). *Statistical Year Book of Vietnam 2021*. https://www.gso.gov.vn/wp-content/uploads/2022/08/Sach-Nien-giam-TK-2021-1.pdf

GSO. (2021c). *Vietnam Population Change and Family Planning Survey*. https://www.gso.gov.vn/tin-tuc-thong-ke/2022/12/ket-qua-chu-yeu-dieu-tra-bien-dong-dan-so-va-ke-hoach-hoa-gia-dinh-thoi-diem-01-4-2021/

GSO. (2022). *Impact of Covid-19 pandemic on labour, employment in Quarter I of the year 2022*. https://www.gso.gov.vn/default/2022/04/tac-dong-cua-covid-19-toi-lao-dong-viec-lam/

HAI. *The HelpAge Social Pensions Database*. Retrieved 1st February from http://www.pension-watch.net/country-data/

HAI Vietnam. (2020). *The impact of COVID-19 on older persons in Vietnam 2020 in review*.

Hite, L. M., & McDonald, K. S. (2020). Careers after COVID-19: Challenges and changes. *Human Resource Development International*, *23*(4), 427-437. https://doi.org/10.1080/13678868.2020.1779576

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American psychologist*, *44*(3), 513. https://doi.org/10.1037/0003-066X.44.3.513

Humphrey, A., Costigan, P., Pickering, K., Stratford, N., & Barnes, M. (2003). *Factors affecting the labour market participation of older workers*. Corporate Document Services Leeds, UK. https://www.voced.edu.au/content/ngv%3A6811

ILO. (2013). *The 19th International Conference of Labour Statisticians*. http://www.ilo.ch/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_230304.pdf

ILO. (2019). *A comprehensive old age pension system for Viet Nam: Delivering on Resolution 28/NQ-TW*. Retrieved 1 May from https://www.ilo.org/hanoi/Whatwedo/Publications/WCMS_729374/lang--en/index.htm

ILO. (2022a). *ILO Monitor on the world of work*. https://www.ilo.org/global/publications/books/WCMS_859255/lang--en/index.htm

ILO. (2022b). *Thailand Social Protection Diagnostic Review: Review of the pension system in Thailand*. https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_836733.pdf

ILO. (2022c). *World Employment and Social Outlook: Trends 2022*. https://www.ilo.org/global/research/global-reports/weso/trends2022/WCMS_834081/lang--en/index.htm

ILO. (2023). *Statistics on labour productivity*. https://ilostat.ilo.org/topics/labour-productivity/

Jansen, A. (2018). Work–retirement cultures: a further piece of the puzzle to explain differences in the labour market participation of older people in Europe? *Ageing & Society*, *38*(8), 1527-1555. https://doi.org/10.1017/S0144686X17000125

Jiskrova, G. K., Bobák, M., Pikhart, H., & Ksinan, A. J. (2021). Job loss and lower healthcare utilisation due to COVID-19 among older adults across 27 European countries. *J Epidemiol Community Health*, *75*(11), 1078-1083. https://doi.org/10.1136/jech-2021-216715

Kidd, S., Gelders, B., & Tran, A. (2019). Potential impacts of social pensions in Viet Nam. *Ha Noi: ILO*.

Kwak, C., & Clayton-Matthews, A. (2002). Multinomial logistic regression. *Nursing research*, *51*(6), 404-410. https://doi.org/10.1097/00006199-200211000-00009

Lakshmanan, S. (2019). How, When, and Why Should You Normalize/Standardize/Rescale Your Data? *Towards AI—The Best of Tech, Science, and Engineering*, *1*. https://towardsai.net/p/data-science/how-when-and-why-should-you-normalize-standardize-rescale-your-data-3f083def38ff

Latt, Z. M. (2018). *Determinants of labor force participation among older person in Myanmar* (Publication Number 2562003448) Chulalongkorn University].

Lee, S., Schmidt-Klau, D., & Verick, S. (2020). The labour market impacts of the COVID-19: A global perspective. *The Indian Journal of Labour Economics*, *63*(1), 11-15. https://doi.org/10.1007/s41027-020-00249-y

Legendre, B., Pedrant, A.-C., & Sabatier, M. (2018). Should I stay or should I go? An econometric analysis of retirement decisions by couples. *Applied Economics*, *50*(53), 5814-5829. https://doi.org/10.1080/00036846.2018.1488067

Li, Y., & Mutchler, J. E. (2020). Older adults and the economic impact of the COVID-19 pandemic. *Journal of Aging & Social Policy*, *32*(4-5), 477-487. https://doi.org/10.1080/08959420.2020.1773191

Liao, T. F. F., & Liao, T. F. (1994). *Interpreting probability models: Logit, probit, and other generalized linear models*. Sage.

Ling, D. C., & Chi, I. (2008). Determinants of work among older adults in urban China. *Australasian Journal on Ageing*, *27*(3), 126-133. https://doi.org/10.1111/j.1741-6612.2008.00307.x

Liu, Y.-C. (2003). *Relationships between career resilience and career beliefs of employees in Taiwan*. Texas A&M University. https://www.proquest.com/openview/86a4b1a0339a1460c1a2213a65757f19/1?pq-origsite=gscholar&cbl=18750&diss=y

MacNaughton, G., & Frey, D. F. (2015). Decent work, human rights and the sustainable development goals. *Geo. J. Int'l L.*, *47*, 607. https://doi.org/10.2139/ssrn.2613999

Marquis, M. H. (2002). What's behind the low US personal saving rate? *FRBSF Economic Letter*. https://ideas.repec.org/a/fip/fedfel/y2002imar29n2002-09.html

Mason, A. (2007). Demographic dividesnds: the past, the present, and the future. *Contributions to Economic Analysis*. https://doi.org/10.1016/S0573-8555(07)81004-2

Milligan, K., & Schirle, T. (2018). The labor force participation of older men in Canada. In *Social Security programs and retirement around the world: Working longer*

(Vol. 24874, pp. 51-65). University of Chicago Press. https://doi.org/10.3386/w24874

Mincer, J. (1974). Schooling, Experience, and Earnings. Human Behavior & Social Institutions No. 2. https://www.nber.org/system/files/chapters/c1767/c1767.pdf

Mincer, J. (1984). Human capital and economic growth. *Economics of education review*, *3*(3), 195-205.

Mintzberg, H. (1987). The strategy concept I: Five Ps for strategy. *California management review*, *30*(1), 11-24. https://doi.org/10.2307/41165263

Mishra, P., & McDonald, K. (2017). Career resilience: An integrated review of the empirical literature. *Human Resource Development Review*, *16*(3), 207-234. https://doi.org/10.1177/1534484317719622

Mishra, S. P., & Mohanty, B. (2022). Approaches to strategy formulations: A content analysis of definitions of strategy. *Journal of Management & Organization*, *28*(6), 1133-1160. https://doi.org/10.1017/jmo.2019.86

Mohd, S., Senadjki, A., & Mansor, N. Labor Force Participation of Elderly in Malaysia: Evidence from Household Income Expenditure Survey.

Morris, D., & Mallier, T. (2003). Employment of older people in the European Union. *Labour*, *17*(4), 623-648. https://doi.org/10.1111/j.1121-7081.2003.00255.x

Morrow-Howell, N., Galucia, N., & Swinford, E. (2020). Recovering from the COVID-19 pandemic: a focus on older adults. *Journal of Aging & Social Policy*, *32*(4-5), 526-535. https://doi.org/10.1080/08959420.2020.1759758

Nagel, L. (2020). The influence of the COVID-19 pandemic on the digital transformation of work. *International Journal of Sociology and Social Policy*. https://doi.org/10.1108/IJSSP-07-2020-0323

News, V. (2023). *Challenges in promoting employment among urban elderly*. Retrieved 24 October from https://vietnamnews.vn/society/1595528/challenges-in-promoting-employment-among-urban-elderly.html

Newton, N. J., Chauhan, P. K., Spirling, S. T., & Stewart, A. J. (2019). Level of choice in older women's decisions to retire or continue working and associated well-being. *Journal of Women & Aging*, *31*(4), 286-303. https://doi.org/10.1080/08952841.2018.1444947

Nigg, B. R. a. W. (2020 August 11). *People temporarily away from paid work in the UK: August 2020*. London Datastore. https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employment andemployeetypes/articles/peopletemporarilyawayfrompaidworkintheuk/august2 020

OECD. (2021). *Elderly population (indicator)*. Retrieved 28th April from https://data.oecd.org/pop/elderly-population.htm

Ogawa, N., Mansor, N., Lee, S.-H., Abrigo, M. R., & Aris, T. (2021). Population Aging and the Three Demographic Dividends in Asia. *Asian Development Review*, *38*(1), 32-67. https://doi.org/10.1162/adev_a_00157

Ojo, A. O., Fawehinmi, O., & Yusliza, M. Y. (2021). Examining the predictors of resilience and work engagement during the COVID-19 pandemic. *Sustainability*, *13*(5), 2902. https://doi.org/10.3390/su13052902

Oostendorp, R. H., & Doan, Q. H. (2013). Have the returns to education really increased in Vietnam? Wage versus employment effect. *Journal of Comparative Economics*, *41*(3), 923-938. https://doi.org/10.1016/j.jce.2012.12.002

Orimo, H., Ito, H., Suzuki, T., Araki, A., Hosoi, T., & Sawabe, M. (2006). Reviewing the definition of "elderly". *Geriatrics & gerontology international*, *6*(3), 149-158. https://doi.org/10.1111/j.1447-0594.2006.00341.x

Ozimek, A. (2020). The future of remote work. *Available at SSRN 3638597*. https://doi.org/10.2139/ssrn.3638597

Pang, L., De Brauw, A., & Rozelle, S. (2004). Working until you drop: The elderly of rural China. *The China Journal*(52), 73-94. https://doi.org/10.1016/j.jrurstud.2022.03.018

Parinding, K. A., Anwar, C., Suparman, S., & Paembonan, L. (2021). The Work Participation of the Elderly during the COVID-19 Pandemic in Palu City. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, *4*(4). https://doi.org/10.33258/birci.v4i4.3445

Paweenawat, S. W., & Liao, L. (2021). *Labor supply of older workers in Thailand: The role of co-residence, health, and pensions*. http://hdl.handle.net/10419/238581

Peachey, P. K. K. (2001). *Indicators for the Minimum Data Set Project on Ageing: A Critical Review in sub-Saharan Africa*. https://www.who.int/healthinfo/survey/ageing_mds_report_en_daressalaam.pdf

Pit, S., Fisk, M., Freihaut, W., Akintunde, F., Aloko, B., Berge, B., Burmeister, A., Ciacâru, A., Deller, J., & Dulmage, R. (2021). COVID-19 and the ageing workforce: global perspectives on needs and solutions across 15 countries. *International Journal for Equity in Health*, *20*(1), 1-22. https://doi.org/10.1186/s12939-021-01552-w

Quandt, S. A., LaMonto, N. J., Mora, D. C., Talton, J. W., Laurienti, P. J., & Arcury, T. A. (2021). COVID-19 pandemic among immigrant Latinx farmworker and non-farmworker families: A Rural–Urban comparison of economic, educational, healthcare, and immigration concerns. *NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy*, *31*(1), 30-47. https://doi.org/10.1177/1048291121992468

Quinby, L., Rutledge, M. S., & Wettstein, G. (2021). How Has COVID-19 Affected the Labor Force Participation of Older Workers? *Available at SSRN 3954484*. https://doi.org/10.2139/ssrn.3954484

Rahman, A. A., Jasmin, A. F., & Schmillen, A. (2020). The vulnerability of jobs to Covid-19: The case of Malaysia. *Yusof Ishak Institute*, *No. 2020 - 09*(Economic Working Paper). http://hdl.handle.net/11540/12748

Rajan, S. I. (2010). Demographic ageing and employment in India. *Bangkok: International Labour Organization, Regional Office for Asia and the Pacific.(ILO Asia-Pacific Working paper series)*. https://hdl.handle.net/1813/87643

Rani, U., & Dhir, R. K. (2020). Platform work and the COVID-19 pandemic. *The Indian Journal of Labour Economics*, *63*(1), 163-171. https://doi.org/10.1007/s41027-020-00273-y

Reddy, A. B. (2016). Labour force participation of elderly in India: patterns and determinants. *International Journal of Social Economics*. https://doi.org/10.1108/IJSE-11-2014-0221

Rowe, G., & Nguyen, H. (2002). Older workers and the labour market. *Perspectives on labour and income*, *3*(12), 23-26. https://www.researchgate.net/publication/253822051_Older_workers_and_the_labour_market

Ryan, C., & Sinning, M. (2010). *Who Works beyond the" Standard" Retirement Age and Why? A National Vocational Education and Training Research and Evaluation Program Report*. ERIC. https://eric.ed.gov/?id=ED512530

S. Blum, M. B., R.C. Silver. (2012). *Encyclopedia of Human Behavior*. https://doi.org/https://doi.org/10.1016/B978-0-12-375000-6.00110-5

Sanchez, D. G., Parra, N. G., Ozden, C., & Rijkers, B. (2020). Which jobs are most vulnerable to COVID-19? What an analysis of the European Union reveals. *What an Analysis of the European Union Reveals (May 11, 2020). World Bank Research and Policy Briefs*(148384). https://ssrn.com/abstract=3602354

Sanderson, S. S. a. W. (2019). *Measuring population ageing: bridging research and policy*.

https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd
/files/unpd_egm_201902_s1_sergeischerbov.pdf

Sanderson, W. C., & Scherbov, S. (2007). A new perspective on population aging.
Demographic research, *16*, 27-58.
https://doi.org/https://www.jstor.org/stable/26347928

Sanderson, W. C., & Scherbov, S. (2019). New Measures of Population Ageing. Expert
Group Meeting:"Measuring population ageing: Bridging Research and Policy",
Bangkok, Thailand, 25–26 February 2019. *Policy*, *25*, 26.
https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd
/files/unpd_egm_201902_s1_sergeischerbov.pdf

Sazmaz, E. B., Ozkok, I., Simsek, H., & Gulseven, O. (2021). The Impact of COVID-
19 on European Unemployment and Labor Market Slack. *Available at SSRN
3766376*. https://doi.org/10.2139/ssrn.3766376

Schmidt, L., & Sevak, P. (2009). Taxes, wages, and the labor supply of older Americans.
Research on Aging, *31*(2), 207-232. https://doi.org/10.1177/0164027508328310

Schofield, D. J., Shrestha, R. N., Passey, M. E., Earnest, A., & Fletcher, S. L. (2008).
Chronic disease and labour force participation among older Australians. *Medical
Journal of australia*, *189*(8), 447-450. https://doi.org/10.5694/j.1326-
5377.2008.tb02119.x

Schramm, R. L. A. a. J. (2020). *Coronavirus' Devastating Economic Impact on Workers
Age 50-Plus*. Retrieved 17 November 2022 from https://www.aarp.org/politics-
society/advocacy/info-2020/coronavirus-economic-impact-older-workers.html

Sharma, M. (2023). Coping Strategies. *Salem Press Encyclopedia of Health*.
https://discovery-ebsco-
com.chula.idm.oclc.org/c/3q5j6g/details/ltkvhilezz?q=Coping%20Strategies

Sigg, R. (2005). A global overview on social security in the age of longevity.
International Social Security Association Geneva.

https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd
/files/unpd_egm_200508_09_sigg.pdf

Stephenson, E., & DeLongis, A. (2020). Coping strategies. *The Wiley encyclopedia of health psychology*, 55-60. https://doi.org/10.1002/9781119057840.ch50

Sundell, A. (2020). *Center, standardize and normalize variables*. https://www.stathelp.se/en/center_en.html

Swiaczny, F. (2019). *Demographic megatrends and global population growth* Meeting on Population, Food Security, Nutrition and Sustainable Development, New York. https://policycommons.net/artifacts/47785/population-food-security-nutrition-and-sustainable-development/

Teerawichitchainan, B., Prachuabmoh, V., & Knodel, J. (2019). Productive aging in developing southeast Asia: Comparative analyses between Myanmar, Vietnam and Thailand. *Social Science & Medicine*, *229*, 161-171. https://doi.org/10.1016/j.socscimed.2018.09.053

Tien, N. D. (2014). An analysis of labour market returns to education in Vietnam: evidence from the national labour force survey 2012. *International Training Centre of the International Labour Organization Working Paper*, *3*, 1-31. https://www.itcilo.org/sites/default/files/inline-files/nguyen.pdf

Tong, Y., Chen, F., & Su, W. (2019). Living arrangements and older people's labor force participation in Hong Kong, 1986–2016. *Social Science & Medicine*, *229*, 50-59. https://doi.org/10.1016/j.socscimed.2018.10.011

Tran, B. X., Nguyen, H. T., Le, H. T., Latkin, C. A., Pham, H. Q., Vu, L. G., Le, X. T. T., Nguyen, T. T., Pham, Q. T., & Ta, N. T. K. (2020). Impact of COVID-19 on economic well-being and quality of life of the Vietnamese during the national social distancing. *Frontiers in psychology*, *11*, 565153. https://doi.org/10.3389/fpsyg.2020.565153

Tuominen, E., & Takala, M. (2006). Ageing Workforce and Employers' Attitudes to Employment of Older Persons–The Case of Finland. https://urn.fi/URN:ISBN:951-691-065-3

Umar, M., Xu, Y., & Mirza, S. S. (2021). The impact of Covid-19 on Gig economy. *Economic Research-Ekonomska Istraživanja*, *34*(1), 2284-2296. https://doi.org/10.1080/1331677X.2020.1862688

UN. (1991). United Nations Principles for Older persons, Adopted by General Assembly resolution 46/91 of 16 December 1991.

UN. (2022a). *Living Arrangements of Older Persons*. https://www.un.org/development/desa/pd/data/living-arrangements-older-persons

UN. (2022b). *World Population Prospects 2022*. https://population.un.org/dataportal/data/indicators/71/locations/704/start/2000/end/2050/table/pivotbylocation

Visaria, A., & Dommaraju, P. (2019). Productive aging in India. *Social Science & Medicine*, *229*, 14-21. https://doi.org/10.1016/j.socscimed.2018.07.029

Weeks, J. R. (2020). *Population: An introduction to concepts and issues*. Cengage Learning. https://www.academia.edu/32381843/POPULATION_An_Introduction_to_Concepts_and_Issues_Tenth_Edition

Wongboonsin, K., Guest, P., & Prachuabmoh, V. (2005). Demographic change and the demographic dividend in Thailand. *Asian Population Studies*, *1*(2), 245-256. https://doi.org/10.1080/17441730500317493

Woodd, M. (1999). The move towards a different career pattern: are women better prepared than men for a modern career? *Women in Management Review*. https://doi.org/10.1108/09649429910255465

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT press.

http://www.mmf.lnu.edu.ua/images/stories/depart/mee/wooldridge_cross_section
_and_panel_data.pdf

Wooldridge, J. M. (2015). *Introductory econometrics: A modern approach*. Cengage learning.
http://lms.aambc.edu.et:8080/xmlui/bitstream/handle/123456789/217/Introductor
y%20econometrics.%20A%20modern%20approach%20(%20PDFDrive%20).pdf
?sequence=1

Woźniak, B., Brzyska, M., Piłat, A., & Tobiasz-Adamczyk, B. (2022). Factors affecting work ability and influencing early retirement decisions of older employees: an attempt to integrate the existing approaches. *International Journal of Occupational Medicine and Environmental Health*, *35*(5), 509-526. https://doi.org/10.13075/ijomeh.1896.01354

Ybema, J. F., Geuskens, G. A., van den Heuvel, S. G., de Wind, A., Leijten, F. R., Joling, C. I., Blatter, B. M., Burdorf, A., van der Beek, A. J., & Bongers, P. M. (2014). Study on Transitions in Employment, Ability and Motivation (STREAM): the design of a four-year longitudinal cohort study among 15,118 persons aged 45 to 64 years. *British Journal of Medicine and Medical Research*, *4*(6), 1383-1399. https://doi.org/10.9734/BJMMR/2014/7161

Ziegenhain, P. (2021). Getting Old Before Getting Rich (and not Fully Realizing It): Premature Ageing and the Demographic Momentum in Southeast Asia. In *Global Political Demography* (pp. 167-193). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-73065-9

Zieliński, M. (2022). The Effect of the COVID-19 Pandemic on the Labor Markets of the Visegrad Countries. *Sustainability*, *14*(12), 7386. https://doi.org/10.3390/su14127386

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