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Labour migration from third countries into the Central and Eastern European countries: the case of Estonia

Master's Thesis

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Abstract

This master's thesis examines the factors that attract or repulse migrant employees from third countries to CEE countries. In this research, the analysis is focused on the case of Estonia, utilising the LFS data from 2010 to 2020. Descriptive statistics show that third-country migrants' educational background, language proficiency, ethnicity and citizenship, age, gender, marital status, and Estonia's labour laws and migration policies have enticed them to work in Estonia. In the following, regression analysis is carried out using three models: logistic regression to map socio-economic factors differentiating immigrants from third countries, multinomial logistic regression to examine factors explaining labour market status, and Mincer wage equation to identify the immigrant wage gap. The first model found that labour migrants with secondary education, one foreign language, and married, female, and old adults are more likely to be from third countries. The results of the second model suggest that improved academic qualifications and language skills of labour migrants increase the chances of employability. Finally, the results of the third model highlight the impact of human capital features, personal attributes and birthplace on wages. Our findings contribute to the existing literature and offer valuable insights for policymakers and researchers.

Keywords:
labour migration, third countries, Central and Eastern European countries, employment, Estonia
JEL classification: F22, F66, J2, J6, J7

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I have written this master's thesis independently. Any ideas or data from other authors or sources have been appropriately referenced.

Contents

1 Introduction

In recent years, Central and Eastern European countries have become popular destinations for migrants from third countries. Precisely, they entice people from non-European countries as well as from the former Soviet Union and Southeast Europe. The negative economic and social welfare, inappropriate social security, political disputes, and inadequate standard of living are indeed some of the indispensable reasons and push factors for citizens of third countries to migrate to the more developed countries (Latek, 2019). Furthermore, some pull factors also should be considered as labour shortages in the CEE countries caused by the low birth rate, emigration, economic growth, etc. (Szarzec and Nowara, 2017). The migration flows of third-country nationals could bring certain economic and demographic benefits to the receiving countries. Hence, migrants help the host country's economy develop by filling labour market gaps and contributing to tax revenue (Kerr and Kerr, 2011). Likewise, they aid in handling demographic imbalances in the destination countries (Coleman, 2008). On the other hand, migrants ultimately induce difficulties in receiving countries, including a rise in demand for goods and services. An increase in real estate prices could also be one example of a negative consequence (Eurostat, 2023). Yet, if there is increased demand for locally produced goods and services, the overall effect on the local economy could be more positive. Moreover, transculturation, intermittent loss of tradition and custom by local people, and increases in population negatively influence existing social institutions (Vertovec and Wessendorf, 2005).

Accordingly, in the research, we are interested in studying the principal aspects of migration flows and finding out the motivations for migrants to arrive in Central Eastern European countries from past studies. The author aims to focus on labour migration from third countries to CEE countries. By studying the literature, we will understand how well third-country migrants are doing in the labour market in Estonia and how their performance compares to that of the local population. An analysis of the literature will also enable us to identify significant changes in CEE's migration areas, for instance, how the source and the destination countries of migration have changed over the years. The aim of the thesis is to analyse the labour market performance of third-country migrants in the Estonian Labour market. The performance of labour migrants is measured using indicators such as status, whether they are employed, inactive or unemployed in the labour market, their average wage and aspects such as language proficiency and educational level that affect the performance.

Several research papers have previously investigated and analysed labour migration for various Central Eastern European countries (Lauren, 2016; Tammaru et al., 2020; Hazans, 2012; Hazans, 2016 etc.). Still, existing research papers were mainly focused on outward migration as well as return migration (Masso et al., 2018; Luchyk, 2017 etc.). The executive summaries of the BARMIG project, which is the base for this paper, highlight that the immigration of third-country nationals has increased compared to other migrants since the 2010s. This factor necessitates a separate analysis specifically for this group. In this paper, we will primarily consider inward migration to

CEE countries and study the recent literature on a particular topic. This paper will attempt to fill the gap and aim to set and answer the research question. What are the pull factors for CEE countries to receive foreign workers? To answer that question, we will be chiefly applying the Statistics Estonia Labour Force Survey database as quantitative data in the paper. For data analysis and conducting descriptive statistics, the timeframe is considered from 2010 to 2020. The period is chosen based on the fact that labour migration from third countries has seen a rise, particularly since 2010.

Our primary focus in this paper is Estonia which has had positive net migration since 2015. The situation in Estonia is thus different from the two other Baltic States. It was anticipated a while ago that net migration would change from negative to positive (Tammaru and Eamets, 2021). In comparison, other Baltic states have maintained extensively negative net migration (Simons, 2021). For instance, Lithuania has undergone the most significant inflows and outflows of migrants and the most negative net migration, with approximately -170,000 migrants annually -11.6% net migration rate per 1000 inhabitants in the 2015-2020 time period among the three countries since its independence. Latvia has also had more emigrants than immigrants, which caused a negative net migration (roughly -150,000) annually -7.6% per 1000 inhabitants, particularly from 2004 to 2019. Yet, that was a minor proportion than in Lithuania but a higher proportion than in Estonia (Simons, 2021). The positive net migration in Estonia is due to the return migration and migration from European Union 3rd countries, approximately half of both. Return migration is one of the causes of a parallel rise in immigration and emigration (Puur et al., 2017; Lauren et al., 2020).

We will try to examine and assess the causes of immigrant sorting across jobs, and for that, we will use the Roy framework. A thorough and theoretically sound framework for analysing individual self-selection is provided by the Roy model[1]. The Roy model states that an individual's relative advantage is what drives self-selection (Borjas et al., 2019). As a result, the income distribution in the host and home regions determines whether people's propensity to migrate with either higher or lesser abilities. If the income distribution in the host region is more balanced than in the home region, and if the correlation between gains in both locations is positive, migrants are chosen from the lower tail of the income distribution, and vice versa (Borjas, 1987).

The structure of the thesis is arranged so that in the next section, we examine some related studies and literature regarding labour migration, especially from third countries to Central and Eastern European countries. We start by providing general information concerning labour migration theories as well as the Roy model and proceed by reviewing several studies on our primary focus country, Estonia, where we perceive the results and outcomes of migration. Besides Estonia, we discuss some other CEE countries like Poland, Slovakia, Czechia, and Hungary. These particular Central and Eastern European countries have been selected because they are the top countries in terms of receiving a substantial number of labour migrants from third countries. Afterwards, in the

[1] An AI chatbot is used as a tool to verify specific pieces of information regarding the Roy model in the literature review. OpenAI. (2023). ChatGPT (March 14 version), large language model, https://chat.openai.com/

literature review, we refer to the reports from the BARMIG project. The project aimed to evaluate how industrial relations institutions in six European nations of Central and Eastern Europe are responding to changes in labour markets caused by migration. It specifically examined the function of employer organisations and unions in addressing the effects of migration on social rights and working circumstances for labour migrant workers. The following third section is about data and descriptive statistics, where we analyse and describe the labour force survey dataset, particularly for Estonia. We also identify certain variables which are used for our descriptive regression analysis. In the fourth section, we describe the research methodology. We apply three models for regression analysis: logistic, multinomial logistic and Mincerian wage regression. In the same fourth section, we also interpret the results of the investigation. Finally, the fifth and last section summarizes the findings and conclusions of our paper.

CERCS code: S180 Economics, econometrics, economic theory, economic systems, economic policy

2 Literature review

2.1 Labour migration theories and the Roy model

The grounds and consequences for labour migration in host and source countries have been a much-debated economic subject in the recent past. Various theories that are valuable to comprehend modern-day international labour migration and its influences on the labour market have been established so far. One of the predominant economic theories, the neo-classical economic theory, explains the international migration phenomenon. According to this theory, salary disparity in the various labour markets and differences in the economic opportunities between countries are the driving aspects of migration. According to economists, labour migrations are primarily influenced by demand factors in the receiving countries and supply factors in the origin countries (Ciarniene and Kumpikaite, 2011). Neoclassical economists also claim that migration is a rational decision made by individuals desiring to maximize their financial and economic welfare. They suppose that individuals have defined their preferences in advance and will make decisions based on available information. From this perspective, migration is seen as a market phenomenon driven by supply and demand for labour. The new economics of migration is another theory that disputes the previous neo-classical economic theory. This theory states that the decision in terms of migrating is made by not just one individual but collectively by the household to enhance employment chances and earnings and minimize risks, as most developed countries have trustworthy insurance systems and social services (Triandafyllidou and Dines, 2022).

Our study involves utilising the Roy model to examine the decision-making processes of individuals in labour economics with respect to employment and occupation selection. The model was first presented by economist Andrew Roy in his seminal paper, "Some Thoughts on the Distribution of Earnings", in 1951 (Roy, 1951).

The Roy model declares that individuals choose their occupations and employment based on the expected utility that they derive from each option. These options contain different careers or professions, jobs, industries, and sectors. The expected utility is determined by various aspects such as income, working conditions, job security, and non-monetary benefits. The model assumes that individuals have perfect information about their choices and make rational decisions based on their preferences. The Roy model has been widely used in empirical research to study the labour market and make predictions about individual behaviour. One notable application of the model is in estimating the returns to education. The model indicates that individuals with higher levels of education will earn more due to the higher expected utility of their chosen occupation. This prediction has been supported by empirical studies that find a positive correlation between education and earnings (Heckman and Honore, 1990).

Over recent years, the Roy model has gained significant popularity for examining the influence of policy interventions on labour market outcomes. This model enables researchers to estimate

the potential results of diverse policy scenarios, thereby facilitating the identification of optimal strategies for enhancing the labour market outcomes of individuals as well as the wider society (Jales and Yu, 2020).

Although it has been a highly effective framework, the Roy model has encountered specific criticisms over the years. A general critique is that the model depends largely on hypotheses regarding individual decision-making processes that may not consistently be applicable in practical circumstances. Further, some researchers doubt the model's precision in predicting outcomes, especially in complicated decision-making scenarios involving several factors (Heckman, 2001). Nevertheless, despite the criticisms mentioned earlier, the Roy model continues to be a valuable resource for comprehending the decision-making processes of individuals with regard to employment and education. As scholars continue to refine and utilise the model in different contexts, it will likely serve as a critical framework for analysing labour market results and influencing policy decisions in the foreseeable future.

2.2 Labour migration in Central and Eastern Europe

In the literature review, we will look into certain studies conducted to assess the impacts of labour migration on the CEE countries' economies and societies. For instance, the report from Lauren (Lauren, 2016) focused on and analysed the most noteworthy outcomes in the field of migration in Estonia and how they changed the country's economy. The author reported that Estonia had been actively making amendments to its legislation which have made inward migration for employment purposes easier for certain groups of employees who could contribute to the Estonian economy and society since 2013. In such a manner, the country might negate the unpleasant consequences of an ageing population and emigration. There was an annual immigration quota of 0.1% of the permanent population implemented and introduced by the Estonian government for non-EU immigrants using temporary labour, e.g., in the forms of posted workers, e.g., there were granted 2,218 residence permits for working and 32,245 short-term working registrations (Lauren et al., 2020). That may have affected the working conditions of migrant workers. The immigration quota policy is planned to handle the quantity of non-EU immigrants and ensure their successful integration into Estonian society. This quota is reviewed and revised each year by the government. In 2019, the employment rate for foreigners who were born outside of the EU-28 was 71.4% in Estonia (higher than the EU-28 average of 58%, according to a Eurostat table), while the national average for people aged 20 to 64 was 80.2%. (Lauren et al., 2020). Russia and Ukraine, followed by India, Belarus, and Nigeria, are the most frequently immigrated third-country nations (Lauren et al., 2020). On the other hand, according to Statistics Estonia's most recent information from Statistics Estonia, Finland and Ukraine prevail as the source countries of migrants arriving in Estonia. In 2021, overall, 19,524 persons immigrated to Estonia (the highest recorded in recent years), and

12,481 persons emigrated from the country. The recent report by Menedek and Mareena which analysed the labour market integration of third-country nationals in Croatia, Czechia, Hungary and the Slovak Republic and addressed the similar strategic implementation by another government (Menedek and Mareena, 2021). The study mainly focused on Hungary and the third-country citizens that come to the country for several reasons. Hungary has been experiencing a labour shortage for a while because of the unrestricted labour movement to the other Western EU countries (Menedek and Mareena, 2021). The country has been losing its qualified candidates. Therefore, the Hungarian government, similar to the Estonian government, made some legislative amendments to facilitate the international recruitment process and overall employment migration. The authors discovered that most of the labour migrants come from the neighbouring country Ukraine and countries from outside Europe like Vietnam, Iran and Turkey. The conclusion of these studies highlights the commitment of both countries to draw competent employees and develop their economic expansion and social development through well-determined immigration policies.

Another project worth mentioning is "RITA-RÄNNE", led by Professor T.Tammaru (Tammaru and Eamets, 2021). During the project, they calculated the cost of immigration and its benefits to the Estonian state. They found out that labour migration is economically advantageous for the country. According to calculations, an immigrant with a high school education who arrived in Estonia and worked for roughly ten years pays approximately 220,000 euros more taxes to the state budget than he/she receives from the finance and grants compliance services (Tammaru et al., 2020). The authors used the income-expenditure model within the project to evaluate the benefits and costs of migration and to assess how various types of immigration and emigration affect the revenues of the Estonian state budget. They also argued that the usefulness of immigration and emigration depends on different circumstances, e.g. arrivals' gender and educational level, the length of stay in the country, and consideration for the time value of money. The project by Professor Tammaru (Tammaru et al., 2020) concluded that labour migration brings more income to the Estonia state budget than its costs.

A relatively recent study from EMN (European Migration Network), elaborated by Hanzlíková and Slama (Hanzlíková and Slama, 2018), focused on the labour market integration of third-country nationals in the Slovak Republic. Labour immigration has been a challenge for Slovakia as it has become an actively growing segment of foreign migration (Hanzlíková and Slama, 2018). The authors emphasise the significance of creating labour migration programmes and coordinating the selection standards of foreigners to receive immigrants who will possibly positively impact the Slovak economy. In the study, they also listed particular negative influences and risks in labour migration. For instance, the increase in illegal employment negatively affects certain employees' privileges as it restricts possibilities for legal labour migration, as well as pressure on local infrastructure and fast conversion of the labour force raises social pressures.

Drbohlav researched international migration in the Czech Republic, focusing on labour im-

migration (Drbohlav, 2003). In the article, the author stated that economic immigrants who hold long-term residence permits for employment or entrepreneurial activity in Czechia have the highest share among the different types of international migrants. The author described immigrants in Czechia as two separate groups. Young people, especially males with high education and skill who come from Eastern third countries but work in underpaid and unskilled jobs, are considered as the "Eastern" category. Females and older people coming from Western countries with high educational levels who usually work in professional and managerial areas are defined as the "Western" category. Two main reasons Czechia attracts the 3rd country nationalities are the country's economic development and labour shortages. The fact that unemployment in the Czech Republic had been the lowest among the EU countries for several years (2.8% in June 2021; Statista 2021) proves that the country has a healthy economy. Since 2011, there has been considerable growth in the number of labour migrants in Czechia, reaching its peak in 2020. Based on Czech Statistical Office, Ukrainian immigrants are at the top by far, with 165,654 foreigners or 26.1% of the total labour migrants who came to work in Czechia in the last quarter of 2020 (Czech-Statistical-Office, 2020). According to statistics, the second and third most numerous groups of third-country nationals are accordingly Vietnamese and Russians (Martišková and Šumichrast, 2020).

Shifting the focus to a different Central and Eastern European (CEE) nation, Poland, statistical research from the standpoint of Ukrainian studies (Skoczyńska-Prokopowicz, 2018) delved into the topic of Ukrainian immigration and its impact on the country's labour market. The study sought to identify the reasons why Ukrainians migrated to Poland and analyse the benefits and drawbacks of this external labour migration on Ukraine's economy. The positive results are categorized as decreasing unemployment in the national labour market and lessening social tension in the community. Yet, the adverse effects are, for example, the loss of the most ambitious part of the labour force and discrimination against Ukrainian citizens by local employers. Typically, for instance, the report from LSE IDEAS about the CEE countries in a post-crisis context (Anghel and Mierina, 2019) states that the primary incentives for individuals from countries such as Russia, Ukraine, and Belarus to relocate for work, especially in the Baltic states and Poland are the prospects of better salaries and the prevalence of the Russian language in those areas. There are specific reasons that make Poland an excellent place to settle for migrants: it offers low housing prices and taxes compared to other EU countries. Renting or buying an apartment in Warsaw, Krakow, or another large city is cheaper than in big European capitals (Filipek and Polkowska, 2020). However, one can still enjoy all the advantages of living in a big city. The highest migration growth was recorded in 2015-2018 for Poland. The Ukrainian conflict and Russia's annexation of Crimea were the main contributors to this increase. Increased migration is also related to Poland's declining unemployment rate or the firm sector's increasing average monthly wage (OECD-Economic-Surveys, 2020).

An intriguing study by Gödri (Gödri, 2018) calculated the effect of personal such as education, age and language proficiency and cluster factors, including the size and social network of the

immigrant community, on linguistic assimilation based on migration in Hungary. He showed how language proficiency impacts immigrants' labour market status. There are obviously considerable further aspects of cultural assimilation, but language proficiency is a fundamental component. The study investigated and demonstrated that foreign immigrants who speak the host country's native language are about 3–4 percent more active and partake in the labour market or education compared to those who do not. Those immigrants most likely find paid occupation in the 12 months preceding the survey (Gödri, 2018). In the case of Estonia, the study about the adaptation of new immigrants, one of the main obstacles for labour migrants to enter the Estonian labour market is the language barrier (Kaldur et al., 2019). The study argues that foreigners who do not have proficiency in Estonian encounter challenges in getting a job in specific industries, except for the IT sector, where there are more companies with English-speaking environments. The authors contend that the lack of Estonian is not just an obstacle to finding employment but also to adapting to the work environment, as many local employees may prefer communicating in Estonian rather than English. To summarize, these studies conclude that language proficiency, especially in the host countries' native language, is an essential feature for immigrants to successfully integrate into the labour market as well as assimilate into the local culture.

In our research, we are next summarizing the various national reports from "The Bargaining for migrant workers' social rights and working conditions in countries of Central and Eastern Europe (BARMIG)" project. The project determined the consequences of migration on altering labour markets in the receiving countries. It assessed how professional employer organisations (PEO) and trade unions in the receiving countries such as Czechia, Croatia, Estonia, Hungary, Slovakia, and Poland respond to these adjustments.

Various studies reviewed by the national report of Estonia concluded that since 2017 or specifically in 2017-2019, there had been a growth in the number of immigrants. However, this was not linked to a rise in the return migration, considering that the number of Estonians among the immigrant population decreased in the last two years of that period (Masso et al., 2021). The report indicated that Ukraine and Russia are the central source countries for migration. The report indicated that Ukraine and Russia are the central source countries for migration. In the descriptive statistics part of the thesis, there is a figure based on our calculations which visually illustrates and provides some supplementary details in regard to the top third-country nationals, including Ukrainians and Russians, who came to Estonia for employment between 2010 and 2020. The study conducted by Lauren (Lauren et al., 2020) analysed that in the year 2019, 24,327 out of 32,245 registered short-term employees were from Ukraine (Lauren et al., 2020), which is approximately three-fourths of the whole registered short-term employees. The National report prepared by Mezsmann (Mezsmann, 2022) studied labour migration and its effects on Hungary. Using data from Eurostat's Labour Force Survey, the author assessed and described the rising share of third-country national employees in the Hungarian labour market. They found out that the major source countries

of immigrants are Ukraine and Serbia. In the study, the primary reasons for an increase in labour immigration from third countries were interpreted as occurring labour shortages caused inter alia by emigration from the country, which means that these factors pushed the government to act and make some amendments to ease the migration procedure for foreigners.

The Republic of Poland is known as one of the most attractive places for migrants from third countries among Central and Eastern European countries. It is no coincidence that many people choose Poland as a permanent residence or as the first country to enter Europe. The National report of Poland from the Maria Curie-Sklodowska University, elaborated by Filipek and Polkowska (Filipek and Polkowska, 2020), provided some surveys about migrant workers and their working circumstances in Poland. According to Statistics Poland, in 2019, nearly 80% of the legally migrated foreign employees were Ukrainians and Belarusians (Statistics-Poland, 2020). The authors analysed and concluded that the rising inflow of foreign migrants did not negatively influence the labour market in the country, as the unemployment rate had been relatively low in 2015-2018. Similar to Poland, Czechia is another chosen country in the CEE area, for labour migration. Foreigners made up more than 12% of the employment in the Czech labour market (Martišková and Šumichrast, 2020). According to data from Labour offices in Czechia, 644,164 foreigners were registered as employees in 2020, and 254,106 of them were labour migrants from third countries. Relatively more recent data provided by the Interior Ministry's report for 2021 confirmed that the number of registered immigrant workers was 701,830 in total, including 300,454 third-country nationals (Czech-Statistical-Office, 2020).

Although Slovakia is not considered one of the classic final destinations for migrants, after joining the EU in 2004, legal migration has remarkably increased in the country (ZEPSR, 2021). The most rapid growth in the number of migrants is observable, particularly since 2016 (ZEPSR, 2021). The report by The Association of Electrotechnical Industry of the Slovak Republic within the BARMIG project examined the rising number of migrant employees within national labour marketplaces. It analysed how Slovakian employers' associations react to these modifications and obstacles (ZEPSR, 2021). Analyses have revealed that the labour force share of migrants from third countries has been growing relatively steadily since 2012. They furthermore determined that an increase in the number of granted work or business permits for migrant workers is correlated with a drop in the unemployment rate. The labour share of migrants from third countries experienced a slowdown during the COVID-19 pandemic, as there was a tendency for less growth. Similar to Estonia and Poland, Ukrainian migrant workers have the most significant percentage of third-country nationals who choose Slovakia as a destination country. The source countries for immigrants that come after Ukraine are Serbia and Vietnam. Generally, Slovakia is one of the Central Eastern European countries with minor impediments for immigrants who choose the country for residence. For instance, formalities such as acquiring a visa or receiving a residence permit for immigrants to Slovakia are much more manageable and straightforward than in other states. Besides, no regulation

is traditionally established for the citizens of foreign countries to dwell on the country's territory for at least 180 days, which is necessary for an undertaking to register a permanent residence in the future (Immigration Residency blog, September 2021).

3 Data and descriptive statistics

3.1 Data

The dataset we use in the empirical analysis is the Estonian Labour Force Survey, the survey in which the data are gathered throughout the year from people using either telephone or face-to-face interview data collection method, and results have been published on a quarterly basis since 2002 by Statistics Estonia. We will investigate three separate files in terms of household, members, and personnel for the years 2010-2021, which are provided by the Statistics Estonia. The Labour Force Survey provides a summary in regard to the labour market variations, job circumstances, employment and unemployment.

The dataset includes the variables of nationality (Estonian or non-Estonian), country of birth, ethnicity and citizenship used to determine foreigners who resettled to the country for employment. Besides those, we use several explanatory variables, such as language proficiency, level of education (basic, secondary, college), age, gender, marital status, labour status as well as wage, for the descriptive statistics to sort out how those variables influence labour migration. We take into account migrant workers who were born abroad and are third-country nationals who reside and work in Estonia.

3.2 Descriptive statistics

Table 1 displays the percentage of third-country labour migrants among all migrants, encompassing those who relocated to Estonia from different EU countries. According to Labour Force Survey data, between the years 2010 and 2020, there were in total of 25,481 observations of labour migrants in Estonia. Among them, the group with the largest representation is third-country labour migrants, accounting for 93.14%, which equates to a total of 23,732 immigrants. There were 1749 individuals who arrived in Estonia for work from European countries, and their share was 6.86%. The proportion of locals is described in Table 1 as well. Hence, between 2010 and 2020, there were a total of 195,836 observations for locals in the Labour Force Survey, and when we include locals in the total count of all migrants, they make up 88.49% of the total labour force population.

Table 2 provides a summary of the findings from a descriptive statistical analysis conducted on third-country labour migrants in Estonia from 2010 to 2020, using data from the Estonian Labour Force Survey sample. One of the explanatory variables that we applied during the analysis was the education level of migrants. As is shown in Table 2, the education level was categorized as "Basic", "Secondary", and "College." Nevertheless, there were some missing values in the data, but they were not considered and presented separately in the table. Among third-country migrants, the share of those with a secondary education level was 56.4%, which was higher than those with basic and college education. These results actually highlight the importance of acknowledging the education

Table 1. The share of third-country and EU migrants in Estonia

Based on country of birth	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**Total**	**Weighted Total**
All migrants*	2,593	2,625	2,509	2,319	2,262	2,235	2,181	2,117	2,119	2,211	2,311	**25,481**	**25,481**
3rd-country migrants	2,448	2,480	2,385	2,192	2,099	2,083	2,032	1,931	1,949	2,025	2,106	**23,581**	**23,732**
EU migrants	145	145	123	127	162	152	149	186	169	186	204	**1900**	**1749**
Locals	14,453	15,473	17,486	17,358	17,310	16,883	16,949	19,528	19,692	19,704	21,000	**195,836**	**195,836**
Share of 3rd-country migrants	94.41%	94.47%	95.08%	94.53%	92.83%	93.19%	93.18%	91.23%	92.00%	91.58%	91.18%	**92.54%**	**93.14%**
Share of EU migrants	5.59%	5.53%	4.92%	5.47%	7.17%	6.81%	6.82%	8.77%	8.00%	8.42%	8.82%	**7.46%**	**6.86%**
Share of Locals	87.65%	87.63%	88.13%	88.46%	88.92%	89.00%	89.43%	89.36%	88.65%	88.07%	87.94%	**88.49%**	**88.49%**

Source: Author's calculations based on the Estonian Labour Force Survey.

Note: The weights are applied in the analysis.

Note: The row "All migrants" in the table does not include locals, and the share of third-country migrants and EU migrants is calculated based on the total of all migrants excluding locals.

Note: The share of Locals in the table represents their share from the combination of All migrants + Locals.

levels of labour migrants, as such aspects can facilitate the successful integration of third-country labour migrants in Estonia. We furthermore utilized the language proficiency of labour migrants in Estonia during our analysis. Out of the total migrant population, 39.2% were found to be fluent in two or more languages. The remaining 60.8%, or 14,335 individuals, were proficient in one foreign language. These outcomes suggest that the majority of third-country nationals who have immigrated to Estonia have knowledge of at least one foreign language. According to the table, a minor share of third-country individuals, accounting for approximately 9%, are proficient in the Estonian language.

An analysis of the differentiation of third-country migrants according to gender was also part of the descriptive statistics, and its findings are described more comprehensively in Table A.1. According to the data in Table 2, there was a higher proportion of females than males among the labour migrants who arrived in Estonia between 2010 and 2020. Specifically, the share of females was 57.6%. This finding could indicate that female migrants were more inclined to choose Estonia as their destination, conceivably due to better employment opportunities. Nevertheless, additional research may be necessary to comprehend better the factors contributing to this gender discrepancy.

For third-country migrants (Table 2), it was discovered that the majority (equivalent to 64.7%) are married employees in Estonia, while a very small fraction (6.7%) are single. Besides the married

Table 2. Descriptive statistics based on EE-LFS

Explanatory variables (education, languages, gender, marital status, age, ethnicity and citizenship)	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**Count**	**Weighted count**	**Total %**	**Weighted %**
Basic	18.61%	19.94%	18.31%	9.52%	7.95%	8.57%	8.77%	7.10%	5.65%	5.44%	4.99%	**2,402**	**2,403**	**10.19%**	**10.19%**
Secondary	56.90%	54.06%	55.11%	55.07%	56.70%	57.53%	57.82%	60.79%	58.15%	57.32%	56.08%	**13,406**	**13,294**	**56.85%**	**56.38%**
College	18.88%	19.70%	21.86%	22.33%	22.10%	23.47%	25.01%	23.32%	27.93%	30.03%	31.39%	**5,780**	**5,984**	**24.51%**	**25.38%**
Proficient in 1 foreign language	64.62%	64.52%	63.43%	62.05%	62.20%	62.72%	61.34%	62.76%	60.39%	57.20%	53.90%	**14,409**	**14,335**	**61.10%**	**60.79%**
Proficient in 2 and more languages	35.38%	35.48%	36.57%	37.80%	37.80%	37.28%	38.66%	37.24%	39.61%	42.80%	46.10%	**9,172**	**9,246**	**38.90%**	**39.21%**
Proficient in Estonian language	8.74%	9.49%	9.09%	9.26%	8.84%	9.00%	9.17%	8.47%	9.02%	8.41%	9.03%	**2,665**	**2,115**	**11.30%**	**8.97%**
Male	43.57%	42.82%	41.30%	42.68%	43.75%	43.41%	42.28%	43.91%	42.76%	41.20%	43.28%	**10,089**	**10,011**	**42.78%**	**42.45%**
Female	56.43%	57.18%	58.70%	57.32%	56.25%	56.59%	57.72%	56.09%	57.24%	58.80%	56.72%	**13,492**	**13,570**	**57.22%**	**57.55%**
Single	3.81%	3.86%	4.05%	3.99%	4.90%	4.67%	4.82%	4.47%	5.26%	6.96%	6.40%	**1,158**	**1,159**	**4.91%**	**6.61%**
Married	75.73%	74.44%	73.01%	76.92%	76.00%	73.05%	73.90%	75.27%	74.01%	71.36%	71.05%	**17,437**	**15,250**	**73.95%**	**64.67%**
Widowed	20.47%	21.70%	22.94%	19.09%	19.10%	22.27%	21.28%	20.26%	20.73%	21.69%	22.55%	**4,986**	**6,772**	**21.14%**	**28.72%**
Young (age 0-24)	1.75%	1.26%	0.76%	0.94%	1.00%	0.57%	1.14%	1.22%	0.65%	1.39%	2.02%	**276**	**310**	**1.17%**	**1.31%**
Adults (25-49)	22.53%	21.36%	21.41%	21.81%	21.00%	18.59%	22.14%	20.55%	18.19%	20.62%	21.14%	**4,909**	**5,301**	**20.82%**	**22.48%**
Old-aged adults (50-75)	75.73%	77.37%	77.82%	77.25%	78.00%	80.84%	76.72%	78.23%	81.16%	77.99%	76.84%	**18,396**	**17,971**	**78.01%**	**76.21%**
Ethnic Estonians	10.05%	10.90%	10.17%	9.57%	9.00%	8.20%	8.18%	8.56%	10.17%	9.12%	9.45%	**2,221**	**1,784**	**9.42%**	**7.57%**
Non-Estonians, citizens	28.29%	29.42%	29.73%	31.38%	32.10%	31.05%	27.83%	29.24%	30.43%	30.81%	29.37%	**7,073**	**7,102**	**29.99%**	**30.12%**
Other Non-Estonians, without citizenship	61.66%	59.68%	60.10%	59.05%	58.90%	60.75%	64.00%	62.20%	59.40%	60.07%	61.18%	**14,287**	**14,694**	**60.59%**	**62.31%**

Source: Author's calculations based on the Estonian Labour Force Survey.

Note: The weights are applied in the analysis.

and single employees, there were labour migrants with a share of 28.7% who were widowed. The role of age groups of third-country immigrants on labour migration to Estonia (Table 2) demonstrates that there were more old-aged adults who migrated and started a new life in Estonia. A total of 18,396 migrants, or 76.2%, belonged to that age group (50-75). The predominance of older migrants from third countries may be related to Soviet-era migration patterns and some additional factors. For instance, many countries that have been the leading sources of labour migrants to Estonia, such as Ukraine, Belarus, and Russia, have an ageing population. Hence, there may be plenty of older workers who are looking for job opportunities in different countries. The data reveals that third-country labour migrants in the age group of 25-49 accounted for 22.5%, which was lower than the proportion of older labour migrants but higher than the proportion of younger immigrants (1.3%).

The findings of third-country migrants and their citizenship are also illustrated in Table 2. One intriguing piece of information in the table is the number of ethnic Estonians who were born outside the EU but still decided to move to Estonia for work. Specifically, the share of labour migrants was 7.6%, in this category, according to Labour Force Survey data from 2010 to 2020. The data in the table also disclosed the relevant detail that out of the total third-country nationals who are employed in Estonia's labour market, 30.1% hold citizenship. In contrast, the vast majority of labour migrants (62.3%) did not possess Estonian citizenship. Based on this information, despite not holding Estonian citizenship, a substantial number of third-country migrants have been able to secure employment in Estonia's labour market. The consequence of attracting and retaining a

diverse group of foreign workers in Estonia is underscored by this finding, especially considering the country's declining workforce and ageing population. Moreover, the data implies that Estonia's labour laws and immigration policies might be advantageous in enticing a wide range of migrant labourers.

The shares of EU migrants, third-country migrants, and locals are differentiated separately for each category in Table 3. It is apparent that a significant number of those third-country labour migrants who chose to migrate to Estonia acquired a secondary level of education. In particular, 40.6% of all EU immigrants had secondary education, while the share of third-country immigrants is 56.4% of the total who had secondary education. On the other hand, a higher proportion, 43.2%, of EU migrants received a college degree, while this percentage is 25.38% for third-country labour migrants. According to data, approximately 50.4% of the locals hold secondary-level education, whereas 26.5% obtained a college degree.

Table 3. Descriptive statistics: Third-country migrants vs EU migrants vs Locals

Explanatory variables	Third-country migrants	EU migrants	Locals	**Total (3rd + EU countries)**	**Total (3rd + locals)**
Basic	10.19%	10.32%	15.38%	10.20%	14.71%
Secondary	56.38%	40.61%	50.37%	55.30%	51.14%
College	25.38%	43.24%	26.53%	26.60%	26.53%
Proficient in 1 foreign language	60.79%	28.54%	32.72%	58.58%	36.33%
Proficient in 2 and more languages	39.21%	71.46%	67.28%	41.42%	63.67%
Proficient in Estonian language	8.97%	22.21%	76.60%	9.88%	67.89%
Male	42.45%	50.86%	48.91%	43.03%	48.08%
Female	57.55%	49.14%	51.09%	56.97%	51.92%
Single	6.61%	15.13%	30.34%	7.19%	27.29%
Married	64.67%	63.94%	55.84%	64.62%	56.97%
Widowed	28.72%	20.93%	13.82%	28.18%	15.74%
Young (0-24)	1.31%	7.41%	15.71%	1.73%	13.85%
Adults (25-49)	22.48%	40.93%	49.74%	23.74%	46.23%
Old aged adults (50-75)	76.21%	51.66%	34.55%	74.52%	39.92%
Employed	54.32%	59.47%	65.17%	54.68%	61.35%
Unemployed	6.61%	5.21%	5.55%	6.52%	5.11%
Inactive	39.06%	35.32%	29.28%	38.81%	33.55%
Average gross wage	1302.225 €	1920.519 €	1595.259 €	1347.388 €	1561.951 €
Total	**23,732** **100%**	**1,749** **100%**	**195,836** **100%**	**25,481** **100%**	**221,317** **100%**

Source: Author's calculations based on the Estonian Labour Force Survey.

Note: The weights are applied in the analysis.

Note: The first Total column in the table represents the combined percentages of third-country and European labour migrants for each category, whereas the second Total is the combined percentages of locals and third-country nationals.

Moreover, data in terms of language variables indicates that 71.5% of the total number of EU

migrants and 67.3% of the total quantity of Estonian locals knew at least two languages. On the contrary, this share is equal to 39.2% out of all immigrants from third countries. Besides, the table demonstrates the proficiency of all three categories in the Estonian language. As indicated, a minor percentage of third-country nationals (8.9%) are able to speak Estonian, whereas European labour migrants have relatively higher proficiency at 22.2%.

When comparing the employment situation of labour migrants in the Estonian labour market, it is evident that labour migrants are more frequently inactive, accounting for around 39.1% as well as more unemployed third-country individuals (approximately 6.6%) than migrants from the EU and locals. An analysis reveals that locals and European labour migrants have a higher likelihood of being employed in comparison to third-country migrants.

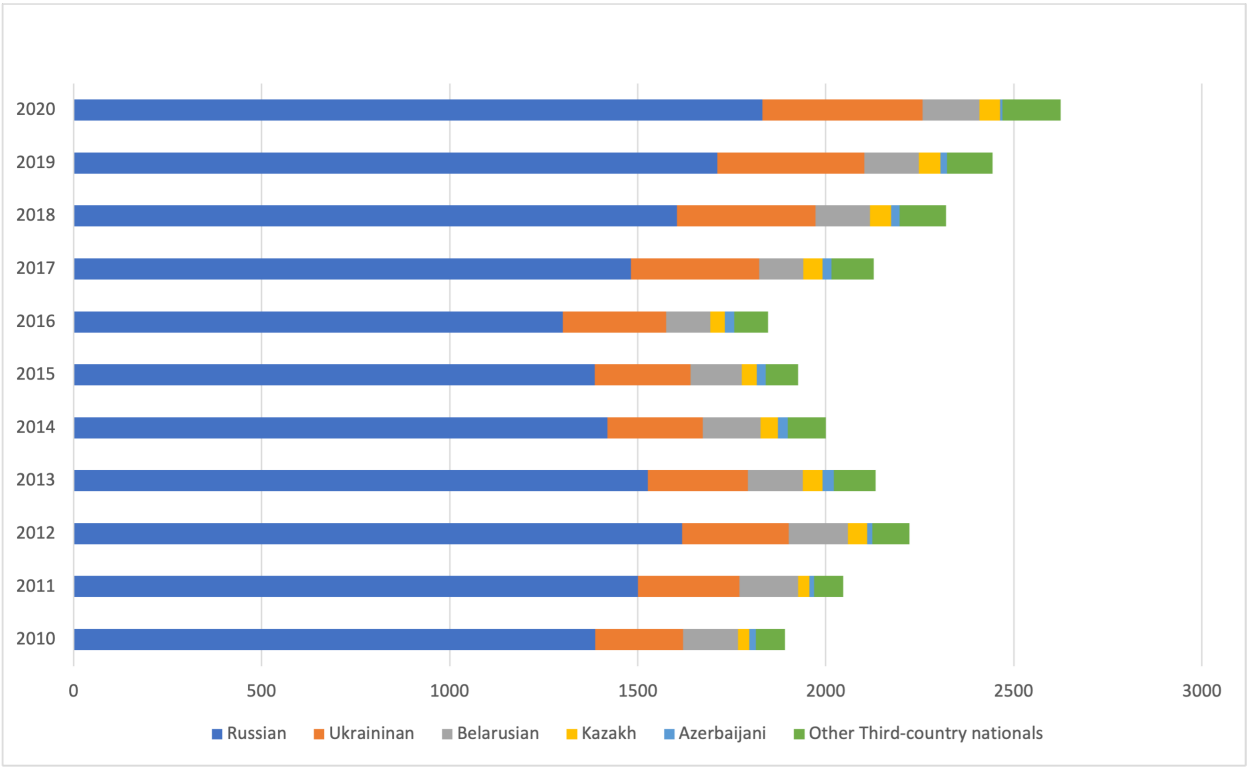
Finally, the third table provides information on the mean gross wage for labour employees from non-European, European countries and locals. As is shown in the table, the average gross salary seems to be higher for those individuals who migrated from EU countries. Their gross average wage is roughly 1920 euros, while third-country and local labour employees tend to earn about an average of 1302 and 1595 euros gross wage, respectively. This wage differential among the labour employees, especially for EU and third-country nationals, might be one of the pull factors which argues that Estonia is more interested in receiving competent and proficient labour migrants from non-EU countries, as they are usually willing to be employed for relatively lower salaries. The table also distributes the combined average wage of individuals (1347 euros) from European and non-European countries as well as the combined average wage of third-country labour migrants and locals (1561 euros).

Furthermore, Table A.1, which can be found in the appendix, shows the percentage of both genders in each classification. Seemingly, the group of highly educated females with a secondary level degree who arrived in Estonia from third countries has the highest share, with 54.9%. Similarly, among males, the ones with secondary education hold the largest share, accounting for 58.4% of the education level category. Table A.1 also displays that both males and females non-EU labour migrants are usually proficient in a single foreign language, with 61.7% of males and 60.7% of females having competency in one foreign language, outnumbering those who are skilled in at least two foreign languages. Besides, as shown in the table, there is a percentage of males and females, accordingly 10.6% and 11.8%, who can speak Estonian. The categorization of genders based on ethnicity and citizenship reveals that the majority of females as well as males, respectively 55.5% and 71.5%, are third-country nationals who do not hold citizenship of Estonia. Yet, relatively fewer males and females, with a share of 20.9% and 36.9% accordingly, acquired Estonian citizenship. The last explanatory variable used in Table A.1 is the status of third-country migrants, which classify individuals by being employed, unemployed and inactive in the Estonian labour market based on gender. Data discloses that the most considerable portion of males is active employees. Approximately 61.2% of males belong to the "Employed" category, and those who are outside of the

Estonian labour market have a lesser share, with 31.4% and the rest, 7.47% of men, are unemployed. The outcomes for females with regard to their labour market statuses are relatively similar to males, with around 49.3% of females being employed and actively working in Estonia. Females who belong to the inactive group constitute a smaller proportion of 44.7%, while the remaining about 6% are not employed nor able to find a job.

The descriptive figure 1, which is made based on Table A.2 (see Table A.2 in the appendix), displays the leading five third-country nationals who relocated to Estonia between 2010 and 2020. The largest share, at 70.81%, is held by Russian labour migrants, with Ukrainians coming in second place at 14.18%. The third most significant country is Belarus, accounting for 7.15%, followed by Kazakh (2.11%) and Azerbaijani (1.04%) immigrants who selected Estonia for employment. Besides these five countries, other third-country immigrants have a total share of 4.71%. The reason why the Estonian job market appeals to labour migrants from these countries is because of the historical and cultural links that exist between these countries and Estonia due to their shared past as former Soviet Union republics. Additionally, some of these countries have ethnic minorities residing in Estonia, which may create a sense of familiarity and facilitate labour migrants from these countries to integrate into Estonian society.

Figure 1. Top five third-country nationals who migrated to Estonia for work



Source: The Estonian Labour Force Survey by Statistics Estonia, author's own calculations

4 Methodology

This section presents the statistical methods and predictive modelling techniques that are utilized to evaluate the degree of correlation between various variables.

4.1 Regression analysis

In this subsection, I perform a regression analysis by using the logistic and multinomial logistic regression models as well as the mincer wage equation. The logistic regression method will be used to estimate the labour migrants' country of birth variable and interpret the features of third-country and EU labour migrants (Table 4). Its capability to handle different variables, interpretability and predictive accurateness make the logistic regression model a very efficient method for statistical analysis of migration (Venkatesan and Sasikala, 2019). I involve certain independent variables, such as education, language proficiency, gender, ethnicity and citizenship, marital status and age, which will play a role as predictors. Based on analysis from earlier studies, these aforementioned variables are expected to be correlated with the labour market performance of migrants. If we consider Y as a dependent binary variable, then:

$$Y = 1, \quad \text{in the case of third-country migrants} \tag{1}$$

$$Y = 0, \quad \text{in the case of EU migrants} \tag{2}$$

and if we assume having X as our independent variable, the formula I apply could be defined as:

$$Y = \ln\left[\frac{p_1}{1-p_1}\right] = \beta_1 + \beta_1 X_1 + \ldots + \beta_K X_K \tag{3}$$

where p_1 indicates the probability of migrants being third-country citizens, β stands for the regression coefficient symbol, and X_i is a predictor, which will be our independent variables mentioned above. In addition, I apply logistic regression once more to predict the outcome variable. However, this time I substitute one of the categories of EU migrants with local Estonians who returned home. Accordingly, following the previous approach, Y will be equal to 1 if migrants are from third countries and will be equal to 0 if they are Estonian nationals or locals (Table 4).

The second classification method I utilize will be multinomial logistic regression to predict the status variable, which specifies the statuses of labour immigrants by dividing them into three categories: employed, unemployed and inactive. Inactive migrant workers are considered as those on leave, expected to return to work as well as employees who do not plan to return to work. The individuals who are actively working are classified as employed migrant workers, while those who are not working are classified as unemployed migrants. Considering this time, our independent variable has three categories, and they are determined as follows:

$$Y = 1, \quad \text{if migrant worker is employed} \tag{4}$$

$$Y = 2, \text{ if migrant worker is inactive} \tag{5}$$

$$Y = 3, \text{ if migrant worker is unemployed} \tag{6}$$

Then the multinomial logistic regression formula for specifying the statuses of migrant workers from third countries will look like this:

$$\begin{aligned} Y_1 &= \beta_{10} + \beta_{11}X_1 + \beta_{12}X_2 + \cdots + \beta_{1K}X_K + \epsilon_1 \\ Y_2 &= \beta_{20} + \beta_{21}X_1 + \beta_{22}X_2 + \cdots + \beta_{2K}X_K + \epsilon_2 \\ Y_3 &= \beta_{30} + \beta_{31}X_1 + \beta_{32}X_2 + \cdots + \beta_{3K}X_K + \epsilon_3 \end{aligned}$$

where X_1, X_2, ..., X_k are individuals' characteristics that might affect their labour market statuses. K is the number of independent variables, and ϵ is the error term for status.

Further in the analysis, I involve the Mincerian wage regression model to find out how personal factors such as educational attainment, language ability, and country of origin, as well as demographic and socio-economic characteristics, such as age, gender, location and occupational sector of labour employees, influence migrants' wages in the labour market of Estonia. The Mincer wage equation is a commonly used model that allows analysing the relationship between individuals' wages and their characteristics, such as education and experience. The form of the Mincer wage equations will be as follow for us:

$$\ln(\text{Wage}) = \beta_0 + \beta_1\text{Education} + \beta_2\text{Country of Origin} + \beta_3\text{Language Proficiency} + \varepsilon \tag{7}$$

$$\ln(\text{Wage}) = \beta_0 + \beta_1\text{Gender} + \beta_2\text{Age} + \varepsilon \tag{8}$$

$$\ln(\text{Wage}) = \beta_0 + \beta_1\text{Occupation} + \beta_2\text{Locations} + \varepsilon \tag{9}$$

Where $\ln(wage)$ demonstrates the natural logarithm of the full-time gross wage; In the first equation, Education indicates the individual's level of education; Country of Origin represents whether an individual is from a third country or EU country; Language Proficiency depicts an individual's language skills; In the second equation, age and gender indicate labour workers' demographic characteristics; In the third equation, occupation variable shows which occupation classification labour workers belong to based on the ISCO; Location variable illustrates where labour employees are settled; β_0, β_1, β_2 and β_3 are the coefficients, and ϵ is the error term.

4.2 Results

The findings of the regression analysis are interpreted in this particular subsection.

4.2.1 Logistic regression model

Table 4 illustrates the results of the initial logistic regression, which helps us to forecast the origins of labour migrants by analyzing the independent variables. According to the first observation, certain independent variables such as "secondary education," "widowed," "age 50-75," and "non-citizen" have an odds ratio of 1. This outcome implies that there is not necessarily an association between those variables and the likelihood of receiving a third-country migrant. The odds ratio of 1 also indicates that other independent variables in the model are more strongly connected and account for a bigger proportion of the variability. The table demonstrated that there is an inverse correlation between language proficiency level and the probability of being a migrant from a third country. That means the chance of being a migrant from a third country decreases as the language proficiency level gets higher. Among labour migrants, gender, marital status, and age are most closely associated with the likelihood of being a third-country migrant. The analysis reveals that female and married individuals are more likely to be third-country migrants among labour migrants. The chances of labour migrants coming from third countries are the lowest for those who are part of the age group 15-24. Conversely, migrants have higher odds of being non-EU migrants if they are adults. Based on the information, it also appears that an association exists between the increased odds ratio of being ethnic Estonians and holding Estonian citizenship and the likelihood of migrants coming from third countries.

Analysis results of the second logistic regression model are described in Table 4 as well. In this model, a binary variable is predicted as being a local or a labour migrant who comes from a third country. Based on the outcome, we observe that in comparison to the migrants from third countries, the odds of being a local are the highest for young individuals at age 15 to 24. Moreover, according to the analysis, those young local labour workers are more likely to be male than the opposite individuals from third countries. The model reveals that predictor variables such as language proficiency and primary and college education levels have a negative effect on the probability of being local. However, the significance of the impact is relatively small as the odds are close to 1.

4.2.2 Multinomial logistic regression model

The findings of the multinomial logistic regression are described in Table 5, whereas the response variable in the model is the labour market status of individuals from third countries. In the model, the "employed" category is chosen to be used as the reference category since it is the labour market status that occurs most frequently.

We initially start analyzing the estimated model for "unemployed" to the baseline category "employed" and then accordingly "inactive" to "employed". According to data provided in the table, in the case of individuals being migrants from third countries, it increases the multinomial log-odds for them to be unemployed compared to the baseline category. This output implies that

Table 4. Logistic regression analysis results:
Third-country migrants vs EU migrants & Locals vs Third-country migrants

	Third-country migrants - EU migrants		Locals - Third-country migrants	
Labour migrants	Odds ratio	Standard error	Odds ratio	Standard error
country of birth	0.324***	0.019	0.964	0.021
language proficiency	0.652***	0.054	0.963	0.031
basic education	0.620***	0.035	0.687***	0.016
college education	1	.....	1	.....
secondary education	0.802***	0.042	1.241***	0.026
male	0.891	0.110	0.000	0.080
single	0.964	0.069	0.000	0.034
married	1	.....	0.000	0.032
widowed	0.165***	0.024	15.282***	1.150
young(0-24)	0.523***	0.029	5.685***	0.126
adults(25-49)	1	.....	1	.....
old adults(50-75)	1.116	0.091	108.774***	3.189
Ethnic Estonians	1.689***	0.106	3.762***	0.087
Non-Estonian citizens	1	.....	1	.....
Other non-Estonians	36.283***	2.866	8219.743	7159517
_cons				
Number of observations:	**23,357**		Number of observations	**199,958**
Pseudo R-squared:	**0.095**		Pseudo R-squared	**0.487**

Source: Author's calculations based on the Estonian Labour Force Survey.

Note: the variables such as secondary education, widowed, old adults, and Other non-Estonians are chosen as base categories in the table.

Note: The asterisks "*","**" and "***" in the table show the levels of significance accordingly <0.05, <0.01 and <0.001.

third-country migrants face some challenges in finding employment. The table suggests that having proficiency in at least two languages and holding a college degree would be expected to decrease the likelihood of labour migrants being unemployed by accordingly 0.282 and 0.294 units. Therefore, enhancing academic capabilities and language skills may help to increase the employability of labour immigrants. The effect of gender is that males are less likely to be unemployed than females. While married individuals are less likely to be unemployed, being a single labour migrant increases the odds of unemployment. Furthermore, the analysis demonstrates that young labour migrants have difficulties in finding and maintaining employment rather than adults. The impact of citizenship and ethnicity on labour market status points that those who have Estonian citizenship or belong to the ethnic Estonian group are able to secure employment relatively smoothly.

Quite the opposite of the estimation for unemployment, Table 5 indicates that being a third-country labour migrant is associated with a reduction of 0.264 units in the probability of being inactive in the Estonian labour market. The educational effect reveals that having only a basic

academic background increases the odds of being inactive for labour migrants. However, those individuals with higher education, such as a college degree and advanced language proficiency, are more likely to be active labour market employees. The results also suggest that there is a higher probability for women labour migrants to be inactive employees rather than men. If an individual is an adult aged 25-49 and has a married marital status, it would be foreseen that their chances of being an inactive employee would decrease. Non-Estonians who hold citizenship have a higher probability of being active, whereas ethnic Estonians have a higher tendency to be inactive.

Table 5. Multinomial logistic regression analysis results: status of a third country and EU migrants

	Status	Unemployed	Status	Inactive	Status	Employed
Labour migrants	Coef.	Standard error	Coef.	Standard error		
country of birth	0.264*	0.118	-0.264***	0.059		
language proficiency	-0.282***	0.063	-0.459***	0.033		
basic education	0.175	0.106	1.148***	0.049		
college education	-0.294***	0.069	-0.232***	0.036		
secondary education	0	.....	0	.....		
male	-0.074	0.060	-0.486***	0.032		
single	0.434**	0.131	0.072	0.084		
married	-0.154*	0.077	-0.281***	0.037	(base	outcome)
widowed	0	.....	0	.....		
young(0-24)	0.957***	0.219	0.253	0.136		
adults(25-49)	0.344***	0.062	-1.651***	0.459		
old adults(50-75)	0	.....	0	.....		
Ethnic Estonians	-0.718***	0.127	0.027	0.052		
Non-Estonian citizens	-0.474***	0.069	-0.229***	0.034		
Other non-Estonians	0	.....	0	.....		
_cons	-2.120***	0.140	0.773***	0.070		
Number of observations:	**23,357**					
Pseudo R-squared:	**0.098**					

Source: Author's calculations based on the Estonian Labour Force Survey.

Note: The labour status employed is chosen as the base category in the table.

Note: The asterisks "*","**" and "***" in the table show the levels of significance accordingly <0.05, <0.01 and <0.001.

4.2.3 Mincerian wage regression

In Table 6, the results of the Mincerian regression analysis are described. The model investigated the impact of foreigner status, education and language proficiencies on the wages of

Table 6. The Mincerian wage regression analysis results

ln_wage	Coef.	Std. error
foreigner(third-country)	-0.181***	0.029
education	0.069***	0.005
proficiency in 2 and more language	0.164***	0.017
proficiency in Estonian	0.159***	0.020
_cons	7.562***	0.024
Number of observations:	116,701	
R-squared:	0.005	

Source: Author's calculations based on the Estonian Labour Force Survey.

Note: The asterisks "*","**" and "***" in the table show the levels of significance accordingly <0.05, <0.01 and <0.001.

individuals in The Estonian labour market. According to the analysis, being an individual from a third country is associated with a drop of 0.181 units in wages compared to the European migrants and locals. This highlights that most individuals from Non-EU countries work in a job with relatively less amount of salaries. The findings also reveal that a one-unit increase in education level corresponds with 0.069-unit wage growth. Further, language variables demonstrate that having proficiency in at least two languages as well as speaking Estonian are correlated with approximately 0.164 and 0.159 units of wage increases, respectively, in the labour market of Estonia. These outcomes suggest that attaining a higher level of education and being capable of speaking several languages, especially the host country's native language, are significant advantages and contribute to getting higher wages in the labour market.

The second Mincer wage equation results are showcased in Table 7. Analysis reveals that being male is correlated to a wage increase of 0.477 units, holding other variables constant. This finding implies the existence of a gender wage gap in the Estonian labour market. However, it is essential to study further fundamental aspects contributing to this wage discrepancy. The impact of our second variable, age, is that every one-unit increase in the age of labour workers has corresponded with a decrease of 0.013 units in wages. The outcome suggests that older employees tend to be paid relatively lower wages in the labour market compared to younger workers. A factor such as the potential decline in productivity may be a cause for this negative relationship.

The last and third table (Table 8) of the Mincer wage equation illustrates the effects of occupational sectors and the work location of labour workers on their wages. The analysis results demonstrate that labour employees who work in a job that belongs to, for example, an elementary occupations group based on The International Standard Classification of Occupations (ISCO) earn lower wages than those who belong to the professional or manager occupation classification group.

Table 7. The Mincerian wage regression analysis results

ln_wage	Coef.	Std. error
Gender	0.477***	0.015
Age	-0.013***	0.001
_cons	8.352***	0.029
Number of observations:	116,707	
R-squared:	0.014	

Source: Author's calculations based on the Estonian Labour Force Survey.

Note: The asterisks "*","**" and "***" in the table show the levels of significance accordingly <0.05, <0.01 and <0.001.

The location variables indicate that being an employee in cities such as Tallinn, Tartu and Parnu is associated with an increase of 0.265, 1.668 and 1.452 unit wage increases in an orderly manner. Conversely, working in cities, for example, such as Saare and Rapla, correlates with wage declines in the Estonian labour market. The conclusion is that the big cities may have more opportunities and higher demands, corresponding to better wages.

Table 8. The Mincerian wage regression analysis results

ln_wage	Coef.	Std. error
Occupation	-0.091***	0.003
Location Tallinn	0.265***	0.022
Location Tartu	1.668***	0.034
Location Parnu	1.452***	0.046
Location Saare	-0.090	0.046
Location Rapla	-0.036	0.057
_cons	7.946***	0.023
Number of observations:	116,707	
R-squared:	0.058	

Source: Author's calculations based on the Estonian Labour Force Survey.

Note: The asterisks "*","**" and "***" in the table show the levels of significance accordingly <0.05, <0.01 and <0.001.

Note: In the table, only the results of five certain cities are presented, but in general, the majority of cities have positive coefficients except for Saare, Rapla, and Hiiu.

5 Conclusion

This thesis analyses the labour market performance of individuals from third countries and investigates the factors that attract those labour migrants by using data from the Estonian Labour Force Survey covering the years 2010 to 2020. The findings presented in our thesis make a contribution to the existing literature and provide valuable insights for policymakers and researchers engaged in labour market integration and immigration endeavours.

The outcomes of our descriptive statistical analysis underscore the importance of human capital attributes such as advanced educational level and proficiency in foreign languages, especially knowing the host country's national language, which aids labour migrants in successfully integrating into the destination country's labour market. Our findings regarding proficiency in the host country's language also correspond to the conclusion of specific papers we studied in the literature review. The calculations for statistic analysis furthermore showed that Russia and Ukraine are the main source countries for third-country labour migrants in Estonia. However, recent happenings, such as the war in Ukraine, are not considered during that analysis. Many individuals from Ukraine left their homes due to war and entered Estonia, which secured employment in Estonia's job market (Kadri Lees, 2022). Despite the fact that there are considerable individuals who do not work in a position related to their profession or educational background, most of those Ukrainian war refugees are doing well in the Estonian labour market (Eamets, 2023). The analysis further emphasises certain pull factors of Estonia's labour laws and immigration policies which entice labour migrants. For instance, the results indicate that there are quite many labour migrants, despite not having citizenship in the country, who obtained all necessary work and residence permits to secure their employment through flexible and simplified immigration procedures. During the study, we examined the average wage of particular labour migrants in the Estonian labour market. The wage disparity among labour workers, especially between third-country and European migrants, argues that individuals from third countries are often willing to accept jobs with relatively lower salaries in comparison to EU nationals. This conclusion could be evidence of a pull factor, indicating that Estonia is more interested in receiving competent labour workers from third countries.

Regression analysis findings reveal that labour workers from third countries are more likely to be old adults, and this is most presumably related to the Soviet-era migration patterns, as we found that leading third countries on the migration to Estonia are the former Soviet Union states which have an ageing population. A further multinomial logistic model points out that the likelihood of being unemployed in the labour market declines if labour workers have at least a college degree and are capable of speaking two or more foreign languages. Our investigation also implies that young labour migrants face challenges in getting and maintaining employment compared to adults. The Mincerian wage regression results highlight the effect of various factors on wages in the labour market. These factors include education and proficiency in the native language of the host country

as well as the demographic and socio-economic characteristics, such as age, gender, geographic work location and occupational sector of labour employees, which influence the capability of labour workers to earn higher wages in the labour market.

Due to data limitations, during the research, we solely focus on investigating the pull factors which attract third-country labour migrants to relocate without considering the push factors or conditions in their home countries that drive labour workers to leave their place of origin. Another limitation concerns the Roy model, that we only calculate the wages of labour migrants in the Estonian labour market, whereas their earnings in their home country remain unknown. Besides, our analysis encompasses the outcomes up until the year 2021.

Through this thesis, we intend to stimulate further research and exploration within the field. The findings from our study have the potential to contribute to the policy adjustment regarding labour market integration and immigration.

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A Additional tables

Table A1. Descriptive statistics: Third-country migrants' differentiation based on gender

Explanatory variables (education, languages, citizens, status)	**Male**	**Female**	**Total**
Basic	9.62%	10.61%	2,403
Secondary	58.37%	54.91%	13,294
College	23.28%	26.93%	5,984
Proficient in 1 foreign language	61.67%	60.68%	13,492
Proficient in 2 and more languages	38.33%	39.32%	10,089
Proficient in Estonian language	10.61%	11.82%	2,665
Ethnic Estonians	7.51%	7.61%	1,784
Non-Estonian citizens	20.97%	36.87%	7,102
Other non-Estonians	71.52%	55.52%	14,694
Employed	61.16%	49.28%	12,810
Unemployed	7.47%	5.98%	1,600
Inactive	31.37%	44.74%	9,211
Total	**42.45%**	**57.55%**	**100%**

Source: Author's calculations based on the Estonian Labour Force Survey.
Note: The weights are applied in the analysis.

Table A2. Top five third-country nationals who migrated to Estonia for work

Years (2010-2020)	Russian	Ukrainian	Belarusian	Kazakh	Azerbaijani	Other Third-country migrants
2010	73.32%	12.67%	7.54%	1.59%	0.77%	4.11%
2011	72.41%	13.25%	8.47%	1.34%	0.46%	4.07%
2012	70.94%	12.94%	8.59%	2.01%	0.67%	4.85%
2013	71.57%	11.95%	7.59%	2.25%	1.53%	5.11%
2014	72.19%	11.69%	7.43%	2.41%	1.45%	4.83%
2015	73.00%	12.24%	6.80%	2.11%	1.91%	3.94%
2016	70.66%	13.93%	7.17%	2.20%	1.75%	4.29%
2017	68.51%	17.16%	6.18%	2.57%	1.08%	4.50%
2018	67.51%	16.77%	6.77%	2.60%	1.05%	5.30%
2019	69.25%	16.81%	6.10%	2.50%	0.78%	4.56%
2020	68.34%	17.74%	5.39%	1.96%	0.25%	6.32%
Total	**16,661**	**3,337**	**1,683**	**496**	**246**	**1,106**
Total%	**70.81%**	**14.18%**	**7.15%**	**2.11%**	**1.04%**	**4.71%**

Source: Author's calculations based on the Estonian Labour Force Survey.

Note: The weights are applied in the analysis.

Resümee

Tööjõu ränne kolmandatest riikidest Kesk- ja Ida-Euroopa riikidesse: Eesti näide

Käesolevas magistritöös uuritakse tegureid, mis meelitavad või tõrjuvad kolmandatest riikidest pärit võõrtöötajaid Kesk- ja Ida-Euroopa riikidesse. Käesolevas uurimuses keskendutakse analüüsis Eesti juhtumile, kasutades Eesti Tööjõu-uuringu andmeid aastatest 2010-2020. Kirjeldava statistilise analüüsi tulemused näitavad, et sellised kolmandate riikide sisserändajate tunnused nagu hariduslik taust, keeleoskus, rahvus ja kodakondsus, vanus, sugu ja perekonnaseis, samuti Eesti tööõiguse ja rändepoliitika eelised, võivad olla mõjutanud sisserändajate otsust Eesti tööturu kasuks. Järgnevalt viiakse töös läbi regressioonanalüüs kolme mudeli abil, need on logistiline regressioon kolmandate riikide sisserändajaid eristavate sotsiaalmajanduslike tegurite kaardistamiseks, multinomiaalne logistiline regressioon tööturustaatust selgitavate tegurite uurimiseks, ja Minceri palgavõrrand sisserändajate palgalõhe tuvastamiseks. Esimese mudeli hindamise tulemustest selgub, et kolmandatest riikidest pärit isikud on suurema tõenäosusega tööjõurändajad, kellel on keskharidus, kes valdavad üht võõrkeelt ja on abielus, naised ja vanad täiskasvanud. Teise mudeli tulemused näitavad, et töömigrantide parem akadeemiline kvalifikatsioon ja keeleoskus suurendavad nende töövõimalusi. Minceri palgavõrrandi hindamise tulemused toovad esile inimkapitali omaduste, isikuomaduste ja sünnikoha mõju palgale. Magistritöö järeldused täiendavad olemasolevat kirjandust ja pakuvad väärtuslikke teadmisi poliitikakujundajatele ja teadlastele.

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