DISSERTATIONES
RERUM
OECONOMICARUM
UNIVERSITATIS
TARTUENSIS
83

LAURA HELENA KIVI

Regional labour markets and assimilation of foreign labour force

DISSERTATIONES RERUM OECONOMICARUM
UNIVERSITATIS TARTUENSIS
83

DISSERTATIONES RERUM OECONOMICARUM
UNIVERSITATIS TARTUENSIS
83

LAURA HELENA KIVI

Regional labour markets and assimilation of foreign labour force

UNIVERSITY OF TARTU
Press
1632

School of Economics and Business Administration, University of Tartu, Estonia

The dissertation is accepted for the defence of the degree of Doctor Philosophiae (in Economics) on 2nd of November 2023 by the Council of the School of Economics and Business Administration, University of Tartu.

Supervisor: Professor emeritus Tiiu Paas,
University of Tartu, Tartu, Estonia

Opponents: Associate Professor Matti Sarvimäki,
Aalto University, Helsinki, Finland

Professor Kadri Männasoo,
Tallinn University of Technology, Tallinn, Estonia

The public defence of the dissertation is on 13th of December 2023 at 10.15 in room 1018, Narva mnt 18, University of Tartu.

The publication of this dissertation is granted by the Doctoral School of Economics and Innovation of University of Tartu created under the auspices of European Social Fund and by University of Tartu School of Economics and Business Administration.

Language editor: Michael Haagensen (English)

ISSN 1406-1309 (print)
ISBN 978-9916-27-417-0 (print)
ISSN 2806-254X (pdf)
ISBN 978-9916-27-418-7 (pdf)

Tartu University Press
www.tyk.ee

TABLE OF CONTENTS

LIST OF AUTHOR'S PUBLICATIONS AND CONFERENCE PROCEEDINGS

I. Papers in international journals

1. **Kivi, L. H.,** Sõmer, M., Kallaste, E. (2020). Language training for unemployed non-natives: who benefits the most? *Baltic Journal of Economics*, Vol. 20, No. 1, 34–58. https://doi.org/10.1080/1406099X.2020.1740403
2. **Kivi, L. H.,** Paas, T. (2021). Spatial interactions of employment in European labour markets. *Eastern Journal of European Studies*, Vol. 12, Special Issue, 196–211. https://doi.org/10.47743/ejes-2021-SI09
3. **Kivi, L. H.,** Järve, J., Anspal, S., Sõmer, M., Seppo, I. (2021). Are we there yet? Intergenerational mobility and economic assimilation of second-generation immigrants in Estonia. *Baltic Journal of Economics*, Vol. 21, No. 2, 158–183. https://doi.org/10.1080/1406099X.2021.1993601

II. Working papers

1. **Kivi, L. H.** (2019). Spatial interactions of regional labour markets in Europe. University of Tartu, Working Paper Series, No. 116.

III. Conferences

1. The European Regional Studies Association (ERSA) Congress on 28 August – 1 September 2023, Alicante, Spain. *Presentation: "The role of neighbourhood effects in regional labour markets"*
2. PhD Summer School in Economics, Management, Governments and Politics, Political Science, Law and Public Administration on 27–29 June 2023, Pühajärve, Estonia. *Poster presentation: "Labour market assimilation of refugees and ethnic composition of firms: the case of Ukrainians in Estonian labour market"*
3. PhD Summer School in Economics, Management, Governments and Politics, Political Science, Law and Public Administration on 28–30 June 2022, Haapsalu, Estonia. *Poster presentation: "Essays on regional labour markets and labour mobility"*
4. 20th International Workshop on Spatial Econometrics and Statistics at the University of Lille on 19–20 May 2022, Lille, France. *Presentation: "Spatial interactions of regional labour markets in Europe: cultural or geographical proximity"*
5. Eurasia Business and Economics Society (EBES) 39th Conference on 6–8 April 2022, Rome, Italy. *Presentation: "Neighbourhood effects in European regional labour markets: are they different between domestic and cross border regions?"*
6. The Annual Conference of Estonian Economic Association on 20–21 January, 2022, Pärnu, Estonia. *Poster presentation: "Regional unemployment in the framework of cultural and geographic proximity"*

7. The European Regional Studies Association (ERSA) Congress on 24–27 August 2021, online, originally intended to take place in Bolzano, Italy. *Presentation: "Do cooperation or competition effects dominate in the European labour markets?"*
8. PhD Summer School in Economics, Management, Governments and Politics, Political Science, Law and Public Administration on 28–30 June 2021, Narva-Jõesuu, Estonia. *Presentation: "Are we there yet? Intergenerational mobility and economic assimilation of second-generation immigrants in Estonia"*
9. The Paris School of Economics (PSE) Summer School on the topic of Migration Economics on 14–18 June 2021, online, originally intended to take place in Paris, France. *Presentation: "Are we there yet? Intergenerational mobility and economic assimilation of second-generation immigrants in Estonia"*
10. The Regional Studies Association (RSA) Russia Division's Workshop "Spatial Developments in Challenging Times" as part of the XIV conference "Russian Regions in the Focus of Changes" on 14–16 November 2019 in Yekaterinburg, Russia. *Presentation: "The role of spatial interactions in development of regional labour markets"*
11. PhD Summer School in Economics, Management, Governments and Politics, Political Science, Law and Public Administration on 26–28 June 2019, Laulasmaa, Estonia. *Presentation: "Language training of non-natives – future in flexible and shorter courses"*
12. 4th Central European PhD Workshop on Technological Change and Development at the University of Szeged on 5–6 April 2019, Szeged, Hungary. *Presentation: "Spatial interactions of regional labour markets in Europe"*

INTRODUCTION

List of original studies

This PhD thesis relies on three original studies (published or accepted for publication), each referred to throughout the thesis with a respective Roman numeral.

I. **Kivi, L. H.,** Paas, T. (2021). Spatial interactions of employment in European labour markets. *Eastern Journal of European Studies*, Vol. 12, Special Issue, 196–211. https://doi.org/10.47743/ejes-2021-SI09

II. **Kivi, L. H.,** Järve, J., Anspal, S., Sõmer, M., Seppo, I. (2021). Are we there yet? Intergenerational mobility and economic assimilation of second-generation immigrants in Estonia. *Baltic Journal of Economics*, Vol. 21, No. 2, 158–183. https://doi.org/10.1080/1406099X.2021.1993601

III. **Kivi, L. H.,** Sõmer, M., Kallaste, E. (2020). Language training for unemployed non-natives: who benefits the most? *Baltic Journal of Economics*, Vol. 20, No. 1, 34–58. https://doi.org/10.1080/1406099X.2020.1740403

Motivation and conceptual idea of the research

Regional labour market outcomes are determined by the interaction between labour demand and supply on the basis of a wage setting mechanism (see seminal model by Blanchard and Katz, 1992). However, previous studies (e.g. Halleck Vega & Elhorst, 2014; Rios, 2017) indicate that regional labour market participants are not restricted to the activities in their current region of residence, but consider wider opportunities and can thus change the supply and demand for labour in other regions. These interactions, mostly in the form of short-distance labour migration movements and commuting, create connections between neighbouring regional labour markets, known as spatial interactions (Anselin, 1998; Elhorst, 2014; LeSage & Pace, 2009). At the same time, both short-distance cross-border movements and long-distance labour mobility can lead to questions of foreign labour force assimilation in regional labour markets, as immigrants tend to be at a disadvantage in the host country's labour market (see Adsera & Chiswick, 2007).

The focus of this thesis is how spatial labour market interactions and foreign labour force shapes regional labour markets. Studying regional labour markets in the context of spatial interactions and foreign labour force is important for three main reasons. First, studying labour market interactions gives an indication of the formation and persistence of disparities in local labour market outcomes (e.g. disparities in unemployment and employment rates). Disparities in unemployment rates between regional labour markets are as wide as or at times wider than between national labour markets; for example, national unemployment rates in the EU in 2021 ranged from 2.8% to 14.8%, while the unemployment rates in

NUTS 2 regions varied in Spain from 9.8% to 26.6%, in Belgium from 2.8% to 12.4% and in Italy from 3.8% to 19.3% (Eurostat, 2023e). As Taylor (1996) states, decreasing these disparities would lead to desired macroeconomic outcomes, such as higher national output and lower inflation.

Second, foreign labour force constitutes a significant share of the total labour force in regional labour markets. In 2021, 13% of all the labour force in the European Union were foreign-born (Eurostat, 2023b). While foreign-born form a substantial share of the total labour force, their labour market outcomes tend to be inferior to native-born. It has been widely documented that at least upon arrival immigrants usually earn lower wages than native-born workers with comparable measurable characteristics (Adsera & Chiswick, 2007). Although labour migrants tend to outperform other migrant groups in the host region's labour market, there are still questions concerning long-term assimilation and inferior labour market outcomes (Bakker et al., 2017; Luik et al., 2018).

Third, the inferior labour market performance of immigrants has been argued to reflect the low transferability of pre-migration skills and lack of country-specific human capital (Basilio et al., 2017; Friedberg, 2000). Local language proficiency is seen as a vital aspect of country-specific human capital as it allows direct communication with co-workers and clients as well as the transfer of pre-immigration experience, knowledge and skills to the host country's labour market (Orlov, 2018). Therefore, local language training could largely benefit the immigrant population and it is vital to investigate the effects of language learning on the labour market outcomes of the immigrant population.

This thesis contributes to the literature by filling a research gap in terms of: i) how regional labour markets affect each other through spatial interactions, ii) how the foreign labour force and their descendants assimilate to the regional labour market in the long term, and iii) how the assimilation of foreign labour force and their descendants is impacted by local language skills.

While regional labour market outcomes have not been the main focus of regional development studies (Barro & Sala-i-Martin, 2004), they have attracted attention due to empirical observations of large disparities in regional labour market outcomes (see Elhorst, 2003). Disparities in (un)employment rates between regional labour markets have even been noted to be larger than between national labour markets (Elhorst, 2003). In addition, it has been shown that regional labour market indicators tend to cluster geographically (Aragon et al., 2003; Cracolici et al., 2007; Halleck Vega & Elhorst, 2016; Overman & Puga, 2002). Although similarities in regional labour supply and demand-side factors can explain some of the similarities in labour market outcomes between neighbouring regions, interactions with the labour markets of neighbouring regions have also been proven to be important. For example, Badinger and Url (2002) report that spatial effects account for about one-fifth of the variation in the unemployment rate. These considerations have paved the way for spatial econometric methods making it possible to study the interactions between regional labour markets in terms of spatial dependence and spatial spillovers (see Anselin, 1998; Elhorst, 2014; LeSage & Pace, 2009). Although spatial interactions can to some extent reflect agglomeration

economies and knowledge spillovers between regions, one of the main mechanisms of spatial interactions is the labour mobility between regional labour markets (Molho, 1995; Niebuhr, 2003; Patacchini & Zenou, 2007). Therefore, investigating spatial interactions at a regional level provides an additional approach to study cross-regional mobility. Moreover, studying regional labour markets without taking spatial dependence into account may lead to biased and inefficient estimates (Anselin, 1998). Study I contributes to the literature in this area by investigating the type and dynamics of the spatial interactions in European regional labour markets.

Although labour mobility can be a helpful mechanism in reacting to shocks, the assimilation of foreign labour force is not always smooth. The immigrant-native wage gap has been widely documented in Europe and in the US (Adsera & Chiswick, 2007; Borjas, 2015; Chiswick, 1978; Hammarstedt, 2003; Ingwersen & Thomsen, 2021). While labour migrants tend to fair better than other migrant groups (humanitarian and family migrants; see e.g. Bakker et al., 2017; Luik et al., 2018) in the host country's labour market, they still have many challenges to overcome. At least upon arrival, immigrants often lack country-specific human capital. Their earlier experience, qualifications, education and other job-related skills are not perfectly transmittable to the host country's labour market (Basilio et al., 2017; Chiswick, 1978). Moreover, immigrants might also lack information on the labour market and social system of the host country, as well as local language proficiency (Friedberg, 2000). In the classical human capital framework (Becker, 1975) these challenges are expected to decrease with time spent in the host country as immigrants learn the local language and gather country-specific knowledge and labour market skills. Although studies using European data find that immigrants do catch up to some extent with similar natives in terms of their labour market outcomes, considerable wage differences still remain after many decades in the country (Beyer, 2019; Bratsberg et al., 2014; Sarvimäki, 2011). Besides lack of human capital, lack of social capital (e.g. restricted access to job-related social networks) can create challenges for immigrants, hindering their adjustment to host country's labour market (Leschke & Weiss, 2020). Lastly, immigrants might face discrimination in the host country's labour market (Arrow, 1973).

Overall, first-generation immigrants face different challenges, which might lead them to be at a disadvantage in the host country's labour market. However, the long-term perspective suggests that in the assimilation of immigrants into regional labour markets, not only does the labour market performance of the first generation of immigrants matter, but also does that of their children. Earlier empirical evidence has shown that the income positions of the children are related to the income positions of their parents, with at least one-fifth of the economic advantages and disadvantages being carried over from one generation to the next (Corak, 2013, 2016). In addition, theoretical models on intergenerational earnings mobility (Becker & Tomes, 1979, 1986; Solon, 2004) explain how investments in the child's human and non-human capital and intergenerational transmissions of genetic ability, skills, common values and social networks create a significant relationship between the income positions of parents and their children. Therefore,

if first-generation immigrants are at a disadvantage in the host country's labour market and the income positions are carried over from one generation to the next, then second-generation immigrants are also likely to find themselves at an earnings disadvantage compared to their native peers. Overall, investigating the intergenerational earnings mobility of immigrant families makes it possible to assess the long-term labour market assimilation of the immigrant population. A contribution to this area is made by Study II, which investigates the intergenerational earnings mobility for immigrant and native families and the role of parental background in explaining the native-immigrant income gap at the level of the second generation.

As immigrants face challenges in assimilation to the local labour market, a natural solution for enhancing their labour market performance is increasing their country-specific human capital. As stated above, a vital aspect of the country-specific human capital is state language proficiency. Different theoretical explanations list the benefits of fluency in the host language. These include increased productivity in the workplace due to enhanced possibilities for communication with clients and co-workers (Hayfron, 2001), greater potential to transfer pre-migration experience and skills (Orlov, 2018) and more efficient job searches (Chiswick, 1991). Earlier empirical evidence has confirmed the significant positive relationship between state language proficiency and the earnings of employed immigrants (Beyer, 2019; Bleakley & Chin, 2004; Budría et al., 2017). However, as Aldashev et al. (2009) point out, insufficient language proficiency is likely to restrict the labour market participation of the immigrant population. Therefore, it is vital to also investigate the impact of language proficiency on the employment probability of the immigrant population. The evidence in this regard is still relatively scarce (see e.g. Budría et al., 2019; Dustmann & Fabbri, 2003) compared to the evidence of language proficiency on earnings. In addition, to enhance the local language skills of the immigrant population, more evidence is needed regarding the impact of language courses. There are relatively few studies focusing on the impact of local language courses on the labour market outcomes of the non-natives (see Lochmann et al., 2019; Prey, 2000; Sarvimäki & Hämäläinen, 2016). Study III adds to the literature by exploring the impact of state language training on the employment probability and labour income of unemployed non-native speakers.

Study I uses data on NUTS 2 regions in Europe. As noted above, regional labour markets in the EU are characterised by large disparities in regional employment and unemployment indicators. There is earlier evidence based on single-country datasets, which indicates that European regional labour market indicators tend to cluster (Aragon et al., 2003; Cracolici et al., 2007; Semerikova, 2015), indicating that spatial interactions could play an important role in European regional labour markets. However, only a few studies have focused on analysing the spatial interactions of the regional labour markets for a larger group of countries in the EU (Halleck Vega & Elhorst, 2014, 2017; Niebuhr, 2003). Study I tries to fill this gap by investigating spatial spillover effects for NUTS 2 regions in Europe including both domestic and foreign relationships and accounting for cross-border interactions.

Study II and Study III focus on one of the NUTS 2 regions – Estonia. Estonia provides an interesting example for studying the long-term assimilation of labour migrants and their descendants. During the Soviet era, labour migration to Estonia was incentivised, leading to a sizeable community of mostly Russian-speaking first, second and third-generation immigrants. In 2021, first, second and third-generation foreigners constituted of 27% of the Estonian population (Statistics Estonia, 2023a). While Russian-speakers were not disadvantaged on arrival, the last three decades since independence and economic restructuring have been characterised by significant wage and employment gaps (Leping & Toomet, 2008). In line with international practice, state language skills and training are seen as one of the key solutions for enhancing the labour market performance of non-native speakers. The considerable share of the second-generation population and its relative homogeneity provide a perfect example for studying the intergenerational earnings mobility and the benefits of state language learning for the foreign population.

Research aims and tasks

The aim of this thesis is to provide insights into regional labour markets in the context of spatial interactions and foreign labour force.

There are different ways to define a region. On the one hand, a region could be seen as an area part of a country, such as a parish or a county. On the other hand, region could denote a larger area made up of multiple countries (see Rydén, 2002). In addition to geographical borders, regions can be defined by administrative, cultural or linguistic borders. Regional labour markets could also be determined based on commuting flows, such that the commuter interactions within regions are higher than with other regions (Fischer & Nijkamp, 1991; Kropp & Schwengler, 2016). This thesis uses an administrative approach to define regional labour markets. The NUTS classification (Nomenclature of territorial units for statistics) determines NUTS 2 level regions as basic regions for the application of regional policies (Eurostat, 2023a); therefore, NUTS 2 regions are studied in this thesis. Study I uses data on all of the NUTS 2 regions in Europe. Study II and Study III focus on one of the NUTS 2 regions, which is also a country – Estonia.

Another central concept in this thesis is foreign labour force. *Foreign labour force* is defined as foreign-born, who are part of the labour force (employed or unemployed and seeking employment). A foreign-born is defined as someone who was born outside of their country of residence (according to current administrative boundaries). However, most of the literature does not distinguish the foreign-born by their labour market status and refers to all foreign-born together; therefore, the wider term *immigrants*, which involves both active and inactive foreign-born, is also used in this thesis. Study I investigates spatial interactions, including interactions within and across national borders. Therefore, in addition to foreign labour force, Study I includes interregional migrants and commuters. Study II and Study III focus on both the foreign labour force and on their children. The foreign labour force is also referred to as *first-generation immigrants* and the children of the foreign-born are referred to as *second-generation immigrants*.

Figure 1 displays the central concepts of this thesis explained above and how each study fits within the common framework. Each of the studies in this thesis focus on a different aspect of how regional labour markets and foreign labour force interact. Study I investigates spatial interactions, with one of the main mechanisms of spatial interactions being the movement of the labour force. The focus of Study I is on analysing whether cooperation effects (positive spatial dependence) or competition effects (negative spatial dependence) dominates in European regional labour markets, and studying the dynamics of spatial interactions. Study II examines the labour market outcomes of the foreign labour force and their children (the second generation). Intergenerational transmissions of human and social capital mean that earnings advantages and disadvantages tend to persist over generations. Study II analyses how the first generation's outcomes can affect those of their children. Study III focuses on the assimilation of foreign labour force and their descendants in the local labour market. As explained above, assimilation in the host labour market can be hindered by the lack of country-specific human capital. Study III estimates how state language training, aimed to increase the country-specific human capital, impacts the labour market outcomes of foreign labour force and their descendants.

All three studies analyse labour market outcomes. Study I and Study III focus on employment rate, while Study II and Study III analyse the impact of inter-generational transfers and local language skills on labour income.

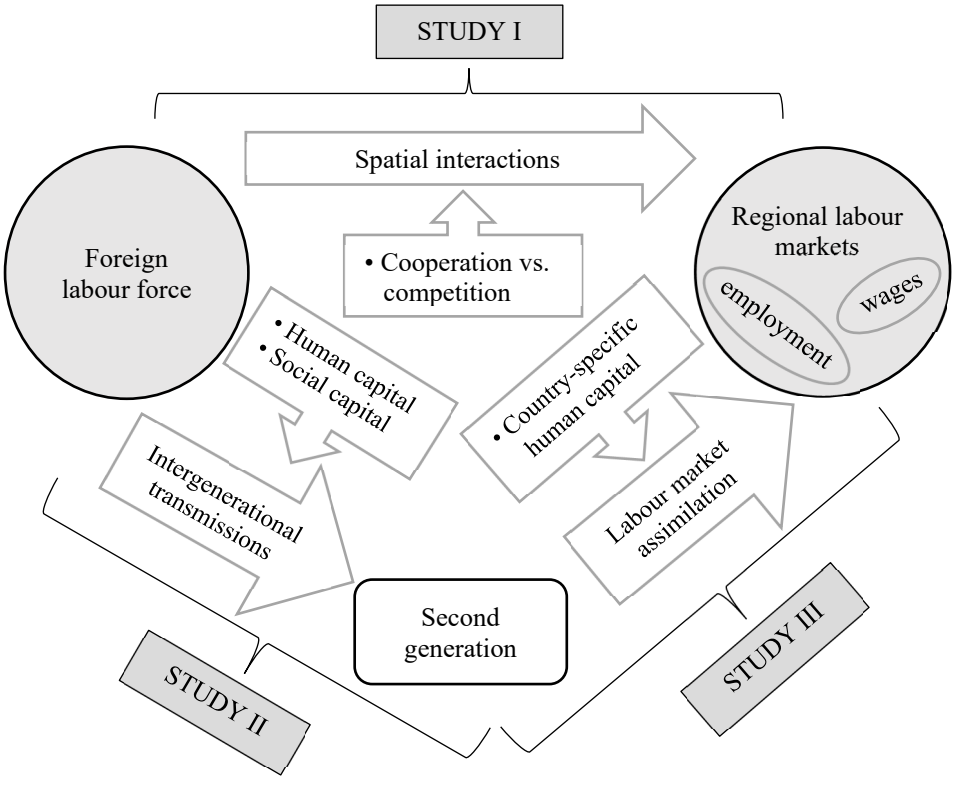


Figure 1. Overview of studies in the thesis.

Each of the studies has a specific research gap to fill. Table 1 provides an overview of the motivation, most relevant earlier studies, research gap and novelty of each study.

Study I focuses on investigating spatial interactions (see also Table 1). As explained above, migration flows and commuting across regions (Blanchard & Katz, 1992; Patacchini & Zenou, 2007), agglomeration (Overman & Puga, 2002) and knowledge spillovers (Autant-Bernard & LeSage, 2011) create spatial spillovers between regional labour markets. Therefore, analysing spatial interactions provides an additional possibility to study cross-regional mobility. In addition, analysing regional labour markets without considering spatial dependence might result in biased and inefficient estimates (Anselin, 1998).

Earlier studies have largely investigated unemployment rate spatial dependence using single-country datasets and found positive spatial dependence (Aragon et al., 2003; Filiztekin, 2009; Halleck Vega & Elhorst, 2016). Research using employment rate indicators has found mixed results on the sign of dominating effects (Brada et al., 2021; Lewis et al., 2011; Mayor & López, 2008). Study I analyses both domestic and cross-border interactions adding evidence on spatial dependence in a multi-country setting. Furthermore, earlier research lacks investigations on the dynamics of spatial dependence. In European regional labour markets, the EU integration process could impact the development of spatial spillovers. Earlier evidence suggests that the labour market integration of the European Union has been slow (see e.g. Krause et al., 2017). Study I contributes to filling the gap by investigating whether the dynamics of spatial interactions reflect the EU integration process.

As noted above, inferior labour market performance and lower earnings among first-generation immigrants in Europe have long been documented (Beyer, 2019; Chiswick, 1980; Hammarstedt, 2003). At the same time, studies on intergenerational mobility have found that at least one-fifth of the economic advantages and disadvantages are carried over from parents to children in Western Europe and Scandinavia (see Corak, 2006). If the first generation of immigrants are faring worse in the host country's labour market and these disadvantages are inherited to the next generation, then the wage gap is likely to persist in the second-generation.

Earlier studies focus on the intergenerational earnings mobility of immigrant families in US, Canada and Scandinavia (Abramitzky et al., 2021; Aydemir et al., 2009; Bratu & Bolotnyy, 2023; Hammarstedt & Palme, 2012; Hermansen, 2016), leaving a research gap in investigating intergenerational mobility in Eastern and Central European countries. Study II tries to fill the gap by analysing intergenerational mobility in a country where the share of second-generation immigrants is substantial (19.5% of the working age population in Estonia was native-born with at least one foreign-born parent in 2021 (Eurostat, 2023c). Furthermore, earlier explanations of the native-immigrant income gap have focused on differences in cognitive skills, use of skills at work, returns to education and official language skills (Bleakley & Chin, 2004; Friedberg, 2000; Ridala & Toomet, 2019; Tverdostup & Paas, 2019). Parental background as one indicator of human and social capital has received less attention in explaining the wage gap between second-

generation immigrants and natives. Study II contributes here by estimating the role of parental background in explaining the gap.

Study III also departs from the empirical observation of the lower labour market outcomes of immigrant populations (Adsera & Chiswick, 2007). Different theoretical explanations have listed host country language skills as a vital part of the country-specific human capital (Chiswick, 1991). Host country language skills is seen as a productive trait, transferer of pre-immigration human capital and enhancer of job search (Hayfron, 2001; Orlov, 2018). Earlier research has studied the relationship between host country language proficiency and the earnings of employed immigrants (Bleakley & Chin, 2004; Budría et al., 2017; Dustmann & van Soest, 2002). However, much less is known about the impact of host country language skills on the labour market outcomes of the unemployed population. Study III aims to fill this gap by investigating the impact of local language training on employment probability and labour income of unemployed non-natives. In addition, earlier evidence on the effectiveness of local language training is still relatively scarce (Gerfin & Lechner, 2002; Hayfron, 2001; Lochmann et al., 2019) and shows considerable lock-in effects during the first months of the training (Delander et al., 2005; Prey, 2000). To increase the effectiveness of language training different ways to shorten the lock-in effect and increase long-term gain could be considered. Study III contributes by analysing the heterogenous effects of language training by course types and participant groups.

Overall, more research is needed to understand how foreign labour force and regional labour markets interact. As explained above, it is known that regional labour markets interact with each other due to foreign and domestic labour force movements, knowledge spillovers and agglomeration effects. However, there still exists a gap in understanding these interactions and their dynamics in different settings. In addition, foreign labour force assimilation in regional labour markets needs further attention as gaps in wage and employment outcomes for both first and second-generation immigrants are still partly unexplained. Different factors, such as the influence of parents or improvement of language skills could help to explain the gaps and thus require further research. All in all, these are the research gaps this thesis aims to fill.

To fulfil the aim of the thesis and fill the research gaps explained above, the following set of specific research tasks is addressed.

Theoretical and empirical background of the thesis (Chapter 1 of this thesis)

1. To provide a general overview of the literature on regional labour markets in the context of spatial interactions and the assimilation of foreign labour force.

Study I

2. To estimate the dominating type of spatial interactions in European regional labour markets.
3. To assess the intensity and dynamics of spatial interactions over time in European regional labour markets.

Study II

4. To investigate the level of intergenerational earnings mobility by the birth country of the parents (native-born vs. foreign-born).
5. To examine the role of parental background in explaining the difference in the earnings of the children of foreign-born and native-born.

Study III

6. To estimate the impact of local language training on the employment probability of unemployed non-native speakers.
7. To assess the effect of local language courses on the labour income of unemployed non-native speakers.

Discussion and conclusions (Chapter 3 of this thesis)

8. To discuss the results of the studies and provide policy implications.
9. To outline the limitations of the studies and avenues for future research.

Table 1. Overview of the motivation, relevant earlier findings, research gap and novelty of studies in the thesis

Study	Focus	Motivation	Earlier findings	Research gap and novelty
I	Spatial inter-actions	Migration flows and commuting across regions (Blanchard and Katz, 1992; Pattacchini and Zenou, 2007), agglomeration (Overman and Puga, 2002) and knowledge spillovers (Autant-Bernard and LeSage, 2011) create spatial spillovers. Investigating spatial interactions at a regional level provides an additional approach to study cross-regional mobility.	Spatial interactions of unemploy-ment + single-country datasets (Cracolici et al., 2007; Halleck Vega & Elhorst, 2016; Semerikova, 2015) – positive dependence. Spatial interactions of employment + single-country datasets (Brada et al., 2021; Lewis et al., 2011; Mayor & López, 2008) – mixed results.	Previous research on spatial interactions of unemployment rate in a single-country context → Multi-country context with foreign and domestic interactions included.
		Analysing regional labour markets without taking the spatial dependence into account may lead to biased and inefficient estimates (Anselin, 1998).	Earlier evidence on the slow labour market integration of the EU (Dorn & Zweimüller, 2021; Krause et al., 2017).	Lack of evidence on the dynamics of spatial interactions during crisis and across integration process → Study dynamics of the spatial interactions in EU.
II	Intergene-rational mobility of foreign families	Native-immigrant income gap: inferior labour market performance and lower earnings for 1st-generation immigrants in Europe (e.g. Chiswick, 1980; Hammarstedt, 2003; Beyer, 2016).	Intergenerational mobility of immigrants studied in US (Abramitzky et al., 2021); Canada (Aydemir et al., 2009); Norway (Hermansen, 2016); Sweden (Bratu & Bolotnyy, 2023; Hammarstedt & Palme, 2012); Netherlands (Zorlu & van Gent, 2020).	Earlier evidence on the intergenerational mobility of immigrants in Northern America and Scandinavia → Country context of a transition country with high share of second-generation immigrants.

Study	Focus	Motivation	Earlier findings	Research gap and novelty
		Intergenerational mobility: at least 1/5 of the economic advantages and disadvantages carried on from parents to children in Western Europe and Scandinavia (see Corak, 2006).	Wage gap in second generation explanations: difference in returns to education (Leping & Toomet, 2008); cognitive skills (Ridala & Toomet, 2019); official language skills (Lindemann, 2014; Toomet, 2011); the use of skills at work (Tverdostup & Paas, 2019).	Unexplained part of the native-immigrant income gap in the second generation → Parental background as indicator of human and social capital and one potential explanatory factor of the gap.
III	Language skills and training	Native-immigrant income gap: inferior labour market performance and lower earnings of immigrants in Europe (e.g. Chiswick, 1980; Hammarstedt, 2003; Beyer, 2016).	State language skills and earnings of employed population (Bleakley & Chin, 2004; Budría et al., 2017; Dustmann & van Soest, 2002): mostly significant positive relationship found.	Previous research on the impacts of language skills and training with the focus on employed population and wage → Focus on unemployed population in both employment and wage context.
		Language training as a key factor of labour market integration, language skills as a productive trait, transferer of pre-immigration human capital, enhancer of job search (OECD 2018: 100–101; Hayfron, 2001; Orlov, 2017).	Few studies on the effectiveness of language training (e.g. Gerfin & Lechner, 2002; Hayfron, 2001; Lochmann et al., 2019), evidence of lock-in effects in the first months of the training (Delander et al. 2005, Gerfin and Lechner 2002).	Earlier evidence of lock-in effects in the first months of the training → Heterogenous effects by course types and participant groups – who should be targeted?

Source: compiled by the author.

Research data and methodology

Table 2 summarises the methodological tools used in each of the studies, considering the specific research tasks.

Table 2. Overview of the data and research methods used in the thesis

Study	Task	Data	Method
I	Task 2. To estimate the dominating type of spatial interactions in European regional labour markets.	Eurostat NUTS 2 regions data	Spatial econometric models: spatial lag model (SLM), spatial error model (SEM), and spatial autoregressive model with autoregressive disturbances (SARAR)
I	Task 3. To assess the intensity and dynamics of spatial interactions over time in European regional labour markets.	Eurostat NUTS 2 regions data	Spatial econometric models: spatial lag model (SLM), spatial error model (SEM), and spatial autoregressive model with autoregressive disturbances (SARAR)
II	Task 4. To investigate the level of intergenerational earnings mobility by the birth country of the parents (native-born vs. foreign-born).	Combined registry dataset	Multiple OLS
II	Task 5. To examine the role of parental background in explaining the difference in the earnings of the children of foreign-born and native-born.	Combined registry dataset	Oaxaca-Blinder decomposition
III	Task 6. To estimate the impact of local language training on the employment probability of unemployed non-native speakers.	Combined registry dataset from the Estonian Tax and Customs Board and Unemployment Insurance Fund	Kaplan-Meier survival curves; propensity score matching combined with coarsened exact matching
III	Task 7. To assess the effect of local language courses on the labour income of unemployed non-native speakers.	Combined registry dataset from the Estonian Tax and Customs Board and Unemployment Insurance Fund	Propensity score matching combined with coarsened exact matching

Source: compiled by the author.

Study I exploits data from the Eurostat database. Data on NUTS 2 regions is used. The NUTS classification establishes a hierarchy of three NUTS levels for each EU member state. NUTS 2 level is defined as basic regions for the application of regional policies (Eurostat, 2023a). The main advantage of the dataset is the comparability of the labour market and cofounding variables across different EU countries and regions. The regional labour market information in Eurostat is gathered by carrying out the EU Labour Force Survey in each of the member states. The harmonisation of the data between different EU member states is achieved by adhering to common principles when formulating questionnaires (Eurostat, 2023d). The variables included in the dataset reflect the human capital, demographic composition, economic structure and country-specific conditions of the studied regions.

The dataset used in Study II combines data from the Estonian Population Register linked with data from the registries of the Tax and Customs Board, the Ministry of Education and Research, the Police and Border Guard Board, the Unemployment Insurance Fund, the Health Insurance Fund and the Social Insurance Board. The dataset includes information on age, gender, level of education, region of residence, country of birth, number of children, employment sector and yearly earnings of all people residing in Estonia in the period 2007–2017. As the dataset also contains information on parents, linkages between children and parents are possible. The longitudinal nature of the data makes it possible to observe the labour market outcomes of two generations already (children) or still (parents) of prime working age.

Study III exploits rich individual level registry data from the Estonian Unemployment Insurance Fund linked to income data from the Estonian Tax and Customs Board. The sample includes all individuals who participated in a state language course provided by the Estonian Unemployment Insurance Fund in the period 2015–2016 and those who were registered as unemployed in the same period and did not participate, but whose main language of communication was not Estonian. The dataset contains information on various individual characteristics, information on previous employment and previous and current unemployment spells (e.g., additional labour market services and training received) and information on labour market outcomes after the end of the course.

The choice of research methodology was guided by the research tasks. Study I exploits spatial econometric models to estimate the spatial interaction effects in regional labour markets. The spatial lag model (SLM), spatial error model (SEM), and spatial autoregressive model with autoregressive disturbances (SARAR) are used (see Elhorst, 2014). To estimate the level of absolute and relative intergenerational income mobility, Study II employs the ordinary least squares estimation (OLS) on the rank-rank regression following the income percentile rank approach introduced by the Chetty et al. (2014). To explore the gap in the mean income between natives and second-generation immigrants, a descriptive analysis and Oaxaca-Blinder decomposition approach (Blinder, 1973; Oaxaca, 1973) is used. Study III employs propensity score matching combined with coarsened exact matching (Rubin & Thomas, 2000) to estimate the impact of local language

training on labour market outcomes. The average treatment effect on the treated is estimated using the logit and linear regression models on the matched sample.

Structure of the thesis

This thesis has been organised into three chapters. Chapter 1 provides a detailed overview of the theoretical and empirical background – vital for understanding the regional labour markets in the context of spatial interactions and foreign labour force. Subchapter 1.1 presents a theoretical framework of regional labour markets. Subchapter 1.2 introduces the relevant background for analysing spatial interactions of regional labour markets. Subchapter 1.3 discusses different factors affecting the labour market assimilation of immigrants. Subchapter 1.4 is devoted to the labour market assimilation of the descendants of immigrants, including intergenerational transmissions between different generations of immigrants.

Chapter 2 consists of three original empirical studies. Chapter 3 presents the discussion and conclusions based on the findings of the empirical research articles. Subchapter 3.1 provides an overview of the main contributions and results of each study included in the thesis. Subchapter 3.2 discusses the main findings of the studies and presents policy implications drawn from the results of the studies. Lastly, limitations of the studies and pathways for future research are presented in subchapter 3.3.

Contributions of individual authors

Study I is co-authored with Tiiu Paas. Laura H. Kivi was responsible for conducting the literature review, carrying out the empirical analysis and writing the manuscript. Both authors contributed to formulating the research questions, discussing the empirical results and revising the manuscript throughout the publication process.

Study II is co-authored with Janno Järve, Sten Anspal, Marko Sõmer and Indrek Seppo. Laura H. Kivi wrote the manuscript, she was responsible for choosing the research methodology, conducting the empirical analysis and developing the theoretical framework. Janno Järve took part in preparing the database for empirical analysis and preliminary data analysis. Sten Anspal provided the initial theoretical framework of the analysis. All authors contributed to formulating the research objectives and took part in the discussions and policy recommendations. Laura H. Kivi was responsible for the correspondence with the journal and preparing the revised version of the manuscript.

Study III is co-authored with Marko Sõmer and Epp Kallaste. All authors took part in formulating the research objectives and tasks and discussing the results. Laura H. Kivi conducted the literature review, interpreted the empirical findings and wrote the manuscript with contributions from all co-authors. Marko Sõmer conducted the empirical analysis and described the methodological background.

Epp Kallaste contributed to the description of the institutional background and policy recommendations. Laura H. Kivi was responsible for the correspondence with the journal and revising the manuscript.

Acknowledgements

This thesis would not have happened without support from many along the way.

Firstly, my gratitude goes to my PhD supervisor prof. Tiiu Paas for her continued support on this journey. I am very grateful she encouraged me to start a PhD, motivated me on the occasions I was doubtful and shared her valuable feedback with me. I am also thankful we could discuss various matters regarding the thesis on different events, including writing retreats and conferences.

I am very grateful to my PhD thesis pre-defense opponents, Kadri Männasoo and Jaan Masso, and the pre-defense committee for their thoughtful and constructive feedback, which helped to improve the thesis. I would also like to thank Matti Sarvimäki and Kadri Männasoo for agreeing to be the opponents at the public defense of the thesis.

I am also grateful to Matti Sarvimäki for welcoming me at the Aalto University. I thank him and his colleagues for the valuable discussions and for making my stay in Aalto a pleasant experience.

Further, I would like to express my gratitude to my colleagues at Centar for their support and helpful discussions on various occasions. Epp and Janno, thank you for the extreme flexibility which enabled me to finish this PhD within a reasonable time. I would also like to thank Marko, who is my roommate in the office, and thus was subject to my various updates on the state of the thesis.

I also thank my colleagues from the chair of economic modelling and from the faculty of economics for their insightful comments and discussions on various occasions. Your valuable feedback on different events, from PhD seminars to doctoral summer school presentations, helped to revise and improve the articles of this thesis.

I am also grateful to Anneli Kütt and Katrin Tamm for their help on various administrative matters. I would especially like to thank Katrin Tamm and Diana Eerma for organising various doctoral school events, including writing retreats and summer schools. I am truly grateful I was a PhD student during the time these events were supported.

I would like to thank my fellow (former) PhD students and friends. Gaygysyz, thank you for answering all my PhD related inquiries during the first year(s). Nino, thank you for encouraging me to start the PhD studies and for support along the way. Liis, thank you for various tips on how to finish the PhD thesis successfully. I especially want to thank everyone who participated in the PhD writing retreats. Writing retreats taught me how to be an academic writer, but also provided me an access to interesting discussions and helped to acquire new friends and to enlarge my network.

Last, but not least, I would like to thank my family. Mom, thank you for being the best in everything, including emotional support. Dad, thank you for always loving me, with or without a PhD degree. Kristjan, thank you for telling me that all I need is “a graph”, “a table”, “a figure” and then I would be all done. Rainer, thank you for being extremely supportive and for entitling me “smart”, which enabled me to do this.

1. THEORETICAL AND EMPIRICAL BACKGROUND FOR THE RESEARCH

1.1. Theoretical framework of regional labour markets

Regional labour markets and regional (un)employment indicators have not been the centre of attention in regional development theories. Both neoclassical theory and the theory of new economic geography have focused on the growth of income and income convergence over time, assuming full employment in a classical setting (see e.g., Barro & Sala-i-Martin, 2004; Fujita et al., 1999; Gaspar, 2018). However, regional labour markets have attracted attention because of the large disparities noticed in unemployment and employment indicators within countries (see Elhorst, 2003). Disparities between regions within countries are at times larger than disparities between national labour markets (see Eurostat, 2023e). Therefore, studying labour markets at a national level masks wide differences within countries.

Different theoretical approaches have been developed to explain the empirically observed disparities between regional labour markets. In the neoclassical setting, labour mobility is expected to decrease the disparities in the unemployment rates in the long term (Niebuhr et al., 2012). The disequilibrium and equilibrium approaches, first developed by Marston (1985), explain how such large disparities can still occur. The attention is now turned to these two approaches, after which explanations on regional disparities based on new economic geography are introduced.

In the equilibrium view, each of the regions has its own long-run mean unemployment rate, which is determined by regional supply and demand factors and amenities (Rios, 2017). Although the mean unemployment rates differ across regions, they are characterised by constant utility across regions. Therefore, higher unemployment rates need to be compensated for by some other positive factors (e.g., amenities, higher wages, lower cost of living). In the short-term, labour markets adjust to shocks through labour migration and firm relocation up to the point where only compensating differences between regions remain and each region has reached its own long-run mean unemployment rate (Semerikova, 2015). In the long-term, compensating factors act as a disincentive for further migration. Therefore, as Marston (1985) claims, if unemployment has more of an equilibrium nature, then long-term unemployment rate differentials cannot be reduced, and attempts at government intervention in this regard are futile.

In the disequilibrium view, regions tend towards a common competitive unemployment rate and the differences in unemployment rates level off across regions (Blanchard & Katz, 1992). In this framework, disparities in unemployment rates are assumed to disappear in the long term through firm relocalisation and labour migration between the regions. However, the speed of adjustment may be slowed by restrictions on mobility on both sides of the labour market: workers tend to experience the cost of migration (e.g., housing costs) and firms are restricted by labour market rigidities (e.g., taxation, labour laws, union agreements, welfare

arrangements) (Díaz, 2016; Marston, 1985). If the adjustment process is slow, then labour market disparities persist for a longer period of time. In addition, labour markets might not manage to recover from a shock and reach the underlying mean unemployment rate before a new shock hits the market (Díaz, 2016). Contrary to the equilibrium view, where long-run disparities cannot be decreased by government policies, reducing migration costs and introducing more flexibility to labour markets could, according to the disequilibrium view, help to increase the speed of adjustment, leading to reduced differentials in regional unemployment rates in the long term.

The above discussed approaches reflect traditional neoclassical reasoning, where disparities in regional labour markets are either expected to decrease in the long term or reflect the disparities in the regional amenities, which compensate for the higher risk of unemployment or lower wage rate. While they explain the variability in the regional labour market indicators, they do not explain the geographical distribution of these indicators. Since the seminal work by Krugman (1991a, 1991b), new economic geography (NEG) models, aiming to explain regional development and the geographic concentration of economic activities, have emerged (see Gaspar (2018) for an overview of later studies). The main feature of these models is that increasing returns to scale and transportation costs create incentives for workers and firms to be concentrated in space (Fujita et al., 1999). These forces can lead to circular causation: firms wish to be located where markets are larger to reduce transportation costs, while larger markets are also more attractive for workers as they provide lower prices of manufactured goods and thus higher standards of living (Krugman, 1991b). This creates a pattern of core and periphery regions, the former being more productive, while the latter are characterised by lower productivity (Gaspar, 2018).

The focus of most of the NEG models is on regional income rather than (un)-employment rates; the core-periphery model by Krugman (1991b), for example, assumes full employment. However, some studies diverge from the full employment assumption and include unemployment in new economic geography (see e.g., Epifani & Gancia, 2005; Suedekum, 2005; Zierahn, 2013). Epifani and Gancia (2005) combine job search frictions with the core-periphery model framework. The model reflects how firms in larger regional markets (in core regions) benefit from the agglomeration forces. The prospect of higher profits due to agglomeration increases the value of creating vacancies. As new vacancies open up, more workers are incentivised to move from the periphery to the core region. The increase in labour supply reinforces the agglomeration benefits and the circle continues until a new steady-state is reached. As the job-finding rate increases with the increase in vacancies, the unemployment rate in the core region decreases. At the same time, the real value of profits decreases in the periphery, leading to less vacancies, lower labour market tightness and higher unemployment rates in the periphery. The theoretical model by Suedekum (2005) focuses on frictions in wage setting and implies that core regions, where workers and firms are agglomerated, will be characterised by higher real wages and lower unemployment rates than peripheral regions. Similarly, Zierahn (2013) focuses on frictions in wage setting

based on efficiency wages, but includes both centrifugal and centripetal forces in the model. The model confirms the earlier implications on unemployment disparities. In a nutshell, the above discussed theoretical models predict that the self-reinforcing nature of agglomeration economies can translate into a core-periphery unemployment gap.

The above-discussed theoretical frameworks, as well as previous empirical studies (see Elhorst (2003) for an overview) provide implications of different factors explaining the regional labour market disparities (see also an overview of different factors in Table 3). In the equilibrium view, most of the factors affecting the unemployment rate are variables that compensate for the high level of unemployment. Those variables are wages, industrial composition and amenities. For instance, areas with a more pleasant climate, active cultural life, lower population density or better infrastructure are expected to exhibit a higher unemployment rate (see e.g., Aragon et al., 2003; Badinger & Url, 2002). Under the disequilibrium view, the main variables affecting regional unemployment rates are those affecting the speed of adjustment. Those variables are age structure, average education level, employment growth, population density and the structure of the housing market. For example, young people are more likely to move to another region as their opportunity costs from moving are lower and they are less risk averse than older cohorts (Aragon et al., 2003; Díaz, 2016; Filiztekin, 2009). Overall, there are various regional factors which can explain the level of the (un)-employment rate in the same region. In the next subchapter, attention is turned to explaining how the characteristics of neighbouring labour markets can affect the labour market outcomes of a given region.

Table 3. Overview of factors explaining regional unemployment rate disparities according to the equilibrium and disequilibrium views

Factor	Theoretical approach	Explanation	Studies
Wages	Equilibrium view	Higher unemployment in the area is assumed to be compensated by higher wages in the area.	Aragon et al. (2003), Badinger and Url (2002), Marston (1985), Semerikova (2015).
Amenities	Equilibrium and dis-equilibrium view	Equilibrium view: more pleasant climate, active cultural life, lower population density compensate for high level of unemployment. Disequilibrium view: job searching and matching in more densely populated areas is more efficient than in remote areas. However, urban areas attract job seekers from other regions and the accompanying supply effect might increase unemployment.	Aragon et al. (2003), Badinger and Url (2002), Semerikova (2015).
Composi-tion of industries	Equilibrium view	Regions that specialise in declining industries are assumed to exhibit higher unemployment rates than regions that specialise in growing industries.	Aragon et al. (2003), Díaz (2016), Elhorst (2003), Filiztekin (2009), López-Bazo et al. (2002), Niebuhr (2003), Semerikova (2015).
Age structure	Disequi-librium view	Younger people: more likely to move (lower opportunity costs). However, barriers in terms of entering the labour market. Older generation: educational mismatch could decrease labour market opportunities.	Aragon et al. (2003), Díaz (2016), Filiztekin (2009), López-Bazo et al. (2002), Semerikova (2015).
Human capital	Disequi-librium view	Highly skilled workers more demanded in the labour market, more efficient in finding jobs and more likely to move to seek new employment opportunities.	Aragon et al. (2003), Badinger and Url (2002), Díaz (2016), Elhorst (2003), López-Bazo et al. (2002), López-Hernández (2013), Overman and Puga (2002), Semerikova (2015).
Housing prices	Disequi-librium view	Speed of the adjustment is slowed by restrictions on mobility of workers (housing prices reflect cost of migration).	Badinger and Url (2002).

Source: compiled by author based on Aragon et al. (2003), Badinger and Url (2002), Díaz (2016), Elhorst (2003), Filiztekin (2009), Niebuhr (2003), Marston (1985), López-Bazo et al. (2002), López-Hernández (2013), Overman and Puga (2002), Semerikova (2015).

1.2. Spatial interactions of regional labour markets

Different factors affecting regional labour market indicators were discussed above. However, regional labour markets are not only affected by regional demand, regional supply, wage setting and national institutional factors in the same region. Neighbouring labour market characteristics have been proven to also be important. While the theoretical considerations of labour and firm mobility and core-periphery regions explored in the last subchapter support this, empirical evidence also supports this claim.

The first raw evidence of that is the clustering of (un)employment rates in neighbouring labour markets. Regions with high (un)employment rates tend to have neighbours with high (un)employment rates as well. While this can be partly explained by the similarity in regional characteristics, numerous studies have found significant spatial effects for regional labour markets after controlling for various regional characteristics. Molho (1995) uses UK regional data and finds that unemployment rate changes in one region are affected by unemployment rate and employment growth rate changes in neighbouring areas. Cracolici et al. (2007) show that regional unemployment rates in Italy are characterised by positive spatial dependence. Positive spatial effects are also found for regional labour markets in Germany (Semerikova, 2015) and Spain (López-Bazo et al., 2002). Aragon et al. (2003) find support for the nuisance form of spatial dependence in unemployment rates in the Midi-Pyrénées region in France. Lastly, Halleck Vega and Elhorst (2016) use provincial data in the Netherlands and find that spatial dependence in unemployment rates is significant even after controlling for common factors, while Ciołek (2021) detects positive spatial dependence for local administrative units in Poland.

The main conclusion of these studies is that regional labour markets are affected by shocks in the labour markets of their neighbours and directly by changes in unemployment rates and in the various regional characteristics in neighbouring labour markets. The same could be concluded based on studies focusing on employment indicators, although there is much less evidence in this regard (see Brada et al., 2021; Lewis et al., 2011; Mayor & López, 2008; Pavlyuk, 2011).

While the above discussed studies focus on spatial effects within a country, there are only a limited number of studies on effects for many neighbouring countries. In the context of EU countries, it has mainly been found that significant spatial effects prevail; however, these effects are usually only noticed either within country borders or that the effects decrease with the inclusion of cross-border neighbours. Halleck Vega and Elhorst (2014) use data for regions in Western Europe for the period 1986–2010 and find that the majority of spillover effects for unemployment and participation rates are highly significant within country borders, while employment growth exhibits significant spillover effects also across country borders. Halleck Vega and Elhorst (2017) study the spatial effects of the labour force participation rate of EU regions and show that including cross-border neighbours decreases the spillover effects of explanatory variables for the neighbouring regions. Niebuhr (2003) finds that unemployment rate changes in

one EU region over the period 1986–2000 are related to unemployment rate changes in the neighbouring regions within a country. The author also finds significant results when including cross-border neighbours; however, only in the case that cross-border regions are included with scaled down weights. Lastly, Overman and Puga (2002) include international neighbours and use stochastic kernel mapping to conclude that the regional unemployment rates in European NUTS 2 regions in 1996 were much more related to their closest neighbours' unemployment rates than to the national average unemployment rates.

Theoretical explanations on spatial interaction mechanisms firstly outline labour mobility in the form of commuting and migration as one of the mechanisms. The seminal model by Blanchard and Katz (1992) explains how regional labour markets respond to regional labour demand shocks. The model assumes that regions produce different bundles of goods, and labour and firms are mobile across regions. The model consists of four equations for short-run labour demand, wage-setting, labour supply and long-run labour demand. The authors have developed an empirical model which estimates the joint behaviour of the employment growth rate, employment rate and the participation rate based on the theoretical model.

The model by Blanchard and Katz (1992) does not implicitly model linkages between regions; however, migration is taken into account indirectly. Halleck Vega and Elhorst (2014) extend the model and incorporate the spatial effects of the unemployment rate, labour force participation rate and employment growth rate into the model. The model implies a few explanations of the interactions between neighbouring labour markets, all focusing on labour and firm mobility. First, employment growth in one region can influence the unemployment rates in neighbouring regions. In this case, increased labour demand and new jobs created in a region affect the opportunities available for the unemployed in neighbouring regions, given that they are willing to move. Second, changes in the unemployment rate in a region can affect the participation rate in neighbouring regions. If people seeking employment feel discouraged by the poor labour market conditions (high unemployment) in their own region (see e.g. Long (1953, 1958) and Dagsvik et al. (2013) on the discouraged worker effect), they might move to neighbouring regions for work. Furthermore, unemployment rates in one region can impact employment growth in another region. On the one hand, when unemployment is relatively high in a region, firms will wish to move there because there is a larger pool of workers to choose from and regions with higher unemployment rates tend to have relatively lower wages (known as the wage curve, see Blanchflower & Oswald, 1994). If the firms relocate to high-unemployment regions, this could lead to a decrease in employment growth in neighbouring regions. On the other hand, high unemployment can also signal potential economic problems in the region, which in turn might cause high-skilled workers to emigrate from that region (Halleck Vega & Elhorst, 2014). This might discourage firms from expanding their activities in a regional labour market characterised by high unemployment and encourage them to focus on other (neighbouring) regions with lower unemployment rates.

Overall, these theoretical considerations point to the movement of workers and firms as one of the mechanisms of interaction effects between regional labour markets. Blanchard and Katz (1992) find that labour demand shocks have stronger effects on unemployment rates than wages, and conclude that labour migration is a more important adjustment mechanism than firm movement in response to local shocks. The lower importance of firm movement could be related to the higher costs of moving for firms (Semerikova, 2015). Later works using similar theoretical frameworks have also found empirical support for labour mobility as one of the mechanisms creating spatial dependence. Molho (1995) finds that unemployment rate changes in the local labour markets of the UK are negatively related to employment growth in neighbouring regions and positively to unemployment rate changes in neighbouring regions. The study shows that the spatial effects of employment growth rates are strongest after a time lag and the majority of the spatial effects of unemployment rates are highly localised, finding support for both migration and commuting behaviour in creating spatial spillovers. Similarly, Niebuhr (2003) finds using EU NUTS 2 and NUTS 3 regional data, that unemployment rate changes in one region are affected by employment growth in neighbouring regions. The study concludes that labour mobility is one of the factors causing spatial dependence. Lastly, Patacchini and Zenou (2007) analyse UK Travel-To-Work-Area data and show that the majority of the spatial spillover effects are highly localised, pointing to the commuting behaviour of workers.

In addition to labour mobility, which could be seen as the main mechanism of spatial dependence, there are also others. Spatial dependence may reflect the agglomeration of economic activities. As discussed above, theoretical new economic geography models explain how increasing returns to scale combined with transportation costs, and factor mobility might lead workers and firms to be concentrated in space, creating geographical clusters of economic activity (Fujita et al., 1999; Gaspar, 2018; Krugman, 1991b). If these geographical clusters extend across regional borders, spatial dependence in unemployment and employment rates between neighbouring labour markets could be expected. In addition to theoretical explanations, some empirical studies have tried to show that the formation of (un)employment rate clusters could be related to agglomeration. For example, Overman and Puga (2002) suggest that the polarisation process in the regional labour markets in Europe between 1986 and 1996 was mostly demand-driven. They show that European NUTS 2 regions with relatively high unemployment rates have been accompanied by relatively low employment growth, while the opposite is true for regions with relatively low unemployment rates. They argue that the demand-side driven effect is partly due to agglomeration, although they do not provide exact mechanisms. In addition, Cracolici et al. (2007) find, based on Italian data, that the spatial effects are partly demand-driven and argue it reflects agglomeration.

Another explanation of spatial effects between the labour markets of neighbouring regions is the existence of knowledge spillovers. Knowledge spillovers between firms and workers in geographically close regions might occur due to increased possibilities of face-to-face meetings (Autant-Bernard & LeSage, 2011).

Furthermore, Puškárová and Piribauer (2016) show that the knowledge and human capital stock levels (measured as patent stock and share of secondary educated) significantly impact total factor productivity (TFP) not only in the same but also in neighbouring areas using EU NUTS 2 regional data. Although increases in TFP do not necessarily result in decreases in unemployment rates (see discussion in Pissarides & Vallanti, 2007), the same direction in movements in (un)employment rates could be expected for neighbouring labour markets in response to changes in TFP.

Different theoretical explanations of spatial interaction mechanisms in the local labour markets lead to different implications on the sign of the spatial effects. First, the agglomeration of economies could lead to both positive and negative dependence in unemployment and employment rates. On the one hand, if clusters of activity extend across regional borders (as argued in Overman & Puga, 2002), neighbouring labour markets are expected to exhibit similar regional labour market conditions, meaning that the positive spatial effects would dominate. On the other hand, if agglomerated core regions are confined within the borders of one regional unit, then a high-employment and low-unemployment core region would be surrounded by peripheral regions with inferior local labour market performance. This would lead to a situation where negative spatial dependence dominates. Considering commuting and migration mechanisms in general, based on the theoretical considerations outlined in Halleck Vega and Elhorst (2014) and Rios (2017) extensions of the Blanchard and Katz (1992) model, different implications for regional labour market interactions could be drawn as well. Employment growth in a region could encourage the labour force of the neighbouring regions to relocate there. On the one hand, if the migration wave consists mostly of former unemployed, who find employment in the host region's labour market, then both regions could benefit and see a decrease in unemployment rates (assuming the lack of a substitution effect). This would result in positive spatial dependence. However, an increase in the job opportunities in the neighbouring region could attract proportionally more highly educated labour force, who are assumed to be more mobile (Aragon et al., 2003) and are likely employed already (Elhorst, 2003). If the migrants are positively selected, it could lead to an increase in disparities in the local labour market indicators and consequently negative spatial dependence (see Niebuhr et al., 2012). Indeed, Granato et al. (2015) study regional labour markets in Germany and find that the migration of low and medium-skilled workers reduced regional disparities in unemployment rates, while the migration of highly-skilled workers reinforced the disparities.

Empirical evidence that focuses on unemployment rates tends to find that positive spillover effects dominate between neighbouring labour markets (Ciołek, 2021; Cracolici et al., 2007; Semerikova, 2015). The evidence on employment rates in less clear and finds mixed results on the sign of dominating effects (Brada et al., 2021; Lewis et al., 2011; Mayor & López, 2008; Pavlyuk, 2011). One reason for the difference in the results for the spatial dependence of employment and unemployment rates could be the above discussed heterogeneities in the impact of the migration of different skills groups. If unemployment rates reflect the mobility

of the low-skilled proportionately more and employment rates reflect more the mobility of high-skilled, then this could result in the differences in the sign of the dominating effects for the different labour market indicators.

Overall, the studies on spatial interactions have shown that regional labour markets are closely connected to their neighbouring labour markets within country borders. Significant interaction effects within country borders have been found for regions in various countries (Aragon et al., 2003; Ciołek, 2021; Semerikova, 2015). There is much less evidence on spatial spillovers between regional labour markets across national borders (Halleck Vega & Elhorst, 2017; Niebuhr, 2003). Study I contributes to the literature in this regard by investigating the spatial spillover effects for the NUTS 2 regions in Europe including both domestic and foreign relationships and accounting for cross-border interactions. In addition, as explained above, theoretical literature on spatial interaction mechanisms has provided implications of both positive and negative spatial spillovers. Moreover, empirical evidence has not been clear about whether positive interaction effects or negative interaction effects (reflecting the mobility of the high-skilled) dominate in the case of the spatial dependence of the employment rate (Brada et al., 2021; Lewis et al., 2011; Pavlyuk, 2011). Study I examines this issue further by analysing the spatial interaction effects of regional employment rates in European NUTS 2 regions.

Earlier research points to labour mobility, agglomeration and knowledge spillovers as the mechanisms creating spatial dependence between regional labour markets (Autant-Bernard & LeSage, 2011; Blanchard & Katz, 1992; Cracolici et al., 2007; Niebuhr, 2003). In the next chapter, attention is turned to one of the main mechanisms of spatial dependence – labour migration. Although, as discussed above, in the neoclassical approach labour migration can potentially help regional labour markets respond to shocks and reduce disparities between regional labour markets (Blanchard & Katz, 1992) and should be therefore encouraged, the focus is now turned to the difficulties related to migrant adjustment to local labour markets.

1.3. Factors affecting the labour market assimilation of immigrants

The labour market integration of immigrants has been extensively studied in the literature. It has been documented that immigrants tend to have inferior labour market performance and consequent lower earnings than natives with similar characteristics in Europe (Adsera & Chiswick, 2007; Hammarstedt, 2003; Ingwersen & Thomsen, 2021) and to a lesser extent in the US (Chiswick, 1978). This generalisation masks differences between immigrants on the basis of different countries of origin (Dustmann & Fabbri, 2005; Lehmer & Ludsteck, 2011; Lemos, 2017), purposes of migration (Bakker et al., 2017; Bratsberg et al., 2014; Luik et al., 2018) and the length of stay in the host country (Chiswick, 1978; Lubotsky, 2007; Sarvimäki, 2011). Immigrants with longer stays tend to fair better than the most

recent arrivals (Borjas, 2015; Sarvimäki, 2011), while humanitarian migrants perform on average worse than family migrants, whose labour market performance in turn is inferior to that of labour migrants (Bakker et al., 2017; Luik et al., 2018).

Explanations of the immigrant-native earnings gaps depart from the classical human capital framework (Becker, 1975), where higher levels of human capital transmit into more favourable labour market outcomes. However, as first introduced in the seminal study by Chiswick (1978), immigrant productive characteristics, such as education, qualifications, experience and other job-related skills might not be perfectly transmittable to the host country labour market. This claim is supported by the empirical finding that immigrants' returns to education and labour market experience (attained in the country of origin) tend to be lower than the same indicator for natives (Basilio et al., 2017; Chiswick & Miller, 2008; Dustmann, 1993). In addition to the imperfect transmission of earlier skills, immigrants might lack knowledge of the language, customs, nature of the labour market and the social system of the host country (Friedberg, 2000).

Overall, this means that at least upon arrival immigrants tend to lack country-specific human capital. Over time spent in the host country, immigrants are assumed to increase their language proficiency, country-specific knowledge and labour market skills, and thus catch up with the natives in terms of wages. Early evidence on US data shows that convergence happens as fast as within 10–15 years (Chiswick, 1978). However, later studies (Borjas, 1985, 1995a, 2015; Lubotsky, 2007) have criticised Chiswick (1978) estimate and found it overly optimistic. First, as pointed out by Borjas (1985, 1995a), studies using a single cross-sectional dataset do not consider the difference in the quality of immigrant cohorts. If earlier immigrants have higher levels of unobserved skill characteristics, which lead them to be more successful in the host country labour market than immigrants from recent arrival cohorts, then speed of convergence is overestimated using cross-sectional data. As the findings by Borjas (2015) show, this is the case in the US, where the quality of immigrant cohorts (measured by relative earnings at arrival) is shown to decrease over time until the arrival of cohorts in the 1990s. Second, cross-sectional estimates are affected by selective outmigration, as immigrants who are less successful in the host country labour market, are more likely to leave the country. Lubotsky (2007) takes selective outmigration into account by using longitudinal data and finds that although immigrant earnings in the US rise faster than native earnings throughout the first 20 years in the country (decreasing the gap by 10–15 pp), it is around half as fast as earlier estimates based on repeated cross-sections and is not enough to close the initial native-immigrant earnings gap at arrival.

Studies using European data also find significant immigrant-native wage and employment gaps at arrival and although the gaps tend to decrease with time, full convergence is generally not found. Sarvimäki (2011) shows that annual labour earnings and average working months of immigrants in Finland are lower upon entry than natives of the same age, similar family structure and similar local labour market. The results indicate that during the 20 years of living in the country, only men from OECD countries catch up with the locals in terms of income and

employment, while the labour market performance of other groups remains below that of similar natives. Similarly, Beyer (2019) uses German data and finds that employed immigrants earn considerably less after arrival than employed natives with similar characteristics and have a higher probability of being unemployed than similar natives. The results indicate a gradual decline in the gap; however, differences still remain after 30 years in the country. Lastly, Bratsberg (2014) finds similar results for refugees in Norway.

As noted above, differences in observable characteristics, including differences in human capital, do not usually fully explain the immigrant-native wage gap. Immigrants' returns to observed human capital tend to be lower than that of natives, and immigrants are often overeducated for their positions (Chiswick & Miller, 2009). The literature offers two main explanations for why immigrants with formally similar degrees have lower returns to education than natives. First is a non-recognition problem, where employers lack information on the quality and content of the education of the origin country, making migrant workers' diplomas a poor signal of their true productivity (Banerjee & Lee, 2015). Second, the difference in the content and quality of the education might result in actual skill differences between natives and immigrants with officially similar degrees (Cim et al., 2020). Empirical studies suggest that acquiring education in the host country helps to decrease the earnings gap substantially (Beyer, 2019; Manuel & Plesca, 2020). Moreover, controlling for skills in addition to formal education level has also shown to decrease the gap (Smith & Fernandez, 2017).

In addition to the challenges discussed above, immigrants often lack one key component of country-specific human capital – local language proficiency. One of the first empirical studies to recognise the importance of host language skills in immigrant labour market integration was Chiswick (1991). The study investigated English language fluency determinants and the effect of language fluency on earnings for immigrants in the US and found that reading fluency is more important than speaking fluency in determining earnings. Vast empirical evidence has followed since then and confirmed the importance of language proficiency for the successful labour market performance of immigrants in various countries; for example, in the UK (Dustmann & Fabbri, 2003), in the US (Bleakley & Chin, 2004), in Germany (Aldashev et al., 2009; Beyer, 2019; Dustmann & van Soest, 2001, 2002), in Australia (Chiswick & Miller, 1995), in Spain (Budría et al., 2017, 2019) and in Israel (Berman et al., 2003).

A major share of the empirical studies on the language skills of immigrants focuses on the effects of language proficiency on earnings. Bleakley and Chin (2004) find that English language proficiency has a significant positive effect on the earnings of adults who immigrated to the US as children. Beyer (2019) shows that good German language skills significantly reduce the wage gap between the immigrant and native workers in Germany. Budría et al. (2017) explore the effect of the Spanish language proficiency of immigrants in Spain using an instrumental variable quantile regression approach. They find the average effect of around 17% on earnings with heterogenous effects across the earnings distribution ranging from insignificant at the lower quantiles to 30% at the top quantiles. Chiswick and

Miller (1995) investigate the relationship between English language skills and the earnings of Australian immigrants and find OLS estimates of around 5%. They show that the estimate for Australia is lower than the effect of fluency in the destination language for the US, Canada and Israel. Lastly, Dustmann and van Soest (2002) find a positive effect of German language speaking fluency on earnings ranging from 5% to 14% for men and from 4% to 12% for women.

The studies discussed above, as most of the literature, focus on the effects of language skills on earnings, excluding the unemployed and inactive from the sample. However, insufficient language proficiency is likely to restrict the labour market participation of the immigrant population (see Aldashev et al., 2009). Therefore, in addition to the effect of language skills on earnings, it is also vital to investigate the effect of language proficiency on employment probability. Dustmann and Fabbri (2003) study the effect of language skills on the labour market performance of the non-white immigrant population in the UK and find that English language proficiency increases the probability of employment by around 22 percentage points. Similarly, Aldashev et al. (2009) show that German language proficiency significantly increases participation and employment probability of immigrants from former guest worker countries. In addition, Budría et al. (2019) find that state language proficiency in Spain raises employment probability by 15 and 22 pp among immigrant men and women respectively. Yao and van Ours (2015), however, do not find any significant effect of having difficulties in reading and speaking the Dutch language on employment probability and hours of work for female and male immigrants in the Netherlands.

There are different theoretical explanations of the benefits of fluency in the host language, focusing on increasing productivity at the workplace and more effective and efficient job search (Chiswick, 1991; Hayfron, 2001). As discussed above, in the classical human capital framework, host country language proficiency is a vital part of country-specific human capital (Chiswick, 1978). In this framework, investments in host country language skills increase the productivity of the worker and transmit into more favourable labour market outcomes for three main reasons. First, language proficiency allows for communication with co-workers and clients, being a productive trait in itself (Hayfron, 2001). Second, host country language skills make it possible to transfer pre-immigration knowledge, experience and other job-related skills to the host country labour market. For example, Orlov (2018) investigates the impact of attending an English language course in Canada and shows that over half of the positive effect that language skills have on wages is driven by the transfer of pre-immigration cognitive skills to the host country labour market. Lastly, a good level of host country language skills could increase the possibilities for attaining education, qualifications and other job-related skills in the host country. Bleakley and Chin (2004) find that English language proficiency has a positive effect on earnings for those adults who migrated to the US as children and argue that much of this effect is explained by immigrants with higher language proficiency attaining higher levels of education.

Besides increasing worker productivity at work, language proficiency is also seen to be beneficial in the job search process (Chiswick, 1991). Good host lan-

guage command enables immigrants to understand the local labour market conditions and helps them acquire information about optimal job search strategies (Dustmann & Fabbri, 2003). Immigrants might have restricted access to job-related social networks, which are shown to be an important informal job search channel (Leschke & Weiss, 2020). Language proficiency likely increases the opportunities for forming social networks with natives and thus further facilitates effective job searches.

The earlier evidence discussed above indicates that insufficient host country language skills can be a substantial barrier for entering the local labour market. Therefore, language training is seen as a key component of the labour market integration of recent migrants by many OECD countries (OECD, 2018, pp. 100–101). Despite the common offering of language training, literature on the effectiveness of local language courses is relatively scarce. The limited literature on the effect of language training generally finds that the impact of state language training on employment probability is positive after the initial lock-in effect (Clausen et al., 2009; Delander et al., 2005; Prey, 2000). The effect of language training on earnings is only investigated in a few studies and the results are inconclusive with Hayfron (2001) finding no significant effects, while Sarvimäki and Hämäläinen (2016) find positive effects. Study III of this thesis contributes to the literature by investigating the effect of local language training on both the employment probability and earnings of non-native speakers.

Overall, earlier evidence has found that immigrants tend to be at a disadvantage when entering the local labour market. Different challenges, such as imperfect transferability of qualifications, skills and education obtained in the country of origin, a lack of country-specific human capital (including host country language proficiency) and restricted access to job-relevant social networks restrict the labour market outcomes of the immigrant population. While disadvantages are assumed to diminish over time spent in the host country, empirical evidence discussed above has shown that immigrants do not fully catch up with the natives even after decades in the country. However, in the long-term perspective of immigrant assimilation on regional labour markets, it is not only the labour market performance of the first generation of immigrants that matters, but also that of their descendants. The next subchapter focuses on explaining the theoretical and empirical background of the labour market assimilation of the second generation of immigrants.

1.4. Labour market assimilation of the descendants of immigrants

The above-mentioned factors have been used to explain the native-immigrant income gap at the level of the first generation of immigrants. However, earlier studies have shown that income position tends to be carried over from one generation to the next. Intergenerational income elasticity has been shown to range from around 0.2 in the Nordics to 0.5 in the US, UK and Italy, meaning that at least one-fifth of the economic advantages and disadvantages are carried over to the next generation

(see Corak, 2013, 2016). There are different reasons why the parental income positions are related to the income positions of the next generation.

Most studies on intergenerational earnings mobility depart from the model of intergenerational transmissions by Becker and Tomes (1979, 1986). In the model parents choose to forgo some of their present earnings to invest in the human capital of their child. Independent of investments, the model also includes the transmission of endowments from parents to children. The inheritability of endowments and the propensity to invest in the human capital of the children determines the degree of intergenerational mobility. Solon (2004) develops the approach further, adapting it to better facilitate the development of mobility over time as well as for comparisons across countries.

Becker and Tomes (1986) do not differentiate endowments by nature, mentioning genetically determined characteristics (e.g. genetic ability) and family culture (e.g. parents as role models, goals related to education). Later empirical studies have focused on the genetic ability channel (Abramitzky et al., 2021), transmission of social capital (social contact networks, family reputation, connections, see e.g. Büchner et al., 2012), transmission of time preferences (Brenoe & Epper, 2019) and transmission of financial behaviour and financial literacy (Brown et al., 2018; Kreiner et al., 2020). Overall, although the human capital channel (both through direct investments in the child's human capital as well as through the inheritability of ability and skills) is one of the most notable, there are also other factors explaining the persistence of income positions across generations.

The on average lower levels of parental income, combined with intergenerational transmissions of ability, preferences, skills and investments in the child's human and non-human capital, would mean that second-generation immigrants also find themselves at the lower levels of the income distribution compared to their peers. This argument holds if immigrant families exhibit similar rates of intergenerational mobility to natives. However, if immigrants are more upwardly mobile than natives, then the income gap would diminish in the second generation. The opposite is true in the case of the lower upward mobility of immigrants.

Explanations of higher upward mobility of the children of foreign-born first focus on the ability channel (see e.g. Abramitzky et al., 2021; Bolotnyy & Bratu, 2018). This strand of thought assumes that immigrant parents do not work in occupations reflecting their true level of ability. As discussed above, minimal host country education, lack of official language skills, limited social and job-related contact networks or discrimination might lead the first generation of immigrants to accept low-quality positions. If these challenges are less pronounced for the second generation of immigrants and the level of ability transmission is high, then intergenerational mobility might be higher among immigrant families than among natives (Aydemir et al., 2009). Abramitzky et al. (2021) find children of immigrants to have higher rates of upward mobility than children of US-born. They test the existence of the ability channel by comparing the immigrant-native mobility gap at the level of the second generation by immigrant father's age on arrival and language in the sending country. Fathers who have entered the country at a younger age, are assumed to gain a higher level of country-specific human

capital, and thus, are less likely to be overqualified for their positions in adulthood. Therefore, their children are assumed to be closer to natives in terms of their mobility level than children of immigrants who moved to the US at an older age. The authors find support for the existence of the ability channels as the mobility gap is found to increase with the increase in the father's age on arrival and this change is more pronounced for individuals with fathers from non-English-speaking countries. Similarly, Bolontyy and Bratu (2018) use Swedish registry data and find children of foreign-born at the lower ends of the parental income to be slightly more upwardly mobile in terms of income ranks and much more likely to attain a college education or above than children of Swedish-born from similar parental income ranks. In addition, it is observed that the share of parents with a college degree is higher for immigrants than for natives at the lower end of the income distribution. This evidence indicates that the fact that the ability transmission channel combined with parents' earnings does not reflect their whole level of ability could explain the results found for Swedish immigrants.

The second strand of explanations of the higher upward mobility of immigrants focuses on the transmission of values and goals related to education and labour market success. If the move to a foreign country was motivated by wider opportunities for the next generation, immigrant families could be self-selected and value education and labour market success more than native families from a similar level of income distribution. Although this channel is discussed in most of the studies focusing on the intergenerational mobility of immigrants (e.g. Aydemir et al., 2009; Hermansen, 2016), due to the lack of a possible identification mechanism, it is rarely tested. Abramitzky et al. (2021) try to test the importance of the channel by comparing the propensities to invest in the child's education for native and immigrant families, proxied by the educational attainment of sons over the income distribution of the fathers. They use 1910 and 1940 US Census data and do not find support for the hypothesis, although they do not rule out the presence of self-selection in more recent cohorts.

In addition to the positive self-selection, transmission of common values could also result in lower upward mobility among immigrants. The transmission of common values at the level of ethnic group is reflected in the Borjas (1992, 1995b) model of intergenerational transmissions, which includes a component of "ethnic capital". According to the model, the value of the human capital of the child does not only depend on the human capital level of the parent and the time spent by the parent investing in the human capital of the child, but also on the average level of the human capital of the ethnic group the child belongs to. The last component is labelled "ethnic capital" and is supposed to reflect the average quality of the ethnic environment a child is raised in. In addition to the transmission of common cultural values, Borjas (1992, p. 126) also mentions social contacts and economic opportunities provided by the ethnic environment as possible transmission channels. While the transmission of common cultural values does not necessarily require growing up in immigrant-dense neighbourhoods, for the last two factors to influence the child's later life outcomes, ethnically concentrated neighbourhoods should be assumed. Indeed, in his later work, Borjas (1995b) extends the ethnic

capital model to estimate how much of the ethnic capital effect could be explained by the socioeconomic background of the neighbourhood where the children grew up. He uses 1970 US Census data and finds that the neighbourhood fixed effects largely capture the ethnic capital effects. Additional ethnic capital effects are shown to remain significant in the case of highly segregated neighbourhoods, while parental influence decreases with an increase in segregation. Therefore, the results indicate that in strongly segregated neighbourhoods the ethnic group influence might take over the parental influence.

Along these lines, later works have studied immigrant residential segregation as one of the factors in explaining the differences in intergenerational mobility between natives and immigrants or different ethnic groups (see Bratu & Bolotnyy, 2023; Chetty et al., 2020; Hermansen, 2016). Bratu and Bolotnyy (2023), using Swedish data, find that differences in upward mobility disappear when comparing the children of foreign-born to the children of natives who grew up in the same neighbourhood (defined as 100×100 metre areas, containing on average 60 inhabitants). In addition, location choice could also explain the higher upward mobility of immigrants. Abramitzky et al. (2021) argue that while immigrants do not have ties to any particular region, they might be more inclined to settle in areas with better upward mobility prospects for their children. They show that this is the case for earlier immigration waves to the US, where differences in upward mobility diminish when county fixed effects are considered. However, empirical evidence for blacks and whites in the US (see Chetty et al., 2020) and for second-generation immigrants in Norway (see Hermansen, 2016) suggests that neighbourhood effects do not always explain the differences in the mobility levels between the studied groups.

The intergenerational transmission channels in the case of segregated neighbourhoods vary from the above discussed common values (e.g. neighbourhood adults and older peers as role models) to the transmission of social connections (e.g. access to job-related contact networks) (Chetty et al., 2020). In addition, neighbourhood effects and immigrant residential segregation could affect the human capital accumulation of the child through the lower quality of schools (e.g. less-qualified teachers and less funding; Hermansen, 2016). It follows naturally that less segregated neighbourhoods would result in more social connections and more shared values across different countries of origin or ethnic groups, which would lead to similar levels of intergenerational mobility. However, the results by Chetty et al. (2020) for black and white families in the US indicate that the close geographical proximity of different groups and common schools might not always lead to the disappearance of the mobility gap even inside the same neighbourhood. Instead, they find that the presence of same ethnicity role models (presence of black fathers) is related to a decrease in the mobility gap. In addition, Hermansen (2016) finds using Norwegian data that including neighbourhood effects does not considerably decrease the native-immigrant income gap for the second generation.

Besides the factors discussed above, second-generation immigrants could exhibit lower relative or absolute upward earnings mobility if the children of immi-

grants are restricted by some of the same challenges as their parents. Lower official language skills, discrimination in the labour market and lower returns to education could leave both foreign-born parents and their children at a disadvantage in the host country's labour market (Abramitzky et al., 2021). These challenges could also affect the parents' incentives to invest in their children's human capital (Hermansen, 2016), having both a direct and indirect effect on the intergenerational mobility of the immigrant population.

The different intergenerational transmission channels discussed above lead to different implications for the level of intergenerational upward mobility of second-generation immigrants compared to the level of upward mobility of their native peers from a similar parental income distribution. The implications of the different transmission channels are summarised in Table 4.

Empirical results also vary with country context, as institutions and the composition of immigrant cohorts also affect the level of the relative and upward mobility of the immigrants. While empirical studies focused on intergenerational earnings mobility of second-generation immigrants are still scarce, some conclusions could be drawn. US based studies, which mostly focus on labour migrants, have mostly found that immigrants tend to be more upwardly mobile than their native peers (Abramitzky et al., 2021). In Canada, second-generation immigrants have been shown to have the same level of relative earnings mobility as natives (Aydemir et al., 2009). Hermansen (2016) finds comparable levels of upward mobility for children of foreign-born and natives at the lower levels of the income distribution using Norwegian data. However, earlier research based on Danish, Swedish and Dutch data indicates intergenerational mobility to be lower for immigrant families. Schnitzlein (2012) shows based on brother correlations[1] that the earnings of the second generation of immigrants are more affected by the family and community level factors than the earnings of native Danes. In addition, Eriksen and Munk (2020), using income rank estimates, find that absolute upward mobility in Danish municipalities is negatively correlated with the share of first and second generation of non-Western immigrants. Evidence for Sweden shows both earlier (those who entered the country before 1970s) and more recent immigrants to have less relative and absolute upward mobility than natives (Bratu & Bolotnyy, 2023; Hammarstedt & Palme, 2012). Lastly, Zorlu and van Gent (2020) study third-generation immigrants in the Netherlands and find that they exhibit lower upward mobility over the course of parental income distribution than their native peers with Dutch grandparents.

[1] The brother correlation is the share of the variance in permanent earnings that can be attributed to factors shared by brothers. It is calculated as the ratio of the variance of a family specific component and a sum of the variances of the family specific and the individual-specific component of the error term based on a multilevel model (see more details Schnitzlein (2012, p. 336)).

Table 4. Theoretical implications of different intergenerational transmission channels on the upward mobility of foreign and native families

Intergenerational transmission channel	Theoretical implications for the intergenerational mobility	Explanation
Ability channel (Abramitzky et al., 2021; Bolotnyy & Bratu, 2018)	Upward mobility$_{foreign}$ ≥ Upward mobility$_{native}$	First generation of immigrants overqualified. Less restrictions for their children (acquire host country education and language proficiency, social networks etc.) to reach their potential.
Values and goals (Aydemir et al., 2009; Hermansen, 2016)	Upward mobility$_{foreign}$ ≥ Upward mobility$_{native}$	Immigrants self-selected in terms of motivation. Education and success valued in the family.
Ethnic capital (Borjas, 1992, 1995b)	Upward mobility$_{foreign}$? Upward mobility$_{native}$	Impact of the average level of human capital in the ethnic group the child belongs to.
Neighbourhood effects (Chetty et al., 2020; Hermansen, 2016)	Upward mobility$_{foreign}$ < Upward mobility$_{native}$	Common values (neighbourhood adults and older peers as role models), transmission of social connections (lack of access to job-related contact networks), lower quality of schools (less-qualified teachers, less funding).

Source: compiled by author based on Abramitzky et al. (2021), Aydemir et al. (2009), Bolotnyy and Bratu (2018), Borjas (1992, 1995b), Chetty et al. (2020), Hermansen (2016).

In addition to immigrants, country context also matters for the wider population in determining the level of intergenerational mobility. Earlier empirical evidence finds that the cross-country variation in the level of earnings mobility is related to the level of income inequality in a country. Countries with a higher level of income inequality tend to have lower intergenerational earnings mobility, a relationship that has been called "The Great Gatsby Curve" (Jerrim & Macmillan, 2015). Corak (2013) discusses mechanisms that explain this relationship. Higher income inequality is linked to higher returns to education, which leads to lower intergenerational mobility for two main reasons. First, highly educated parents have a higher capacity to invest in their children's education as their earnings are relatively larger compared to settings where returns to education are low. Second, their incentives to do so are greater, as the expected returns to education are likewise high for their children. In addition to returns to education, high income inequality could reflect high diversity of the population of a country; for instance, large differences in social connections and family culture between the families. This in turn could explain differences in intergenerational mobility between families and lead to low intergenerational mobility in the country. Lastly, public policies which determine how public expenditure on education and health care

are spent and policies affecting work-life balance impact a country's level of intergenerational mobility (Huang et al., 2021).

The theoretical and empirical considerations discussed above have indicated that the level of intergenerational mobility in immigrant families and the difference in the level of mobility from that of natives can be explained by several different factors, including transmission of ability, transmission of common values and goals, transmission of social connections and limitations related to lower official language skills and discrimination in the labour market. Country context might also affect the mobility level of immigrants, as returns to education, institutions and composition of the immigrant cohorts vary. Study II contributes to the literature by investigating the intergenerational earnings mobility in Estonia, a country characterised by a substantial share of second-generation immigrants.

2. EMPIRICAL STUDIES

3. DISCUSSION AND CONCLUSIONS

3.1. Summary of the studies

Study I. Spatial interactions of employment in European labour markets

Study I investigates spatial interactions in the European regional labour markets with emphasis on the dominating effects and the dynamics of possible interactions during crises, economic recovery and the EU integration process. Regional labour market interactions have received more attention in the literature since labour mobility was shown to be one of the decisive mechanisms in decreasing labour market disparities between regions (see Blanchard & Katz, 1992). Since then, spatial interactions between regional labour markets have been studied mostly using single-country datasets and unemployment indicators. The evidence so far indicates that spatial interactions play an important role in explaining the variability of unemployment rates (Badinger & Url, 2002).

The study first contributes to the literature by determining the dominating type of spatial interactions in European regional labour markets (see research task 2 in Table 5). Earlier evidence has focused mostly on the spatial dependence of the unemployment rate and investigated spatial effects using single-country datasets (Cracolici et al., 2007; Halleck Vega & Elhorst, 2016; Semerikova, 2015). Study I includes both domestic and foreign relationships, making it possible to account for cross-border interactions. The earlier evidence on the spatial interactions of the employment rate has found mixed results in terms of the sign of the dominating types of effects (Brada et al., 2021; Lewis et al., 2011; Mayor & López, 2008). Therefore, the first main question asked in this study is whether positive (co-operation) effects dominate over negative (competition) effects in a multi-country setting.

Second, the study focuses on investigating the dynamics of these spatial effects (see research task 3 in Table 5). The earlier mixed results on the dominating effect could be related to differences in business cycles (e.g. Brada et al. (2021) find positive spatial spillovers using data from the 2008 financial crisis). In addition, the EU integration process could affect the developments of spatial interactions. Determining the importance of the spatial interactions during a crisis and across the integration process provides new empirical evidence to assess the need for cross-border cooperation during new periods of uncertainty.

The study finds that European regional labour markets cluster in space. Regions with high employment rates are surrounded by regions with similar high employment rates. The results indicate that different forms of spatial dependence exist. The employment rate in one region is shown to be affected directly by the employment rate changes in other regions. The results of Study I show that co-operation effects dominate over competition effects in European regional labour markets.

Table 5. Research tasks and main results

Study	Task	Main results
I	Task 2. To estimate the dominating type of spatial interactions in European regional labour markets.	Employment rate in one region is affected by employment rate changes and unobserved shocks in other regions. Cooperation effects dominate.
I	Task 3. To assess the intensity and dynamics of spatial interactions over time in European regional labour markets.	Spatial interactions in employment rates have slightly risen since the Eastern enlargement of the European Union in 2004 and continued to increase during the previous financial crisis.
II	Task 4. To investigate the level of intergenerational earnings mobility by the birth country of the parents (native-born vs. foreign-born).	The relative intergenerational income mobility is around the same level for natives and children of foreign-born. The intergenerational income mobility is relatively high in Estonia for both groups with around 20% of income advantages being carried over to the next generation.
II	Task 5. To examine the role of parental background in explaining the difference in the earnings of the children of foreign-born and native-born.	Gaps in income ranks of second-generation immigrants and natives are related to differences in parental background.
III	Task 6. To estimate the impact of local language training on the employment probability of unemployed non-native speakers.	The impact of local language training on the probability of being employed is positive after the end of the initial lock-in effect.
III	Task 7. To assess the effect of local language courses on the labour income of unemployed non-native speakers.	Local language training helps the unemployed non-natives find employment, but does not give them access to higher-paying positions.

Source: compiled by the author.

The second main finding of the study is the relative stability and resilience of the spatial interaction effects across the economic cycles and EU integration process. The results show that spatial effects have slightly risen since the Eastern enlargement of the European Union in 2004. Since 2010, spatial dependence has been relatively stable. The slow increase and relative stability of the spatial dependence is in line with the slow growth of the labour market integration (measured in labour mobility) in the EU (see e.g. Krause et al., 2017).

Study I estimates cross-sectional spatial error model (SEM), spatial lag model (SLM) and spatial autoregressive model with autoregressive disturbances (SARAR) using data on NUTS 2 level regions in 2018. Appendix 1 reports the results of the panel data models (fixed effects model, spatial error model with fixed effects,

spatial lag model with fixed effects and spatial autoregressive model with autoregressive disturbances and fixed effects) using data on NUTS 2 level regions over the period 2004–2018. The estimates from the panel data models show that the spatial autocorrelation coefficient λ in the SEM model and the spatial autoregressive coefficient ρ in the SLM model are positive and statistically significant. Both the spatial autocorrelation coefficient λ and the spatial autoregressive coefficient ρ are found to be positive and significant in the SARAR model. Overall, the results of the panel data models confirm the findings reported in Study I.

The results from Study I indicate that both cross-border and within-country interactions play an important role in the development of regional labour markets. The results indicate that employees are not restricted to their region of residence. They are looking for new development opportunities outside their home regions, which would result in labour migration across different regions. Study II and III focus on different aspects of the assimilation of foreign labour force using one of the European NUTS 2 regions – Estonia – as an example.

Study II. Are we there yet? Intergenerational mobility and economic assimilation of second-generation immigrants in Estonia

The aim of Study II is to investigate the role of intergenerational mobility in explaining the income gap between second-generation immigrants and their native counterparts. The native-immigrant income gap is a well-established finding in the literature. Earlier evidence shows that first-generation immigrants have inferior labour market performance and lower earnings compared to their native peers in a wide range of countries (Adsera & Chiswick, 2007; Hammarstedt, 2003; Ingwersen & Thomsen, 2021). At the same time the earnings of the children are shown to be related to the income position of their parents (Corak, 2013, 2016). Therefore, if first-generation immigrants are at a disadvantage in the host country labour market and the level of intergenerational mobility is low, then these disadvantages are likely to persist into the next generation.

The first main contribution of this study is to the literature investigating the level of intergenerational earnings mobility (see research task 4 in Table 5). Study II contributes by investigating the intergenerational earnings mobility of the second-generation immigrants in a country where the share of second-generation immigrants in the population is substantial. In 2021, the share of second-generation immigrants (native-born with at least one foreign-born parent) in the working age population (15–64) was 19.5% in Estonia, which was the highest share among EU countries (Eurostat, 2023c). Besides empirical contributions, the results of Study II provide preliminary indications on which of the theoretical intergenerational transmission channels prevail for immigrant families.

Second, Study II contributes to the literature on immigrant-native income gaps by investigating the role of parental background in explaining these gaps (see research task 5 in Table 5). Earlier explanations of the native-immigrant income gap range from differences in returns to education (Friedberg, 2000), cognitive skills (Ridala & Toomet, 2019), official language skills (Beyer, 2019; Bleakley

& Chin, 2004) and the use of skills at work (Tverdostup & Paas, 2019). Adding parental background as an explanatory variable makes it possible to control for the various channels of influence of the parental income position. As earlier studies have argued, parents can affect their children's labour market outcomes through investments in and the transmission of human and social capital as well as the transmission of time preferences, goals and values related to education (Abramitzky et al., 2021; Becker & Tomes, 1986; Brenoe & Epper, 2019; Büchner et al., 2012). Therefore, besides the human capital channel, which can be directly measured in the form of formal education or more specific skills measures (e.g. literacy and numeracy measures in the PIAAC study), adding parental background as a cofounding variable makes it possible to shed further light to the immigrant-native income gap in relation to differences in non-human capital.

Following the income percentile rank approach introduced by Chetty et al. (2014), the study finds that an increase of 1 percentile in the parent income rank is associated on average with a 0.2 percentile increase in the child income rank. That means that around one-fifth of any economic advantage or disadvantage is carried over from the parents to the children. The estimates found in this study for Estonia are comparable to earlier findings in the Nordics; for example, Finland and Norway have been shown to have a roughly similar level of intergenerational mobility (see estimates by Corak, 2016), while the US, UK and Italy have a much higher rate of intergenerational earnings elasticity. It must be noted that although in international comparisons the results of this study indicate a relatively high level of earnings mobility for the country of Estonia, the magnitude of the association between the income position of parents and the income position of their children is still considerable.

The study compares the level of intergenerational earnings mobility on the basis of the birth country of the parents. The results show that relative income mobility does not statistically differ for the children of foreign-born and native-born. Therefore, the results indicate that being born to a higher income family compared to being born into a low-income family has a similar effect for the children of natives and foreign-born. The higher magnitude of a relationship for foreign-born families would have meant that the children of the foreign-born would be even more likely to be trapped in similar low-income levels as their parents. At the same time, this is not to say that parental income level does not play a role in explaining the difference in the average income levels of the children of foreign-born and native-born. The results indicate that if the parents of second-generation immigrants are on average worse off than the parents of natives, then a proportion of this disadvantage will be carried over into the next generation.

This study also asks what the role of parental income is in explaining the income gap between second-generation immigrants and their native peers. The parents of second-generation immigrants are shown to be more concentrated at the lower levels of income distribution. The children of foreign-born are also shown to have on average lower income levels than children of natives with an income rank gap very similar to that of their parents' generation. The results indicate that

the differences in the income levels of the parents explain up to 21% of the gap. Controlling for educational, residential, occupational and family related choices, the differences in parental income rank account for 8% of the gap. The remaining gap could be related to differences in social capital endowment and transmissions between parents and children (e.g. poorer quality of social networks), labour market discrimination or lower level of language skills for both generations. The next study focuses on one of these factors – local language proficiency and its impact on the labour market outcomes of non-native speakers.

Study III. Language training for unemployed non-natives: who benefits the most?

The aim of Study III is to investigate the impact of state language training on the employment probability and labour income of the unemployed first and second-generation immigrant population. Study III departs, like Study II, from the empirical observation of a native-immigrant income gap (Adsera & Chiswick, 2007). Earlier theoretical implications suggest that host country language skills are a vital part of country-specific human capital, impacting both labour productivity and job search effectiveness and efficiency of the immigrant population (Chiswick, 1991; Hayfron, 2001; Orlov, 2018).

Earlier empirical studies have mostly focused on the impact of state language skills on the earnings of the employed population and found a significant positive relationship (Bleakley & Chin, 2004; Budría et al., 2017; Dustmann & van Soest, 2002). However, studies focusing only on employed individuals do not reflect the full effect of language skills on wages, as insufficient levels of language proficiency restrict the labour market participation of the immigrant population (Aldashev et al., 2009). Therefore, it is vital to investigate the effect of language proficiency on both the earnings and employment probability of non-natives. In addition, while state language proficiency has been found to hold a reasonable wage premium in earlier studies, there are relatively few studies on the effectiveness of state language training (see e.g. Gerfin & Lechner, 2002; Hayfron, 2001; Lochmann et al., 2019). Study III contributes to the literature by studying the impact of the local language training on the employment probability and labour income of unemployed non-native speakers (see research tasks 6 and 7 in Table 5).

The study finds that state language training has a positive significant effect on the probability of being employed starting from the 11th month after the start of the course. This effect is around 8 pp and remains significant until the end of the two-year observation period. The negative impact in the first months of the course reflects a lock-in effect, meaning that the individuals participating in the language course lower their job search activity, which results in less likelihood of entering employment in the first months from the start of the training. The negative lock-in effect is in line with earlier results on the impact of state language training (Clausen et al., 2009; Delander et al., 2005; Prey, 2000).

The study also investigates the heterogenous effects of local language training by analysing different types of language courses, different levels of language

skills and the different linguistic and economic regional environments. This was motivated by the considerable lock-in effect found in the first months since the start of the language training, which raises the question, whether some course types or participant groups benefit more from the training or have a smaller lock-in effect and should be therefore targeted for training. The study finds that shorter and more flexible courses have a smaller lock-in effect, while the long-run effects do not differ by course type. The lock-in effect is smallest for those with the lowest level of initial language skills, while the same group has the highest long-term effects. Therefore, the results for different levels of language training indicate that language training is most effective for the unemployed with the lowest level of language proficiency. Comparing these effects by region, it is found that the lock-in effect is smaller for those living outside the capital region, while the long-term effect does not differ by residential region.

The study also estimated the impact of local language training on the labour income of the previously unemployed. The study does not find a significant effect of language training on the labour income of the course participants. Therefore, the results indicate that while local language training helps unemployed non-native speakers find employment, it does not increase their chances of finding higher-paying positions. This result and its implications for the importance of the different impact mechanisms of language training will be further discussed in the next subchapter.

3.2. Discussion of the studies and policy implications

The results from Study I show that positive spatial dependence prevails in European regional labour markets. Earlier literature on spatial interaction mechanisms provided explanations for both positive and negative spatial spillovers. Negative spillovers could occur if agglomerated core regions are confined within the borders of one regional unit (Overman & Puga, 2002). In this case the high employment core region would be surrounded by low employment peripheral regions. In addition, negative spatial dependence could have reflected the fact that the positive selection of immigrants leads to an increase in disparities in the local labour market indicators (Niebuhr et al., 2012). The findings of Study I show that this is not the case for NUTS 2 regional labour markets in EU countries. The results indicate instead that regions benefit from employment rate growth in neigbouring regions. Therefore, relevant policy measures should be in place to allow for increased possibilities for cooperation with neighbouring regions.

The findings of this thesis indicate that the spatial interaction effects have been relatively stable during the EU integration process. The results show that spatial effects have slightly risen since the Eastern enlargement of the European Union in 2004, followed by a stable path since 2010. Appendix 2 shows that the spatial dependence coefficients have followed similar dynamics as the labour mobility in the EU (measured as the share of those in the labour force born in an EU27 country but living in another EU27 country). Although causality cannot be

claimed based on this evidence, the slow increase in spatial interactions could be related to the slow increase in labour mobility between the EU countries. The EU labour market gradually opening up to the new member states during the period 2004–2009 might explain the slight increase in spatial coefficients over the same time period. Further increases in the strength of spatial interactions and labour mobility could be hindered by the cultural and linguistic differences between regions (Dorn & Zweimüller, 2021).

The results from Study II showed that differences in parental income can account for the gap in the income level of the child after educational attainment has been controlled for. Therefore, the results indicated that the role of parental income in explaining the difference in the earnings of the second generation could be related to other theoretical intergenerational mobility channels besides transmission of human capital. Other theoretical explanations include the transmission of common values, transmission of common contact networks and overall neighbourhood effects as the most important aspects of intergenerational earnings transmissions for immigrant families (Abramitzky et al., 2021; Aydemir et al., 2009; Borjas, 1992, 1995b). Therefore, the results of this thesis provide preliminary indications that community and neighbourhood level factors could be important in facilitating the long-term assimilation of the immigrant population. While some earlier empirical studies (Abramitzky et al., 2021; Bratu & Bolotnyy, 2023) find that the differences between the upward mobility of the children of immigrants and of natives disappear within close districts, supporting further geographical integration of long-term immigrants seems a natural suggestion for closing the gap in labour market outcomes. However, as the results by Chetty et al. (2020) for black and white families in the US point out, common neighbourhoods and common schools might not always lead to the disappearance of the mobility gap even inside the same neighbourhood. They argue that common schools do not automatically facilitate social connections inside the school. Further research is needed on this topic to reach detailed policy recommendations. Estonia would provide an interesting example to study the issue further, as the schooling system of the country is still segregated into Estonian and Russian language tracks and thus the social networks of different ethnicities are segregated from childhood.

The theoretical human capital framework lists host country language skills as one of the vital factors of country-specific human capital, important for the labour market assimilation of the foreign population. The results from Study II give preliminary indications of the importance of language skills, as children from mixed families tended to do better in the labour market than the children of foreign-born from similar levels of the parental income distribution. Study III examined the impact of language learning further and found that language training in the local language does help unemployed non-natives to find employment. Taking these results together it is natural to suggest that providing increased possibilities for language learning to the foreign population is one of the key factors for successful long-term assimilation in the local labour market. In terms of the targeted population, Study III shows that language training tends to be most beneficial for those with the lowest prior level of the state language skills. Interestingly, state lan-

guage learning also had a positive impact in language enclaves; that is, in regions with a high share of non-native speakers. The results of Study III also suggest that more flexible courses could be offered to help decrease the initial lock-in effect.

Earlier studies investigating the effect of language proficiency on the labour market performance of the immigrant population mainly focus on the impact on earnings for the employed population and find significant positive effects on labour income (e.g. Bleakley & Chin, 2004; Budría et al., 2017). Study III investigates the impact of language training both on the employment probability and labour income of unemployed non-native speakers. The results of Study III do not indicate any additional effect on labour income. There could be different explanations for these findings. One possibility is that the focus is on language training instead of language skills per se. There are different mechanisms through which language training could increase the labour market outcomes of the immigrant population. First, improving language skills could increase productivity at work and lead to more efficient job searches (Chiswick, 1991; Hayfron, 2001; Orlov, 2018). Second, participation in the language training could signal to potential employers the superior ability and motivation of the participant (Lochmann et al., 2019). Third, language course participants could trade information on job search strategies and vacancies, facilitating access to job-relevant social networks and increasing the efficiency and effectiveness of job searches (Lochmann et al., 2019). The fact that Study III finds significant effects on employment probability but not labour income indicates that mechanisms that simplify the job search are an important part of the effect of language training, while the mechanisms increasing productivity at work are less so. This is supported by the fact that earlier evidence on the earnings effect of language training is ambiguous (Hayfron, 2001; Sarvimäki & Hämäläinen, 2016), while there is more support for the positive employment effect of language training (see Clausen et al., 2009; Delander et al., 2005; Prey, 2000). Overall, providing access to state language courses for unemployed non-native speakers could lead to additional benefits, such as signalling, information and network effects.

This thesis investigates the intergenerational mobility for native and foreign families using the data of a former transition country, Estonia. The thesis finds that the level of intergenerational mobility is relatively high in Estonia, the estimates being comparable to earlier findings on the Nordics (see estimates by Corak, 2016). Earlier research has documented that countries with a lower level of income inequality tend to have a higher level of intergenerational mobility, an association referred to as "The Great Gatsby Curve" (Corak, 2013). During the Soviet era, wages were compressed in Estonia, thus income and wealth inequalities have only emerged during the last 30 years. Income inequality in Estonia rose rapidly in the 1990s, and has followed a more stable path since the early 2000s (see e.g. Tammaru et al., 2020). Therefore, the population studied in this thesis were growing up while income inequalities were emerging. As cohorts who have spent their entire childhood in an era of high inequality reach their prime working age, Estonia

might experience a decrease in intergenerational mobility. Any further significant increases in income inequality would also likely hinder intergenerational mobility.

As mentioned above, this thesis found that intergenerational mobility is relatively high in the case of Estonia. The relative intergenerational mobility is found to be around the same magnitude for native and foreign families, thus immigrant children are no more restricted by the low income level of their parents than native children would be. However, absolute mobility differs by family type, meaning that children of immigrants end up on average in lower income positions than their native peers from the same parental income percentile rank. Overall, this means that although the immigrant-native earnings gap is not increasing over generations (as it would if the relative intergenerational mobility would be low), it has also not decreased.

To try to increase the absolute mobility of the children from immigrant families, different options could be considered. Earlier empirical research suggests that an increase in public spending on primary and secondary education could increase the upward mobility of disadvantaged groups (Huang et al., 2021). Both this thesis and earlier studies on second-generation immigrants in Estonia (see e.g. Lindemann & Saar, 2012) have noted that the children of immigrants in Estonia exhibit lower educational levels compared to their native peers. One distinct characteristic of the Estonian education system is two parallel tracks of education – one with Estonian as the language of instruction, the other with Russian. The dual system means that Russian-speaking youth are at a disadvantage when leaving school. As the results from earlier studies (Lindemann, 2014; Lindemann & Saar, 2012) have indicated, the lower level of Estonian language skills among Russian-speaking youth hinders their access to higher education and the labour market. Furthermore, PISA studies also show that students from Russian-language schools in Estonia exhibit considerably lower test scores than students from Estonian-language schools (Lauri et al., 2023). Various smaller reforms have taken place over the years to increase the volume of Estonian-language teaching in Russian-language schools; however, the two parallel tracks have remained with 14% of primary and secondary education students studying in the Russian language in 2022 (Statistics Estonia, 2023b). The Government of Estonia has now approved a plan to transition Russian-language kindergartens and schools to Estonian-language education starting in 2024. If the current planned educational reform is successful, then the increase in Estonian language proficiency among the Russian youth could reflect in positive long-term benefits through increased education levels and employment outcomes for the studied group.

All in all, this thesis leads to several interesting conclusions on how regional labour markets and foreign labour force interact. The analysis of spatial interactions led to the conclusion that significant spatial dependence exists between European regional labour markets. Cooperation effects dominate, meaning that in general, regions benefit from the employment rate growth of neighbouring regions. Increases in the strength of spatial interactions have been accompanied by increases in labour mobility in the EU. Further increases in labour mobility and cooperation effects could be hindered by the cultural and linguistic differences between

regions (Dorn & Zweimüller, 2021). Therefore, different methods to increase opportunities for cooperation with neighbouring regions should be considered.

The analysis on the role of local language training in the assimilation of foreign labour force showed that training in the local language helps unemployed non-natives find employment. Therefore, the results of this thesis support providing language training opportunities for the foreign population to increase their labour market assimilation. The findings indicate that the employment effects are the largest for the those with the lowest prior level of language skills and that positive effects also exist in language enclaves. Therefore, language learning should also be encouraged in areas with a high share of non-native speakers. Language training courses for unemployed tend to exhibit large lock-in effects to unemployment during the first months of the training. Therefore, while designing language training courses aimed at the unemployed, different ways to decrease the lock-in effects should be considered. For example, language training that aims to reach the whole level of language skills (e.g. language levels A2, B1, B2) could be divided into smaller sub-level courses.

The analysis of the intergenerational transmissions indicated that besides the transmission of human capital, other channels, such as the transmission of common values, common contact networks and overall neighbourhood effects could be important aspects of intergenerational earnings transmissions for immigrant families. Some earlier evidence, discussed above, points to the disappearance of the upward mobility gap between native and immigrant families in close districts. However, these findings are not causal, as a decrease in geographical segregation does not automatically lead to social integration. Therefore, further geographical integration alone might not lead to the desired labour market outcomes of children of immigrants.

The thesis also provides a couple of Estonian-specific conclusions. The thesis finds that intergenerational earnings mobility is still high in Estonia, where income inequalities first emerged 30 years ago after the restoration of independence. However, as subsequent cohorts grow up during the era of higher inequality, Estonia might experience a decrease in intergenerational mobility in the future. Second, the thesis finds that there still exists a considerable gap in labour income of the mostly Russian-speaking second-generation immigrants compared to their native peers. One explanation of the findings could be the dual education system, which means that Russian-speaking youth are at a disadvantage when leaving school due to their low Estonian language proficiency. Therefore, if the current planned educational reform to transition Russian-language kindergartens and schools to Estonian-language education is successful, then it could result in positive long-term benefits of increased education levels and employment outcomes for the Russian-speaking youth.

3.3. Limitations and avenues of future research

The studies presented in this thesis have their own shortcomings. The limitations are not expected to affect the stability and robustness of the results but must be taken into account when interpreting the findings. Furthermore, they provide interesting pathways for future research.

Study I uses NUTS 2 level regional data from the Eurostat database. The NUTS classification is a system set up by Eurostat that establishes a hierarchy of three NUTS levels for each EU member state. At the moment, most of the regional statistics are provided by Eurostat at the NUTS 2 level and not available at the less aggregated level (NUTS 3 level). Although the NUTS 2 level is defined as *basic region* for the application of regional policies (Eurostat, 2023a), the availability of NUTS 3 level data would open up interesting additional research possibilities. In particular, NUTS 3 level data would make it possible to include smaller regions and capture the effects of within country interactions also in the Baltic states (Estonia, Latvia and Lithuania), which each consist of one or two regions at the NUTS 2 level. In addition, as some earlier studies on single-country datasets have used the NUTS 3 level data (López-Bazo et al., 2002; Semerikova, 2015), the availability of NUTS 3 level data would allow for easier comparisons with earlier findings. Lastly, smaller regions would be able to capture and study some of the localised effects; for example, effects related to commuting.

The main limitations of Study II also stem from data availability. The database used in Study II covers 11 years. The shortness of the longitudinal component does not allow us to observe the income of a child's parents at the time of their birth or early childhood, while maintaining the ability to observe the income of the child in the later stages of his or her life. Instead, parental income is observed when the child is entering the labour market (aged 24–26). While observing the parents' income at the more mature stage of their labour market experience has its benefits (being a more reliable proxy for permanent earnings), it could be argued that average income over the course of childhood would be a more exact measure of parental investments in the human and non-human capital of the child (e.g. Hermansen (2016) uses parental income over the time the child was aged 13 to 20). Further studies could benefit from obtaining a linked parent-child database covering a longer timeframe making it possible to take the parental background into account starting from the birth of the child until the child's entry to the labour market.

The second avenue of future research relies in further investigating the intergenerational transmission mechanism. In Study II we are able to control for the educational, residential, occupational and family related choices of the children. However, even after taking these choices into account the parental background remains significant in explaining the income rank of the child and the difference in income ranks between the second-generation immigrants and their native peers. While differences in social capital transmissions and the segregation of social capital networks could be one explanation for the remaining significance of the parental background, the exact mechanism of these transmissions could be further

studied. For example, a survey-based study could estimate the systematic difference in the social networks of the foreign-born, the native-born, and the children of both groups (e.g. collecting data on the number of friends and acquaintances from different ethnic groups). In the same way, differences in values and the transmission of values could be investigated; for example, preferences related to education, diligence and motivation. For a systematic overview of the success of the child, these relationships could be studied at different points in the child's educational and occupational career; for example, when starting higher education studies, entering the labour market and points of significant salary increase. Besides earnings mobility, occupational mobility could be studied in the same way. In addition to adding new empirical evidence on the immigrant-native income gap at the level of the second generation, this kind of study could help to verify the importance of different theoretical intergenerational transmission channels.

Propensity score matching combined with coarsened exact matching is used in Study III to estimate the effect of local language training on the labour market outcomes of the non-native population. The treatment and control group are matched on a rich set of background characteristics, including a wide range of sociodemographic variables (e.g. gender, age, region of residence) and variables related to previous employment and unemployment history (e.g. occupation, other labour market training and labour services received). However, the causal interpretation of the results relies on the conditional independence assumption (see Rosenbaum & Rubin, 1983), making matching a less preferred strategy to randomised controlled trial. Randomised controlled trials (RCTs) are often considered a gold standard of causal inference (see discussion in Deaton & Cartwright, 2018). However, the implementation of an RCT does come with its difficulties, including the high cost of RCTs, the difficulties in ensuring full compliance and ethical issues, perhaps explaining why the experimental evaluations have remained relatively rare in economics (Imbens & Wooldridge, 2009). If further studies would be able to overcome these challenges, RCT-based analysis on language training and other integration or active labour market programmes targeted at the immigrant population would benefit the literature.

REFERENCES

Abramitzky, R., Boustan, L., Jácome, E., & Pérez, S. (2021). Intergenerational Mobility of Immigrants in the United States over Two Centuries. *American Economic Review*, *111*(2), 580–608. https://doi.org/10.1257/aer.20191586

Adsera, A., & Chiswick, B. R. (2007). Are there gender and country of origin differences in immigrant labor market outcomes across European destinations? *Journal of Population Economics*, *20*(3), 495–526. https://doi.org/10.1007/s00148-006-0082-y

Aldashev, A., Gernandt, J., & Thomsen, S. L. (2009). Language usage, participation, employment and earnings. *Labour Economics*, *16*(3), 330–341. https://doi.org/10.1016/j.labeco.2008.11.004

Anselin, L. (1998). *Spatial Econometrics: Methods and Models*. Springer.

Aragon, Y., Haughton, D., Haughton, J., Leconte, E., Malin, E., Ruiz-Gazen, A., & Thomas-Agnan, C. (2003). Explaining the pattern of regional unemployment: The case of the Midi-Pyrénées region. *Papers in Regional Science*, *82*(2), 155–174. https://doi.org/10.1007/s101100200106

Arrow, K. J. (1973). The Theory of Discrimination. In O. Ashenfelter & A. Rees, *Discrimination in Labor Markets* (pp. 3–33). Princeton University Press. https://www.degruyter.com/document/doi/10.1515/9781400867066-003/html

Autant-Bernard, C., & LeSage, J. P. (2011). Quantifying knowledge spillovers using spatial econometric models. *Journal of Regional Science*, *51*(3), 471–496. https://doi.org/10.1111/j.1467-9787.2010.00705.x

Aydemir, A., Chen, W.-H., & Corak, M. (2009). Intergenerational Earnings Mobility Among the Children of Canadian Immigrants. *The Review of Economics and Statistics*, *91*(2), 377–397.

Badinger, H., & Url, T. (2002). Determinants of regional unemployment: Some evidence from Austria. *Regional Studies*, *36*(9), 977–988. https://doi.org/10.1080/0034340022000022558

Bakker, L., Dagevos, J., & Engbersen, G. (2017). Explaining the refugee gap: A longitudinal study on labour market participation of refugees in the Netherlands. *Journal of Ethnic and Migration Studies*, *43*(11), 1775–1791. https://doi.org/10.1080/1369183X.2016.1251835

Banerjee, R., & Lee, B. Y. (2015). Decreasing the Recent Immigrant Earnings Gap: The Impact of Canadian Credential Attainment. *International Migration*, *53*(2), 205–218. https://doi.org/10.1111/j.1468-2435.2012.00775.x

Barro, R. J., & Sala-i-Martin, X. (2004). *Economic growth* (2nd ed). MIT Press.

Basilio, L., Bauer, T. K., & Kramer, A. (2017). Transferability of Human Capital and Immigrant Assimilation: An Analysis for Germany. *LABOUR*, *31*(3), 245–264. https://doi.org/10.1111/labr.12096

Becker, G. S. (1975). *Human capital: A theoretical and empirical analysis, with special reference to education*. Columbia University Press for NBER.

Becker, G. S., & Tomes, N. (1979). An equilibrium theory of the distribution of income and intergenerational mobility. *Journal of Political Economy*, *87*(6), 1153–1189.

Becker, G. S., & Tomes, N. (1986). Human capital and the rise and fall of families. *Journal of Labor Economics*, *4*(3, Part 2), S1–S39.

Berman, E., Lang, K., & Siniver, E. (2003). Language-skill complementarity: Returns to immigrant language acquisition. *Labour Economics*, *10*(3), 265–290. https://doi.org/10.1016/S0927-5371(03)00015-0

Beyer, R. (2016). The Labor Market Performance of Immigrants in Germany. *IMF Working Papers*, *16*(6), 39.
Beyer, R. C. M. (2019). Wage Performance of Immigrants in Germany. *German Economic Review*, *20*(4), e141–e169. https://doi.org/10.1111/geer.12159
Blanchard, O. J., & Katz, L. F. (1992). Regional evolutions. *Brookings Papers on Economic Activity*, *1*, 1–75.
Blanchflower, D. G., & Oswald, A. J. (1994). *Wage curve*. MIT Press.
Bleakley, H., & Chin, A. (2004). Language Skills and Earnings: Evidence from Childhood Immigrants. *Review of Economics and Statistics*, *86*(2), 481–496. https://doi.org/10.1162/003465304323031067
Blinder, A. S. (1973). Wage Discrimination: Reduced Form and Structural Estimates. *The Journal of Human Resources*, *8*(4), 436–455. https://doi.org/10.2307/144855
Bolotnyy, V., & Bratu, C. (2018). *The Intergenerational Mobility of Immigrants and the Native-Born: Evidence from Sweden*. https://oconnell.fas.harvard.edu/files/bolotnyy/files/bolotnyy_bratu_igm.pdf
Borjas, G. J. (1985). Assimilation, Changes in Cohort Quality, and the Earnings of Immigrants. *Journal of Labor Economics*, *3*(4), 463–489.
Borjas, G. J. (1992). Ethnic Capital and Intergenerational Mobility. *The Quarterly Journal of Economics*, *107*(1), 123–150. https://doi.org/10.2307/2118325
Borjas, G. J. (1995a). Assimilation and Changes in Cohort Quality Revisited: What Happened to Immigrant Earnings in the 1980s? *Journal of Labor Economics*, *13*(2), 201–245. https://doi.org/10.1086/298373
Borjas, G. J. (1995b). Ethnicity, Neighborhoods, and Human-Capital Externalities. *The American Economic Review*, *85*(3), 365–390.
Borjas, G. J. (2015). The Slowdown in the Economic Assimilation of Immigrants: Aging and Cohort Effects Revisited Again. *Journal of Human Capital*, *9*(4), 483–517. https://doi.org/10.1086/676461
Brada, J. C., Gajewski, P., & Kutan, A. M. (2021). Economic resiliency and recovery, lessons from the financial crisis for the COVID-19 pandemic: A regional perspective from Central and Eastern Europe. *International Review of Financial Analysis*, *74*, 1–12. https://doi.org/10.1016/j.irfa.2021.101658
Bratsberg, B., Raaum, O., & Røed, K. (2014). Immigrants, Labour Market Performance and Social Insurance. *The Economic Journal*, *124*(580), F644–F683. https://doi.org/10.1111/ecoj.12182
Bratu, C., & Bolotnyy, V. (2023). Immigrant intergenerational mobility: A focus on childhood environment. *European Economic Review*, *151*, 104353. https://doi.org/10.1016/j.euroecorev.2022.104353
Brenoe, A. A., & Epper, T. (2019). Parenting Values Moderate the Intergenerational Transmission of Time Preferences. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3473772
Brown, M., Henchoz, C., & Spycher, T. (2018). Culture and financial literacy: Evidence from a within-country language border. *Journal of Economic Behavior & Organization*, *150*, 62–85. https://doi.org/10.1016/j.jebo.2018.03.011
Büchner, C., Cörvers, F., Traag, T., & van der Velden, R. (2012). How do education, cognitive skills, cultural and social capital account for intergenerational earnings persistence? Evidence from the Netherlands. *ROA Research Memoranda*, *7*. https://doi.org/10.26481/umaror.2012007

Budría, S., Colino, A., & Martínez de Ibarreta, C. (2019). The impact of host language proficiency on employment outcomes among immigrants in Spain. *Empirica*, *46*(4), 625–652. https://doi.org/10.1007/s10663-018-9414-x

Budría, S., Martinez de Ibarreta, C., & Swedberg, P. (2017). The impact of host language proficiency across the immigrants' earning distribution in Spain. *IZA Journal of Development and Migration*, *7*(1), 12. https://doi.org/10.1186/s40176-017-0094-2

Chetty, R., Hendren, N., Jones, M. R., & Porter, S. R. (2020). Race and Economic Opportunity in the United States: An Intergenerational Perspective. *The Quarterly Journal of Economics*, *135*(2), 711–783. https://doi.org/10.1093/qje/qjz042

Chetty, R., Hendren, N., Kline, P., Saez, E., & Turner, N. (2014). Is the United States Still a Land of Opportunity? Recent Trends in Intergenerational Mobility. *American Economic Review*, *104*(5), 141–147. https://doi.org/10.1257/aer.104.5.141

Chiswick, B. R. (1978). The Effect of Americanization on the Earnings of Foreign-born Men. *Journal of Political Economy*, *86*(5), 897–921.

Chiswick, B. R. (1980). The Earnings of White and Coloured Male Immigrants in Britain. *Economica*, *47*(185), 81–87. https://doi.org/10.2307/2553169

Chiswick, B. R. (1991). Speaking, Reading, and Earnings among Low-Skilled Immigrants. *Journal of Labor Economics*, *9*(2), 149–170.

Chiswick, B. R., & Miller, P. W. (1995). The Endogeneity between Language and Earnings: International Analyses. *Journal of Labor Economics*, *13*(2), 246–288. https://doi.org/10.1086/298374

Chiswick, B. R., & Miller, P. W. (2008). Why is the payoff to schooling smaller for immigrants? *Labour Economics*, *15*(6), 1317–1340. https://doi.org/10.1016/j.labeco.2008.01.001

Chiswick, B. R., & Miller, P. W. (2009). The international transferability of immigrants' human capital. *Economics of Education Review*, *28*(2), 162–169. https://doi.org/10.1016/j.econedurev.2008.07.002

Cim, M., Kind, M., & Kleibrink, J. (2020). Occupational mismatch of immigrants in Europe: The role of education and cognitive skills. *Education Economics*, *28*(1), 96–112. https://doi.org/10.1080/09645292.2019.1677558

Ciołek, D. (2021). Changes in the labour market during the COVID-19 pandemic and their spatial interactions – evidence from monthly data for Polish LAU. *Geographia Polonica*, *94*(4), 523–538. https://doi.org/10.7163/GPol.0218

Clausen, J., Heinesen, E., Hummelgaard, H., Husted, L., & Rosholm, M. (2009). The effect of integration policies on the time until regular employment of newly arrived immigrants: Evidence from Denmark. *Labour Economics*, *16*(4), 409–417. https://doi.org/10.1016/j.labeco.2008.12.006

Corak, M. (2006). Do Poor Children Become Poor Adults? Lessons from a Cross-Country Comparison of Generational Earnings Mobility. In J. Creedy & G. Kalb (Eds.), *Dynamics of Inequality and Poverty* (Vol. 13, pp. 143–188). Emerald Group Publishing Limited. https://doi.org/10.1016/S1049-2585(06)13006-9

Corak, M. (2013). Income inequality, equality of opportunity, and intergenerational mobility. *Journal of Economic Perspectives*, *27*(3), 79–102.

Corak, M. (2016). Inequality from Generation to Generation: The United States in Comparison. *IZA Discussion Papers*, *9929*.

Cracolici, M. F., Cuffaro, M., & Nijkamp, P. (2007). Geographical Distribution of Unemployment: An Analysis of Provincial Differences in Italy. *Growth and Change*, *38*(4), 649–670. https://doi.org/10.1111/j.1468-2257.2007.00391.x

Dagsvik, J. K., Kornstad, T., & Skjerpen, T. (2013). Labor force participation and the discouraged worker effect. *Empirical Economics*, *45*(1), 401–433. https://doi.org/10.1007/s00181-012-0598-9

Deaton, A., & Cartwright, N. (2018). Understanding and misunderstanding randomized controlled trials. *Social Science & Medicine*, *210*, 2–21. https://doi.org/10.1016/j.socscimed.2017.12.005

Delander, L., Hammarstedt, M., Månsson, J., & Nyberg, E. (2005). Integration of Immigrants: The Role of Language Proficiency and Experience. *Evaluation Review*, *29*(1), 24–41. https://doi.org/10.1177/0193841X04270230

Díaz, A. M. (2016). Spatial Unemployment Differentials in Colombia. *Revista Desarrollo y Sociedad*, *76*, 123–163. https://doi.org/10.13043/dys.76.3

Dorn, D., & Zweimüller, J. (2021). Migration and Labor Market Integration in Europe. *Journal of Economic Perspectives*, *35*(2), 49–76. https://doi.org/10.1257/jep.35.2.49

Dustmann, C. (1993). Earnings adjustment of temporary migrants. *Journal of Population Economics*, *6*(2). https://doi.org/10.1007/BF00178559

Dustmann, C., & Fabbri, F. (2003). Language Proficiency and Labour Market Performance of Immigrants in the UK. *The Economic Journal*, *113*(489), 695–717.

Dustmann, C., & Fabbri, F. (2005). Immigrants in the British Labour Market. *Fiscal Studies*, *26*(4), 423–470. https://doi.org/10.1111/j.1475-5890.2005.00019.x

Dustmann, C., & van Soest, A. (2001). Language Fluency and Earnings: Estimation with Misclassified Language Indicators. *Review of Economics and Statistics*, *83*(4), 663–674. https://doi.org/10.1162/003465301753237740

Dustmann, C., & van Soest, A. (2002). Language and the Earnings of Immigrants. *Industrial and Labor Relations Review*, *55*(3), 473. https://doi.org/10.2307/2696052

Elhorst, J. P. (2003). The Mystery of Regional Unemployment Differentials: Theoretical and Empirical Explanations. *Journal of Economic Surveys*, *17*(5), 709–748. https://doi.org/10.1046/j.1467-6419.2003.00211.x

Elhorst, J. P. (2014). *Spatial Econometrics: From Cross-Sectional Data to Spatial Panels*. Springer. https://doi.org/10.1007/978-3-642-40340-8

Epifani, P., & Gancia, G. A. (2005). Trade, migration and regional unemployment. *Regional Science and Urban Economics*, *35*(6), 625–644. https://doi.org/10.1016/j.regsciurbeco.2004.09.003

Eriksen, J., & Munk, M. D. (2020). The geography of intergenerational mobility—Danish evidence. *Economics Letters*, *189*, 109024. https://doi.org/10.1016/j.econlet.2020.109024

Eurostat. (2023a). *NUTS – Nomenclature of territorial units for statistics. Background.* https://ec.europa.eu/eurostat/web/nuts/background

Eurostat. (2023b). *Population by sex, age, country of birth and labour status [Table lfsa_pgacws]*. https://ec.europa.eu/eurostat/databrowser/view/lfsa_pgacws/default/table?lang=en

Eurostat. (2023c). *Population by sex, age, migration status, country of birth and country of birth of parents [Table lfsa_pgaccpm]*. https://ec.europa.eu/eurostat/databrowser/view/lfsa_pgaccpm/default/table?lang=en

Eurostat. (2023d). *Regional labour market statistics (reg_lmk)*. https://ec.europa.eu/eurostat/cache/metadata/en/reg_lmk_esms.htm

Eurostat. (2023e). *Unemployment rates by sex, age, educational attainment level and NUTS 2 regions (%) [Table lfst_r_lfu3rt]*. https://ec.europa.eu/eurostat/databrowser/view/lfst_r_lfu3rt/default/table?lang=en

Filiztekin, A. (2009). Regional unemployment in Turkey. *Papers in Regional Science*, *88*(4), 863–878. https://doi.org/10.1111/j.1435-5957.2009.00237.x

Fischer, M. M., & Nijkamp, P. (1991). Major Issues in Regional Labour Market Analysis. In D. E. Boyce, P. Nijkamp, & D. Shefer (Eds.), *Regional Science* (pp. 43–78). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-76311-3_3

Friedberg, R. M. (2000). You Can't Take It with You? Immigrant Assimilation and the Portability of Human Capital. *Journal of Labor Economics*, *18*(2), 221–251. https://doi.org/10.1086/209957

Fujita, M., Krugman, P., & Venables, A. J. (1999). *The Spatial Economy: Cities, Regions, and International Trade*. The MIT Press. https://doi.org/10.7551/mitpress/6389.001.0001

Gaspar, J. M. (2018). A prospective review on New Economic Geography. *The Annals of Regional Science*, *61*(2), 237–272. https://doi.org/10.1007/s00168-018-0866-5

Gerfin, M., & Lechner, M. (2002). A Microeconometric Evaluation of the Active Labour Market Policy in Switzerland. *The Economic Journal*, *112*(482), 854–893. https://doi.org/10.1111/1468-0297.00072

Granato, N., Haas, A., Hamann, S., & Niebuhr, A. (2015). The impact of skill-specific migration on regional unemployment disparities in Germany. *Journal of Regional Science*, *55*(4), 513–539. https://doi.org/10.1111/jors.12178

Halleck Vega, S., & Elhorst, J. P. (2014). Modelling regional labour market dynamics in space and time. *Papers in Regional Science*, *93*(4), 819–841. https://doi.org/10.1111/pirs.12018

Halleck Vega, S., & Elhorst, J. P. (2016). A regional unemployment model simultaneously accounting for serial dynamics, spatial dependence and common factors. *Regional Science and Urban Economics*, *60*, 85–95. https://doi.org/10.1016/j.regsciurbeco.2016.07.002

Halleck Vega, S., & Elhorst, J. P. (2017). Regional labour force participation across the European Union: A time–space recursive modelling approach with endogenous regressors. *Spatial Economic Analysis*, *12*(2–3), 138–160. https://doi.org/10.1080/17421772.2016.1224374

Hammarstedt, M. (2003). Income from Work Among Immigrants in Sweden. *Review of Income and Wealth*, *49*(2), 185–203. https://doi.org/10.1111/1475-4991.00082

Hammarstedt, M., & Palme, M. (2012). Human capital transmission and the earnings of second-generation immigrants in Sweden. *IZA Journal of Migration*, *1*(4), 1–23. https://doi.org/10.1186/2193-9039-1-4

Hayfron, J. E. (2001). Language training, language proficiency and earnings of immigrants in Norway. *Applied Economics*, *33*(15), 1971–1979. https://doi.org/10.1080/00036840010018630

Hermansen, A. S. (2016). Moving Up or Falling Behind? Intergenerational Socioeconomic Transmission among Children of Immigrants in Norway. *European Sociological Review*, *32*(5), 675–689. https://doi.org/10.1093/esr/jcw024

Huang, X., Huang, S., & Shui, A. (2021). Government spending and intergenerational income mobility: Evidence from China. *Journal of Economic Behavior & Organization*, *191*, 387–414. https://doi.org/10.1016/j.jebo.2021.09.005

Imbens, G. W., & Wooldridge, J. M. (2009). Recent Developments in the Econometrics of Program Evaluation. *Journal of Economic Literature*, *47*(1), 5–86. https://doi.org/10.1257/jel.47.1.5

Ingwersen, K., & Thomsen, S. L. (2021). The immigrant-native wage gap in Germany revisited. *The Journal of Economic Inequality*, *19*(4), 825–854. https://doi.org/10.1007/s10888-021-09493-8

Jerrim, J., & Macmillan, L. (2015). Income Inequality, Intergenerational Mobility, and the Great Gatsby Curve: Is Education the Key? *Social Forces*, *94*(2), 505–533. https://doi.org/10.1093/sf/sov075

Krause, A., Rinne, U., & Zimmermann, K. F. (2017). European labor market integration: What the experts think. *International Journal of Manpower*, *38*(7), 954–974. https://doi.org/10.1108/IJM-05-2017-0101

Kreiner, C. T., Leth-Petersen, S., & Willerslev-Olsen, L. C. (2020). Financial Trouble Across Generations: Evidence from the Universe of Personal Loans in Denmark. *The Economic Journal*, *130*(625), 233–262. https://doi.org/10.1093/ej/uez046

Kropp, P., & Schwengler, B. (2016). Three-Step Method for Delineating Functional Labour Market Regions. *Regional Studies*, *50*(3), 429–445. https://doi.org/10.1080/00343404.2014.923093

Krugman, P. (1991a). *Geography and trade* (Nachdr.). MIT Press.

Krugman, P. (1991b). Increasing Returns and Economic Geography. *Journal of Political Economy*, *99*(3), 483–499.

Lauri, T., Põder, K., & Kunitsõn, N. (2023). Discrimination or explained differences? Individual and school-level effects explaining the minority achievement gap. *Journal of Baltic Studies*, *54*(3), 553–580. https://doi.org/10.1080/01629778.2022.2103579

Lehmer, F., & Ludsteck, J. (2011). The Immigrant Wage Gap in Germany: Are East Europeans Worse Off? *International Migration Review*, *45*(4), 872–906. https://doi.org/10.1111/j.1747-7379.2011.00871.x

Lemos, S. (2017). Mind the gap: A detailed picture of the immigrant-native earnings gap in the UK using longitudinal data between 1978 and 2006. *Regional Science and Urban Economics*, *63*, 57–75. https://doi.org/10.1016/j.regsciurbeco.2016.11.001

Leping, K.-O., & Toomet, O. (2008). Emerging ethnic wage gap: Estonia during political and economic transition. *Journal of Comparative Economics*, *36*(4), 599–619.

LeSage, J., & Pace, R. K. (2009). *Introduction to Spatial Econometrics* (0 ed.). Chapman and Hall/CRC. https://doi.org/10.1201/9781420064254

Leschke, J., & Weiss, S. (2020). With a Little Help from My Friends: Social-Network Job Search and Overqualification among Recent Intra-EU Migrants Moving from East to West. *Work, Employment and Society*, *34*(5), 769–788. https://doi.org/10.1177/0950017020926433

Lewis, W. Jr., DiFurio, F., & Goode, T. (2011). Testing for the Presence of Spatial Dependence in Manufacturing Employment in South Carolina Counties. *Southern Business & Economic Journal*, *34*, 41–53.

Lindemann, K. (2014). The Effects of Ethnicity, Language Skills, and Spatial Segregation on Labour Market Entry Success in Estonia. *European Sociological Review*, *30*(1), 35–48. https://doi.org/10.1093/esr/jct020

Lindemann, K., & Saar, E. (2012). Ethnic inequalities in education: Second-generation Russians in Estonia. *Ethnic and Racial Studies*, *35*(11), 1974–1998.

Lochmann, A., Rapoport, H., & Speciale, B. (2019). The effect of language training on immigrants' economic integration: Empirical evidence from France. *European Economic Review*, *113*, 265–296. https://doi.org/10.1016/j.euroecorev.2019.01.008

Long, C. D. (1953). Impact of effective demand on the labor supply. *The American Economic Review*, *43*(2), 458–467.

Long, C. D. (1958). *The Labor Force under Changing Income and Employment*. Princeton University Press.

López-Bazo, E., Barrio, T. del, & Artis, M. (2002). The regional distribution of Spanish unemployment: A spatial analysis. *Papers in Regional Science*, *81*(3), 365–389. https://doi.org/10.1111/j.1435-5597.2002.tb01239.x

López-Hernández, F. A. (2013). Second-order polynomial spatial error model. Global and local spatial dependence in unemployment in Andalusia. *Economic Modelling*, *33*, 270–279. https://doi.org/10.1016/j.econmod.2013.04.014

Lubotsky, D. H. (2007). Chutes or Ladders? A Longitudinal Analysis of Immigrant Earnings. *Journal of Political Economy*, *115*(5), 820–867. https://doi.org/10.2139/ssrn.240594

Luik, M.-A., Emilsson, H., & Bevelander, P. (2018). The male immigrant–native employment gap in Sweden: Migrant admission categories and human capital. *Journal of Population Research*, *35*(4), 363–398. https://doi.org/10.1007/s12546-018-9206-y

Manuel, N., & Plesca, M. (2020). Skill transferability and the earnings of immigrants. *Canadian Journal of Economics/Revue Canadienne d'économique*, *53*(4), 1404–1428. https://doi.org/10.1111/caje.12473

Marston, S. T. (1985). Two Views of the Geographic Distribution of Unemployment. *The Quarterly Journal of Economics*, *100*(1), 57. https://doi.org/10.2307/1885735

Mayor, M., & López, A. J. (2008). Spatial shift-share analysis versus spatial filtering: An application to Spanish employment data. *Empirical Economics*, *34*(1), 123–142. https://doi.org/10.1007/s00181-007-0167-9

Molho, I. (1995). Spatial autocorrelation in British unemployment. *Journal of Regional Science*, *35*(4), 641–658. https://doi.org/10.1111/j.1467-9787.1995.tb01297.x

Niebuhr, A. (2003). Spatial interaction and regional unemployment in Europe. *European Journal of Spatial Development*, *1*(5), 1–26.

Niebuhr, A., Granato, N., Haas, A., & Hamann, S. (2012). Does Labour Mobility Reduce Disparities between Regional Labour Markets in Germany? *Regional Studies*, *46*(7), 841–858. https://doi.org/10.1080/00343404.2010.532118

Oaxaca, R. (1973). Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review*, *14*(3), 693–709. https://doi.org/10.2307/2525981

OECD. (2018). *International Migration Outlook 2018*. OECD. https://doi.org/10.1787/migr_outlook-2018-en

Orlov, G. (2018). *The Impact of Language Training on the Transfer of Pre-Immigration Skills and the Wages of Immigrants*. Cornell University. https://www.ssrn.com/abstract=3412195

Overman, H. G., & Puga, D. (2002). Unemployment clusters across Europe's regions and countries. *Economic Policy*, *17*(34), 115–148. https://doi.org/10.1111/1468-0327.00085

Patacchini, E., & Zenou, Y. (2007). Spatial dependence in local unemployment rates. *Journal of Economic Geography*, *7*(2), 169–191. https://doi.org/10.1093/jeg/lbm001

Pavlyuk, D. (2011). Spatial Analysis of Regional Employment Rates in Latvia. *Sustainable Spatial Development*, *2*, 56–62.

Pissarides, C. A., & Vallanti, G. (2007). The Impact of TFP Growth on Steady-State Unemployment. *International Economic Review*, *48*(2), 607–640. https://doi.org/10.1111/j.1468-2354.2007.00439.x

Prey, H. (2000). Evaluation of Training Programs in St. Gallen, Switzerland. *Schweiz Zeitschrift Für Volkswirtschaft Und Statistik*, *136*(3), 417–432.

Puškárová, P., & Piribauer, P. (2016). The impact of knowledge spillovers on total factor productivity revisited: New evidence from selected European capital regions. *Economic Systems*, *40*(3), 335–344. https://doi.org/10.1016/j.ecosys.2015.09.006

Ridala, S., & Toomet, O. (2019). Wage Gap in an Ethnically Segmented Labor Market: The Role of Cognitive Skills. *Eastern European Economics*, *57*(1), 20–30. https://doi.org/10.1080/00128775.2018.1524713

Rios, V. (2017). What drives unemployment disparities in European regions? A dynamic spatial panel approach. *Regional Studies*, *51*(11), 1599–1611. https://doi.org/10.1080/00343404.2016.1216094

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, *70*(1), 41–55. https://doi.org/10.1093/biomet/70.1.41

Rubin, D. B., & Thomas, N. (2000). Combining Propensity Score Matching with Additional Adjustments for Prognostic Covariates. *Journal of the American Statistical Association*, *95*(450), 573–585. https://doi.org/10.1080/01621459.2000.10474233

Rydén, L. (2002). The Baltic Sea Region and the relevance of regional approaches. 7–29. In *The Baltic Sea Region. Cultures, Politics, Societies*. The Baltic University Press.

Sarvimäki, M. (2011). Assimilation to a Welfare State: Labor Market Performance and Use of Social Benefits by Immigrants to Finland. *Scandinavian Journal of Economics*, *113*(3), 665–688. https://doi.org/10.1111/j.1467-9442.2011.01652.x

Sarvimäki, M., & Hämäläinen, K. (2016). Integrating Immigrants: The Impact of Restructuring Active Labor Market Programs. *Journal of Labor Economics*, *34*(2), 479–508. https://doi.org/10.1086/683667

Schnitzlein, D. D. (2012). How important is cultural background for the level of intergenerational mobility? *Economics Letters*, *114*(3), 335–337. https://doi.org/10.1016/j.econlet.2011.11.007

Semerikova, E. (2015). Spatial Patterns of German Labor Market: Panel Data Analysis of Regional Unemployment. In C. Mussida & F. Pastore (Eds.), *Geographical Labor Market Imbalances* (pp. 37–64). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-55203-8_3

Smith, W. C., & Fernandez, F. (2017). Education, Skills, and Wage Gaps in Canada and the United States. *International Migration*, *55*(3), 57–73. https://doi.org/10.1111/imig.12328

Solon, G. (2004). A model of intergenerational mobility variation over time and place. In M. Corak (Ed.), *Generational Income Mobility in North America and Europe* (pp. 38–47). Cambridge University Press. https://doi.org/10.1017/CBO9780511492549.003

Statistics Estonia. (2023a). *Population by native and foreign-origin, sex, age group, and place of residence (administrative unit), 31 December 2021 [Table HT140U]*. https://andmed.stat.ee/et/stat/rahvaloendus__rel2021__pelisus-ja-ranne__polis-ja-valisparitolu-rahvastik/RL21527

Statistics Estonia. (2023b). *Pupils, discontinuers and grade repeaters in general education by sex, place of residence, mother tongue, school level and language of instruction. Administrative division as at 01.01.2018 [Table RL21527]*. https://andmed.stat.ee/en/stat/sotsiaalelu__haridus__uldharidus/HT140U

Suedekum, J. (2005). Increasing returns and spatial unemployment disparities. *Papers in Regional Science*, *84*(2), 159–181. https://doi.org/10.1111/j.1435-5957.2005.00011.x

Tammaru, T., Marcin´czak, S., Aunap, R., Van Ham, M., & Janssen, H. (2020). Relationship between income inequality and residential segregation of socioeconomic groups. *Regional Studies*, *54*(4), 450–461. https://doi.org/10.1080/00343404.2018.1540035

Taylor, J. (1996). Regional Problems and Policies: A European Perspective. *Australasian Journal of Regional Studies*, *2*, 103–131.

Tverdostup, M., & Paas, T. (2019). Immigrant–native wage gap in Europe: The role of cognitive skills and their use at work. *International Journal of Manpower*, *40*(1), 154–175. https://doi.org/10.1108/IJM-03-2018-0087

Yao, Y., & van Ours, J. C. (2015). Language skills and labor market performance of immigrants in the Netherlands. *Labour Economics*, *34*, 76–85. https://doi.org/10.1016/j.labeco.2015.03.005

Zierahn, U. T. (2013). Agglomeration, congestion, and regional unemployment disparities. *The Annals of Regional Science*, *51*(2), 435–457. https://doi.org/10.1007/s00168-013-0555-3

Zorlu, A., & van Gent, W. (2020). Economic Assimilation of the "Third Generation": An Intergenerational Mobility Perspective on Immigration and Integration. *IZA Discussion Papers*, *13855*.

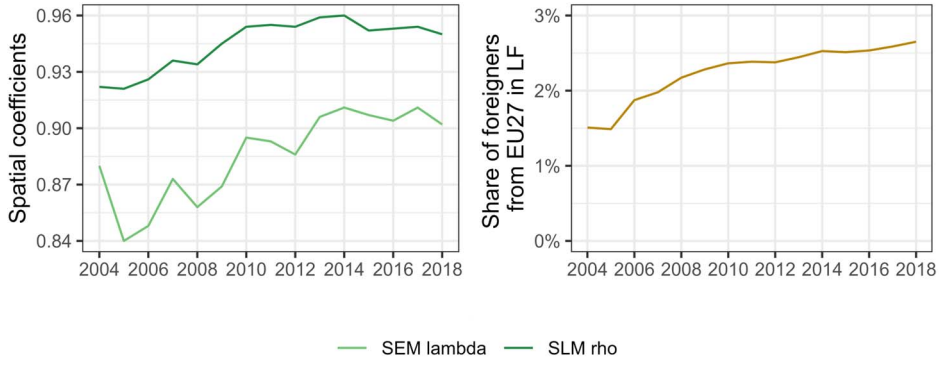
APPENDIX

Appendix 1. Panel data estimates of the regional employment rate based on different types of models for European NUTS 2 level regions for 2004–2018

Employment	FE	SEM_{fe}	SLM_{fe}	$SARAR_{fe}$
Youth	–0.193**	–0.226**	–0.207**	–0.233**
	(0.038)	(0.034)	(0.032)	(0.031)
Services	–0.157**	–0.147**	–0.152**	–0.146**
	(0.027)	(0.024)	(0.023)	(0.022)
Manufacturing	0.039	–0.029	–0.010	–0.053
	(0.035)	(0.031)	(0.030)	(0.028)
Construction	0.399**	0.255**	0.295**	0.204**
	(0.040)	(0.036)	(0.034)	(0.034)
Higher education	0.096**	0.074**	0.078**	0.066**
	(0.021)	(0.018)	(0.018)	(0.017)
λ		0.957**		0.924**
		(0.011)		(0.019)
ρ			0.957**	0.930**
			(0.011)	(0.018)
Country-specific time trend	YES	YES	YES	YES
AIC	–18249	–18962	–18983	–19382
BIC	–17974	–18766	–18788	–19180
R^2	0.716			

Note: * significant at 5%; ** significant at 1%. Standard errors are in brackets. N=3450 (230 NUTS 2 regions over the period 2004–2018). The table shows panel data estimates of fixed effects model (FE), spatial error model with fixed effects (SEM_{fe}), spatial lag model with fixed effects (SLM_{fe}) and spatial autoregressive model with autoregressive disturbances and fixed effects ($SARAR_{fe}$). The dependent variable is employment rate. All models include country-specific time trend, regional and year fixed effects. Choice of the spatial weight matrix and explanatory variables follows the cross-sectional model of Study I. See more details on the model specification in Study I, pp. 202–204.

Appendix 2. Spatial coefficients of employment rates and share of foreigners from EU27 in the labour force for 2004–2018



Source: compiled by author based on (Eurostat, 2023b). Share of foreigners from EU27 in the LF is measured as a ratio of active population (aged 16–74) in the EU, who reside in an EU27 country, but are born in another EU27 country, to the whole active population (aged 16–74) of the EU. Spatial coefficients are as reported in Study I, Figure 2.

SUMMARY IN ESTONIAN

Regionaalsed tööturud ja välistööjõu assimileerumine

Motivatsioon ja uurimuse kontseptuaalne idee

Regionaalse tööturu väljundid määratakse tööjõunõudluse ja -pakkumise koosmõjul palgakujunduse mehhanismiga (vt ka Blanchari ja Katzi (1992) mudelit). Siiski näitavad eelnevad uuringud (nt Halleck Vega & Elhorst, 2014; Rios, 2017), et regionaalsel tööturul osalejad ei piirdu tegevusega oma elukoharegioonis, vaid kaaluvad laiemaid võimalusi ning võivad seeläbi muuta tööjõunõudlust ja -pakkumist teistes regioonides. Need ülekanded, peamiselt töö- ja pendelrände vormis, loovad seosed naaberregioonide tööturgude vahel, mida tuntakse ruumiliste ülekannete nime all (Anselin, 1998; Elhorst, 2014; LeSage & Pace, 2009). Samal ajal võivad nii piiriüleste liikumiste kui ka töörände tõttu kerkida esile küsimused välistööjõu assimileerumise osas regionaalsetel tööturgudel, kuna sisserändajatel on tendents olla sihtriigi tööturul ebasoodsamas olukorras (vt Adsera & Chiswick, 2007).

Käesoleva doktoritöö fookus on sellel, kuidas ruumilised ülekanded ja välistööjõud kujundavad regionaalseid tööturge. Regionaalsete tööturgude uurimine ruumiliste seoste ja välistööjõu kontekstis on oluline kolmel peamisel põhjusel. Esiteks annab tööturgude ruumiliste seoste uurimine indikatsiooni regionaalsete tööturunäitajate kujunemisest ja püsimisest (nt töötuse ja tööhõive määra erinevustest). Töötuse määra erinevused regionaalsete tööturgude vahel on sama suured või mõnikord suuremad kui riiklike tööturgude vahel; näiteks 2021. aastal varieerusid ELis riiklikud töötuse määrad vahemikus 2,8% kuni 14,8%, samas kui Hispaania NUTS 2 regioonides varieerusid töötuse määrad vahemikus 9,8% kuni 26,6%, Belgias vahemikus 2,8% kuni 12,4% ja Itaalias vahemikus 3,8% kuni 19,3% (Eurostat, 2023e). Nende erinevuste vähendamine aitaks saavutada soovitud makromajanduslikke tulemusi, näiteks suuremat sisemajanduse kogutoodangut ja madalamat inflatsiooni, nagu väidab Taylor (1996).

Teiseks moodustab välistööjõud märkimisväärse osa regionaalsete tööturgude kogutööjõust. 2021. aastal oli Euroopa Liidus 13% kogu tööjõust pärit välismaalt (Eurostat, 2023b). Kuigi välistööjõud moodustab olulise osa kogutööjõust, on nende tööturunäitajad tavaliselt kehvemad kui kohalikel töötajatel. On laialdaselt täheldatud, et vähemalt riiki jõudmisel teenivad sisserändajad tavaliselt madalamaid palku kui kohalikud töötajad, kes on võrreldavate mõõdetavate omadustega (Adsera & Chiswick, 2007). Kuigi töörändajad kipuvad võrreldes teiste ränderühmadega sihtriigi tööturul paremini hakkama saama, võib ka nende puhul tekkida küsimusi seoses pikaajalise kohanemise ja madalamate tööturunäitajatega (Bakker et al., 2017; Luik et al., 2018).

Kolmandaks väidetakse, et sisserändajate kehvemad tööturunäitajad peegeldavad migratsioonieelsete oskuste väiksemat ülekantavust ja riigispetsiifilise inimkapitali puudumist (Basilio et al., 2017; Friedberg, 2000). Kohaliku keele oskust on nähtud olulise osana riigispetsiifilisest inimkapitalist, kuna see võimaldab

suhelda kaastöötajate ja klientidega ning migratsioonieelsete kogemuste, teadmiste ja oskuste ülekandmist sihtriigi tööturule (Orlov, 2018). Seega võiks kohaliku keele õpe sisserändajatele kasulik olla ja on oluline uurida keeleõppe mõju sisserändajate tööturunäitajatele.

Väitekiri panustab kirjandusse, vastates mitmele olulisele küsimusele. Esiteks, kuidas on regionaalsed tööturud omavahel ruumiliste ülekannete tõttu seotud. Teiseks, kuidas sisserändajad ja nende järeltulijad pikaajalises vaates regionaalsel tööturul kohanevad. Viimaks, kuidas mõjutab kohaliku keele oskus sisserändajate ja nende järeltulijate kohanemist regionaalsel tööturul.

Regionaalsed tööturud ei ole olnud regionaalse arengu teooriate põhifookuses (Barro & Sala-i-Martin, 2004). Samas on nad sattunud huviorbiiti tänu empiirilistele tähelepanekutele tööturunäitajate suurtest regionaalsetest erinevustest (vt ka Elhorst, 2003). Töötuse ja tööhõive määrade erinevused regionaalsete tööturgude vahel on isegi märkimisväärselt suuremad kui riiklike tööturgude vahel (Elhorst, 2003). Lisaks on täheldatud, et regionaalsed tööturunäitajad kalduvad geograafiliselt klasterduma (Aragon et al., 2003; Cracolici et al., 2007; Halleck Vega & Elhorst, 2016; Overman ja Puga, 2002). Ehkki sarnasused naaberregioonide tööjõu pakkumise ja nõudluse tegurites võivad osaliselt selgitada naaberregioonide tööturunäitajate sarnasusi, on osutunud oluliseks ka ruumilised seosed naaberregioonidega. Näiteks Badinger ja Url (2002) väidavad, et ruumilised efektid selgitavad umbes viiendiku töötuse määra varieeruvusest. Need kaalutlused on viinud ruumiliste ökonomeetriliste meetodite arenguni, mis võimaldavad uurida regionaalsete tööturgude vahelisi seoseid kui ruumilist sõltuvust ja ruumilisi ülekandeid (vt Anselin, 1998; Elhorst, 2014; LeSage & Pace, 2009). Kuigi ruumilised seosed võivad teatud määral kajastada aglomeratsiooni ja teadmiste ülekandeid regioonide vahel, on üks peamisi ruumiliste seoste mehhanisme tööjõu liikuvus regionaalsete tööturgude vahel (Molho, 1995; Niebuhr, 2003; Patacchini & Zenou, 2007). Seega pakub regionaalsel tasemel ruumiliste seoste uurimine täiendavat lähenemist regioonide vahelise tööjõu mobiilsuse uurimisele. Lisaks võib regionaalsete tööturgude uurimine ilma ruumilisi seoseid arvesse võtmata viia nihkega ja ebamõjusate hinnanguteni (Anselin, 1998). Uurimus I annab oma panuse sellesse valdkonda, uurides ruumiliste ülekannete tüüpe ja dünaamikat Euroopa regionaalsetel tööturgudel.

Kuigi tööjõu liikuvus võib šokkidele reageerimiseks olla kasulik mehhanism, pole välistööjõu assimileerumine alati sujuv. Sisserändajate ja kohalike palgalõhet on laialdaselt näidatud nii Euroopa kui ka Ameerika Ühendriikide andmetel (Adsera & Chiswick, 2007; Borjas, 2015; Chiswick, 1978; Hammarstedt, 2003; Ingwersen & Thomsen, 2021). Kuigi tööränd ajad kipuvad sihtregiooni tööturul paremini hakkama saama kui muud ränderühmad (humanitaar- ja pererändajad; vt nt Bakker et al., 2017; Luik et al., 2018), seisavad neil siiski ees mitmed väljakutsed. Sihtriiki jõudmisel puudub neil sageli riigispetsiifiline inimkapital. Nende eelnevad kogemused, kvalifikatsioonid, haridus ja muud tööga seotud oskused ei ole täiuslikult ülekantavad sihtregiooni tööturule (Basilio et al., 2017; Chiswick, 1978). Lisaks ei pruugi sisserändajal olla piisavalt informatsiooni sihtriigi tööturu ja sotsiaalsüsteemi kohta ning kohaliku keele oskust (Friedberg, 2000). Klassi-

kalise inimkapitali teooria (Becker, 1975) kohaselt peaksid need väljakutsed aja jooksul vähenema, kui sisserändajad õpivad kohalikku keelt ja koguvad riigispetsiifilisi teadmisi ning arendavad tööturuoskusi. Kuigi Euroopa andmeid kasutavad uuringud leiavad, et sisserändajate tööturunäitajad lähenevad aja jooksul mõningal määral sarnaste kohalike näitajatele, püsivad siiski märkimisväärsed palgaerinevused aastakümneid pärast riiki saabumist (Beyer, 2019; Bratsberg et al., 2014; Sarvimäki, 2011). Lisaks inimkapitali puudumisele võib ka sotsiaalkapitali puudumine (nt piiratud ligipääs tööga seotud sotsiaalsetele võrgustikele) raskendada sisserändajate kohanemist sihtriigi tööturul (Leschke & Weiss, 2020). Viimaks võib sisserändajatele sihtriigi tööturul osaks saada ka diskrimineerimine (Arrow, 1973).

Kokkuvõttes seisavad esimese põlvkonna sisserändajad silmitsi erinevate väljakutsetega, mis võivad neid panna sihtriigi tööturul ebasoodsasse olukorda. Siiski, analüüsides sisserändajate perekondade pikaajalist assimilatsiooni regionaalsetel tööturgudel, ei ole oluline mitte ainult esimese põlvkonna sisserändajate tööturunäitajad, vaid ka nende laste omad. Varasemad empiirilised uuringud on näidanud, et laste sissetulekupositsioonid on seotud nende vanemate sissetulekupositsioonidega ning vähemalt üks viiendik majanduslikust ebavõrdsusest kandub ühelt põlvkonnalt teisele üle (Corak, 2013, 2016). Lisaks selgitavad põlvkondadevahelist sissetulekute mobiilsusust käsitlevad teoreetilised mudelid (Becker & Tomes, 1979, 1986; Solon, 2004), kuidas investeeringud lapse inim- ja mitteinimkapitali ning geneetiliste võimete, oskuste, ühiste väärtuste ja sotsiaalsete võrgustike põlvkondadevaheline ülekandumine, loovad seose vanemate ja nende laste sissetulekupositsioonide vahel. Seega, kui esimese põlvkonna sisserändajad on sihtriigi tööturul ebasoodsas olukorras ning sissetulekupositsioonid kanduvad ühelt põlvkonnalt järgmisele, paiknevad ka teise põlvkonna sisserändajad tõenäoliselt kohalike eakaaslastega võrreldes madalamatel sissetulekupositsioonidel. Kokkuvõttes võimaldab sisserändajate põlvkondadevahelise sissetulekute mobiilsuse uurimine hinnata sisserändajate pikaajalist tööturu assimilatsiooni. Sellesse valdkonda panustab uurimus II, mis uurib sisserändajate perekondade ja kohalike perekondade põlvkondadevahelist sissetulekute mobiilsust ning vanemate tausta rolli teise põlvkonna sisserändajate ja kohalike palgalõhe selgitamisel.

Sisserändajate tööturunäitajate parandamiseks on üks loomulik lahendus suurendada nende riigispetsiifilist inimkapitali. Nagu eespool mainitud, on oluline osa riigispetsiifilisest inimkapitalist riigikeeleoskus. Erinevad teoreetilised selgitused loetlevad riigikeele valdamise eeliseid. Nende hulka kuuluvad: suurenenud produktiivsus töökohal täiendavate võimaluste tõttu klientide ja kaastöötajatega suhtlemiseks (Hayfron, 2001), suurem tõenäosus migratsioonieelsete kogemuste ja oskuste ülekandmiseks (Orlov, 2018) ning suurem efektiivsus töökoha otsimisel (Chiswick, 1991). Varasemad empiirilised uuringud on kinnitanud märkimisväärset positiivset seost riigikeeleoskuse ja hõivatud sisserändajate töiste sissetulekute vahel (Beyer, 2019; Bleakley & Chin, 2004; Budría et al., 2017). Siiski osutavad Aldashev et al. (2009), et ebapiisav keeleoskus piirab tõenäoliselt immigrantide tööturul osalemist. Seetõttu on oluline uurida ka keeleoskuse mõju sisserändajate tööturule sisenemise tõenäosusele. Selles osas on tõendid endiselt suh-

teliselt napid (vt nt Budría et al., 2019; Dustmann & Fabbri, 2003). Lisaks on tarvis rohkem uurida riigikeele kursuste mõju. On suhteliselt vähe uuringuid, mis keskenduvad keelekursuste mõjule sisserändajate tööturunäitajatele (vt nt Lochmann et al., 2019; Prey, 2000; Sarvimäki & Hämäläinen, 2016). Uurimus III panustab sellesse valdkonda, uurides riigikeele õppe mõju töötute sisserändajate tööhõive tõenäosusele ja sissetulekule.

Uurimus I kasutab Euroopa NUTS 2 regioonide andmeid. Nagu eespool märgitud, iseloomustavad ELi regionaalseid tööturge suured erinevused regionaalse tööhõive ja töötuse näitajates. On varasemaid tõendeid ühe riigi andmetel, mis näitavad, et Euroopa regionaalsete tööturgude näitajad kipuvad klasterduma (Aragon et al., 2003; Cracolici et al., 2007; Semerikova, 2015), mis viitab sellele, et ruumilised ülekanded võivad mängida Euroopa regionaalsetel tööturgudel olulist rolli. Siiski on vaid mõned uuringud keskendunud regionaalsete tööturgude ruumiliste ülekannete analüüsimisele suurema hulga ELi riikide puhul (Halleck Vega & Elhorst, 2014, 2017; Niebuhr, 2003). Uurimus I püüab täita seda tühimikku, uurides ruumilisi ülekandeid Euroopa NUTS 2 regioonides, hõlmates nii riigipiiridesiseseid kui -üleseid seoseid.

Uurimused II ja III keskenduvad ühele NUTS 2 regioonile – Eestile. Eesti on huvitav näide töörändajate ja nende järeltulijate pikaajalise assimilatsiooni uurimiseks. Nõukogude ajal soodustati tööränne Eestisse, mis tõi kaasa märkimisväärse venekeelse esimese, teise ja kolmanda põlvkonna sisserändajate kogukonna. Aastal 2021 moodustasid esimese, teise ja kolmanda põlvkonna sisserändajad Eesti elanikkonnast 27% (Statistikaamet, 2023, tabel RL21527). Kuigi venekeelsed sisserändajad ei olnud saabudes ebasoodsas olukorras, on viimased kolm aastakümmet pärast iseseisvuse taastamist ja majandusreforme viinud oluliste palga- ja tööhõivelõhedeni (Leping & Toomet, 2008). Rahvusvahelise praktika kohaselt peetakse riigikeele oskust ja sellealaseid koolitusi üheks peamiseks lahenduseks võõrkeelse elanikkonna tööturunäitajate parandamisel. Teise põlvkonna rahvastiku oluline osakaal ja selle suhteline homogeensus pakuvad suurepärast näidet, et uurida sisserändajate põlvkondadevahelist sissetulekute mobiilsust ja riigikeele õppimise eeliseid.

Uurimismetoodika ja andmed

Tabel 1 võtab kokku igas uurimuses kasutatud metoodilised vahendid, lähtudes konkreetsetest uurimisülesannetest.

Tabel 1. Ülevaade doktoritöös kasutatud uurimismeetoditest ja andmetest

Uurimus	Uurimisülesanne	Andmed	Meetod
I	Ülesanne 2. Hinnata Euroopa regionaalsetel tööturgudel domineerivat ruumiliste ülekannete liiki.	Eurostati NUTS 2 regioonide andmed	Ruumiökonomeetria mudelid: ruumilise lükke mudel (SLM), ruumilise vea mudel (SEM) ja ruumiline autoregressiivne mudel autoregressiivsete vigadega (SARAR)
I	Ülesanne 3. Uurida ruumiliste seoste intensiivsust ja dünaamikat Euroopa regionaalsetel tööturgudel.	Eurostati NUTS 2 regioonide andmed	Ruumiökonomeetria mudelid: ruumilise lükke mudel (SLM), ruumilise vea mudel (SEM) ja ruumiline autoregressiivne mudel autoregressiivsete vigadega (SARAR)
II	Ülesanne 4. Analüüsida põlvkondadevahelist sissetulekute mobiilsust vanemate sünniriigi lõikes (kohalikud vs sisserändajad).	Ühendatud registriandmed	Regressioonianalüüs
II	Ülesanne 5. Uurida vanemate tausta rolli kohalike ja teise põlvkonna sisserändajate sissetulekute erinevuste selgitamisel.	Ühendatud registriandmed	Oaxaca–Blinderi dekomponeerimine
III	Ülesanne 6. Hinnata kohaliku keele õppe mõju töötute välispäritolu elanike tööhõivele.	Eesti Maksu- ja Tolliameti ja Töötukassa ühendatud registriandmed	Kaplan-Meieri elulemuskõverad; tõenäosuspõhine sobitamine kombineerituna rediskretiseeritud täppissobitamisega
III	Ülesanne 7. Analüüsida kohaliku keele õppe mõju töötute välispäritolu elanike töistele sissetulekutele.	Eesti Maksu- ja Tolliameti ja Töötukassa ühendatud registriandmed	Tõenäosuspõhine sobitamine kombineerituna rediskretiseeritud täppissobitamisega

Allikas: autori koostatud.

Uurimuses I kasutatakse NUTS 2 regioonide andmeid Eurostati andmebaasist. NUTS klassifikatsioon määratleb igale ELi liikmesriigile kolm NUTS taset. NUTS 2 tase on määratletud kui põhiregioon regionaalpoliitika rakendamiseks (Eurostat, 2023a). Andmestiku peamine eelis on tööturu ja kaasnevate muutujate võrreldavus erinevates ELi riikides ja regioonides. Eurostati regionaalset tööturu informatsiooni kogutakse ELi tööjõu-uuringu läbiviimisega igas liikmesriigis. Andmete harmoneerimine erinevate ELi liikmesriikide vahel saavutatakse, järgides ühiseid põhimõtteid küsimustike koostamisel (Eurostat, 2023d). Andmekogumis sisalduvad muutujad peegeldavad uuritavate piirkondade inimkapitali, demograafilist koosseisu, majandusstruktuuri ja riigitaseme tingimusi.

Uurimus II kasutab andmestikku, kus Eesti rahvastikuregistri andmed on ühendatud andmetega Maksu- ja Tolliameti, Haridus- ja Teadusministeeriumi, Politsei- ja Piirivalveameti, Töötukassa, Haigekassa ja Sotsiaalkindlustusameti registritest. Andmestik sisaldab teavet kõigi Eestis elavate inimeste vanuse, soo, haridustaseme, elukohapiirkonna, sünniriigi, laste arvu, tööhõivesektori ja aastaste sissetulekute kohta perioodil 2007–2017. Kuna andmestik sisaldab ka teavet vanemate kohta, on võimalik luua seoseid laste ja vanemate vahel. Andmestik võimaldab jälgida kahe põlvkonna (laste ja vanemate) tööturu tulemusi, kui nad on juba (lapsed) või veel (vanemad) oma peamises tööeas.

Uurimus III kasutab rikkalikke indiviidi taseme registriandmeid Eesti Töötukassast, mis on ühendatud sissetulekuandmetega Maksu- ja Tolliameti registritest. Valimisse kuuluvad kõik isikud, kes osalesid perioodil 2015–2016 eesti keele kursusel, mida korraldas Eesti Töötukassa, ja need, kes olid samal ajal töötuna registreeritud, kuid ei osalenud ja kelle peamine suhtluskeel ei olnud eesti keel. Andmestik sisaldab teavet erinevate individuaalsete omaduste, varasema tööhõive ja varasemate ning praeguste töötuse perioodide kohta (nt täiendavatel tööturuteenustel ja koolitustel osalemine) ning teavet tööturunäitajate kohta pärast kursuse lõppu.

Uurimismetoodika valik on tehtud lähtuvalt uurimisülesannetest. Uurimus I kasutab ruumiökonomeetria mudeleid, et hinnata ruumilisi seoseid regionaalsetel tööturgudel. Nimelt kasutatakse ruumilise lükke mudelit (SLM), ruumilise vea mudelit (SEM) ja ruumilist autoregressiivset mudelit autoregressiivsete vigadega (SARAR) (vt Elhorst, 2014). Uurimus II kasutab tavalisel vähimruutude meetodil hinnatud regressiooni põlvkondadevahelise sissetulekute mobiilsuse taseme hindamiseks, järgides sissetulekuprotsentiili põhist (*rank-rank*) lähenemist, mida tutvustasid esimesena Chetty et al. (2014). Sissetulekute erinevuste uurimiseks kohalike ja teise põlvkonna sisserändajate vahel kasutatakse kirjeldavat analüüsi ja Oaxaca–Blinderi dekomponeerimist (Blinder, 1973; Oaxaca, 1973). Uurimus III kasutab keeleõppe mõju hindamiseks tööle saamise tõenäosusele ja palgatasemele tõenäosuspõhist sobitamist kombineerituna rediskretiseeritud täppissobitamisega (Rubin & Thomas, 2000). Keskmist mõju osalenutele hinnatakse logistilise ja lineaarse regressioonimudeli abil kasutades sobitatud valimit.

Kokkuvõte ja järeldused

Doktoritöö jõuab mitmete huvitavate järeldusteni. Ruumiliste ülekannete analüüsist järeldub, et Euroopa regionaalsete tööturgude vahel eksisteerib oluline ruumiline sõltuvus. Koostöömõjud domineerivad, mis tähendab, et üldiselt saavad regioonid naaberregioonide tööhõive kasvust kasu. Euroopa Liidus on ruumilised ülekanded tugevnenud paralleelselt tööjõu liikuvuse suurenemisega. Edasisi suurenemisi tööjõu liikuvuses ja ruumilistes ülekannetest võivad takistada kultuurilised ja keelelised erinevused piirkondade vahel (Dorn & Zweimüller, 2021). Kokkuvõttes tuleks kaaluda erinevaid võimalusi suurendamaks koostööd naaberregioonidega.

Kohaliku keele õppe mõjude analüüsi tulemustest järeldub, et kohaliku keele õppimine aitab töötutel sisserändajatel tööd leida. Seega toetavad selle väitekirja tulemused keeleõppe võimaluste pakkumist sisserändajatele nende tööturule integreerumise suurendamiseks. Mõjud tööhõivele on suurimad neil, kellel on eelnevalt madalaim keeleoskuse tase, ja positiivsed mõjud eksisteerivad ka keeleenklaavides. Seetõttu tuleks keeleõpet soodustada ka piirkondades, kus on suur osakaal võõrkeelseid elanikke. Töötutele mõeldud keelekursustel kipub esimestel kuudel pärast koolituse algust olema suur töötusesse lukustamise efekt. Seetõttu tuleks töötutele suunatud keelekursuste kavandamisel kaaluda erinevaid võimalusi lukustusefekti vähendamiseks. Näiteks võiks keelekursuse, mille eesmärk on jõuda terve keeleoskuse tasemeni (nt keeletase A2, B1, B2), jagada väiksemateks alamtaseme kursusteks.

Põlvkondadevahelise mobiilsuse analüüs osutab, et inimkapitali ülekandumise kõrval võivad muud kanalid, nagu ühiste väärtuste ülekandumine, ühiste sotsiaalsete võrgustike ülekandumine ja naabruskonna mõjud, olla olulised aspektid sisserändajate perede põlvkondadevahelise sissetulekute mobiilsuse selgitamisel. Mõned varasemad tõendid viitavad sellele, et erinevused ülespoole suunatud mobiilsuses kohalike ja sisserändajate perede vahel kaovad kui võrrelda samades naabruskondades elavaid perekondi. Siiski ei ole need leiud põhjuslikud, kuna geograafilise segregatsiooni vähenemine ei vii automaatselt sotsiaalse integratsioonini. Seega ei pruugi pelgalt geograafiline integratsioon üksi viia teise põlvkonna sisserändajate soovitud tööturutulemusteni.

Väitekiri jõuab ka mõnede Eesti-spetsiifiliste järeldusteni. Töös leitakse, et põlvkondadevaheline sissetulekute mobiilsus on Eestis, kus sissetulekute ebavõrdsus kerkis esile esmakordselt 30 aastat tagasi pärast iseseisvuse taastamist, endiselt kõrge. Siiski, kuna järgnevad põlvkonnad on üles kasvanud suurema ebavõrdsuse ajastul, võib Eesti tulevikus kogeda põlvkondadevahelise mobiilsuse vähenemist. Teiseks leitakse, et endiselt on märkimisväärne lõhe peamiselt venekeelsete teise põlvkonna sisserändajate ja nende kohalike eakaaslaste töötasudes. Üheks tulemuste selgituseks võib olla kakskeelne haridussüsteem, mis tähendab, et venekeelsed noored on kooli lõpetades madala eesti keele oskuse tõttu kehvemas olukorras. Seega, kui praegu plaanitud haridusreform venekeelsete lasteaedade ja koolide üleminekuks eestikeelsele õppele õnnestub, võib see kajastuda positiivsetes pikaajalistes mõjudes venekeelsete noorte haridustasemele ja tööhõivele.

Töö piirangud ja soovitused tulevasteks uuringuteks

Selle väitekirja uurimustel on omad piirangud. Need piirangud ei mõjuta tulemuste stabiilsust ja usaldusväärsust, kuid neid tuleb arvestada tulemuste tõlgendamisel. Lisaks tulenevad neist täiendavad huvitavad uurimisvõimalused.

Uurimus I kasutab Eurostati andmebaasi NUTS 2 taseme regioonide andmeid. NUTS klassifikatsioon on Eurostati poolt loodud süsteem, mis kehtestab iga EL-i liikmesriigi jaoks kolme NUTS taseme hierarhia. Praegu on Eurostatis enamik piirkondliku statistikat NUTS 2 tasemel ega ole kättesaadav madalama taseme regioonide kohta (NUTS 3 tasemel). Kuigi NUTS 2 taset peetakse regionaalsete poliitikate rakendamise põhitasemeks (Eurostat, 2023a), avaks NUTS 3 taseme andmete kättesaadavus huvitavaid täiendavaid uurimisvõimalusi. Eelkõige võimaldaksid NUTS 3 taseme andmed kaasata väiksemaid regioone ja uurida riigisiseseid ruumilisi ülekandeid ka Balti riikides (Eestis, Lätis ja Leedus), mis igaüks koosneb ühest või kahest NUTS 2 taseme regioonist. Lisaks, kuna mõned varasemad ühe riigi andmetel põhinevad uuringud on kasutanud NUTS 3 taseme andmeid (López-Bazo et al., 2002; Semerikova, 2015), võimaldaks NUTS 3 taseme andmete olemasolu hõlpsamini võrrelda tulemusi varasemate leidudega. Lõpuks võimaldaksid väiksemad regioonid uurida ka kohalikke mõjusid, näiteks ruumilisi ülekandeid seoses pendelrändega.

Uurimuse II peamised piirangud tulenevad samuti andmete kättesaadavusest. Uurimuses II kasutatav andmebaas katab 11 aastat. Ajakomponendi lühidus ei võimalda jälgida lapsevanemate sissetulekut lapse sünni ajal või varases lapsepõlves, säilitades samas võime jälgida lapse sissetulekut hilisemas eluetapis. Selle asemel vaadeldakse vanemate sissetulekut, kui laps siseneb tööturule (vanuses 24–26). Kuigi vanemate sissetulekute jälgimisel nende karjääri küpsemas etapis on oma eelised (olles usaldusväärsemaks aluseks üleelukaarelistele sissetulekutele), võib väita, et keskmine sissetulek lapsepõlve jooksul oleks täpsem mõõdik vanemate investeeringutele lapse inim- ja mitteinimkapitali (nt Hermansen (2016) kasutab vanemate sissetulekut ajal, mil laps oli 13–20-aastane). Edasised uuringud võiksid kasu saada seotud vanema-lapse andmebaasist, mis katab pikema ajavahemiku, võimaldades arvestada vanemate taustaga alates lapse sünnist kuni lapse tööturule sisenemiseni.

Teine tulevase uurimistöö suund seisneb põlvkondadevahelise ülekande mehhanismi edasisel uurimisel. Uurimuses II saame kontrollida laste hariduslikke, elukoha, tööalaseid ja perekondlikke valikuid. Siiski jääb vanemate taust isegi neid valikuid arvesse võttes oluliseks teguriks lapse sissetulekupositsiooni ning teise põlvkonna sisserändajate ja nende kohalike eakaaslaste sissetulekupositsiooni erinevuste selgitamisel. Kuigi üheks selgituseks vanemate tausta jätkuvale olulisusele võivad olla sotsiaalkapitali ülekanded ja sotsiaalvõrgustike segregatsioon, võiks nende ülekannete täpsemaid mehhanisme edasi uurida. Näiteks võiks küsitlusuuring hinnata süstemaatilisi erinevusi sisserändajate, kohalike ja mõlema rühma laste sotsiaalsetes võrgustikes (nt kogudes andmeid erinevatest etnilistest rühmadest pärit sõprade ja tuttavate arvu kohta). Samamoodi võiks uurida, kuidas erineb väärtuste, nt hariduse, töökuse ja motivatsiooniga seotud eelistuste, ülekanne

erinevatel rühmadel. Lapse edukuse süsteemseks ülevaateks võiks neid suhteid uurida lapse hariduskäigu ja karjääri erinevatel etappidel, nt kõrgharidusõpingute alguses, tööturule sisenedes ja ametipositsiooni vahetudes. Lisaks teise põlvkonna sisserändajate ja kohalike palgalõhet puudutavatele uutele empiirilistele tõenditele aitaks selline uurimus selgitada erinevate teoreetiliste põlvkondadevaheliste ülekande mehhanismide tähtsust.

Uurimuses III kasutatakse kohaliku keele õppe mõju hindamiseks välispäritolu elanikkonna tööhõivele ja palgale tõenäosuspõhist sobitamist (*propensity score matching*) kombineerituna rediskretiseeritud täppissobitamisega (*coarsened exact matching*). Osalus- ja kontrollgrupp sobitatakse rikkaliku taustateabe alusel, sealhulgas laia valiku sotsiaaldemograafiliste muutujate (nt sugu, vanus, elukohapiirkond) ning varasema tööhõive ja töötuse ajalooga seotud muutujate (nt amet, muudel tööturuteenustel ja koolitustel osalemine) alusel. Siiski põhineb tulemuste põhjuslik tõlgendus tingimusliku sõltumatuse eeldusel (*conditional independence assumption*, vt Rosenbaum & Rubin, 1983), muutes sobitamise vähem eelistatud strateegiaks juhuvalikuga kontrollitud eksperimendiga võrreldes. Juhuvalikuga kontrollitud eksperimente (*randomized controlled trials*, *RCT*) peetakse sageli põhjusliku seose tuvastamise kullastandardiks (vt Deaton & Cartwright, 2018). Siiski kaasnevad juhuvalikuga kontrollitud eksperimentide rakendamisega raskused, sealhulgas eksperimentide kõrge hind, raskused täieliku järgimise tagamisel ja eetilised küsimused, mis võivad selgitada, miks eksperimentaalsed hinnangud on majandusteaduses suhteliselt haruldased (Imbens & Wooldridge, 2009). Kui edasised uuringud suudaksid need raskused ületada, annaks juhuvalikuga eksperimentide põhine analüüs väärtuslikku lisainformatsiooni keeleõppe ja teiste sisserändajatele suunatud integratsiooni- ja aktiivsete tööturumeetmete mõjude kohta.

CURRICULUM VITAE

Name: Laura Helena Kivi
Date of birth: 26 June 1992, Rovaniemi, Finland
Email: laura.helena.kivi@ut.ee

Current position: Researcher, Estonian Centre for Applied Research (CentAR), Tallinn, Estonia

Education:

2018–…	PhD studies in Economics, University of Tartu, Estonia
2014–2017	MA in Quantitative Economics (*cum laude)*, University of Tartu, Estonia
2015–2016	Exchange graduate studies, University of Konstanz, Germany
2011–2014	BA in Economics and Business Administration (*cum laude)*, University of Tartu, Estonia

Professional experience:

2021–…	Junior Research Fellow in Economic Modelling, University of Tartu, Estonia
2017–…	Researcher, Estonian Centre for Applied Research (CentAR), Tallinn, Estonia
2017	Intern, Barmenia Versicherungen, Risk Management and Control Department, Wuppertal, Germany

Studies and research abroad:

2022	Visiting researcher at Aalto University, Department of Economics, Helsinki, Finland
2022	Applied Microeconometrics for PhD students course at Aalto University, Helsinki, Finland
2022	Economics of Migration summer school by the Barcelona School of Economics (BSE), Barcelona, Spain
2022	20th International Workshop on Spatial Econometrics and Statistics at the University of Lille, Lille, France
2021	Migration Economics Summer School by the Paris School of Economics (PSE), online, originally intended to take place in Paris, France
2020	Regression Analysis for Spatial Data course by the GSERM Global School in Empirical Research Methods at the University of Sankt Gallen, Sankt Gallen, Switzerland
2019	Econometrics of Big Data course by the GSERM Global School in Empirical Research Methods at the University of Sankt Gallen, Sankt Gallen, Switzerland
2019	4th Central European PhD Workshop on Technological Change and Development at the University of Szeged, Szeged, Hungary

Language skills: Estonian (native), English (fluent), German (fluent), Finnish (basic command), Russian (basic command)

Main research areas: labour economics, spatial econometrics, regional labour markets, labour market assimilation, intergenerational earnings mobility

ELULOOKIRJELDUS

Nimi: Laura Helena Kivi
Sünniaeg: 26. juuni 1992, Rovaniemi, Soome
E-post: laura.helena.kivi@ut.ee

Praegune ametikoht: analüütik, Eesti Rakendusuuringute Keskus CentAR, Tallinn, Eesti

Haridus:

2018–…	majandusteadus, doktoriõpe, Tartu Ülikool, Eesti
2014–2017	matemaatiline majandusteadus, magistriõpe (*cum laude)*, Tartu Ülikool, Eesti
2015–2016	vahetusõpingud, Konstanzi Ülikool, Saksamaa
2011–2014	majandusteadus, bakalaureuseõpe (*cum laude)*, Tartu Ülikool, Eesti

Töökogemus:

2021 – …	majanduse modelleerimise nooremteadur, Tartu Ülikool, Eesti
2017 – …	analüütik, Eesti Rakendusuuringute Keskus CentAR, Tallinn, Eesti
2017	praktikant, Barmenia Versicherungen (Barmenia kindlustus), riskijuhtimise ja kontrolli osakond, Wuppertal, Saksamaa

Välisõpingud ja teadustöö:

2022	külalisteadur, Aalto Ülikool, majandusteaduskond, Helsingi, Soome
2022	Rakendusliku mikroökonomeetria kursus doktorantidele, Aalto Ülikool, Helsingi, Soome
2022	Migratsiooniökonoomika suvekool, *Barcelona School of Economics* (*BSE*), Barcelona, Hispaania
2022	"*20th International Workshop on Spatial Econometrics and Statistics*" seminar, Lille Ülikool, Lille, Prantsusmaa
2021	Migratsiooniökonoomika suvekool*, Paris School of Economics* (*PSE*), Pariis, Prantsusmaa
2020	Ruumiandmete regressioonanalüüsi kursus, *GSERM Global School in Empirical Research Methods*, Sankt Galleni Ülikool, Sankt Gallen, Šveits
2019	Suurandmete ökonomeetria kursus, *GSERM Global School in Empirical Research Methods*, Sankt Galleni Ülikool, Sankt Gallen, Šveits
2019	"*4th Central European PhD Workshop on Technological Change and Development*" seminar, Szegedi Ülikool, Szeged, Ungari

Keelteoskus: eesti keel (emakeel), inglise keel (ladus), saksa keel (ladus), soome keel (vähene), vene keel (vähene)

Peamised uurimisvaldkonnad: töö-ökonoomika, ruumiökonomeetria, regionaalsed tööturud, välitööjõu kohanemine, põlvkondadevaheline sissetulekute mobiilsus

DISSERTATIONES RERUM OECONOMICARUM UNIVERSITATIS TARTUENSIS

1. **Олев Раю.** Экономическая ответственность и ее использование в хозяйственном механизме. Tartu 1991, 390 с.
2. **Janno Reiljan.** Majanduslike otsustuste analüütiline alus (teooria, metodoloogia, metoodika ja meetodid). Tartu 1991.
3. **Robert W. McGee.** The theory and practice of public finance: some lessons from the USA experience with advice for former socialist countries. Tartu 1994, 123 p.
4. **Maaja Vadi.** Organisatsioonikultuur ja väärtused ning nendevahelised seosed (Eesti näitel). Tartu 2000, 220 lk.
5. **Raul Eamets.** Reallocation of labour during transition. Disequilibrium and policy issues: The case of Estonia. Tartu 2001, 252 p.
6. **Kaia Philips.** The changes in valuation of human capital during the transition process in Estonia. Tartu 2001, 289 p.
7. **Tõnu Roolaht.** The internationalization of Estonian companies: an exploratory study of relationship aspects. Tartu 2002, 193 p.
8. **Tiia Vissak.** The internationalization of foreign-owned enterprises in Estonia: An extended network perspective. Tartu 2003, 221 p.
9. **Anneli Kaasa.** Sissetulekute ebavõrdsuse mõjurite analüüs struktuurse modelleerimise meetodil. Tartu 2004, 260 lk.
10. **Ruth Alas.** Organisational changes during the transition in Estonia: major influencing behavioural factors. Tartu 2004, 210 p.
11. **Ele Reiljan.** Reasons for de-internationalization: An analysis of Estonian manufacturing companies. Tartu 2004, 235 p.
12. **Janek Uiboupin.** Foreign banks in Central and Eastern European markets: their entry and influence on the banking sector. Tartu 2005, 185 p.
13. **Jaan Masso.** Labour reallocation in transition countries: efficiency, restructuring and institutions. Tartu 2005, 241 p.
14. **Katrin Männik.** The impact of the autonomy on the performance in a multinational corporation's subsidiary in transition countries. Tartu 2006, 252 p.
15. **Andres Vesilind.** A methodology for earning excess returns in global debt and currency markets with a diversified portfolio of quantitative active investment models. Tartu 2007, 170 p.
16. **Rebekka Vedina.** The diversity of individual values and its role for organisations in the context of changes. Tartu 2007, 177 p.
17. **Priit Sander.** Essays on factors influencing financing decisions of companies: risk, corporate control and taxation aspects. Tartu 2007, 178 p.
18. **Kadri Ukrainski.** Sources of knowledge used in innovation: an example of Estonian wood industries. Tartu 2008, 263 p.
19. **Kristjan-Olari Leping.** Heterogeneity of Human Capital and its Valuation in the Labour Market. Tartu 2008, 160 p.

20. **Kadri Männasoo.** Essays on financial fragility – evidence from the corporate and banking sectors in Central and Eastern Europe. Tartu 2008, 152 p.
21. **Made Torokoff.** Patterns of learning organisation – Estonian experiences. Tartu 2008, 163 p.
22. **Helena Rozeik.** Changes in ownership structures, their determinants and role in the restructuring of enterprises during transition: evidence from Estonia. Tartu 2008, 268 p.
23. **Jaanika Meriküll.** Technological change and labour demand. Tartu 2009, 148 p.
24. **Anne Aidla.** The impact of individual and organisational factors on academic performance in Estonian general educational schools. Tartu 2009, 219 p.
25. **Alexander Gofman.** Experimentation-Based Product Development in Mature Food Categories: Advancing Conjoint Analysis Approach. Tartu 2009, 273 p.
26. **Anne Reino.** Manifestations of organizational culture based on the example of Estonian organizations. Tartu 2009, 272 p.
27. **Krista Jaakson.** Management by values: the analysis of influencing aspects and its theoretical and practical implications. Tartu 2009, 225 p.
28. **Eve Parts.** Social capital, its determinants and effects on economic growth: comparison of the Western European and Central-Eastern European countries. Tartu 2009, 293 p.
29. **Egle Tafenau.** Welfare effects of regional policy in the constructed capital model. Tartu 2010, 187 p.
30. **Epp Kallaste.** Employee workplace representation: an analysis of selected determinants. Tartu 2010, 173 p.
31. **Danel Tuusis.** Interest rate influence on the behavior of economic subjects. Tartu 2010, 201 p.
32. **Elina Kallas.** Emotional intelligence, organizational culture and their relationship based on the example of Estonian service organizations. Tartu 2010, 304 p.
33. **Dorel Tamm.** Alignment between the factors of the innovation process and public sector innovation support measures: an analysis of Estonian dairy processors and biotechnology enterprises. Tartu 2010, 231 p.
34. **Rasmus Kattai.** The links between private sector indebtedness and banking sector vulnerability: An Estonian case study. Tartu 2011, 164 p.
35. **Kurmet Kivipõld.** Organizational Leadership Capability and its evaluation based on the example of Estonian service organizations. Tartu 2011, 199 p.
36. **Janno Järve.** Downward Nominal Wage Rigidity in the Estonian Private Sector. Tartu 2011, 197 p.
37. **Kristina Toming.** The impact of integration with the European Union on the international competitiveness of the food processing industry in Estonia. Tartu 2011, 241 p.

38. **Andrus Kotri.** Customer experience evoking and management in services. Tartu 2011, 360 p.
39. **Andres Kuusik.** Segmentation of repeat visitors using passive mobile positioning data: customer loyalty based approach. Tartu 2011, 158 p.
40. **Tuuli Pärenson.** Social impact evaluation in social enterprises in Estonia: need, readiness and practices. Tartu 2011, 216 p.
41. **Indrek Saar.** Optimal alcohol taxation in Estonia. Tartu 2011, 185 p.
42. **Kertu Lääts.** Management accounting change in a dynamic economic environment based on examples from business and public sector organizations. Tartu 2011, 250 p.
43. **Reelika Irs.** Teacher performance appraisal and remuneration aspects of performance management on the example of Estonian general educational schools. Tartu 2012, 322 p.
44. **Anne Lauringson.** The impact of the generosity of unemployment benefits on Estonian labour market outcomes in a period of crisis. Tartu 2012, 268 p.
45. **Peeter Peda.** The relationship between governance and performance in water services provision in Estonian municipalities. Tartu 2012, 326 p.
46. **Andres Kuusk.** Financial contagion during times of crisis: a meta-analysis based approach with special emphasis on CEE economies. Tartu 2012, 211 p.
47. **Kerly Espenberg.** Inequalities on the labour market in Estonia during the Great Recession. Tartu 2013, 312 p.
48. **Xiaotian Zhang.** Internationalization processes of Chinese firms: The role of knowledge. Tartu 2013, 274 p.
49. **Helen Poltimäe.** The distributional and behavioural effects of Estonian environmental taxes. Tartu 2014, 141 p.
50. **Eneli Kindsiko.** Organisational Control in University Management: A Multiparadigm Approach on the Example of the University of Tartu. Tartu 2014, 211 p.
51. **Diana Eerma.** A bookkeeping approach to social accounting for a university faculty: the case of the University of Tartu. Tartu 2014, 293 p.
52. **Kaia Kask.** Public sector real estate asset management models and their evaluation. Tartu 2014, 264 p.
53. **Ott Pärna.** Managerial and contextual factors influencing innovation in information technology-based public sector services: an exploratory cross-national study. Tartu 2014, 410 p.
54. **Merle Tambur.** Workplace bullying in Estonian organizations: The prevalence and causes. Tartu 2015, 210 p.
55. **Sten Anspal.** Essays on gender wage inequality in the Estonian labour market. Tartu 2015, 195 p.
56. **Oliver Lukason**. Characteristics of firm failure processes in an international context. Tartu 2016, 180 p.
57. **Marko Viiding.** Role of electricity price in competitiveness of the manufacturing industry in liberalised electricity markets: the case of NordPool. Tartu 2016, 188 p.

58. **Bianka Plüschke-Altof.** Images of the Periphery Impeding Rural Development? Discursive Peripheralization of Rural Areas in Post-Socialist Estonia. Tartu 2017, 237 p.
59. **Tarmo Puolokainen.** Public Agencies' Performance Benchmarking in the Case of Demand Uncertainty with an Application to Estonian, Finnish and Swedish Fire and Rescue Services. Tartu 2018, 247 p.
60. **Karin Sakowski.** The Role of National-Institutional Context in Organisations and in Organisational Innovation: The Case of Western and Central and Eastern European Countries. Tartu 2018, 135 p.
61. **Maryna Tverdostup.** Human capital and labour market disparities. Tartu 2018, 248 p.
62. **Bradley James Loewen.** Towards territorial cohesion? Path dependence and path innovation of regional policy in Central and Eastern Europe. Tartu 2018, 232 p.
63. **Kärt Rõigas.** University-industry cooperation in the context of the national innovation system. Tartu 2018, 208 p.
64. **Tatyana Tsukanova.** Insights into the Export Behavior of SMEs from Emerging Economies: Evidence from Russia and China. Tartu 2019, 251 p.
65. **Gerdien Margreeth Grootens.** Leadership of peripheral places: a comparative study of leadership processes in Estonian and Dutch peripheral places. Tartu 2019, 186 p.
66. **Tõnis Tänav.** Dynamics of firm innovation strategies: relationship with public sector support. Tartu 2020, 280 p.
67. **Gaygysyz Ashyrov.** Essays on firm-level corruption. Tartu 2020, 193 p.
68. **Tõnis Eerme.** Big Science as innovation intermediaries – micro- and meso-level effects from the collaboration with the European Space Agency. Tartu 2020, 173 p.
69. **Isaac Nana Akuffo.** The relationship between authentic leadership competences and nepotism, favouritism, and cronyism – the case of the Ghanaian banking sector. Tartu 2020, 147 p.
70. **Virgo Süsi.** Corporate governance and performance of private SMEs. Tartu 2021, 130 p.
71. **Mariia Chebotareva.** Functional Overlapping Competing Jurisdictions (FOCJs) as a Possible Tool for Inter-municipal Cooperation in the Provision of Russian School Services. Tartu 2021, 343 p.
72. **Aare Värk.** Practice-based exploration of knowledge, knowing and knowledge management. Tartu 2021, 128 p.
73. **Nataliia Ostapenko.** Information, Business cycles and Monetary policy. Tartu 2021, 197 p.
74. **Artur Meerits.** First-level military leaders' leadership competencies and their relationship with unit effectiveness in terms of collectivistic leadership with the example of the Estonian Defence Forces. Tartu 2022, 178 p.
75. **Magnus Piirits.** The Impact of Pension Reforms on Pension Inequality in Estonia: An Analysis with Microsimulation and Typical Agent Models. Tartu 2022, 219 p.

76. **Liina Joller-Vahter.** The government as an enabler and accelerator of diffusion of radical innovations. Tartu 2022, 134 p.
77. **Liis Roosaar.** Essays on labour mobility and labour productivity. Tartu 2022, 182 p.
78. **Sigrid Rajalo.** University-industry collaboration: interaction structure and preconditions. Tartu 2023, 117 p.
79. **Nino Kokashvili.** Public sector evolution under conditions of political business cycle – theory and empirical evidence. Tartu 2023, 194 p.
80. **Alo Lilles.** The relationship between university-industry cooperation and regional capabilities in Europe. Tartu 2023, 142 p.
81. **Mark Kantšukov.** Valuation of companies under the distributed profit taxation system. Tartu 2023, 233 p.
82. **Iulia Trabskaia.** Idea and opportunity identification and implementation within the entrepreneurial process and journey. Tartu 2023, 160 p.