

UNIVERSITY OF TARTU

Faculty of Social Sciences

School of Economics and Business Administration



Abolaji Rilwan Oyinloye

Part-time Employment in Estonia and The Business Cycle

Master's thesis

Supervisor:

Visiting Research Fellow Liis Roosaar

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DECLARATION

I have conducted the research study in this work and written the thesis independently. Any ideas or data taken from other authors or other sources have been fully referenced.

ACKNOWLEDGMENT

First and foremost, all glory and adoration go to Almighty Allah for giving me the wherewithal and grace to start and finish my MA program. Without the gift of life and health, none of this would have mattered.

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Lastly, I dedicate this thesis to my family, especially my wife and children who were a beam of hope that made the effort worthwhile; you guys have been wonderful through this journey. And to my ever-supportive friend and brother Jubril Adigun with whom this whole journey was made possible from the beginning.

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ABSTRACT

In today's ever-changing and dynamic labor market, the concept of part-time employment has gained significant traction as a viable alternative to traditional full-time work. Estonia, a thriving Baltic nation known for its technological advancements and entrepreneurial spirit, presents a fascinating case study for examining the effect of the business cycle on part-time work. This paper explores the effect of the business cycle phase on part-time employment in Estonia. Analyzing different economic periods such as the Great Recession, boom, and COVID-19 periods. The two crisis periods are expected to have a severe economic downturn and impact on part-time work. The key result shows that the Great Recession has a higher impact on part-time work than the COVID-19 pandemic period. This led to the conclusion that the recession period has a significant negative effect on part-time employment in Estonia. When the economy is performing below its capacity, part-time employment tends to increase more than full-time employment. The effect of the business cycle on involuntary part-time work is more severe during the Great Recession period based on the analysis of the result. Further analyses also show that geographically West Estonia and South Estonia have a higher probability of having residents who work part-time in the three periods.

Keywords: involuntary part-time work, economic crisis and boom, COVID-19, Great Recession, business cycle

CERCS Codes: S180 - Economics, econometrics, economic theory, economic systems, economic policy;

1 INTRODUCTION

1.1 Overview

In recent decades, there has been significant growth in non-traditional forms of employment in Europe (Fialová, 2017). In 2017, Eurostat data revealed that approximately 43 million individuals aged 15 to 64 in the European Union (EU) were employed part-time, which equates to 19.4 percent of individuals with jobs in the EU. Over the past 15 years, the percentage of individuals working part-time in relation to total employment has ranged between 15.6 percent and 19.6 percent in the EU (Eurostat, 2017). Throughout the period of the Great Recession, there was a significant increase in part-time employment within the U.S. economy that persisted for a considerable duration. Indeed, the proportion of part-time employment in the U.S. has risen during economic downturns and declined during periods of growth and expansion. (Kang et al., 2020) Estonia has a smaller economy compared to a lot of other EU countries. It is pertinent to investigate part-time work over the crisis periods: the Great Recession and the COVID-19 pandemic period as well as factors related to part-time work. Furthermore, we also check the factors between the two crises during the economic boom period.

Prior studies have shown that during the crisis period, there is an increase in non-standard jobs resulting from the loss of full-time jobs, which brings about an increase in the supply of part-time jobs, leading to an increase in involuntary part-time work (Horemans et al., 2016). (Borowczyk-Martins, et al., 2017) gave an insight that under normal conditions, part-time work gives specific groups of employees and employers a choice of job arrangements besides full-time employment. Women, as well as those who are young or old, are more likely to perform voluntary part-time jobs. It is common in some professions and industries and is typically an individual decision made by the workers. However, the compensation is significantly lower than in full-time employment (Fialová, 2017). Fialová (2017) conducted a comparison between Central and Western Europe based on the growth of part-time work in different business phases. Her main finding shows that, in contrast to the West, the change in the business cycle has a substantial negative impact on the rate of part-time employment in Eastern Europe. The gap in these studies is that each of them limited the crisis period to only the Great Recession, see for example (Canon et al., 2014; Fialová, 2017; Kang et al., 2020), and others. This research analyzed part-time work in Estonia during the Great Recession, the period of economic growth, and the COVID-19 pandemic using the probit model following the

example of (Krillo & Masso, 2010). Furthermore, no extensive research has been conducted on differences in the impact of different economic cycle phases on part-time work in Estonia.

1.2 Study Aim

The aim of the current paper is to find out how working part-time has changed in different business cycle phases in Estonia, a small country in the Baltic region geographically situated in Northern Europe. Investigating the change in part-time work during the Great Recession, the boom period, and the COVID-19 pandemic period using the data from the Estonian Labor Force Survey, several contributions to the existing literature are made in this paper. Firstly, according to the best knowledge of the author, there are no studies focusing on comparing the effects of more than one economic recession on part-time work. Only a few have analyzed the general effect the Great Recession had on part-time work, for example, Merikull (2011) in Estonia, Canon et al. (2014) in the U.S, Kang et al. (2020) in the U.S, and Fialová (2017) in Western and Eastern Europe. Also, this paper distinguishes part-time work into voluntary and involuntary part-time work rather than a homogeneous group, this is necessary to find out the growth of each group in different business cycle phases.

1.3 Planned Methodology

For this analysis, the author will make use of data from the Estonian Labor Force Survey, a highly reliable dataset. The dataset has been used in several studies that have been published globally, and it has a good number of individual and firm-specific variables (Leping & Toomet, 2008). The time frame considered is 2007 – 2021, the author captures such a long period to examine the Great Recession, boom, and the COVID-19 pandemic period. Probit models are constructed to analyze the probability to work part-time across the three periods as used by (Krillo & Masso, 2010). The key result shows that the Great Recession has a higher effect on part-time work than during the COVID-19 pandemic period. There was a more significant change in part-time work during the Great Recession than during the COVID-19 period. This led to the conclusion that the two recession periods (The great Recession and COVID-19) had different significant negative effects on part-time employment in Estonia. When the economy is performing below its capacity, part-time employment tends to increase at a higher rate compared to full-time employment.

1.4 Thesis Structure

The rest of the paper is structured as follows: 2 provides an overview of previous literature of part-time work and its relationship with the business cycle; the adopted methodology is described in 3, while a general statistical overview of the data is offered; the results and discussion are indicated in 4 and finally, in 5, the conclusion is presented.

2 THEORETICAL FRAMEWORK OF PART-TIME WORK IN ESTONIA

2.1 Determinants of part-time employment and the effect of the business cycle

According to the ILO Part-time work convention, 1994 (No. 175) “part-time worker” is defined as “*an employed person whose normal hours of work are fewer than those of comparable full-time workers*”. There are two types of part-time work: firstly, voluntary part-time workers who have decided willingly to work part-time rather than get full-time jobs; and secondly, involuntary workers who are unable to find a full-time job. Several surveys reveal that in most industrialized countries, members of the labour force would prefer to work part-time at some stage in their life. (Cam, 2012; Fagan et al., n.d.) . Existing literature strongly indicates that women are more likely than men to work involuntary part-time hours in the United States and that part-time work is typically low paid (Pech et al., 2021).

Voluntary part-time employment sometimes may be a route for individuals to attain a full-time job; a way of earning some money while studying e.g., students, or caring for family, it could also be a way for people with poor health as well as old, retired people to be part of the workforce. Workers with care responsibility make their decision to work part-time due to some constraint which includes lack of childcare services, or the type of work schedule the partners have in a two-parent household. Though they might prefer to work longer hours (Fagan et al., n.d.). Workers who work involuntarily as part-time workers do that mostly because they could not get full-time jobs and not because they are satisfied working part-time, for most households working part-time is not a feasible option due to the lower pay and career nonfulfillment. (Euwals & Hogerbrugge, 2006).

Recent literature has shown that the growth of part-time employment can be attributed to the labor supply and demand factors; the wishes of employees, and the business needs were the primary reason for introducing part-time employment in the company. The growth of part-time employment, from the perspective of labour supply, is the result of a complex interplay of variables, particularly the household division of labor in relation to the sectors and labor market conditions (Weber et al., 2017). Women and men of various ages have very diverse reasons for wanting to work part-time. Human capital and work orientation theories for women explain the impact of differences in women's market resources on their labor supply, which is significantly impacted by the two major drivers for part-time employment: motherhood and

caring responsibilities. Contrarily, most men who work part-time are recent graduates, young employees just entering the workforce, or older, retired workers (Cam, 2012).

Part-time employment for men concerns mostly young labour market entrants or students while female part-time employment is more evenly distributed across age groups and thus, part-time work for women presents a more stable labour market state than for men. Looking at the labour demand side part-time employment serves as a source of cheaper labour for businesses and is viewed as a marginalized, secondary type of employment. Companies sell flexibility as an advantage for working part-time, allowing firms to easily match labour input with the business cycle development. (Fialová, 2017).

The fact that part-time employment's share of total employment changes with the business cycle is a characteristic of this type of work. Part-time work typically increases during the economic downturn and decreases during the boom (Borowczyk-Martins, 2017). There are two effects that can be seen in terms of labor demand, both of which operate countercyclically. The first effect is related to the sectorial makeup of part-time work employment. Services and trade sectors, which primarily hire part-time workers, are typically impacted by downturns later than other sectors like industry or construction. Part-time work is therefore relatively less sensitive to the changes in the economic cycle than full-time employment. The second effect consists of sectoral changes. In order to avoid firing employees and stop hiring new full-timers, employers may reduce working hours during a downturn; as a result, during an upturn, part-timers may transition to full-time jobs (Fialová, 2017).

On the labor supply side, there are several effects noted. First, there is a slack in the labour market and the downturn in economic activity brings about a boom in the number of secondary earners i.e., those who decided to take up part-time work to support household income. This "additional worker effect" operates in a countercyclical manner. Furthermore, during a downturn in the labor market, workers may be more willing to involuntarily reduce their hours worked and unemployed people may be more willing to take part-time positions. This is also known as the "Involuntary part-time effect" (Fialová, 2017). Last, employers may be compelled to hire workers who favor part-time work because of the shrinking of the pool for free labor force during expansions, which could lead to an increase in voluntary part-time employment during economic peaks. Slack in the labor market may result in a decline in the supply of workers. In a downturn, some workers who are not currently employed may be compelled to start working to make up for the loss of family income brought on by the

termination of the employment contract of the spouse. During a recession, the interaction of these different choices leads to a decline in both the number of employed people and the average number of hours worked by those people (Copenhagen Business School, Denmark & Borowczyk-Martins, 2017). Borowczyk-Martins. (2017) concluded that employers and employees alike have a flexible response option to adapt to shifting economic circumstances thanks to part-time work. This is especially evident during economic downturns, particularly the recent Great Recession when the rate of part-time work in many countries hit a record high.

2.2 Characteristics of part-time employment

There is significant uncertainty surrounding the impact of a recession on part-time work from a theoretical standpoint. The extent to which part-time employment is affected by a recession will depend on various factors such as the nature of the recession, which sectors are hit hardest, and the structure of part-time work and its role within the specific country. Therefore, the vulnerability of part-time workers to job losses during an economic crisis may vary, with some being more susceptible than full-time workers. Involuntary part-time employment may increase and serve as a buffer during economic downturns (Horemans et al., 2016).

According to Fialová (2017), there was an increase in the average rate of part-time work in Europe in the late 1990s. However, the growth seems to have slowed down during the economic downturn of 2008-2009. Western Europe's rate of part-time work was stable and steadily increasing, compared to the East where part-time employment fluctuated and only countries like Malta, Cyprus and Slovakia had an upward trend in the part-time work rate. The average growth rate in the West was +3.1 percent in 1998-2007 and the East was reported to have an average decline of -0.5. After the Great Recession the Eastern Europe countries had a stronger part-time growth rate of +4.8 percent between 2008 and 2013 while the Western states maintained a slower but stable growth. The impact of the global economic recession on part-time employment differed between the two groups of countries, with the East showing a greater susceptibility to changes in the business cycle (Fialová, 2017).

The COVID-19 pandemic crisis on the other hand had a different turnout compared to the Great Recession. At this point countries like Norway according to Ingelsrud, (2021), tried to enforce individual employment protection rule, which was enforced in the first wave of the pandemic crisis which also led to most people working from home. This maintained the

employment status of most full-time and part-time workers. But in the second wave of the pandemic firms were beginning to feel the impact of the crisis and had to temporarily terminate some full-time jobs, which increased the rate of part-time work as more people decided to take up involuntary part-time work (Ingelsrud, 2021).

In the U.S there was an increase in the rate of part-time work due to an increase in involuntary part-time employment during the Great Recession, individuals transitioned from full-time to part-time work within the same employer which illustrates how companies modify the intensive margin in reaction to adverse shocks (Kang et al., 2020). According to Borowczyk-Martins (2019), the number of employees in the USA who had to perform part-time jobs owing to unfavorable economic conditions increased significantly during the recession. However, this number started to go down following the recession. Yet, the number of employees who were unable to find full-time employment rose during the crisis and persisted throughout the period of recovery. Even though the unemployment rate was steadily declining, this pattern remained until 2013, resulting in a protracted era of high levels of involuntary part-time work. During the COVID-19 pandemic, the US witnessed an increase in part-time workers due to the lockdown policy. The numbers consist of previous full-time workers which increased by about 5 percent, while the usual part-time workers fell by 3 percent, the increase of the recent part-time workers was related to the increase in the demand for part-time workers in sectors like the health care sector, while the fall in the usual part-time works was due to layoffs from the food, retail, and accommodation industries (Hean & Chairassamee, 2020).

Fialová (2017) in her analysis of the share of part-time employment amongst genders and different age groups in Europe, shows that the highest rate of part-time employment was among young people aged 15-24 in 2013. At the same time, part-time workers aged 25-64 contributed about 20% of the total employment, which means part-time work is very prevalent in the age group of 15-24, but because many in that group do not participate in the labour market, most part-timers are still in the age group of 25-64. The tendency to choose part-time employment was more common amongst women compared to men, primarily because of childcare in the case of nursing mothers. This is particularly true in Western Europe. Eastern Europe, however, have women working less in part-time employment compared to the West with an average rate of 7.5 percent compared to 36.9 in the West in 2013. Eastern European countries do not desire part-time jobs compared to Western European countries as working part-time is mostly involuntary (Fialová, 2017). Sectors also determines the number of part-

time workers, for example the growth of the service sector and health sector brought about an increase in the rate of female part-time work in the Netherlands (see Euwals & Hogerbrugge, 2006). Pech et al. (2021) found that the number of women who are working involuntarily part-time is significantly higher than that of men. In fact, around 7 percent of women are working part-time against their will, which is more than a full percentage point above the average for the general population in the U.S. Given that part-time jobs are predominantly held by women with caregiving responsibilities, it follows that households impacted by this trend are more likely to have dependents such as children and elderly individuals (Horemans et al., 2016). Economic recession has led to a significant rise in involuntary part-time work, which has affected men's increasing involvement in part-time employment. In several countries, young workers make up a considerable portion of the part-time workforce, resulting from the expansion of student employment and involuntary part-time work due to high youth unemployment rates (Fagan et al., 2014).

Comparing the wages of part-time employment and full-time employment according to Nightingale. (2019), people that work part-time have been recognized to receive low pay and less benefits such as pensions and health insurance compared to full-time workers. Also, most individuals working part-time have educational characteristics that put them at risk of being low-paid and have lower motivation than full-time workers. Women who prioritize their careers are more inclined to work mainly or continuously on a full-time basis. For such women, having dependent children at home does not hinder their ability to engage in full-time employment as much. This is because their preferences regarding the time allocated to paid work, family care, and other activities play a significant role in the part-time wage gaps (Nightingale, 2019). With respect to the Great Recession, during the early stages of the crisis, there was a noticeable shift in households from dual-income to female-breadwinner couples, especially in countries that were severely impacted by the crisis (European Commission, 2013). Workers who are involuntarily employed on a part-time basis can be considered to fall somewhere between those who are unemployed and those who work part-time voluntarily. This is because several factors, such as their skills, job history, occupation, and local labor market conditions, contribute to their lower earnings (Horemans et al., 2016).

According to the European Commission (2013, Pg 18) crisis report, there was a significant increase in the proportion of people working part-time in 2010, with the overall figure rising to 38.1%, which was 5.8 percentage points higher than in 2007. For women, the

corresponding increase was 3.8 percentage points, with 24% of women now working part-time. However, when looking at absolute numbers, the situation is different. In 2010, there were 7.3 million female workers who were involuntarily working part-time, compared to 3.2 million men. From 2007 to 2010, the number of female involuntary part-time workers grew by 1.3 million, while the number of men grew by 773 thousand. Although the absolute figures from 2011 show a decrease in involuntary part-time work for both genders, it is still considerably higher than pre-recession levels.

To conclude this section, it is worth emphasizing the effect the economic cycle has on part-time employment which varies from country to country, which could be related to the differences in the labour market institutions as seen in (Fagan et al., 2014; Fialová, 2017; Kauhanen, 2008; Krillo & Masso, 2010; Nightingale, 2019). Different countries have varying labor market regulations and policies that shape the nature of part-time work. These regulations can include minimum wage laws, employment protection legislation, working time regulations, and social security systems. The extent to which these regulations exist, and their specific provisions can influence how part-time work is affected during different phases of the business cycle.

3 DATA AND METHODOLOGY

Our analysis is based on the Estonian Labour Force Survey (Eesti Tööjõu-Uuring, n.d.) data for 2007-2022. The ELFS is a random-sample panel survey of individuals and consists of information for a robust set of individual and job-specific controls. Weights have been used, and therefore the whole analysis is representative of the whole country of Estonia. The sample is focused on workers aged 15 to 75. Following the often-used approach, we excluded self-employed people from the analysis as they cannot be considered part-time workers. We restrict our sample to those who worked part-time and did not work more than 35 hours per week as described by Statistics Estonia: *a part-time employee is an employed person whose usual working time per week is less than 35 hours*, which resulted in a sample of 22,645 respondents. The wage currency was converted from Kroon to the euro from 2007 to 2010. Also, the gross hourly wage was deflated using the consumer price index for 2007. We tested for multicollinearity in the data, which led us to drop the occupation variable as it was not significant, afterward we tested for heteroskedasticity in the data, which was highly significant. To analyze our probit model, we separate the years into different segments which capture the three periods; 2007-2010 for the Great Recession, 2011-2019 for the boom period, and 2020-2022 for the COVID-19 period. In the statistical analysis, first, we analyzed the share of part-time work by gender in Figure 1 based on the data collected from ELFS.

3.1 Share of part-time workers

Figure 1 shows the share of part-time workers from 2007 to 2022, the years are grouped to reflect the three periods: 2008-2010 (Great Recession period), 2011-2019 (Boom period), and 2020-2022 (COVID-19 period). Prior to the Great Recession, there was an upward trend in part-time work in Estonia, but due to the Great Recession of 2008, we can see a sharp decline in the trend up to 2008. Part-time work amongst both genders continue to grow after 2008 as we can see more growth with women fluctuating between 14% and 14.8% during the Great Recession, 15.2% and 15.1% during the boom period and lastly the COVID-19 period started with 15.5% and increased further in 2021 to 19% because of the pandemic. For men it seems to have been constant with little growth over the years. We can see an upward movement throughout the boom period as more women continue to take up part-time jobs in this period. In the literature it was revealed that the increase in the rate of part-time work for women could be related to the fact that we have more women taking up family care activities regardless of the business cycle phase, especially nursing mothers as well as caring for the elderly and for

men, the larger share are young labour market entrants, university students and the retired old people (Canon et al., 2014).

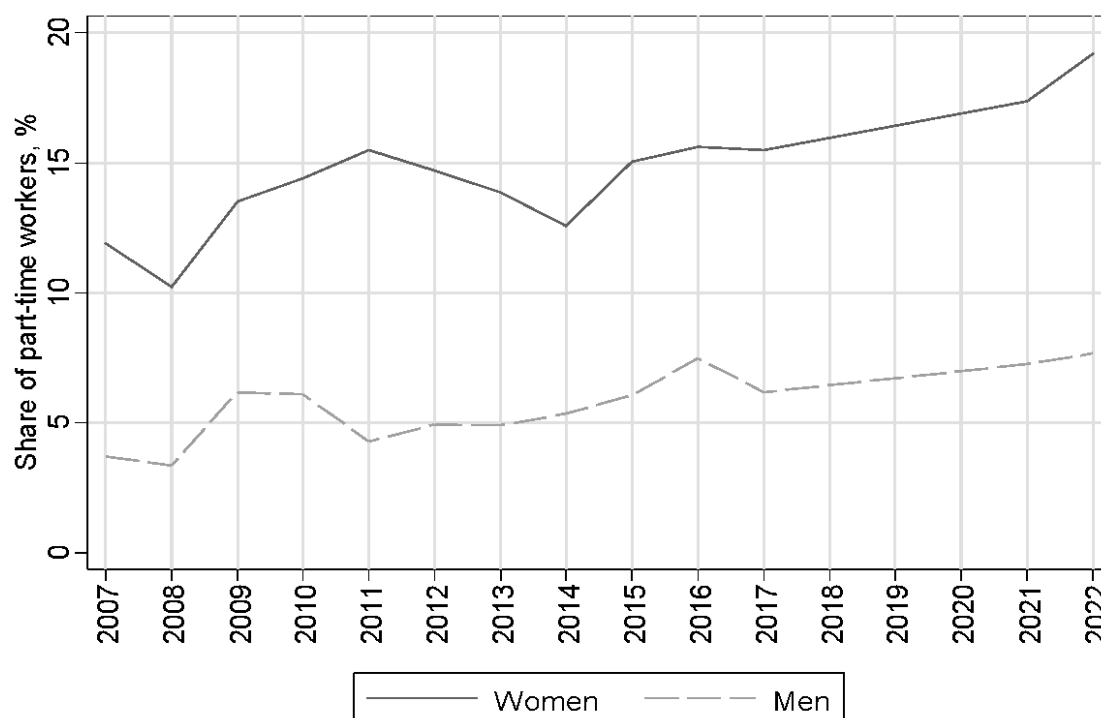


Figure 1: Share of part-time workers. Source: Authors own calculations based on Estonian LFS data.

3.2 Share of part-timers by activity

Secondly, we analyzed five different sectors to ascertain the effect each period has on part-time work between 2008 to 2022. In Figure 2, we can see the share of part-time work by activity. We compare five sectors which are Manufacturing, Construction, Human health and social activities, Agriculture sector, and lastly the total economy. We see that the share of part-time work in most of the sectors dropped in the year 2008 due to the impact the Great Recession had on part-time work in this period, except for the health and manufacturing sector which rather saw a rise in part-timers. Between 2009 and 2010, the share of part-timers fluctuated but slowly increased across the five sectors. During the boom period of 2011 to 2019 the manufacturing and health sectors declined from 21% and 19% respectively, to 15% for manufacturing in 2012 and 11% for the health sector in 2014. This decline is because as the GDP gradually increased, more people began to find full-time jobs in these sectors. Other sectors maintained the same slow growth in the boom period. Furthermore, the COVID-19 period 2020-2021 shows an upward trend in the share of part-time work for all sectors. Due to

the lockdown, less individual contact and less activity in many companies, a lot of sectors employed more per-time workers. Also, some previous full-timers were forced to take up per-time functions to reduce the cost of paying a full-time worker.

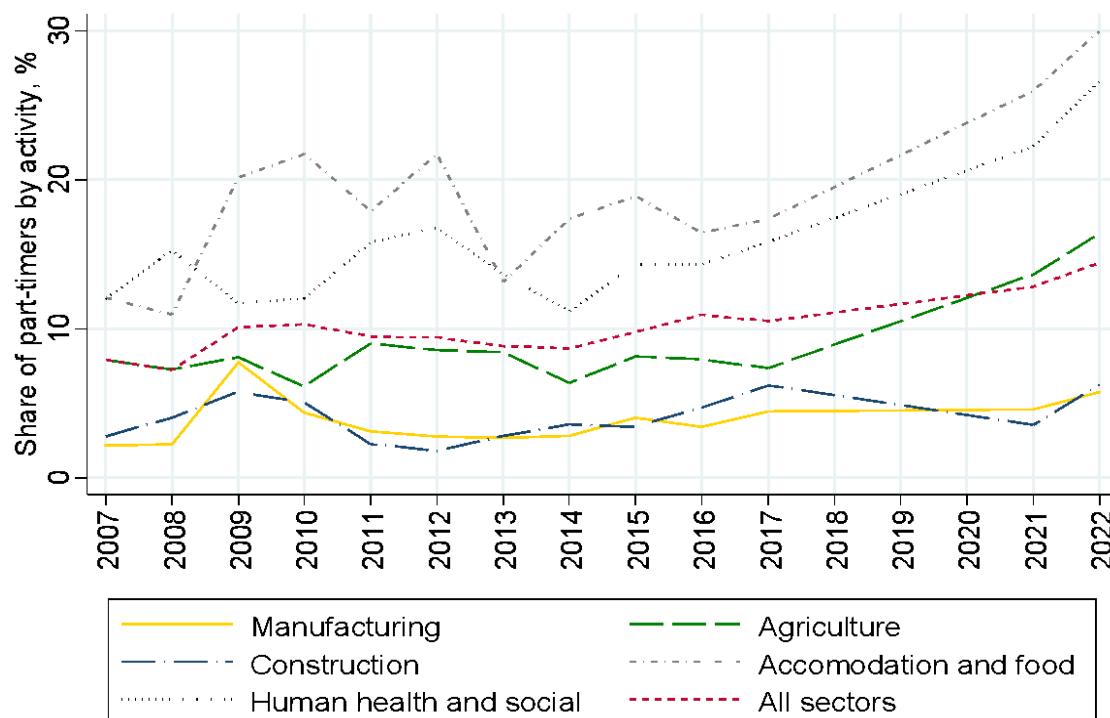


Figure 2: Share of part-timers by activity. Source: Authors own calculations based on Estonian LFS data

3.3 Reasons for working part-time

There are different reasons why people decide to work part-time which could be a personal decision or some other factors. In our analysis we analyzed reasons why Estonians decided to work part-time in the stipulated period, based on the response from the ELFS on the reason for working part-time. To do this first we generate dummy variables for the reasons given. Figure 3 shows the reason for working part-time analyzed by gender. The plot shows that the topmost reason for women during the Great Recession period is “not been able to find a full-time job” fluctuating between 16% and 22% which gradually began to drop during the economic recovery and boom period. Studying for women is the second highest reason for working part-time and it also fluctuates across the periods. All other reasons such as taking care of children, family related reasons and health related reasons fluctuate with lower percentages during the Great Recession and the boom period. This trend is in accordance with the analysis provided by Canon et al. (2014). Prior to the COVID-19 pandemic the percentages for each

reason why women work part-time started to rise for all the reasons provided, the increase persisted till the start of the pandemic in 2020 which could be closely related to the effect of the pandemic, and only dropped in the year 2021 which continued to 2022.

For men, the highest reason for working part-time was “studying”, Furthermore, not been able to find full-time work has the second highest percentage for men. This can be associated to the effect of the Great Recession of 2008 to 2010 due to the slack in the labour market for full-time jobs. Other reasons had a downward trend during the Great Recession and maintained a downward fluctuation throughout the boom period. Notably we can see that health-related reasons rose from 0.2% in 2011 to about 23% in 2021, this could be because of aging effect for men and as they grow older, they begin to encounter health-related issues which requires them to take up part-time work. COVID-19 period for men however had a similar trend with the women, there isn’t much difference between genders during the COVID-19 period.



Figure 3: Reasons for working part-time. Source: Authors own calculations based Estonian LFS data

3.4 Analysis of average hourly wage

Fourth, we find the hourly wage for part-time and full-time workers between men and women. Figure 4 shows that there was an increase in the average hourly wage for part-time workers in 2007 for men to about 6.6 euros per hour compared to full-time workers in this

period, this could be attributed to the effect of the Great Recession on full-time jobs. This increase however, dropped to about 2 euros per hour in 2009, and we can see the average hourly wage for full-time workers starts to increase gradually as the economy started to recover from the effect of the Great Recession and continued throughout the boom period as well as the COVID-19 pandemic period to about 7.8 euros per hour. The average hourly wage for part-time workers, however, slowly increased throughout the periods but drastically fell below the wage of the full-time workers. The average hourly wage of part-time and full-time for women have similar trend across the three periods. We observed a steady increase across the three periods, which is in line with the findings of Krillo and Masso (2010). We can see that the effect of the three periods is more visible for men based on the average hourly wage as we have more men taking up more part-time work during the crisis period than women. The effect of the Great Recession forced a lot of men to take up part-time jobs, most men who would work full-time in normal conditions, were forced to work part-time but earned the hourly wage of a full-time worker. This explains the upward trend for part-time work from 2007 to 2008.

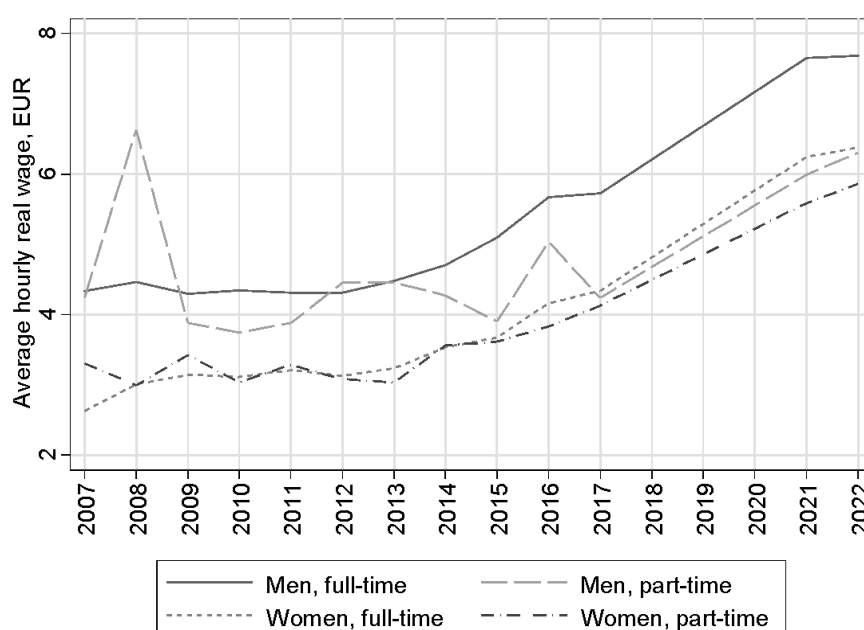


Figure 4: Average hourly wage. Source: Author's own calculations based on Estonian LFS data

Comparing the wages for male and female we observed that male part-time wages have a highly fluctuating figure compared to the female part-time wages across the three periods, this is because men are more often employed part-time while young and studying or old thus their wages are relatively low. The full-time wage for men however shows a continuous

increase after the Great Recession of 2007-2010, which shows that men mostly opt in for full-time jobs. However, for women, the part-time option may be used more often for ages; therefore, the mean wages for full-time and part-time do not differ to some extent. The Estonian government in 2018 made it possible for citizens to receive state family allowances while working part-time, this may serve as an additional incentive for women to work part-time while also taking care of small children see (Võrk, 2009).

3.5 Share of involuntary part-time work

In Figure 5, we analyzed the involuntariness in part-time workers. These are individuals who would like to work more. The analyses show that there was an increase in the share of involuntary part-time work for men during the Great Recession (2008-2010). At the pick of the Great Recession (2008), the percentage of men working part-time was about 48%, which was a lot higher than the previous year (2007) at 32%. This is because of the effect the recession had on economic activity, a lot of men who worked full-time prior to the Great Recession were forced to reduce their working hours and some were laid off from their jobs which required them to take up available part-time jobs.



Figure 5: Share of involuntary part-time work. Source: Authors own calculations based Estonian LFS data

We could see that the trend began to drop after 2008 as the economy started to recover slowly from the shock of the Great Recession, which continued throughout the boom period

(2011-2019), the percentage dropped further from 18% in 2011 to about 11% in 2019. The COVID-19 crisis period, however, saw a different trend for men compared to the Great Recession. We could see that the share of involuntary part-time workers dropped further from 10.2% in 2020 to 10% in 2021. This is because during this period people could work from home, and the government was able to put in place job retention schemes (Meriküll & Paulus, 2022). Women, however, had a decline in the share of involuntary part-time work in 2008 during the Great Recession (2007-2010) from 21% to 15%. The involuntariness for women has shown little significant increase throughout the three periods because, by nature, women voluntarily go in for part-time jobs because of homecare responsibilities. Comparing men and women involuntariness we could from the analysis that men have higher chances to be involuntary part-time workers than women.

4 REGRESSION ANALYSES

4.1 The methodology of the regression analysis

The statistical analysis shows that there are some notable differences in crisis years compared to boom years and the two crises are rather different, but the probit models allow us to understand if the factors change. The regression method used for this paper is the probit model. In the probit model, the inverse standard distribution of the probability is modeled as a linear combination of the predictor. First, we estimated the probit model for each business cycle phase on part-time work in Estonia. Individual I ($I = 1 \dots n$) chooses the working time which is represented as dummy. i.e., the dependent variable is the dummy for part-time work. The general regression specification is given as:

$$Parttime = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k + \mu \quad (1)$$

Where *Parttime* is represented as an individual dummy, $\beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k$ are independent variables which includes age, the reason for working part-time, level of education, employment status, gender, sector, marital status, occupational status, gross wage and work status before the survey. We separated the years into three periods, which are: 2008 – 2010 is the Great Recession period, 2011 – 2019 is the economic boom period and lastly 2020 – 2021 is the COVID-19 period. We ran a separate probit regression analysis for each period. Lastly, we ran regression analysis by gender to identify the effect of the business cycle phases on male and female part-timers. The regression specification is given as:

$$Parttime_male = \beta_{m0} + \beta_{m1} x_{m1} + \beta_{m2} x_{m2} + \dots + \beta_{mk} x_{mk} + \mu \quad (2)$$

$$Parttime_female = \beta_{f0} + \beta_{f1} x_{f1} + \beta_{f2} x_{f2} + \dots + \beta_{fk} x_{fk} + \mu \quad (3)$$

where:

parttime_male and *parttime_female* - are gender dummies,

$\beta_{m*} x_{m*}$ - are independent variables associated with male counterparts,

$\beta_{f*} x_{f*}$ - are independent variables associated with female counterparts, and

μ - is the error term

4.2 Estimation of result

In this chapter, we present the results of the probit model regression. To capture the different effects each variable has on part-time work in different business cycle phases, we ran a separate regression for each period and identified them as the Great Recession period, boom period, and the COVID-19 period. The model includes human capital variables (education, gender dummies), and employer-side variables (location, the type of sector). We had occupational variables in the model but decided to drop them because of multicollinearity and the significant level which was not significant. The reference groups are primary education, North Estonia, the agricultural sector, single, and working.

Table 1: Probit marginal effect result for the Great Recession Period. Source: Authors own calculations based on Estonian LFS data

Variable	Marginal effect	Male	Female
Secondary education	-0.106	-0.007	-0.033*
Tertiary Education	-0.027*	0.010	-0.060**
Age	0.002***	0.003***	0.002**
Human health and social work activity	-0.004	0.068	0.033*
Manufacturing	-0.236	-0.027*	0.005
Construction	0.011	-0.009	0.175***
Accommodation	0.094***	0.032	0.118***
Central Estonia	-0.005	-0.008*	-0.006
North-eastern Estonia	-0.004	0.019*	-0.012
West Estonia	0.012	0.344**	-0.002
South Estonia	0.004	0.012*	0.003
Married or cohabiting	-0.03***	-0.124***	0.007
Divorced separated or a widow	-0.003	-0.080**	0.026*
Gross wage	0.000***	0.000	0.000**
Unemployed	0.026*	0.024	0.022*
Inactive	0.123***	0.056	0.179***

Note:
 Statistical significance level: * significant at 10%; ** significant at 5%; *** significant at 1%
 Reference group: primary education, North Estonia, the agricultural sector, single, and working

The results of the first period, which is the Great Recession period (2008-2010), are presented in Appendix 1, and the marginal effects are in Table 1. The marginal effects calculated from the probit model are expected and in line with the findings of (Krillo & Masso, 2010) in Estonia. The result shows that during the Great Recession, people with secondary and tertiary education have a 1.4% and 0.27% lower probability to work part-time than people with primary

education. For the age variable, it shows that an increase in age between 15 years to 75 years increases the probability of working part-time by 0.1%, which is highly significant. Looking at the sectors, we could see that in the Great Recession period, human health and social work activity, and the manufacturing sector had 0.4% and 24%, respectively lower probability to employing per-time workers during the Great Recession compared to the agricultural sector. The construction sector and accommodation sector have respectively 1% and 9.4% higher probability of employing per-time workers during the Great Recession.

Concerning the locations, compared to North Estonia, employees in Central Estonia and North-eastern Estonia have a lower probability of working part-time. Western Estonia and South Estonia, however, have a higher probability to work part-time, although the coefficients are not significant. The gross wage has no marginal effect on part-time work in this period. Further analysis of gender shows that during the Great Recession, men have a higher probability to work part-time considering most of the variables. Notably, we could see that married men have a 12.4% higher probability to work part-time than women, which is highly significant. Also, we observed that a 1% increase in the age of men will increase part-time work by 0.3%. This result is in line with the analyses of Borowczy-Martins et al. (2017) for the Great Recession. We analyzed the preference for part-time work one year before the great recession and the result shows that unemployed and inactive people have respectively 2.6% and 12.3% higher probability of working part-time compared to employed people.

The result of the second period as in Table 2, which is the boom period (2011-2019), shows that employees with secondary education have a 0.6% lower probability of working part-time compared to employees with primary education. Employees with tertiary education also have a 1.1% lower probability of working part-time compared to employees with primary education during the boom period. The result also shows the high significance of the age variable, this shows that 1% increase in age increases part-time work by 0.2%. Which is highly significant, especially for female part-time workers. Looking at the marginal effect for the sectors during the boom period, we found out that the manufacturing and construction sectors have a lower probability of employing part-time workers compared to the agricultural sector during the boom period. Human health and accommodation both have a 0.2% probability of part-time workers during the boom period.

Table 2: Probit marginal effect result for the boom Period. Source: Authors own calculations based Estonian LFS data via Stata.

Variable	Marginal effect	Male	Female
Secondary education	-0.006	-0.005	-0.008
Tertiary Education	-0.011	-0.014*	-0.013
Age	0.002***	0.000*	0.002***
Human health and social work activity	0.002	0.049**	0.008
Manufacturing	-0.057**	-0.240*	-0.089**
Construction	-0.049**	-0.020*	0.038*
Accommodation	0.024	0.076***	0.026
Central Estonia	-0.011	0.005	-0.034*
North-eastern Estonia	-0.015	-0.006	-0.020*
West Estonia	0.007	0.005	0.006
South Estonia	0.006	0.021***	-0.013*
Married or cohabiting	-0.012	-0.017*	-0.017*
Divorced separated or a widow	0.005	0.017*	0.001
Gross wage	0.003***	0.001*	0.003**
Unemployed	0.043***	0.002	0.083***
Inactive	0.052***	-0.004	0.113***

Note:
 Statistical significance level: * significant at 10%; ** significant at 5%; *** significant at 1%
 Reference group: primary education, North Estonia, the agricultural sector, single, and working

Results for the location of part-time workers show that Central Estonia and North-eastern Estonia have a lower probability of having workers who work part-time compared to North Estonia. West Estonia and South Estonia, however, have 0.7% and 0.6% respectively higher probability of having workers who work part-time compared to North Estonia in the boom period. Looking at the marital status, we found out that compared to single people, married or cohabiting people have a 1.2% lower probability to work part-time. Divorced separated or widows have a 0.5% higher probability of working part-time during the boom period. The gross wage shows a high significance level, which explains that a one percent increase in gross wage increases part-time work by 0.03%, which is also more significant for women. Comparing the gender of the boom period to the Great Recession period, we could see that part-time work is less desired by men in the boom period, unlike the Great Recession period.

In Table 3, we analyzed the result for the COVID-19 period (2020-2021), which is the year of the pandemic. The desire to work part-time is mostly observed amongst people with lower skills and lower education in Estonia in this period. From the table, we can see that people with a secondary education level have a 3.1% less probability to work part-time compared to people with primary education at this period. Also, people with tertiary education as well have a 40.5% less probability to work part-time compared to individuals with primary education. This is different from the analysis of Ingelsrud (2021) in the case of Norway. The service sector such as human health and accommodation respectively had a 3.8% and 4.8% higher probability of employing part-time workers with significant coefficients. During the COVID-19 period, the healthcare sector needed more hands than it would have before the pandemic, due to a lot of people falling sick from the virus. Analyzing the result by location shows that West and South Estonia have a 3.8% higher probability of having residents who are part-time workers compared to North-eastern Estonia. In this region, we have a high population of young people as well as a concentration of companies. West Estonia had more female residents working part-time which is the same for the boom period.

Table 3: Probit marginal effect result for the boom Period. Source: Authors own calculations based Estonian LFS data.

Variable	Marginal effect	Male	Female
Secondary education	-0.031***	-0.023	-0.026*
Tertiary Education	-0.405***	-0.018*	-0.038*
Age	0.001***	0.000**	0.001**
Human health and social work activity	0.038*	0.057***	-0.168***
Manufacturing	-0.071***	-0.053***	-0.155***
Construction	-0.340	-0.048**	-0.066*
Accommodation	0.048*	0.068***	-0.016
Central Estonia	0.007	-0.008	0.031*
North-eastern Estonia	-0.011	-0.016*	-0.031*
West Estonia	0.038***	0.002	0.034**
South Estonia	0.038***	0.013*	0.012*
Married or cohabiting	0.010	-0.029**	0.042***
Divorced separated or a widow	-0.001	-0.021*	0.038**
Gross wage	0.000	-0.000*	0.001*
Unemployed	0.029*	0.039**	0.097***
Inactive	0.091***	0.046***	0.148***

Note:

Statistical significance level: * significant at 10%; ** significant at 5%; *** significant at 1%

Reference group: primary education, North Estonia, the agricultural sector, single, and working

Notably, in the analyses, we could see that women have a higher probability to work part-time during the COVID-19 period compared to the Great Recession period. This is a peculiar difference between the two periods which is in line with the findings of Hean and Chairassamee (2020) in the U.S.

4.3 Interaction effect of age and gender

4.3.1 Great Recession period (2008-2010)

The graph, Figure 6a, shows that there is a higher probability for females between the age of 20 to 65 to work part-time than men, we can see that the margin for men started to decline from age 25. At ages 16 to 20 most young people are just entering the job market, and some are in school, they most likely will take up part-time jobs between that age. From age 25 to 45, men will mostly work full-time. The margin starts to rise again from the age of 50 to 65 as they attain old age and retirement age, they are more likely to take up part-time work. This is also similar for women from the age of 50 to 65. We can observe that the margin for females and males from 20 to 40 is wide because women naturally take up part-time work more than men. This is in line with the findings of (Pech et al., 2021).

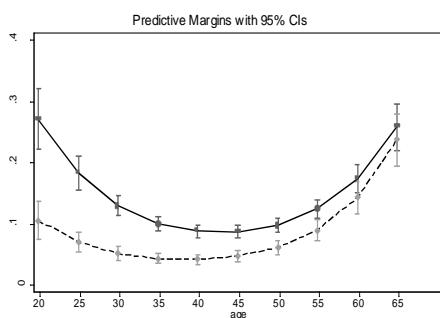
4.3.2 The boom period (2011-2019)

Similarly, in Figure 6b, there is a wider margin gap between the ages of 25 to 40 in this period which is different from the Great Recession period. This is a period of economic buoyancy, though just like the Great Recession period there is still a higher probability for females to work part-time in this period. From the graph, we can predict the normal trend of part-time work, as we know from the literature that there is a wider gap between male and female part-timers during the boom period. There is less involuntariness that mostly arises from slack in the labour market.

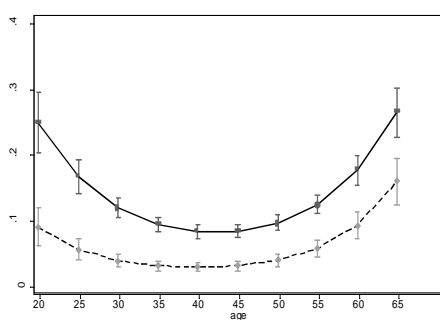
4.3.3 The COVID-19 period (2020-2021)

However, in Figure 6c, the interaction effect between gender and age in this period shows a rather similar pattern and a close margin from the age 40 to 65. There is a reduced probability of working part-time between the age of 25 to 55. This is a lot different from the Great Recession and the boom period. However, we can still see a similar pattern in the growth in the probability of working part-time between the age of 55 to 60. In the three periods, we

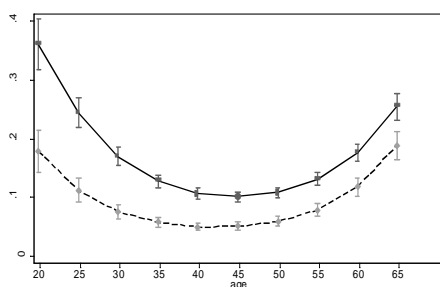
can conclude that over time age has become a more important factor in determining the probability of an individual working part-time regardless of gender.



(a)



(b)



(c)

— Women - - - Men

Figure 6: Predictive margins of part-time work by age and gender. (a) Great Recession period (b) Boom period (c) COVID-19 period. Source: Authors own calculations based Estonian LFS data.

5 CONCLUSION

5.1 Study Outcome

In this paper, we investigated the effect of the business cycle on part-time work using Estonian Labour Force Survey data from 2007-2021. We did a further breakdown of the years into three periods, which are: the Great Recession period 2008-2010 (this is a period of severe economic downturn), the boom period 2011-2019 (this a period of growth and economic buoyancy) and the COVID-19 period 2021-2022 (this is recognized as the pandemic period of little or no human contacts due to the COVID disease). We ran regression using the probit model and reported the marginal effects of each variable on part-time work in Estonia.

From the results, we found out that the effects of the business cycle are similar across the three periods, and we could only see a few exceptions for the Great Recession period. We also found out that across the three periods, we have women working part-time more than men during the boom period and COVID-19 period except from the Great Recession period, where a lot of men were subject to job loss and conversion from full-time to part-time see (Wething, 2014). which corresponds to the reviewed literature. Compared to other empirical findings in the literature, we found out that Estonia has a little percentage of people working part-time compared to other EU countries. Also looking at the COVID period for some countries in Europe according to the literature there were adverse effects of full-timers taking part-time work or getting laid off during the period. The case is different in Estonia, we found out that the share of part-time work in Estonia increased by a little in this period. Full-timers kept their job because of the job retention scheme by the government, and most companies switched to a work-from-home program. To confirm this claim in our analyses we conducted a regression checking the employment status one year before the COVID-19 period and discovered that the status remained the same as during the boom period.

Looking at the share of involuntary part-time work, we found out that based on the analysis, the rise in involuntariness was experienced mostly during the Great Recession and was particular to men. The average hourly wage continues to rise across the three periods. According to the result, the hourly wage of males and females for part-time workers is less than for full-time workers with full-time workers having a margin of about 18%. The only exception was during the Great Recession when we had more people working part-time with an increased hourly wage compared to the full-time workers. The part-time hourly wage for females across

the three periods shows a higher value compared to the full-time wages. Which is contrary to what we find in most studies in other countries. A reason for this could be that the standard of living in other countries compared to Estonia might be a deciding factor that allows female part-time workers to have more disposable income after tax. Another reason could be that there are undocumented funds that are received by female part-time workers probably due to efficiency at work. These undocumented funds will increase the wages of female part-time workers.

The result from the sectors shows that the accommodation sector has continuously recruited part-time workers across the three periods, in this sector, we have part-time workers such as hotel attendants, cleaners, bartenders, etc. The manufacturing sector, however, has a lower probability of recruiting part-time workers based on the result. We also found out that there is a vast concentration of part-time workers in West and South Estonia in the three periods than in other parts of Estonia this is because there are more people and companies in these regions compared to other parts of Estonia. The result based on marital status shows that during the Great Recession, we had more single people working part-time than married and divorced. In the boom period, married and cohabiting people were working less part-time.

An important discovery from our analysis is that compared to some countries like the United States of America and some EU countries, the increase in part-time work during the COVID-19 pandemic period was not significantly high. People still maintained their full-time jobs, which maintained the previous level of part-time jobs. Also, the level of involuntariness remained low as it was during the boom period. This is contrary to what has been seen in some studies, where we have a vast number of people working part-time during the pandemic era in some countries see (Hean & Chairassamee, 2020; Ingelsrud, 2021). The key result shows that the Great Recession has a higher impact on part-time work than the COVID-19 pandemic period. There was a more significant change in part-time work during the Great Recession than during the COVID-19 period. This led to the conclusion that business cycle phases have a different significant negative effect on part-time employment in Estonia. When the economy is performing below its capacity, part-time employment tends to increase at a higher rate compared to full-time employment. The effect of the business cycle on involuntary part-time work was more severe during the Great Recession period based on the result of the analysis. Further analyses also show that geographically West Estonia and South Estonia have a higher probability to have residents who work part-time in the three periods.

5.2 Policy Implication

Policy makers play a big role in shaping the socioeconomic regalia of the state. Based on the findings of the study, the following policy implications are advised.

1. Policy makers should make policies that provide unemployment insurance for part-time workers, this will go a long way to bridge the gap between full-time workers and part-time workers. Especially the involuntary part-time workers.
2. Skills development and training programs could also be a good opportunity for part-time workers. Offering subsidized or low-cost training programs, vocational courses, or apprenticeships specifically designed for part-time workers can help enhance their skills, increase their employability, and create pathways for career advancement. These programs can be supported through partnerships with educational institutions, industry associations, and employers. By investing in the skills development of part-time workers, the country can unlock their full potential and contribute to a more skilled and competitive workforce.

5.3 Suggestion for Further Studies

As at the time of this study, there has been an ongoing war between Russia and Ukraine, which has led to western countries to boycott Russian oil and energy. This has also led to the increase of energy prices. Thus, further studies should be carried out to explore the effect of the war in Ukraine on part-time work in Europe.

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APPENDIX A: Probit Model (Male)

Partt year	Coef.	P> z
2008	-0.016	0.968*
2009	0.276	0.000***
2010	0.247	0.000***
2011	0.089	0.000***
2012	0.124	0.030**
2013	0.132	0.002***
2014	0.148	0.001***
2015	0.185	0.000***
2016	0.277	0.000***
2017	0.225	0.000***
2018	0.316	0.000***
2019	0.372	0.000***
2020	0.400	0.000***
2021	0.357	0.000***
2022	0.452	0.000***
Secondary education	-0.186	0.000***
Tertiary education	-0.063	0.001***

Appendix A. Probit result on years and level of education for male. Source: Authors own calculations based on Estonian LFS data via Stata.

APPENDIX B: Probit Model (Female)

Partt	Coef.	P> z
year		
2008	-0.069	0.025**
2009	0.066	0.034**
2010	0.107	0.001***
2011	0.132	0.000***
2012	0.109	0.030**
2013	0.055	0.062**
2014	0.022	0.450
2015	0.101	0.001***
2016	0.143	0.000***
2017	0.158	0.000***
2018	0.238	0.000***
2019	0.283	0.000***
2020	0.279	0.000***
2021	0.282	0.000***
2022	0.367	0.000***
Secondary education	-0.302	0.000***
Tertiary education	-0.358	0.000***

Appendix B. Probit result on years and level of education for female. Source: Authors own calculations based Estonian LFS data.

APPENDIX C: Difference in hourly wage by gender



Appendix C. Difference in hourly wage by gender

Resümee

Osalise tööajaga tööhõive Eestis ja majandustsükkel

Abolaji Rilwan Oyinloye

Tänapäeva pidevalt muutuval ja dünaamilisel tööturul on osalise tööajaga töötamine märkimisväärselt kasvanud ning see on arvestatav alternatiiv traditsioonilisele täistööajale. Eesti, edukas Balti riik, mis on tuntud oma tehnoloogiliste edusammude ja ettevõtlusvaimu poolest, on huvitav riik, kus uurida majandustsükli seost osalise tööajaga töötamisega. Käesolevas magistritöös uuritakse majandustsükli eri faaside seost osalise tööajaga töötamisega Eestis. Analüüsitakse kolme konkreetset majandustsükli etappi – nagu majanduslangus 2009. aastal, sellele järgnenud majanduskasvu perioodi ja COVID-19-ga seotud kriisi perioodid. Kahe kriisiperioodi puhul eeldatakse, et majanduslangus on seotud muutustega osalise tööajaga töötamises. Käesolevas artiklis hinnatakse probit-mudelid analüüsima inimeste tõenäosust töötada osalise töötajaga, nagu on kasutanud. Analüüsiks kasutab autor usaldusväärseid Eesti tööjõu-uuringu andmeid. Mitmetes ülemaailmselt avaldatud uuringutes kasutatud andmestikus on suur hulk indiviide ja ettevõtteid kirjeldavaid muutujaid. Vaatlusalune ajavahemik on 2008-2021. Nii pika perioodi uurimine on vajalik, et kriiside ajal toimuvaid muutusi saaks võrrelda majanduskasvu perioodiga. Kolme erineva majandustsükli faasi kohta on koostatud kokku kolm probit-mudelid. Uurimuse tulemusena selgus, et majanduslanguse perioodil on oluline negatiivne mõju osalise tööajaga töötamisele Eestis, lisaks nähti, et 2009. aasta majanduslanguse mõju osalise tööajaga töötamisele on suurem kui COVID-19 pandeemiaperioodil. Kui majandus töötab alla võimsuse, kipub osalise tööajaga töötamine suurenema rohkem kui täistööajaga töötamine. Majandustsükli mõju vaeghõivatuna osalise tööajaga töötamisele on tulemuste analüüsi põhjal tugevam suure majanduslanguse perioodil. Täiendavad analüüsid näitavad lisaks, et geograafiliselt on Lääne-Eesti ja Lõuna-Eesti elanike osalise tööajaga töötamise tõenäosus suurem kõigil kolmel perioodil kui Põhja-Eestis.

Märksõnad: tahtmatu osalise tööajaga töötamine, majanduskriis ja majandusbuum, COVID-19, suur majanduslangus, majandustsükkel.

teadusvaldkondade ja -erialade klassifikaator: S180 - Majandus, ökonomeetrika, majandusteooria, majanduslikud süsteemid, majanduspoliitika; S184 - Majanduslik planeerimine

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