

Effect of unemployment benefits on unemployment duration before and during COVID-19 using Estonian data

Wanting Huang



Faculty of Social Sciences

School of Economics and Business Administration

Master's Thesis

Supervisor: Andres Võrk

Tartu, 2022

I have written this Master thesis independently. Any ideas or data taken from other authors or other sources have been fully referenced.

Abstract

This paper aims to explore the effect of unemployment benefits and duration on the actual unemployment spells before and during COVID-19 period. To the best knowledge of the author, there aren't recent studies assessing the disincentive effect during the 2019-covid crisis. The unemployment welfare system was introduced in 2003 by the Estonian Insurance Act which has been amended over years to be more generous. After March 2020 some labor-market specific measures were implemented to preserve the employment relationship and mitigate the financial loss of socially vulnerable groups. In this thesis the author applies the following hazard framework to analyse the disincentive effect: Kaplan-Meier survival model, Cox proportional hazard model and piecewise-constant proportional hazard using the EUIF dataset (Estonian Unemployment Insurance Fund) consisting of 304,531 observations from 2017 to 2021. Demographic characteristics, personal labour market history are analysed to explain the duration of unemployment spell. The results in this paper suggest that the disincentive effect of unemployment benefit towards the behaviour of exiting unemployment has both similarities and differences when comparing the two periods. The disincentive effect weakens during COVID-19 the most for the high income group, professionals, and high-skilled workers. The negative effect of the current crisis is more pronounced in specific types of jobs such as plant and machine operators and assemblers as well as service workers.

Keywords: Disincentive effect, unemployment benefit, survival analysis, hazard rate, COVID-19

Contents

Introduction	5
Background	7
An overview of the unemployment benefit in Estonia.....	7
Impact of COVID-19.....	8
Literature Review	10
Studies of Estonian labor market.....	10
Studies of international labor market.....	13
Methodology	16
Data	18
Results	22
Conclusion	31
References	33
Appendix	36

Introduction

For the sake of preventing poverty, social exclusion and physiological depression, most developed economies and friendly societies have unemployment benefit programs and active labor market measures to alleviate major financial loss during unemployment spells.

As with the unemployment benefit system, its role is controversial. On one hand, unemployment benefits system helps the unemployed alleviate major financial loss during unemployment spells and maintain a basic life quality. On the other, the well-known search and matching theory in labor market application contributed by DALE T. MORTENSEN states that more generous unemployment benefits bring a higher unemployment rate and result in longer job searching time for the unemployed, which had been extensively examined by many theoretical and empirical studies related to unemployment insurance. By 2010 Nobel Prize winners PETER A. DIAMOND, DALE T. MORTENSEN and CHRISTOPHER A. PISSARIDES further developed the model to estimate the effect of different labor-market factors on unemployment, including the generosity of unemployment benefit, number of vacancies, hiring and firing costs, real wage, efficiency of employment agencies. Moreover, long periods of unemployment incline to lead to the loss of professional skills and the ability to adapt to work environment thus resulting in long-term unemployment. Employers are more reluctant to hire people who have been unemployed for a long time.

The global financial crisis in 2008 severely affected the labor market and Estonian economics recovered and improved remarkably after the crisis until 2020 when the covid crisis took place and a downturn was triggered globally which had a strong impact on Estonia. Indeed, the labor market policies expenditures and the number of people unemployed increased dramatically during this period. Starting from 2003, Estonia introduced unemployment insurance benefits system where some unemployed might be eligible for either unemployment insurance benefit or unemployment allowance and the policies

became more mature and refined year by year. On one hand, employment rate sharply increased, and number of registered unemployment decreased until 2008. On the other hand, the number of unemployed who are eligible to receive unemployment benefit just increased slightly over months.

As part of the ongoing worldwide pandemic of COVID-19, the Estonian economy was hit by this global crisis, and it is revealed by the increase of overall unemployment rate. The first covid case was confirmed in Estonia on 27 February 2020 and on 13 March, Estonian government declared the state of emergency. The economic downturn was perceived speedily by the unemployment rate in Q2 2020 where unemployment rate rose to 7.1% which is increasing by 2.1% compared to Q1 2020. The rapid increase in unemployment rate is raising concern given that the restrictions introduced to combat virus are preventing the economy from functioning normally and employment rate from rising, thus eroding the substantial activation of socially disadvantaged workers and young generation during covid period.

This study's finding will redound the understanding of the relationship between unemployment welfare and unemployment spells before and during COVID-19, considering there's no recent study assessing disincentive effect of unemployment benefits during COVID-19. The study identifies the impact of the crisis on individuals with different demographic characteristics, focusing on comparing COVID-19 initial impact in 2020-2021 to pre COVID-19 period 2017-2019, shedding light on the importance of policies adaptation to the specific conditions encountered in the current crisis and acting comprehensively in the COVID-19 response and recovery.

1. The purpose of this study is to quantify the effect of unemployment benefits and granted unemployment duration on unemployment spells, specifically comparing the difference before and during COVID-19. The specific objectives are as follows:

2. To decompose the characteristics related to unemployment spells and identify the decisive factors that differed before and during COVID-19
3. To elaborate on the effect of the magnitude of unemployment benefit on the behavior of leaving unemployment.
4. Based on the findings, give policy implications on how to support the socially vulnerable groups in a wiser and resilient way within the unemployment benefit design.

The statistical model used in the aforementioned initiative are Kaplan-Meier survival model, Cox proportional hazard model and piecewise-constant proportional hazard. Sociodemographic characteristics (age, gender, language, education, region), previous labour market history (previous sector, occupation, earnings) and benefit related (duration and size of benefits) data is used to examine the relationship between unemployment benefit and unemployment spell.

The evidence is that the unemployed wait until running out of unemployment benefits to return to work. Subject to the macroeconomic condition and the lagging of labor market, the unemployed tend to stay longer in unemployment during COVID-19. The disincentive effect weakens during COVID-19 for the high-income group, professionals, and high-skilled workers. The negative effect of the current crisis is more pronounced in specific types of jobs such as plant and machine operators and assemblers as well as service workers. Age and education are important factors for one to exit unemployment.

S180

Background

An overview of the unemployment benefit in Estonia

Estonian Insurance Act as a cornerstone regulates conditions and procedures for the payment and the grant of benefits upon unemployment. The wage-related benefit is affected by the minimum earning ceiling to ensure reasonable welfare. There is also a maximum ceiling of benefit for the purpose of smoothing the security during boom terms and bust terms. If individuals register in the designated agency and their unemployment insurance contribution is at least twelve months during the thirty-six months prior to registration as unemployed, they have the right to receive a monthly unemployment benefit. One is not eligible to receive the benefit if the person's last employment relationship is terminated at the initiative of the employee himself. An insured person is entitled to a maximum of 180 days if the insurance period is less than five years. To be granted 270 days, the insurance period should be more than five years and no longer than ten years. Concretely, the sum of amounts paid in these nine months will be divided by 270, resulting in the average remuneration per calendar day. Those who pay the insurance for more than ten years would be granted 360 days. The size of unemployment benefit per calendar day is on an accrual basis of a person's nine months' salary within a legal employment contract prior to the last three months of unemployment. 60% of the remuneration per calendar day is paid for the first 100 days and 40% for the period of 101 to 360 days. In case the unemployment benefit period is terminated, the unemployed exits unemployment or fails to fulfill the action plan of showing up in an appointment, the unemployment insurance fund stops paying the benefit.

Impact of COVID-19

The labor-intensive service sector such as tourism and food service suffered most during covid when the restriction was introduced to slow down the spread of the virus. According to Statistics Estonia, in the second quarter of 2020, sales revenue of accommodation and food services had decreased 57%

from the same quarter of the previous year. Only the information and communications sector coped relatively well in this crisis and experienced an increase in sales revenue by around 9%. The covid outbreak not only impacts the general unemployment rate. According to EUROSTAT, the youth unemployment rate expanded significantly from 7.7% in February 2020 and reached the top line at 25.1% in July 2020. Although it declined at the beginning of 2021, it remained at the high level up until April 2022 at 19.3%. Minimum Wages in Estonia increased to 584 EUR/Month in the first quarter of 2020 from 540 EUR/Month. Long Term Unemployment Rate in Estonia increased to 1.20 percent in the first quarter of 2020 from 0.8 percent in the last quarter of 2019. A significant decline in the rates of full-time employment and job vacancies is observed due to the covid crisis.

Several labor protection measures were taken to mitigate the effect of the covid crisis to maintain family income and reduce layoffs. 70% of gross wage subsidy was paid by Estonia Unemployment Insurance Fund (EUIF) to employees for at least two months whose employer couldn't provide the agreed amount of work or whose wage has been reduced during covid. Contribution to the mandatory funded pension scheme which is 4% of social tax was suspended between July 2020 and August 2021 and employees have the option to suspend the funded pension scheme which is 2% of social tax.

Unemployment Insurance Act was amended aiming to improve the unemployment protection system. Unemployment benefit was rising from 50% to 60% based on previous job's average earnings as of August 2020. Starting from September 2020, one who registers as unemployed status in the unemployment insurance fund can have a part-time job at the same time, which means the unemployed can simultaneously receive unemployment benefits and undertake a temporary job. As of January 2021, the unemployment allowance increased from 189 euros to 292 euros. Besides, some temporary measures such as covering the sickness reimbursement and offering wage support up to 50% of gross wage for those farmers in the berry-growing sector who are willing to hire

the long-term unemployed. Job Retention Schemes are implemented with the objective of preserving the employment relationship between employers and employees. There are three categories which is the employer directly receives financial subsidies for paying employees with job suspension, or the employee directly receives the subsidies and are available to seek altered employment, or subsidize the employer's wage bills regardless of whether or not the employers have the layoff plans. Most of these measures are related to income compensation, helping the socially vulnerable group and preventing the rise in unemployment. On the other hand, it would distort the unemployment rate because it artificially affected the flow into unemployment.

Although the impact shares some major economic similarities, the current COVID-19 economic downturn is markedly different from the 2008 global financial crisis. In 2008, the crisis began with disruption in the US real estate and financial markets and gradually spread to the whole world with a certain time of delay and had a profound mid-term effect. The COVID-19 pandemic was exerting a more abrupt and unexpected effect where specific economic sectors such as tourism, restaurant service, airline, retail, and automotive were out of action immediately and completely. On the other hand, the lockdown dramatically altered people's mental lives which the 2008 financial crisis never ever had. Loneliness and social isolation are the possible psychological outcomes of the measures taken to stop the spread of the virus. The way people socialize and work was changed considerably. The fear of risk of being infected, transmitting the infection to family, lack of safety measures, impacted the willingness of onsite work and personal contact.

Literature Review

Studies of Estonian labor market

There're a few studies focusing on Estonian labor market covering the aspects of job skills matching, gender equality, labor mobility between countries and so

on. However, there are very few focusing on the effect of unemployment benefits in recent years. Some measures regarding the unemployment insurance system have undergone significant changes. This review explores the trends and findings not only within the unemployment benefit system aspect but also covering the long-term unemployment, youth unemployment and industrial mobility.

Using the data from Estonian Labour Force Surveys (ELFS), Marksoo and Tammaru (2011) elaborate the decisive factors of long-term unemployment in Estonia labor market in the past twenty decades, where the long-term unemployment is accounted for nearly half of the unemployment in 2006. During the economic boom between 2001 to 2008 the long-term unemployment rate dropped critically among those less educational group who were mostly dedicated to real estate and construction sector. Nevertheless, those high educated, young, and native individuals in affluent regions attain more benefits from the economic prosperity. It has also been found that during economic down term long-term unemployment took place in all social demographic group no matter education level and regions. Another study from Ülle Marksoo (2011) investigates people under which regions in Estonia have highest risk of falling into unemployment since the beginning of 1990s to 2010. Ethnic minority group living in north-east part of Estonia persistently experienced the hard hit of unemployment because the industrial area undergone structured changes. It also provides evidence that the difference between population groups and regions was narrowing during economic recession. Northern Estonia where is the capital located had the most diverse industries and thus had the lowest unemployment and long-term unemployment rate.

In economic downturn there is less labor market mobility among industries and occupations. Quantitative result from Jaanika Meriküll (2011) shows that during economics boom 9% of workers changed jobs yearly while in bust period only 6% moved to other jobs. The long-term employment duration is increasing during downturn since companies tend to lay off short term

employees and reduce the number of jobs opening positions. Long term unemployment decreases because there are lots of new entrants during downturn and pushed down the average duration of unemployment. Although the regional inequality of unemployment reached the lowest value since independence in 1991, the possibility of reducing unemployment through domestic internal transfer was blocked by the fact of similar high unemployment rate among regions.

The unemployment among young generation raises the awareness as well. Especially young group in rural area is more likely to be under the risk of social exclusion, a lack of interaction with modern work environment, deficiency in education and limited mobility, thus leads to higher unemployment rate in this segment. Covid crisis undoubtedly worsen this social issue. According to Eurostat (2021), NEET (youth without employment, education, and training) youth in Estonia raised from 9.8% before pandemic and 11.2% in 2020. This testifies the statement of youth unemployment dilemma on the other side.

A study (Anne Lauringson, 2012) implementing duration analysis has been carried out pre-crisis and during crisis in 2008 to quantify the disincentive effect of unemployment benefits in Estonia. Not surprisingly, a larger size of benefit and a longer benefit period tend to hinder recipients from returning to employment, even though in a great recession period but the magnitude is a bit smaller than economic boom. On the other hand, people who stayed longer in unemployment and received more generous benefit stay longer in the accepted job and have a better job and skill matching quality. Those who leave unemployment in the earlier stage of unemployment spell experienced 10% less job matching quality. The same thing we observed from those unemployed with shorter unemployment benefit duration. Longer unemployment benefit recipients tend to stay longer in the accepted job after unemployment spell. At the end of the unemployment benefit duration people became less selective when accepting a job which potentially result in a poor job matching quality. Thus, it suggests that during recession the unemployment benefit system can be

more generous since it is likely to have a positive welfare effect. It's reasonable to design the unemployment benefit system in the way that the unemployed are more easily to start receiving benefit and make it hard to stay long at the unemployment benefit duration. The paper also focuses on the effect of active labor measures. The result presents that there tend to be a lower hazard rate for leaving unemployment before and during active measure.

Studies of international labor market

Countless studies have been carried out to study the impact of generosity of unemployment benefits, which are designed and implemented differently across countries and within country, and thus the disincentive effect is substantially subject to specific supporting measures. Baltic sea states follow International Labor Standards (ILS) and most of EU directive on labor conditions and have a strictness close to EU standards. However, the difference in regulation varies widely cross countries. Compared to other EU countries. Estonia has a stricter rule for continuing receipt of benefit. A thorough analysis from Danielle Venn (2012) where she designed a set of strictness indicator and compares EU member countries and 36 OECD countries' labor market policies implies that Estonia has a relatively strict regulation and legislation among countries. Her study covers the criteria of benefit entitlement, job-search and availability requirement, sanctions for job refusal. For example, voluntary unemployed are not eligible for benefit receipt. Unemployment insurance contribution must be paid for at least 12 months prior to previous 36 months. The unemployed must keep available and actively search for job during active labor market measure. If the unemployed refuse to accept a suitable job for the second time without a good reason unemployment allowance will be terminated. Another study from Raul Eamets and Jaan Masso (2004) explored the aspect of labor protection and law enforcement among Baltic States. They establish that temporary employment is more tolerable in Baltic States compared to other EU

countries. While inside Baltic states, Latvia has less constraints regarding labor dismissals and in favor of employers. In general, Baltic States constitute a slightly stricter regulation than other EU countries pertaining individual and collective dismissals, but what concerns is the statutory implementation situation that some evidence of violation was observed in enterprises.

Jakub Cerveny and Jan C. van Ours (2013) examined whether the great recession affected non-western immigrants more than Dutch locals. In absolute terms the great recession affected non-western immigrants more than locals but in relative terms the job finding rates subjecting to cyclical sensitivity does not differ between immigrants and locals.

Konstantinos Tatsiramos and Jan C. van Ours (2012) elaborates the eligibility conditions affect the unemployment inflows while the benefit structure shapes the replacement rate and the duration of benefit receipt, thus affect the unemployment outflow. There are a few countries (U.S and Canada) adjusting the unemployment benefit duration based on the economic cycle conditions, meaning that if general unemployment rate hits a certain threshold, the unemployment benefit duration would be extended accordingly, which is essentially unusual for OECD countries. It also indicates a negative relation between duration elasticity and unemployment rate, which means the moral hazard is lower during recession when the unemployment rate is high.

Looking at the previous studies of unemployment benefit effect, survival analysis such as Kaplan-Meier survival function, proportional-hazard model and Cox proportional hazards model are widely used as tools to examine some key factors attributed to unemployment duration and the effect of duration on job seeking.

Evidence has been found in a study of German 'Unemployment Benefit II' with discrete-time hazard rate model, where the welfare are generous to not only the unemployed but also the low income family. Exit rate of leaving the need to receive benefits is lower than the exit rate of leaving unemployment, which raised the awareness to embark on the policies that enable a reasonable

and sufficient wage for households and not only fight against unemployment (Hohmeyer and Lietzmann, 2020).

In the paper of Vasilica and Monica (2011) authors explores the key factors contributed to Unemployment exit rate of 16 counties in Romania using Kaplan-Meier analysis and Log Rank Test. What's interesting is that unemployed individuals with higher educational background doesn't show an advantage for exiting unemployment compared to those with lower-level education. On a county-level analysis, age factor is significantly positively related to unemployment survival rate.

Using data from Poviát Labour Office in Sulęcín before and after 2004, when Poland became EU member country and promoted the unemployment benefit terms targeting a certain vulnerable group. In the paper Bieszk-Stolorz, B. & Markowicz, I. (2015) adopt the Cox hazard model and submits that those who ineligible for unemployment benefit have higher hazard rate for leaving unemployment in the first 12 months compared to those who are eligible, while the situation is inverse after 12 months, regardless of gender, before or after the accession.

Except for the quantitative disincentive effect, as a positive side of unemployment benefit, Ammar Farooq et al (2020) study how the unemployment benefit improves the matching quality between personal skills and labor market requirement in the U.S., especially for women, non-white and less-educated workers. The author concludes that job skill matching quality explains the increased of wage after unemployment spells due to more generous unemployment benefit. Longer benefit duration rise the likelihood of staying longer in next job and erase the earning loss because of misplacement. By contrast, it does point to the evidence that improving liquidity is not enough for getting a better job with a higher quality employer while it's the access to networks and other factors contributing to a better job.

Methodology

Kaplan-Meier Survival function

Kaplan-Meier survival function is often used to measure the effect of a treatment which has a likely causal relationship of the occurrence of a certain event, which do not impose strong assumption to data exploration and description. The starting point of an intervention to the time stamp when the number of subjects survived, or an event happened that the subjects exit the censor is called the survival time. In the field of analyzing the unemployment insurance and active measure for unemployed, Kaplan-Meier function is often used to measure the length of time people exit unemployment after a job loss.

The survival rate at any specific time point is calculated by

$$S(t) = \frac{\text{Number of unemployment at the beginning} - \text{Number of people leaving unemployment at time } t}{\text{Number of unemployment at the beginning}}$$

The estimator of the survival function $S(t)$ which implies the probability that unemployment is longer than time t is given as follow:

$$\widehat{S}(t) = \prod_{t_i \leq t} \left(1 - \frac{d_i}{n_i}\right)$$

d_i is the number of events (people who leaving unemployment) take place at time t . n_i is the individuals who had not yet experienced the event or been censored (people who still staying at unemployment). If at the last follow-up, an individual is still alive (or still staying at unemployment) or for some reasons an individual is lost to follow-up, we call this situation right-censoring. Curves of different segmentations can be compared in the way that a vertical gap meaning at a particular time stamp, one segment has a higher proportion of survival time, a horizontal gap meaning that one segment takes longer time to have the event happened than other segments.

Hazard Rate

The hazard rate in the field of studying the benefit effect is defined as the probability that exiting unemployment happened at time t given the condition that the individuals stay at unemployment before time t . Hazard rate in continuous time is a conditional probability assumes that an event will happen in a very short interval.

In this study the cumulative hazard would be used to integrate hazard rate over time. It measures the total amount of risk that has been cumulated up to time t . It gives the number of times that we would expect to observe an event happened over a period if only the event is repeatable.

$$H(t) = \sum_{t_i \leq t} \frac{d_i}{n_i}$$

Where d_i is the number of observation with the specific event take place at time t_i and n_i is the total individuals at risk.

Cox proportional hazard model

It's a standard semi-parametric model in statistics for examining the relationship between hazard rate and covariates. The purpose of the model is to evaluate simultaneously the effect of several factors on survival. It allows us to examine how specified factors related to sociodemographic, historical employment and benefits influence the rate of exiting unemployment. It consists of two parts: the underlying baseline hazard function and the parameters affecting.

$$\log h_i(t) = \alpha(t) + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_k x_{ik}$$

$$h_i(t) = \alpha(t) \exp(\beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_k x_{ik})$$

Where i denotes the observation and x is a set of covariates. $h(t)$ is the hazard function determined by the set of covariates. If all the x_i are equal to zero,

the term $(\beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_k x_{ik})$ would be eliminated and thus $\alpha = \log h_i(t)$ is the baseline hazard which is unspecific and it is considered a semi-parametric approach. β is a vector of parameters to be estimated. A positive β indicates a covariate that is positively associated with the probability that the event takes place, and thus negatively associated with the length of survival. x_{ij} influence the hazard through the form $exp(\beta_j)$, therefore the effect of x_{ij} is proportional.

Data

To achieve the objective of above methods, the study adopted the data from Estonian Unemployment Insurance Fund upon request which administers the collection of unemployment data and pays benefits to employees. The survey includes 304,531 entries of registered anonymous unemployed individual records from 2017 to 2021 covering the aspects of personal unemployed background, wage, benefit received history and duration, and demographic data.

Table 1. Data structure

Demographic data	Pseudo id number, region of living, gender, age, Estonian language knowledge, education level, whether living in rural area, whether disabled
Labor market history	Pervious employment sector, pervious 4-12 months earning, last employment duration, previous unemployment spells, last employment termination reason
Unemployment benefit and duration	Unemployment benefit days granted

	(180 and 270 and 360 days), unemployment benefit waiting days, unemployment benefit amount, Unemployment allowance days granted
Before COVID-19	During COVID-19
Pseudo id number with unemployment start date and end date before 14 th , March 2020	Pseudo id number with unemployment start date after 14 th , March 2020

Subject to the fact that a person should at least pay the unemployment insurance for five years and have been paid for at least 12 months for the previous 36 months, 36% of the total unemployed are eligible to unemployment benefit. Depending on the periods of time a person pays the unemployment insurance contribution, one would be allocated 180, 270 or 360 benefit days. 29,225 out of 304,531 or 10% entries are granted 360 unemployment insurance days, while 24,206 or 8% entries are appointed 270 UI days, 41,348 or 14% are assigned 180 UI days. 293,812 or 96% of the unemployed individuals exited unemployment as of the statistical period. 66,091 or 60% out of 110,286 benefit recipients got a job before end of the benefit period. Majority of the unemployed individuals at around 43% is between 30 to 50 years old, while the age group [15,30) and [50,65] are both around 28%. The top three reasons for being unemployment are Contract deadline (26%), employee-related (27%) and based on mutual agreement (25%). More than half of the unemployed come from the fields of personal service (18%), industry (17%) and business service (15%). Under the educational category, the unemployed with a secondary level degree accounts for 48% of the total. 59% of the unemployed has the last job duration less than twelve months. 45% of the unemployed speak Estonian. Since this study compares the disincentive effect of different duration of benefits, it's important to separately list the data

characteristics of each 180, 270, 360 days segments.

For analyzing the unbiased effect of the unemployed who were the first time to received unemployment benefit, those who received the remaining benefit from previously granted benefit period are excluded from dataset. In the dataset there are two kinds of unemployment spell ending days, one is the day of benefit ending day, another is the actual ending day which is the day the individuals return to the workforce and usually not the same day as the day of benefit ending. Previous studies indicate that the spike of exiting unemployment is usually larger when unemployment spell is defined by the time to the point of benefit exhaustion. The spike of hazard rate is substantially overestimated when classify the time of benefit exhaustion as unemployment exit time. Therefore, in this study the data is cleaned in the way that the actual day of leaving unemployment, which is the length of time from the end of previous job to the start of next job, is applied to all the models for duration estimation. Only the transition from unemployment to next full-time employment is considered.

It's worth noting that the motivation and ability to leave unemployment include one's willingness to work, one's health condition, a candidate's soft skills such as communication and presentation skills and industrial trend subjecting to macroeconomics situation, which are hard to be captured and proved through data. Given the issue of missing personal subjective data, the result of from the survival analysis should be interpreted with caution.

Table 2. Description of Unemployment benefit recipients from 2017 to 2021

	UIB 180 days	UIB 270 days	UIB 360 days
Num of samples	41348	24206	29225
First 100 Days daily amount (EUR)	16.2	19.4	22.7
After 100 Days daily amount (EUR)	13.0	15.1	17.4
Actual unemployed spell (Avg days)	193	231	282
Avg monthly earning before unemployment	699	923	1220
Tertiary Education	31%	36%	48%
Secondary Education	18%	49%	42%
Primary Education	50%	14%	8%
Education: Others	1%	1%	2%
Gender: male	46%	44%	44%

Age Group:			
[15,30)	36%	18%	0%
[30,50)	41%	57%	53%
[50,65]	23%	25%	47%
Estonian Speaker	60%	62%	64%
Rural Area	18%	18%	21%
Last employment duration:			
More than 10 years	0%	2%	35%
3 to 10 years	10%	35%	23%
1 to 3 years	31%	22%	13%
3 to 12months	30%	19%	12%
To 3 months	29%	22%	16%
Last employment field:			
Agriculture	3%	2%	2%
Business service	20%	25%	29%
Construction	11%	10%	5%
Industry	17%	19%	23%
Personal service	19%	18%	14%
Retail	12%	10%	9%
Transport	5%	5%	6%
EducHealthSocPub	7%	6%	10%
Other	5%	4%	4%
Last employment type:			
Clerks	6%	6%	6%
Craft and related trades workers	17%	16%	12%
Elementary occupations	18%	14%	11%
Legislators, senior official and managers	8%	12%	16%
Plant and machine operators and assemblers	9%	10%	12%
Professionals	8%	9%	11%
Service workers and shop and market sales workers	20%	17%	14%
Skilled agricultural and fishery workers	1%	1%	1%
Technicians and associate professionals	11%	14%	15%
Unknown	2%	2%	1%

According to the EUIF dataset, the largest number of unemployed persons are observed at Q2 2020 where the first wave of lockdown was implemented in Estonia, the change in unemployment was developed rapidly and reaching the peak of monthly 11323 new registers in April 2020. Although the number of new registers declined in May 2020, the new unemployment stayed at high level relatively to

previous year. Comparing to the graph of new registers who are eligible to unemployment benefit, a similar tendency is presented while the curve for the eligible seems to be stable over months. Half of the new registers did not meet the criteria for the benefit at the first hit in April

Figure 2. Number of registers by year in EUIF dataset

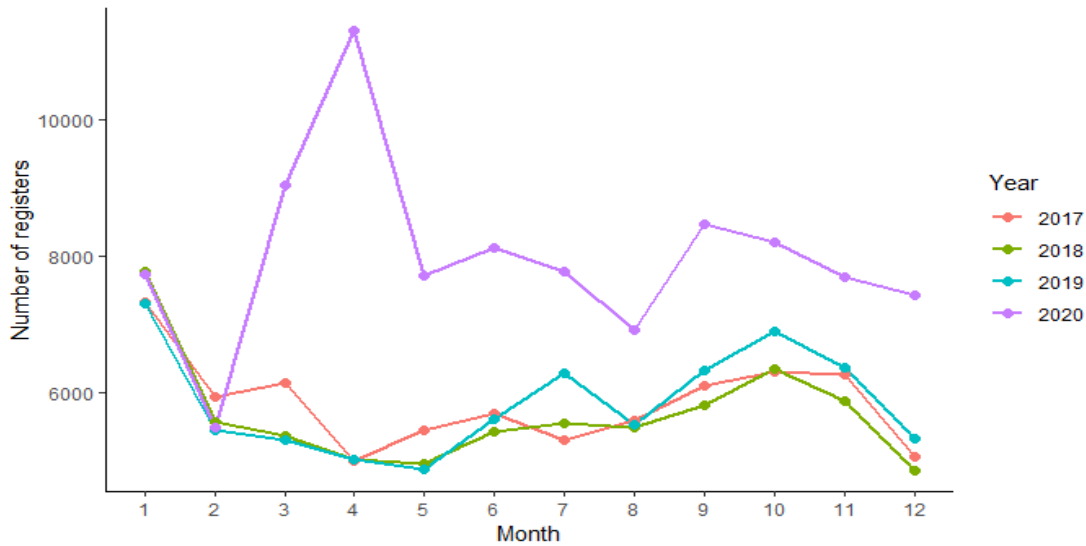
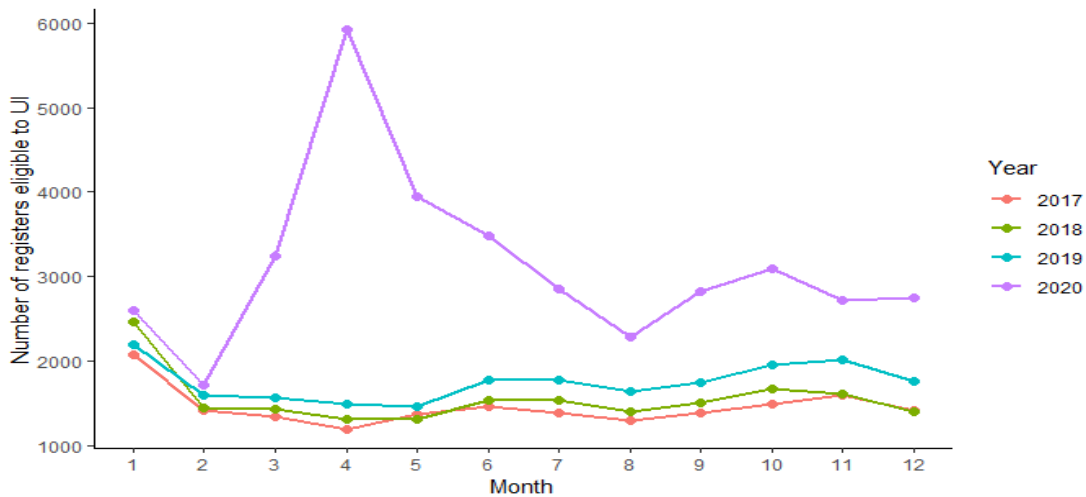


Figure 3. Number of registers eligible for unemployment benefit by year in EUIF dataset



Results

Kaplan-Meier survival function is a nonparametric method for predicting the survival rate at a specific timeframe, which gives the probability of staying at unemployment at past time t . The time to exit of unemployment is of interest

and three groups of individuals are compared with respect to time.

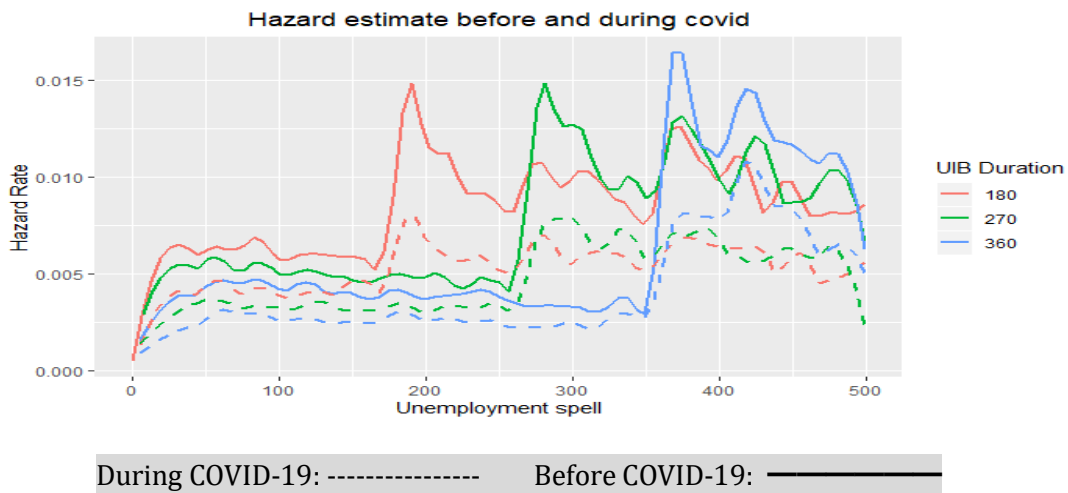
Figure 2. Survival Probabilities before and during covid



Note: Data of benefit recipients with the unemployment spells across March 2020 when the government declared the emergency status in Estonia are excluded.

Pre-covid period and during-covid period are compared using data with March 2020 as a cutoff point. First, the survival estimation of 360 days is consistently higher than that of 270 days and 180 days, meaning that recipients of 360 days are less motivated to leave unemployment. Due to the outbreak of the COVID virus leading to the lagging on labor market, survival rate during covid is constantly higher than that of before covid for three kinds of recipients, which can be interpreted in the way that the disincentive effect is rather milder before crisis, since there're more jobs positions available and created in labor market. During covid 25% of 360-days-benefit recipients need around 175 days to exit unemployment while before covid it's around 80 days. A spike is observed at around 360th days for 360-days-benefit recipients, same patterns are identified for 180 days and 270 days benefit recipients. The probability of leaving unemployment increases dramatically before the end of the period for receiving unemployment benefit.

Figure 3. Hazard rate before and during COVID-19



From figure 3, before pandemic the hazard rate for 180-day-UIB reaches the maximum at around 180 days, for 270-day-UIB appears at 270 days. For 360-day-UIB the first peak of hazard rate appears after 360 days. Before the end of benefit the hazard rate is constant and stay at a low level, reaching the peak at the end of benefit, declining but still maintained at a relative high level after end of benefit. It's evident that people stay at unemployment until the exhaustion of benefit. A general trend is that the lower the UIB duration, the higher the hazard rate before the end of the benefit, which is reflected by the highest hazard rate for 180-UIB recipients before 180 days.

The figure also shows that the hazard of leaving unemployment is consistently much higher before crisis than during covid. Compared to the hazard before pandemic, a tremendous difference is observed for the 360-days-UIB group. The spike of leaving unemployment for 360-days group shows up at around 420 days. Since 270- and 360-day-UIB recipients have either 30- or 60-days waiting periods if they are entitled to redundancy benefit, the delay of leaving unemployment observed after 30 and 60 days of benefit exhaustion.

Figures in appendix present the hazard rate according to different personal characteristics. The probability of female leaving unemployment is interactive to that of male even though the difference seems not significant and the highest

hazard rates both show up at around 360 days regardless the covid period. All the figures show that the hazard rate for leaving unemployment is substantially lower during covid period. Young people exit unemployment earlier at first 360 days and reached the peak at around 180 days, with the middle-aged group following and the elder people exit much later, while after 360 days it's the other way around, which is reasonable considering those being granted 180 benefit duration are relatively young generation. The tertiary educational group tends to stay longer in unemployment until the exhaustion of 360 days unemployment benefit. Primary educational level group exits unemployment faster than any other groups. The lower the education level, the earlier the exit of unemployment. Estonian speakers are inclined to exit earlier than non-Estonian speaker before COVID-19, while the difference becomes less noticeable during covid period. Individuals with last employment duration within a year leave unemployment earlier than others. The longer the previous job duration, the later the exit of unemployment. One experienced more unemployment spell previously exits faster than those experienced less unemployment spells. Most skilled agricultural and fishery workers exits unemployment at around 180 days before COVID-19, while during COVID-19 their hazard rate is highest at 180, 270 and 360 days.

Table 3. Result of estimating parameters before covid in Cox model

	exp(coef)	z	p
UIB duration 270 days	0.8320	-15.634	< 2e-16
UIB duration 360 days	0.6706	-32.283	< 2e-16
Gender	1.0491	4.372	1.23e-15
Age_group [30,50)	0.8183	-15.544	< 2e-16
Age_group [50,65]	0.7219	-21.599	< 2e-16
Education Secondary level	0.9483	-3.677	0.000236
Education Tertiary level	0.9559	-2.765	0.005684
Region North	1.0469	2.566	0.010291
Region North-East	1.0202	0.910	0.363044
Region South	1.0458	2.441	0.014647
Region West	1.0040	0.194	0.846553
Estonian language	1.0624	5.290	1.22e-07
Risk_disabled	0.7905	-18.218	< 2e-16

Previous employment field:			
Business service	0.9000	-2.316	0.020548
Construction	1.0599	1.255	0.209482
EducHealthSocPub	0.9987	-0.028	0.977350
Industry	0.9718	-0.636	0.524610
Other	0.9496	-1.093	0.274573
Personal service	0.9673	-0.763	0.445491
Retail	0.9519	-1.034	0.301084
Transport	1.0645	1.203	0.229035
Previous employment type:			
Craft and related trades workers	1.0771	2.681	0.007338
Elementary occupations	1.1010	3.638	0.000275
Legislators, senior officials and managers	0.8589	-6.304	2.91e-10
Plant and machine operators and assemblers	1.0936	2.845	0.004447
Professionals	0.9905	-0.380	0.703872
Service workers and shop and market sales workers	1.1312	4.677	2.92e-06
Skilled agricultural and fishery workers	1.0651	0.982	0.326093
Technicians and associate professionals	0.9276	-3.275	0.001058
Unknown	1.4591	7.473	7.86e-14
Monthly earnings before spell	1.0574	6.202	5.59e-10

Note: UIB duration 180 days, gender male, age group [15,30], Education primary level, region central, previous employment field: agriculture, previous employment type: clerks are reference categories.

Table 4. Result of estimating parameters during covid in Cox model

	exp(coef)	z	p
UIB duration 270 days	0.8573	-10.328	< 2e-16
UIB duration 360 days	0.7100	-20.904	< 2e-16
Gender	0.9864	-0.966	0.334030
Age_group [30,50)	0.7478	-17.801	< 2e-16
Age_group [50,65]	0.6345	-22.136	< 2e-16
Education Secondary level	0.9458	-3.023	0.002499
Education Tertiary level	0.9172	-4.127	3.68e-05
Region North	0.9104	-3.976	7.02e-05
Region North-East	0.9983	-0.057	0.954475
Region South	1.0938	3.555	0.000378
Region West	1.0540	1.885	0.059455
Estonian language	1.0299	2.051	0.040268
Risk_disabled	0.82911	-10.109	< 2e-16
Previous employment field:			

Business service	0.8836	-1.998	0.045762
Construction	1.0130	0.207	0.836361
EducHealthSocPub	1.0513	0.770	0.441243
Industry	1.0097	0.156	0.875862
Other	0.9453	-0.836	0.402892
Personal service	0.9229	-1.349	0.177459
Retail	0.9064	-1.557	0.119473
Transport	1.0700	0.987	0.323852
Previous employment type:			
Craft and related trades workers	1.0987	2.738	0.006174
Elementary occupations	1.1382	4.021	5.80e-05
Legislators, senior officials and managers	0.8926	-3.611	0.000305
Plant and machine operators and assemblers	1.0157	0.402	0.687627
Professionals	1.0798	2.361	0.018209
Service workers and shop and market sales workers	1.1155	3.725	0.000195
Skilled agricultural and fishery workers	0.9538	-0.496	0.619896
Technicians and associate professionals	0.9618	-1.323	0.185972
Unknown	1.6659	7.594	3.09e-14
Monthly earnings before spell	1.1024	9.442	< 2e-16

Note: UIB duration 180 days, gender male, age group [15,30], Education primary level, region central, previous employment field: agriculture, previous employment type: clerks are reference categories.

Result from table 3 and 4 indicates that before pandemic, unemployment benefit duration, age group, Estonian language knowledge, whether being disabled and last employment salary are key covariates that impacted individuals' hazard rate while during covid, Estonian language knowledge is not a significant covariate, and it seems like educational level and region of employment are important consideration for one's hazard rate.

For categorical variables, groups which are missing in the table is the baseline group being compare with, for example the baseline variable of age group is [15,30). Those with 270 days and 360 days unemployment benefit duration have 0.83 times and 0.67 times lower hazard rate than those with 180 days duration meaning longer benefit duration extends job seeking time. This disincentive effect weakens

during pandemic where those with 360 days duration have 29% lower hazard rate than baseline hazard rate while before pandemic this ratio is 33%. Given the fact that individuals from 360 days duration group have higher average monthly earnings and a larger proportion of high educational level, it implies that the covid crisis reinforces the re-employment of those individuals who having the ability to back into workforce.

The brick-and-mortar retail trade was severely affected by the closures of shops, during COVID-19 unemployed from retail sector were 5% less likely to leave unemployment. The same effect we observed in personal service and business service sectors. Although the current crisis is not originated from financial system, but business service sector highly depends on the economic cycle, and weak profit situation during lockdown disenables the business sectors to absorb more workforces. The education and health social public sector employment situation experienced a recovery during COVID-19, where people in this sector have second highest hazard rate to exit unemployment. Since the education and public sector is traditionally not very sensitive to external shocks and pharmaceutical and medical companies such as COVID treatment, masks would profit from current crisis.

Plant and machine operators and assemblers and Service workers and shop and market sales workers spent more time returning to employment than before COVID-19. Due to travel restriction and avoidance of personal contact, the demand for factory assembly line workers and onsite market sales workers shrank, thus the probability of exiting unemployment is limited. Legislators, senior officials and managers and professionals exited unemployment faster than before COVID-19, which is corresponding to the result that benefit disincentive effect weakens for the 360 days unemployed during COVID-19. This group of highly skilled workers had the ability and more opportunities to return to workforces, and normally they have the option to work remotely, thus they are expected to be suffered less from pandemic. Overall, the negative impact is more pronounced for low-skilled workers and manual workers.

Pandemic has an adverse impact on re-employment of middle aged and old.

For the age group 30-50 and 50-65 a significant decrease of hazard rate around 8% was observed comparing to before pandemic, which it's evident that the middle aged and old are less likely to be re-employed during crisis. Monthly earnings before unemployment spell are a substantial factor impacting unemployment exit. During COVID-19 unemployed with higher salary at last job exit unemployment faster than before. Gender was acted as a significant factor before pandemic, women and people unemployed in north and north-east regions stayed longer time in unemployment during COVID-19.

Table 4 and 5 present estimations for benefit covariates before and during covid period. The time interval is first divided in sub-intervals. A different constant exponential hazard model is then fitted in each sub-interval, modeling the log-hazard as a linear function of benefit covariates. A hazard rate lower than 1 means that the specific benefit covariate has a hazard rate lower than the benchmark. The amount of unemployment benefit seems to be the significant factor that distort the behavior of leaving unemployment. Same benefit level in different groups tend to have homogeneous effect on hazard rate. It is evident that fewer people leave unemployment when benefit amount is at higher level especially before covid period. Since the amount of benefit depends on the previous average salary, it can be interpreted that high salary or senior level position population exhibit much larger disincentive effect. It's noticeable that before COVID-19 the hazard rate of the unemployed with UIB daily rate larger than 50 EUR is less than half of the unemployed without any benefit and benefits at other levels.

During pandemic, different levels of benefit in the same duration group exhibit similar behavior, the key factor to distinguish the hazard of exiting unemployment is the benefit duration, UIB 180 days group has the highest probability to leave unemployment, which is reflected by around 10% higher hazard rate than UIB 270 days group. As we know that the main difference between these three duration groups is the number of years the unemployed contributed to unemployment insurance system which indicates the personal age, it is speculated that during covid, apart from the disincentive effect from benefit duration, age is a

primary hindrance for leaving unemployment.

Table 4. Estimation results for benefit covariates in piecewise constant hazard function before covid period

Observation group	Benefit Covariates	Compare to	Hazard Rate (Relative Risk)
UIB 180	0EUR<UIB daily rate<10EUR	No Benefit	0.950
	10EUR<=UIB daily rate<20EUR		0.901
	20EUR<=UIB daily rate<30EUR		0.859
	30EUR<=UIB daily rate<40EUR		0.815
	40EUR<=UIB daily rate<50EUR		0.841
	50EUR<=UIB daily rate		0.369
UIB 270	0EUR<UIB daily rate<10EUR	No Benefit	0.887
	10EUR<=UIB daily rate<20EUR		0.859
	20EUR<=UIB daily rate<30EUR		0.807
	30EUR<=UIB daily rate<40EUR		0.792
	40EUR<=UIB daily rate<50EUR		0.732
	50EUR<=UIB daily rate		0.386
UIB 360	0EUR<UIB daily rate<10EUR	No Benefit	0.820
	10EUR<=UIB daily rate<20EUR		0.822
	20EUR<=UIB daily rate<30EUR		0.790
	30EUR<=UIB daily rate<40EUR		0.757
	40EUR<=UIB daily rate<50EUR		0.750
	50EUR<=UIB daily rate		0.378

Table 5. Estimation results for benefit covariates in piecewise constant hazard function during covid period

Observation group	Benefit Covariates	Compare to	Hazard Rate (Relative Risk)
UIB 180	0EUR<UIB daily rate<10EUR	No Benefit	0.992
	10EUR<=UIB daily rate<20EUR		0.926
	20EUR<=UIB daily rate<30EUR		0.936
	30EUR<=UIB daily rate<40EUR		0.929
	40EUR<=UIB daily rate<50EUR		0.921
	50EUR<=UIB daily rate		0.858
UIB 270	0EUR<UIB daily rate<10EUR	No Benefit	0.749
	10EUR<=UIB daily rate<20EUR		0.797
	20EUR<=UIB daily rate<30EUR		0.833
	30EUR<=UIB daily rate<40EUR		0.838
	40EUR<=UIB daily rate<50EUR		0.801
	50EUR<=UIB daily rate		0.826
UIB 360	0EUR<UIB daily rate<10EUR	No Benefit	0.651
	10EUR<=UIB daily rate<20EUR		0.641
	20EUR<=UIB daily rate<30EUR		0.640

$30\text{EUR} \leq \text{UIB daily rate} < 40\text{EUR}$	0.649
$40\text{EUR} \leq \text{UIB daily rate} < 50\text{EUR}$	0.654
$50\text{EUR} \leq \text{UIB daily rate}$	0.643

Conclusion

Upon this study, there're commonalities before and during pandemic. The unemployed are not waiting to re-employ until the end of the UI benefit. The analysis to large extent is in line with search theory. The magnitude of the spike differs across different period and labor market conditions. In general, subject to the macro-economic situation together with the disincentive effect, the hazard rate for leaving unemployment is substantially lower during covid period. Young generation and relatively low educated workers exit unemployment faster than any other groups. Age and education level are significant factors that distinguish the hazard rate. People who have a shorter previous job duration and more unemployment spells tend to exit faster. When considering the level of benefit, higher level of benefits has a stronger disincentive effect than low level of benefits before COVID-19, while during COVID-19 the effect from amounts of benefits weakens and the benefit duration plays an important role in exiting unemployment. Moreover, the disincentive effect of different amount of benefit appears to be homogenous during COVID-19. Cox hazard function indicates the benefit duration, age and risk of being disabled and monthly earnings are important elements for explaining hazard rate in both periods. During COVID-19, education level, region of unemployment, and being at some specific industries became key factors to explain the behaviour of exiting unemployment.

A major feature of unemployment benefit systems is that it is constantly changing. Economic sectors that requiring social interaction such as tourism, retail and personal service were the most heavily affected during COVID-19. Plant and machine operators and assemblers as well as service workers and

shop and market sales workers were faced the increased risk of infection. During crisis a more generous unemployment benefits and a lower eligibility requirement can be introduced to specific industries and types of employees since the high unemployment rate is a more important consideration than moral hazard causing by benefit disincentive effect.

Some other factors that might affect labor re-employment include the active participation of labor measures, firms' motivation to recruit individuals who are long-term unemployed, and more importantly, the delay of consumption and investment because of covid outbreak, the willingness of returning back to workplace after long-term lockdown. Whether the longer stay in unemployment during covid improve the next job quality or wage is opening to be tested.

References

Anne Lauringson (2012). The impact of the generosity of unemployment benefits on Estonian labour market outcomes in a period of crisis. Tartu University Press.

Bieszk-Stolorz, B. and Markowicz, I. (2015). Influence of Unemployment Benefit on Duration of Registered Unemployment Spells. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 10(3), pp. 167-183

Bruce D.Meyer (1988). Unemployment Insurance and Unemployment Spells. National Bureau of Economic Research, Working Paper No. 2546

David Card, Raj Chetty, and Andrea Weber (2007). The Spike at Benefit Exhaustion: Leaving the Unemployment System or Starting a New Job? *American Economic Review*

Danielle Venn (2012). Eligibility Criteria for Unemployment Benefits: Quantitative Indicators for OECD and EU Countries. OECD Social, Employment and Migration Working Papers, No. 131, OECD Publishing, 62 p.

David Jarjoura (1988). Smoothing hazard rates with cubic splines. *Communications in Statistics - Simulation and Computation*, Volume 17, Pages 377-392

Diamond, P. (2008) Search theory. *The New Palgrave Dictionary of Economics*. Second Edition. Eds. S. N. Durlauf and L. E. Blume. Palgrave Macmillan

D.R.Cox (1972). Regression Models and Life-Tables. *Journal of the Royal Statistical Society. Series B (Methodological)* Vol. 34, No. 2 (1972), pp. 187-220 (34 pages)

Farooq, A, A Kugler and U Muratori (2020). DO Unemployment Insurance Benefits Improve Match Quality? Evidence from Recent U.S. Recessions. NBER Working

Paper NO. 27574.

Geman, S., and Hwang, C.R. (1982). Nonparametric Maximum Likelihood Estimation by the Method of Sieves. *The Annals of Statistics*, 10(2), 401-414.

Hohmeyer, K. and Lietzmann, T. (2020). Persistence of Welfare Receipt and Unemployment in Germany: Determinants and Duration Dependence. *Jnl. Soc. Pol.* (2020), 49, 2, 299–322

Jaanika Meriküll (2011). Labour market mobility during a recession: the case of Estonia. *Eesti Pank*

Jakub Cervený and Jan C. van Ours (2013). Unemployment of Non-western Immigrants in the Great Recession. *De Economist*, 2013, 161, 463-480, IZA Discussion Paper No. 7598

Kaplan, E. L. and Meier, P. (1958). Nonparametric estimation from incomplete observations. *Journal of the American Statistical Association*, 53(282).

Konstantinos Tatsiramos and Jan C. van Ours (2012). Labor Market Effects of Unemployment Insurance Design. *Journal of Economic Surveys*, 2014, 28 (2), 284 – 311, IZA Discussion Paper No. 6950

Kvieskiene, Giedre, Ilze Ivanova, Karmen Trasberg, Viktorija Stasyte, and Egle Celiešiene (2021). Modelling of Social Policy and Initiatives under COVID-19: Rural NEET Youth Case Study. *Social Sciences* 10: 393.

Manish Kumar Goel, Pardeep Khanna, Jugal Kishore (2010). Understanding survival analysis: Kaplan-Meier estimate. *International Journal of Ayurveda Research* | October-December 2010 | Vol 1 | Issue 4

Mario Cleves, Roberto Gutierrez, William Gould, Yulia Marchenko (2002). An Introduction to Survival Analysis Using Stata. P13-15

Mortensen Dale (1984). Job Search and Labor Market Analysis. Discussion Paper, No. 594, Northwestern University, Kellogg School of Management, Center for Mathematical Studies in Economics and Management Science, Evanston, IL

Mortensen, D. (2008) Labour market search. The New Palgrave Dictionary of Economics. Second Edition. Eds. S. N. Durlauf and L. E. Blume. Palgrave Macmillan

Raul Eamets and Jaan Masso (2004). Labour Market Flexibility and Employment Protection Regulation in the Baltic States. IZA DP No. 1147

Tansel, Aysit; Taşçi, H. Mehmet (2010). Hazard analysis of unemployment duration by gender in a developing country: The case of Turkey. IZA Discussion Papers, No. 4844, Institute for the Study of Labor (IZA), Bonn

Ülle Marksoo (2011). Long-term unemployment and its regional disparities in Estonia. Tartu University Press

Ülle Marksoo and Tiit Tammaru (2011). Long-term unemployment in economic boom and bust: The case of Estonia. *Trames Journal of the Humanities and Social Sciences*, DOI: 10.3176/tr.2011.3.01

Vasilica, C. and Monica, M. (2011). Survival analysis for the unemployment duration. *International Journal of Mathematical Models and Methods in Applied Sciences*, Issue 2, Volume 5, 2011

Appendix

Figure 4. Hazard rate by Age Group before and during COVID-19

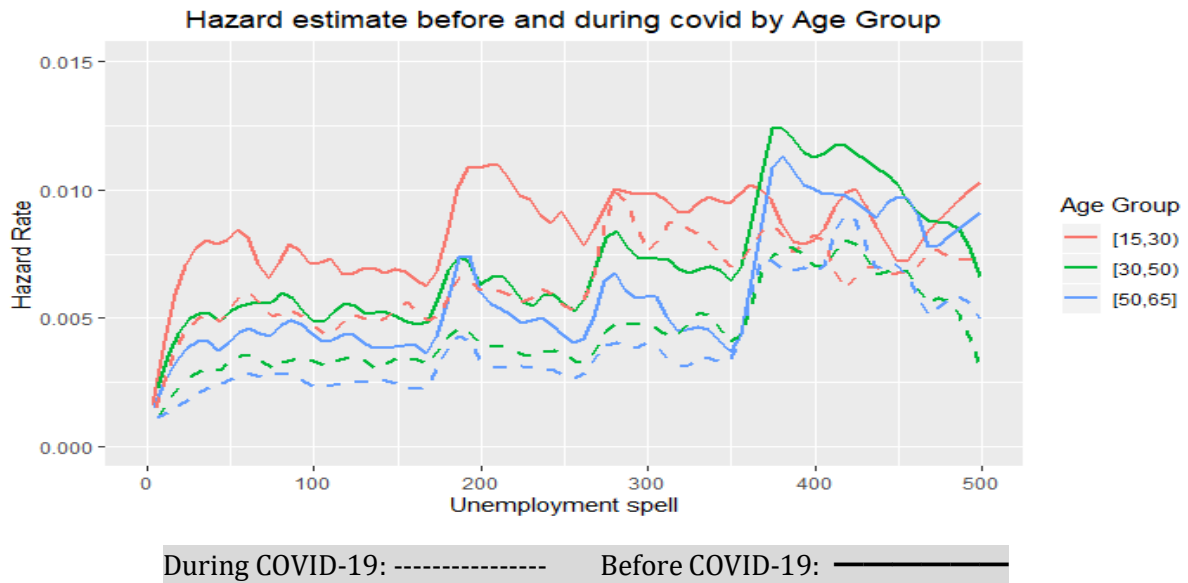


Figure 5. Hazard rate by Gender (Male: 1) before and during COVID-19

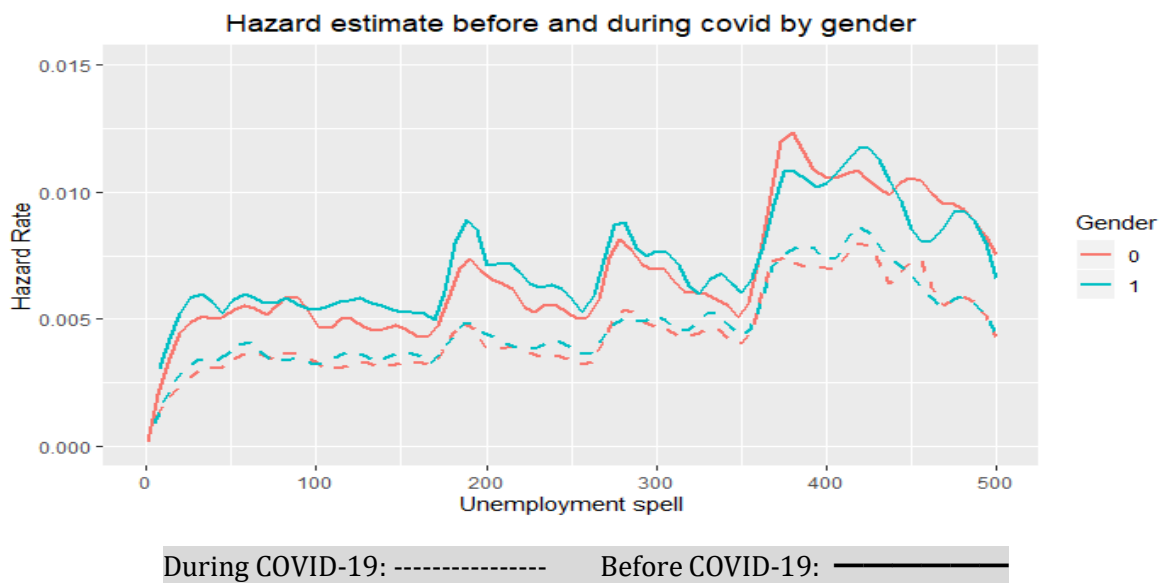


Figure 6. Hazard rate by Language before and during COVID-19

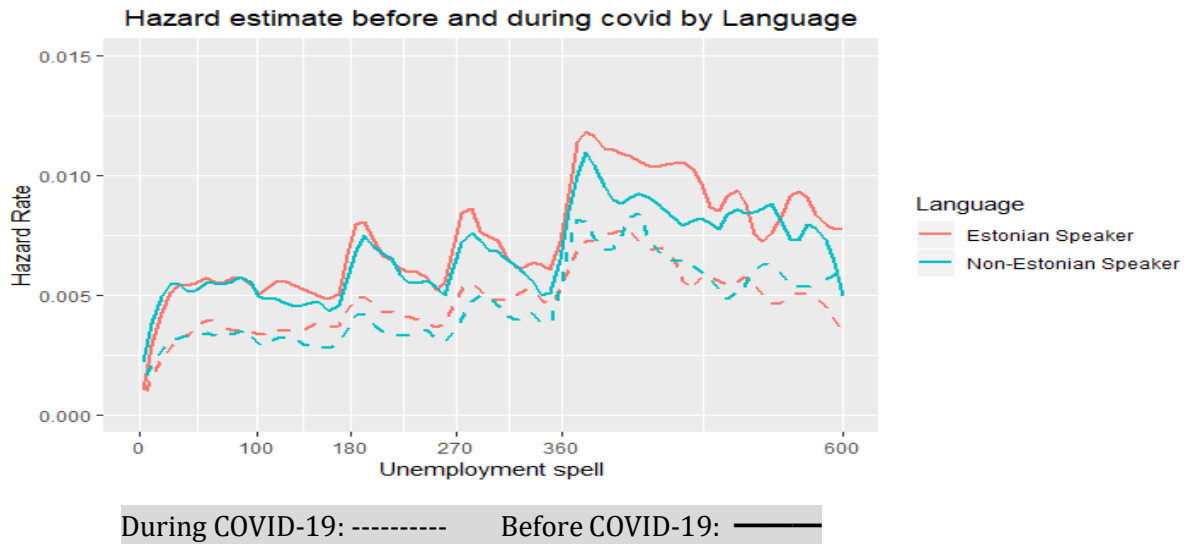


Figure 7. Hazard rate by rural area before and during COVID-19

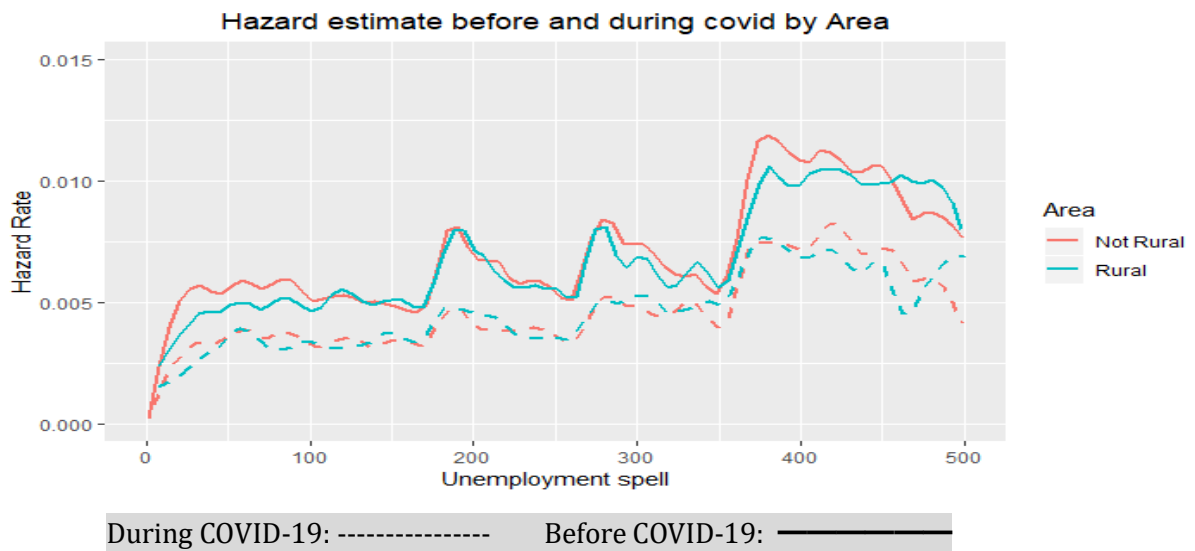


Figure 8. Hazard rate by last employment duration before and during COVID-19

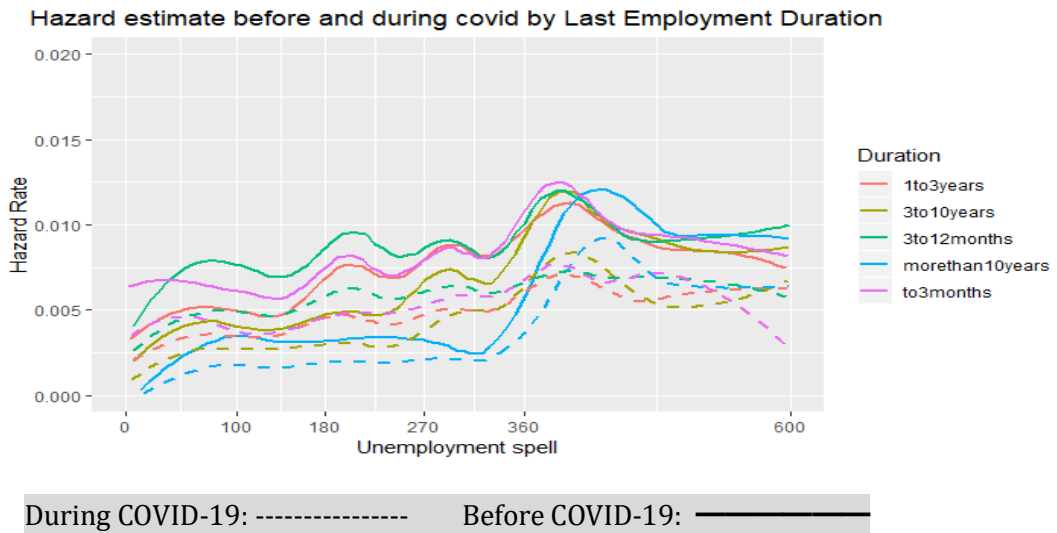


Figure 7. Hazard rate by education before and during COVID-19

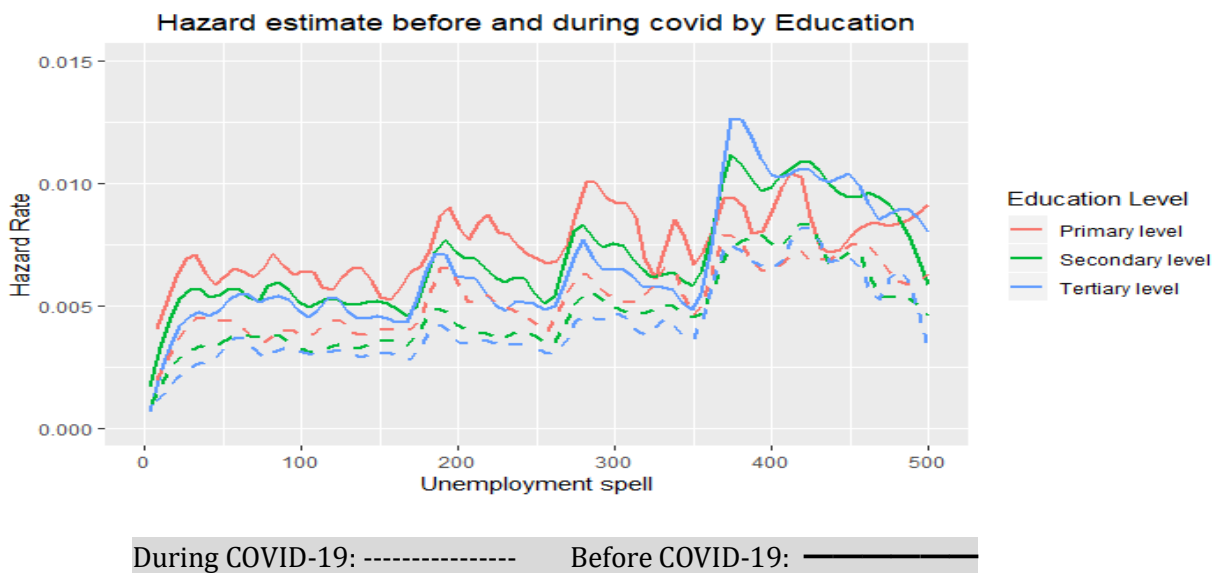


Figure 8. Hazard rate by last employment before COVID-19

Hazard estimate before covid by last employment

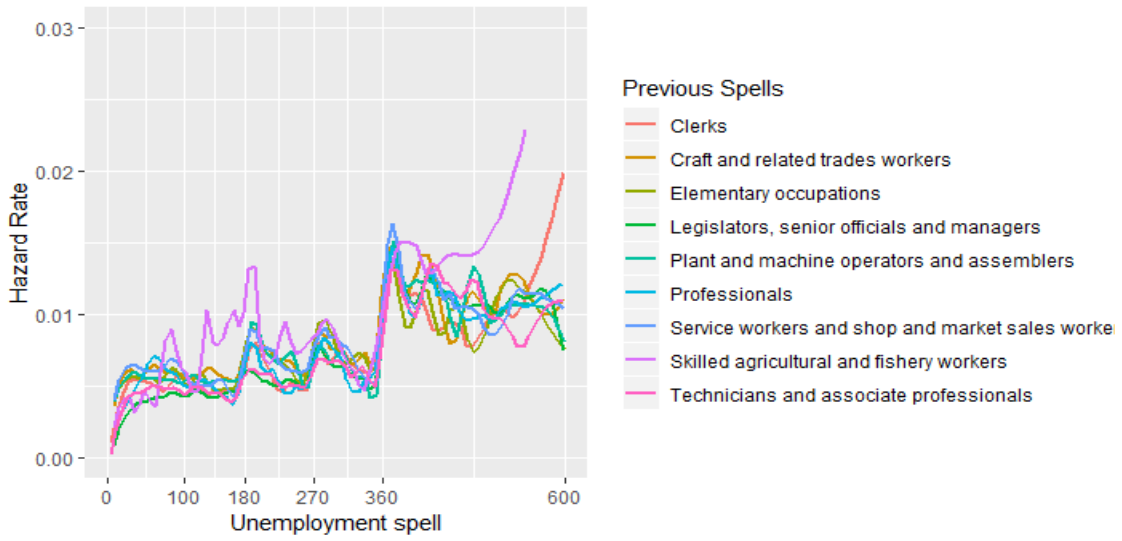
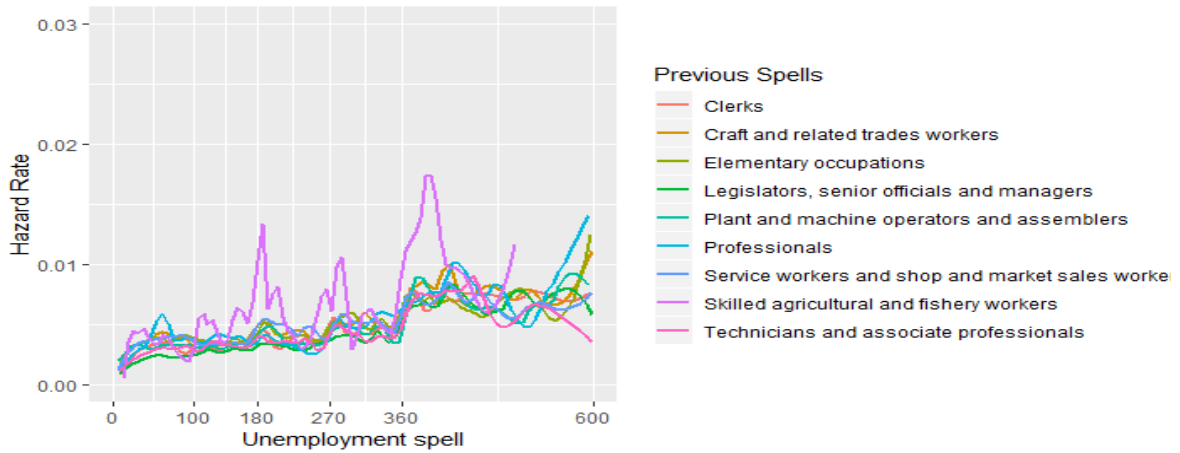


Figure 9. Hazard rate by last employment during COVID-19

Hazard estimate during covid by last employment



Resümee

Töötushüvitiste mõju töötuse kestusele enne COVID-19 ja selle ajal, kasutades

Eesti andmeid

Wanting Huang

Selle artikli eesmärk on uurida töötushüvitiste ja -kestuse mõju tegelikele töötusperioodidele enne COVID-19 perioodi ja selle ajal. Autorile teadaolevalt puuduvad hiljutised uuringud, mis hindaksid 2019. aasta covidi kriisi pärssivat mõju. Töötute hoolekandesüsteem kehtestati 2003. aastal Eesti kindlustusseadusega, mida on aastate jooksul muudetud heldemaks. Pärast 2020. aasta märtsi rakendati mõningaid tööturuspetsiifilisi meetmeid töösuhte säilitamiseks ja sotsiaalselt haavatavate rühmade rahalise kahju leevendamiseks. Käesolevas lõputöös kasutas autor pärssiva mõju analüüsimiseks järgmist ohuraamistikku: Kaplan-Meieri ellujäämismudel, Coxi proportsionaalne ohumudel ja tükkhaaval proportsionaalne oht, kasutades EUIF-i andmestikku (Eesti Töötukassa), mis koosneb 304 531 vaatlusest aastatel 2017–2021. Töötusperioodi kestuse selgitamiseks analüüsitakse demograafilisi tunnuseid jaisiklikku tööturu ajalugu. Käesolevas töös esitatud tulemused viitavad sellele, et töötushüvitise pärssival mõjul töötusest lahkumise käitumisele on kahe perioodi võrdlemisel nii sarnasusi kui ka erinevusi. COVID-19 ajal nõrgeneb pärssiv mõju enim kõrge sissetulekuga rühmade, spetsialistide ja kõrgete kvalifikatsioonidega töötajate raames. Praeguse kriisi negatiivne mõju on tugevam teatud tüüpi töökohtade puhul, nagu tehaste ja masinate operaatorid ja kokkupanijad ning teenindustöötajad.

Märksõnad: pärssiv mõju, töötutoetus, ellujäämise analüüs, ohumäär, COVID-19

Non-exclusive licence to reproduce the thesis and make the thesis public

I, ***Wanting Huang***,

grant the University of Tartu a free permit (non-exclusive licence) to

reproduce, for the purpose of preservation, including for adding to the DSpace digital archives until the expiry of the term of copyright, my thesis

Effect of unemployment benefits on unemployment duration before and during COVID-19 using Estonian data,

supervised by ***Andres Võrk***.

2. I grant the University of Tartu a permit to make the thesis specified in point 1 available to the public via the web environment of the University of Tartu, including via the DSpace digital archives, under the Creative Commons licence CC BY NC ND 4.0, which allows, by giving appropriate credit to the author, to reproduce, distribute the work and communicate it to the public, and prohibits the creation of derivative works and any commercial use of the work until the expiry of the term of copyright.

3. I am aware of the fact that the author retains the rights specified in points 1 and 2.

4. I confirm that granting the non-exclusive licence does not infringe other persons' intellectual property rights or rights arising from the personal data protection legislation.

Wanting Huang

19/05/2022