2010

Language Skills and Social Integration: Ethnic Disparities in Bilingual Economy

Ott S. Toomet
Aarhus School of Business, ottt@asb.dk

Jaanika Meriküll
Tartu University, jaanika.merikull@ut.ee

Language Skills and Social Integration: Ethnic Disparities in Bilingual Economy

Work in progress

Jaanika Meriküll Ott Toomet

May 13, 2010

Abstract

We analyze the relationship between the local language skills and immigrant income in a largely bilingual economy, Estonia. We show that the official language matters little in the private sector, and at the upper end of the income distribution. This is in a striking contrast to what has been found in the literature for single-language dominated economies. Our results point toward importance of co-worker discrimination, possibly through the more subtle aspects of language, or through access to the social networks. This outcome stresses the need for social integration of minorities, and suggest that this does not necessarily happen through the labor market.

JEL codes: J15, J31, J71

Keywords: language skills, immigrants, unexplained differential, discrimination

1 Introduction

Globalization, unequal population growth and development across regions is leading to increasing immigration over the world. This ought to be good news for the aging western economies, projected to be struggling with retaining the current welfare level in the coming decades. However, labor market performance of immigrants typically lags behind of that of the natives. Part of this difference can be explained by human capital variables, such as education and language skills. The rest, unexplained part, is often attributed to a broad concept "discrimination".

Through several decades, economists have struggled to identify the existence and extent of the discrimination. Existing studies indicate that the unexplained difference between the labor market outcomes of different ethnic or racial groups may be rather large (Altonji and Blank, 1999; Blackaby, Leslie, Murphy, and O'Leary, 2005). There is also a number of studies, documenting the disadvantage of having "wrong", immigrant-sounding, names on employment prospects (Bertrand and Mullainathan, 2004; Carlsson and Rooth, 2006). On the other side, the bulk of the literature suggests that a crucial determinant of the explained wage differential is fluency in the local language. According to the estimates, the local language skills may explain between 10 and 30 percent of income differential (Leslie and Lindley, 2001; Chiswick and Miller, 2002; Rooth

and Saarela, 2007) and between 10 and 15 percentage points of employment rate differential (Rooth and Saarela, 2007). This is true in most of the advanced economies, including US, Canada (Chiswick and Miller, 2003; Boyd and Cao, 2009), Europe (Tubergen, Maas, and Flap, 2004; Adsera and Chiswick, 2007) and Australia. There is some evidence that language skills are more important at the upper end of the conditional income distribution (Chiswick, Le, and Miller, 2008).

However, studies devoted to the causal impact of language knowledge, give more ambiguous results (Leslie and Lindley, 2001; Bleakley and Chin, 2004; Chiswick, 2008). Even more, the causal link between language skills and labor market performance may go through different mechanisms. Knowledge of local language improves the chances of obtaining local education (Bleakley and Chin, 2004), provides better access to work-related information and access to more jobs (where the local language is required), access to wider social networks, and improves the productivity at jobs where language skills are used.

The bulk of the previous literature has been devoted to immigrants in the Western countries where they form a small, heterogenous, and relatively recent minority. The relationship between language skills and income reflects the difference between one's options in the "ethnic economy" where there is little need for the local language, and the "mainstream economy". The language skills coefficient in the income regression is related to productivity differences in the mainstream- and ethnic economy. We expect this to be more positive in the upper tail of the ability distribution given small ethnic economy cannot provide high-skill jobs. However, in a bilingual economy the picture may be different. If the "ethnic economy" provides jobs for the high-skilled workers as well, the language coefficient may not be positive at the upper end of the distribution. This may be the case when high-skilled workers face other obstacles besides of language of entering the mainstream economy, such as discrimination or lack of local social networks.

This paper focuses on a largely bilingual economy, Estonia, a former republic of the Soviet Union. The country borders Russia and hosts a large (about 30% of population) mostly Russian-speaking minority, which is fairly homogenous compared to Western immigrants. Unlike the case with other established minorities in Europe, individual bilingualism is not universal here. This creates largely parallel "Estonian-speaking" and "Russian-speaking" economies, both of which can easily absorb the skilled members of the corresponding population groups. The Russian minority is part of the former Russian majority in the USSR, and we can argue that both ethnic groups shared roughly the same skills, needed in business at that time.

Using the Labor Force Survey data we show that the relationship between skills of the official language, Estonian, and the minority income is strikingly different from what is previously found in the literature. Namely, Estonian skills are important at the low end of the income distribution, including for obtaining a job. However, for the high-end jobs, the relationship between language skills and income is non-existent, except if it is one of the domestic languages. This suggests that while the official language gives access to more jobs (because it is required in many situations), it does not help to advance on the income ladder. We argue that the underlying mechanisms are probably related to access to social networks, social integration, and co-worker discrimination. These obstacles may be caused by more subtle aspects of the language and broader cultural dif-

ferences. Based on our results, we discuss the importance of social integration of minorities in other economies, and the relationship between language training and discrimination. We conclude with respective policy implications.

This paper proceeds as follows: the next section provides a brief overview of languages and institutions in Estonia, Section 3 describes the Labor Force Survey data and the following section introduces the methodology. Section 5 presents the results. We test various alternative models and perform a number of robustness checks in the Secion 6. Section 7 discusses the findings and gives policy suggestions, and the last section concludes.

2 Background

This section briefly reviews the institutional background of Estonia, needed for understanding the situation of the majority and minority groups. A longer description is provided by Leping and Toomet (2008).

Before the Second World War, Estonia was ethnically relatively homogenous, populated mainly be ethnic Estonians. After the War, the country (then a Soviet Republic) became a destination of a substantial immigration, partially as a side effect of industrialization. This resulted the immigrant population reaching to about 40% by 1989, most of whom settled in the mineral-rich Nort-Eastern part of the country, and in the capital Tallinn. The large inflow of mainly Russian-speaking labor led to two *de facto* official languages by 1970s. Certain areas in the economic and public sphere, such as the army, railways and the merchant fleet were completely dominated by Russian-speaking workers, while the others, for instance agriculture, were dominated by ethnic Estonians. In those enterprises which were directly controlled from Moscow, Russian was the internal language. Both Estonian- and Russian-language media was widely followed, the colleges taught a large number of subjects in Russian and Estonian, and service sector was largely bilingual. However, the bilingualism was mainly one-sided as the bulk of Estonians spoke Russian, but not the way around, partly because of separate schools with Estonian and Russian as the instruction language. The widening use of Russian caused increasing concerns about the future of the Estonian people and the language. One particular outcome of these concerns was an unwillingness to participate in the mainstream Soviet society and in this way the country remained fairly segregated by ethnicity.

The tide turned during the last years of *perestroika*. The Estonian-speaking population became organized relatively quickly and grasped the upper hand in the newly independent country in 1991. Estonian was stated as the sole official language of the country, even more, according to the constitution, the main *reason d'être* of the Estonian State is to preserve and develop Estonian language and culture. Due to new roles of languages in the nation-state, the above-mentioned "one-sided bilingualism" slowly started turning around as the younger generation of ethnic Estonians are less and less fluent in Russian while the opposite is true for ethnic Russians. The country has retained segregated schools, divided according to the instruction language. In this way the country lacks one of the most important institutions to boost social ties in relatively early age. As a biproduct of the rapid integration to West, importance of English (and Finnish) language rose substantially.

The relationship between the two main ethnic groups has mostly been "nor-

mal" though somewhat tense in periods. Most notably, the tensions exploded to large-scale riots in Tallinn in spring 2007 due to relocation of a Soviet WWII monument. There is no direct evidence of ethnic discrimination, however, substantial income disparities arose (and still persist) about when the country gained it's independence (Leping and Toomet, 2008). A widespread dissatisfaction with the social and economic position has led many members of the Russian-speaking younger generation to emigrate (Aptekar, 2009).[1] In everyday life, both ethnic groups are largely living on their own with a limited contacts. The separate worlds are also reflected in media which may present quite different and occasionally antagonistic viewpoints depending on the language (Korts and Kõuts, 2002).

3 Data

3.1 Sample Selection and Variables

The study employs Estonian Labour Force Survey (LFS) which was first time conducted in 1995. Until year 1999 the survey provided an annual cross-section, later is was conducted as a rotating panel, conducted quarterly. The different waves include mostly similar information, although the details may vary. The number of distinct individuals is around 4000 annually, however, due to the rotating structure, we have about 16000 annual observations.

The current study is mostly based on LFS waves 2000-2009. This time period was mainly selected in order to use data, originating from a similarily sampled survey, and to avoid the turbulent 1990s when the country was under rapid transformation from communist to market economy. However, we also present a few long-run results where we include information back to 1989. The reader should keep in mind that while the pre-2000 waves include retrospective income, they do not include retrospective language skills. In this way the results before 1995 are partly based on extrapolation, assuming individual language skills did not vary before that date.

We limit ourselves to males in the primary working age, between 20 and 60 years old. The dataset allows us to control for standard personal characteristics and human capital variables, such as age, education and family status. Below, we discuss the most important variables of this study. The full set of explanatory variables is presented in the Table 7 in the Appendix A.

Information on ethnicity is based on a question about the respondents' *ethnic nationality*, which is present in all waves of the survey. In most cases, this means the individual ethnic identity. Usually, the identification is language based, although it may differ in certain circumstances, as for individuals born in multi-lingual families. This variable only allows us to distinguish between Estonian and non-Estonian workers. However, as most of those who are not ethnic Estonian use Russian as their first language, we denote them by "Russian" or "minority" below.

We use monthly salary at the main job as the income variable. The way this information is collected was changed several times during the 1990s, however, since 2000 the "last net salary at the main job" is reported. The other outcome

[1] This in many ways parallels to the developments in Quebec during and after the introduction of legislation, promoting the use of French language (Albouy, 2008).

variable, labor force status (either working, unemployed or inactive) is also provided in the survey.

The survey includes self-reported information on language skills. The respondents are asked about all the languages spoken. Distinction is made between domestic languages (one or more), and other languages. Unfortunately, for a number of years the domestic language is only reported as Estonian/non-Estonian, while more languages are distinguished otherwise (including Russian and English). However, as available data suggests, extremely low number of respondents speaks anything else than Estonian or Russian at home. Some guidance is provided for evaluating one's language skills. Namely, the survey reports whether the respondent is able to write and speak (coded as 3), speak (code 2), or only understand (code 1) the language. This coding is used in the results below. Hence the language data we have is more detailed and potentially less noisy than several popular datasets, including the US census.

We include a dummy for *immigrant status*, which we define as moving to the country at age 8 or above. Hence we call "immigrants" those individuals who started their schooling, one of the main stage of socialization, outside the country.

3.2 Descriptive Statistics

First, we report the development of unemployment rate and income since 1989 till 2009 for both ethnic groups (Figures 1 and 2).

As Figure 1 indicates, Russians have experienced higher unemployment rate since early stages of the economic transition. The differential has grown and shrinked along to the general unemployment. The average nominal salary has undergone a massive increase during the last decades (Figure 2). While the both ethnic groups started with relatively similar income, by 1995 the average income of ethnic Russians lagged behind that of ethnic Estonians. Later, the gap has fluctuated but never closed. Looking at the unconditional income distributions (Figure 3), we can see that Estonians have substantially more mass in the upper tail. The income disparities seem to be prevailingly glass-ceiling type of high-income feature.

Next, we discuss the most important variables and their relationship for both ethnic groups (Table 1). The full descriptive statistics is provided in Table 8 in Appendix A.

In terms of the labor force status the non-Estonian minority is characterised by slightly lower employment rates, but lower inactivity and inclination towards higher unemployment.

The rest of the descriptive statistics is presented only for the economically active population. We may observe that there are no substantial differences in individual characteristics across these ethnic groups. The education attainment has historically been somewhat different among Estonians and Russians. The Russians have had higher proportion of males with secondary education, Estonians with primary education, while the share of males with tertiary education has been essentially the same. However, we can see a clear convergence in terms of educational background.

The share of non-Estonians that have immigrated at the working or schooling age has substantially diminished over the last 10 years. The immigration

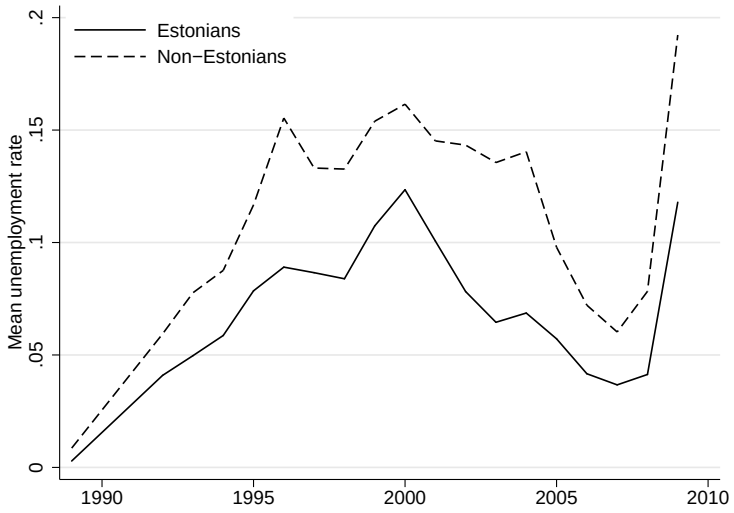

Figure 1: Unemployment rate for ethnic Estonian and Russian males 1989-2009.

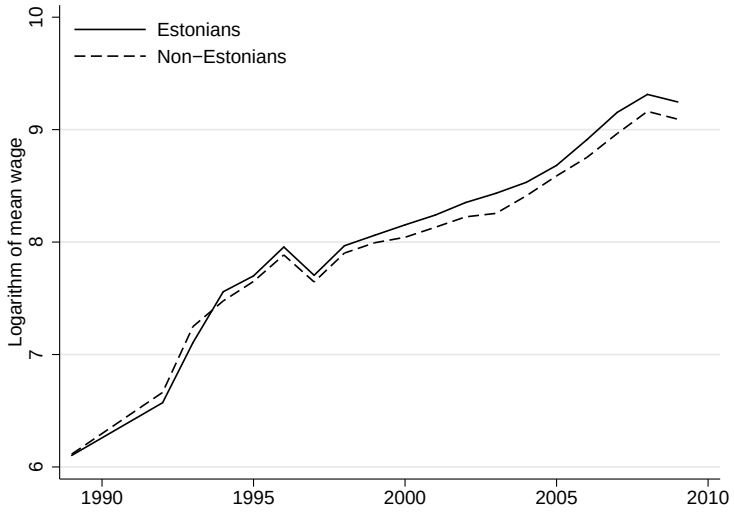

Figure 2: Average salary for ethnic Estonian and Russian males 1989-2009. The dip at about 1996 is related to the survey starting to reporting net salary instead of gross salary.

from other regions of Soviet Union practically ceased around 1990 and earlier immigrants are gradually retiring from the labor market. The segregation of non-Estonians in terms of the residence county is high, one third of non-Estonians are living in the industrial North-East where the share of Estonians is only 15%. The largest population of non-Estonians is living in the capital region where the share of these ethnic groups is almost equal.

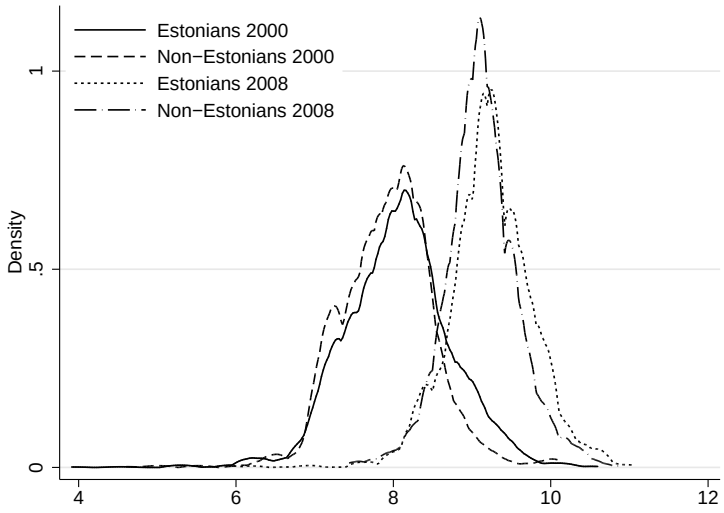

Figure 3: Distribution of (log) wage for Estonian and Russian males, 2000 and 2009.

The descriptive statistics indicate that ability to use Estonian language has improved substantially among the minority. Slightly more than half of non-Estonians had some knowledge of the language in 2000, by 2009 this proportion had increased to about two third. The English language skills have improved as well, although minority skills are lagging behind to those of the majority. Only about 2% of ethnic Estonians do not use Estonian as a domestic language, while up to 10% of non-Estonians speak Estonian at home. Such an inclination towards titular language derives probably from practical considerations, such as to extend the options available for children.

The employer characteristics provide more variable patterns across ethnicity. The Estonians are inclined to work in agriculture, public administration and trade; the non-Estonians in mining, manufacturing and transport. There is some tendency for convergence in employment structure across industries, but the variations are present during all the analysed period, possibly partly due to regional settlement pattern. The occupational structure provides another variability over ethnicities. While Estonians are more present among managerial, professional and agricultural occupations; there is much more Russians in craft and related trade occupations.

The employement structure across industries explains also the employment of non-Estonians in larger enterprises. The non-Estonians are slightly more often employed in foreign-owned firms and less often in government sector. The longer job tenure of non-Estonians has decreased to the level of Estonians. There is some evidence of higher enterpreneurship among Estonians. Estonians seem to be increasingly relying on social networks for acquiring jobs and have surpassed the traditionally high indicator for Russians. This may be related to business cycle.

	Estonians			Non-Estonians		
	2000	2005	2009	2000	2005	2009
Workforce status (all males 20-60 years old)						
Inactive	0,14	0,17	0,14	0,11	0,14	0,12
Individual characteristics (only employed males)						
College degree	0,15	0,19	0,20	0,13	0,20	0,19
married	0,70	0,68	0,64	0,75	0,71	0,59
Immigrant	0,01	0,01	0,00	0,35	0,25	0,20
kids	0,24	0,22	0,27	0,20	0,21	0,21
Capital region	0,33	0,37	0,33	0,50	0,52	0,59
North-East	0,03	0,03	0,03	0,33	0,34	0,30
Home language Esonian	0,98	0,97	0,98	0,10	0,06	0,08
Estonian, skill level 1	0,01	0,01	0,01	0,11	0,20	0,23
Estonian, skill level 2	0,00	0,01	0,00	0,18	0,14	0,17
Estonian, skill level 3	0,00	0,00	0,00	0,17	0,23	0,20
English, average skill level	1,75	2,19	2,45	1,37	1,62	1,89
Experience in company	5,06	5,37	5,38	6,22	5,63	5,38
networks	0,29	0,35	0,49	0,38	0,49	0,43
Manufacturing	0,21	0,22	0,20	0,28	0,27	0,26
electricity	0,02	0,02	0,02	0,06	0,04	0,03
Construction	0,12	0,15	0,20	0,13	0,16	0,18
trade	0,14	0,12	0,12	0,09	0,09	0,10
transport	0,11	0,11	0,12	0,22	0,19	0,16
real estate	0,07	0,09	0,09	0,06	0,07	0,08
Public admin	0,07	0,08	0,07	0,03	0,03	0,02
Education	0,02	0,03	0,05	0,02	0,01	0,02
# employees	2,67	2,77	2,90	3,86	3,44	3,49

Table 1: Averages of selected explanatory variables

4 Methodology

We follow a simple empirical strategy, estimating the labor market outcomes for the Russian minority as a function of the language skills and other workplace and human capital specific variables of individual i:

$$\log w_{it} = \boldsymbol{\alpha}' \boldsymbol{X}_{it} + \boldsymbol{\beta}' \boldsymbol{L}_{it} + \eta_i + \varepsilon_{it}. \tag{1}$$

Here $\boldsymbol{L}$ is a set of language skill descriptors, $\boldsymbol{X}$ the other individual and job-specific characteristics, η_i individual-specific effect, and ε_{it} is the idiosyncratic error term. For unemployment analysis, we provide similar calculations using probit model.

Additional evidence on the impact of covariates at different part of conditinal wage distribution can be obtained by quantile regression Koenker and Bassett (1978). Here we estimate the conditional quantile of the wage distribution, using a model, similar to 1:

$$Q_\vartheta(\log w|t, \boldsymbol{X}, \boldsymbol{L}) = \boldsymbol{\alpha}' \boldsymbol{X} + \boldsymbol{\beta}' \boldsymbol{L}, \tag{2}$$

where $Q_\vartheta(\log w|\cdot)$ is the ϑ-s quantile of the distribution of $\log w$, conditional on

covariates. The panel structure of our data can be handled by bootstrapping the standard errors (to be done!....).

Although our main focus in on the returns to language skills, we get additional evidence by performing Oaxaca-Blinder type of decomposition (Oaxaca, 1973; Blinder, 1973). We mostly follow the standard procedure. However, as the skills of Estonian language is virtually universal among ethnic Estonians (and Russian among ethnic Russians), we cannot obtain a meaningful estimate for returns to these skill for the respective ethnic groups. Hence, we choose to decompose the gap between ethnic Estonians who are fluent in Russian, and ethnic Russians who are fluent in Estonian. This is achieved by setting the corresponding language skill dummies to unity and the others to zero. Note that we still use the model, estimated on the full sample.

We also perform the decomposition on the conditional quantiles of the wage distribution, employing the methodology by Machado and Mata (2005). Here we choose to estimate the model to be deomposed on the restricted sample only.

5 Results

5.1 A longitudinal view

First, let us first look at the long-run relationship between the language skills and income (parameter α in (1)). The first plot (Figure 4) depicts the coefficient in the unemployment regression (negative value means language skills are related to lower unemployment). We present both coefficient of Estonian skills for ethnic Russians (circles) and those of Russian skills for ethnic Estonians (triangles) for 1989-2009 period. The result is not surprising: better command of the local language is related to lower unemployment. Better command of the minority language is virtually insignificant.

The next figure, Figure 5, plots analogous estimates for the income regression (positive values mean better language command is associated to higher income). The message is completely different: fluency in the official language helps to explain little of the minority income, while command of Russian language is related to sizable (between 5 and 10%) wage premium for ethnic Estonians.

Together, both figures suggest that fluency in the official language has a positive impact on workers with unstable employment record (presumably low-skilled ones) while the impact is limited for those who are seldom unemployed.

5.2 Estimates

In this section we look at the associationship between language skills and labor market outcomes both in average (by OLS) and across different income quantiles of conditional income distribution. We analyse years 2000-2009 and focus on the relationship between skills of Estonian language and income for the ethnic minority. The extensions and robustness checks are provided below in Section 6. Here we only report the relevant language-related coefficients, all results are given in Appendix B. We estimate 5 different specifications incorporating different sets of explanatory variables (Table 2). All specifications include individual random effects.

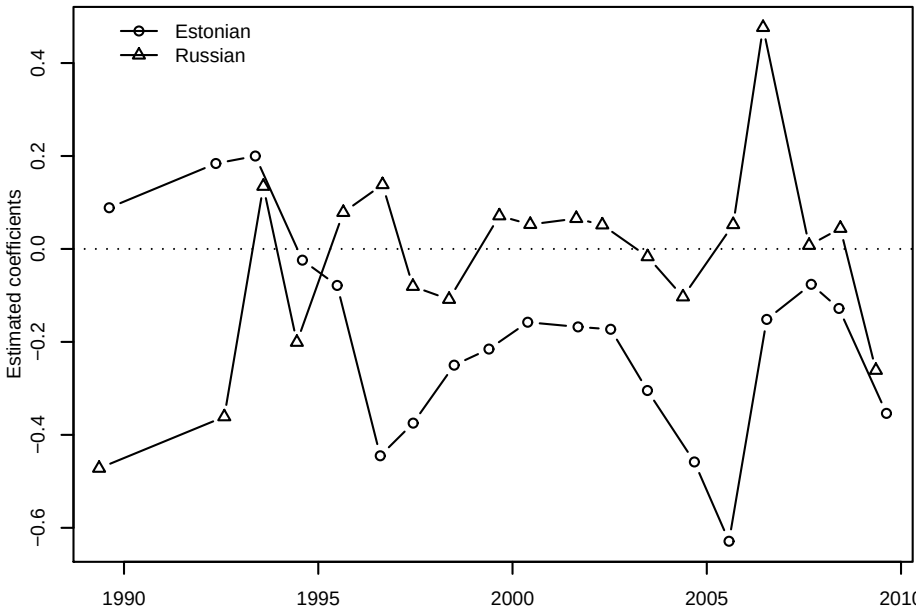

Figure 4: Estimated coefficients for Estonian and Russian language profficiency in the unemployment regression.

Figure 5: Estimated coefficients for Estonian and Russian language profficiency in the wage regression.

The first model, which only includes year dummies but no other controls,

	1	2	3	4	5
Estonianhome	0.100**	0.100**	0.075*	0.085**	0.084**
	0.038	*0.036*	*0.041*	*0.035*	*0.032*
Estonian1	0.090**	0.080**	0.050**	0.033	0.027
	0.026	*0.025*	*0.025*	*0.024*	*0.023*
Estonian2	0.064**	0.066**	0.018	0.007	-0.004
	0.025	*0.025*	*0.027*	*0.026*	*0.024*
Estonian3	0.059*	0.056*	0.005	0.017	0.010
	0.031	*0.031*	*0.033*	*0.031*	*0.030*
year dummies	√	√	√	√	√
indiv. characteristics		√	√	√	√
region			√	√	√
industry, occupation				√	√
job characteristics					√

Table 2: Results for language parameters in OLS models

shows a mild positive relationship between the Estonian skills and income. However, most of the relationship is explained away by individual, and especially regional controls. After including the regional controls, the Estonian skills are related to even lower wage premium than Chiswick and Miller (2007) find for overeducation in English in US. The only clear exception is using Estonian as a domestic language, that parameter is virtually unchanged across different sets of explanatory variables. Including industry, occupation, and other job-specific variables further decreases the estimates, suggesting that part of the language skill premium is originating from better jobs. However, most of the differences between models are not statistically significant. Under all specifications, the skill premiums are substantially lower than is typically found in the literature.

Next, we look at the impact for different quantiles (Table 5.2). We use the specification of the model 3 and present the results for the conditional income quantiles 0.1, 0.2, median, 0.8 and 0.9. We see a few sizable positive estimates for the lowermost quantiles, at and above the median the coefficients are small and mostly insignificant. Although a little noisy, the general pattern suggests that Estonian language only matters at the low end of the income distribution. The only exception to this rule is speaking Estonian as a domestic language, which has positive impact at the high end as well.

We see that the quantile regression confirms the earlier impression from long-run graphs. Skills of Estonian language are more important at the low end of the income spectrum.

6 Extensions and Robustness Analysis

6.1 Other languages

These results may be criticized because the language skills may be measured with large error, which potentially may bias our results toward zero. Although we argue that the LFS measure, based on the distinct abilities (understanding, reading, and writing), is better than self-evaluation without any guidance (for instance, US census reports the levels "very well", "well", "not well", and "not at

Table 3: Estimated parameters for years 2000–2009. Standard errors in italics.

	$q = 0.1$	$q = 0.2$	$q = 0.5$	$q = 0.9$	$q = 0.95$
			full sample		
Estonianhome	0.131***	0.025	0.026	0.041*	0.053*
	(0.032)	(0.028)	(0.019)	(0.022)	(0.030)
Estonian1	0.080***	0.055***	0.032**	0.025	0.021
	(0.023)	(0.021)	(0.014)	(0.016)	(0.022)
Estonian2	0.095***	0.043*	-0.002	-0.067***	-0.047*
	(0.025)	(0.023)	(0.016)	(0.018)	(0.024)
Estonian3	0.013	0.028	0.032*	-0.033*	-0.040
	(0.027)	(0.024)	(0.017)	(0.020)	(0.027)

all"), self-reported skills include a large degree of subjectivity (for some evidence, see Bleakley and Chin, 2004). In this section, we perform a similar analysis, focusing on the impact of skills of Russian (for ethnic Estonians) and English language (for ethnic Russians).

The results are given in Table 4. Skills of these languages are consistently related to higher income. Even more, in most cases better language skills ("1" being the best) are related to higher salary than worse skills. We can also see that English is clearly more strongly related to income at the upper income quantiles while the relationship is mostly flat for Russian. These outcomes correspond well to the literature (Uusitalo, 2010) and strongly suggest that language information in the survey is not too noisy.

	OLS	$q = 0.2$	$q = 0.5$	$q = 0.8$	$q = 0.9$
			English (ethnic Russians)		
English1	0.040	-0.017	0.049***	0.076***	0.124***
	(0.029)	(0.036)	(0.018)	(0.020)	(0.028)
English2	0.115***	0.014	0.035*	0.149***	0.145***
	(0.031)	(0.039)	(0.019)	(0.022)	(0.030)
English3	0.146***	0.008	0.119***	0.233***	0.237***
	(0.036)	(0.045)	(0.022)	(0.025)	(0.034)
			Russian (ethnic Estonians)		
RussianHome	0.003	-0.011	-0.020	0.008	-0.002
	(0.035)	(0.029)	(0.024)	(0.028)	(0.043)
Russian1	0.023	0.037*	0.016	0.014	0.024
	(0.027)	(0.021)	(0.017)	(0.020)	(0.030)
Russian2	0.061**	0.070***	0.047***	0.060***	0.061**
	(0.024)	(0.018)	(0.015)	(0.017)	(0.026)
Russian3	0.085***	0.098***	0.090***	0.093***	0.096***
	(0.024)	(0.018)	(0.015)	(0.017)	(0.026)

Table 4: Estimated parameters for years 2000–2009. Standard errors in italics.

All these results are in striking contrast to the results for the Estonian language, reported in the Table 5.2 above. One may argue that as there are very

few native English speakers in Estonia, everyone is evaluating English skills in a similar way. In contrast, as Estonian has never been an international language, one may suspect that native speakers and others may have quite different opinion about what it means to be fluent (Russian is somewhat in between these two extremes). However, the differences in estimating one's English and Estonian skills should probably be rather large for explaining the outcome above, and can only sustain in case of low level of communication between the respective ethnic groups.

6.2 Regional Differences

There previous research also suggests that local language is an equally necessary asset in both majority and minority language concentration areas (Chiswick and Miller, 2002). In this section we employ the unequal distribution of minority population. In terms of the percentage of the ethnic Russian population, the country can roughly partitioned into three regions:

- The capital Tallinn and surrounding area (capital area). This is the region with most vibrant economy, dominated by services and manufacturing. Here are located most of the national headquarters and national public sector institutions. The average salary has traditionally been up to 30% higher than in the rest of the country while the unemployment has been below the average.

  The capital area is essentially bilingual, as the ethnic Russian population makes close to 50% of the population. However, due to large concentration of government institutions, the formal requirements for working knowledge of Estonian may be important as well.

- The North-East has traditionally been dominated by big mineral extraction, processing and energy plants. These industries suffered a lot during the restructuring, following the collapse of the Communist system. The unemployment has been high and development of small enterprises slow ever since.

  The dominating language in that region is Russian as the ethnic Russian population makes about 80% of the population. In everyday life, there is little need for the official language, Estonian. However, in public sector the language is still necessary because of the formal requirements, as well as because of need to communicatin with the Estonian-speaking parts of the country.

- The rest of the country has diverse industrial structure, ranging from education and manufacturing to agriculture and wood processing. As ethnic Russians form a minority of about 10%, Estonian is clearly the most important language in these areas.

We perform similar analysis as above for all three partitions. The results are given in Table 5.

The capital area shows results, quite similar the those for the whole country. Namely, Estonian as a domestic language is rewarded across most of the income spectrum, slightly more for the upper qunatiles. However, as a second language it only matters at the lower end of the wage distribution. Although more noisy,

the results for the North-East are not too different. However, in the rest of the country, domestic bilingualism seems to be of no value. As a surprise, Estonian as a secondary language seems to be even related to lower income than otherwise. This is probably related to endogenous mobility.

	OLS	$q = 0.1$	$q = 0.5$	$q = 0.9$	$q = 0.95$
			Capital Area		
Estonianhome	0.139***	0.094*	0.088.	0.212**	0.249***
	0.039	*0.045*	*0.046*	*0.068*	*0.069*
Estonian1	0.035	0.120**	0.024	-0.011	-0.066*
	0.027	*0.044*	*0.022*	*0.025*	*0.032*
Estonian2	0.044.	0.141***	0.015	-0.044.	-0.077*
	0.025	*0.039*	*0.020*	*0.022*	*0.032*
Estonian3	0.070**	0.136*	0.033	0.065*	0.047
	0.025	*0.056*	*0.022*	*0.029*	*0.034*
			North-East		
Estonianhome	0.086.	0.175**	0.098.	0.066	0.300*
	0.050	*0.059*	*0.050*	*0.123*	*0.134*
Estonian1	0.116***	0.090	0.137***	-0.006	0.037
	0.035	*0.084*	*0.035*	*0.049*	*0.081*
Estonian2	-0.000	0.129***	-0.022	-0.065.	-0.068
	0.030	*0.035*	*0.038*	*0.037*	*0.053*
Estonian3	0.048*	0.066*	0.063**	0.035	0.090*
	0.021	*0.031*	*0.024*	*0.037*	*0.043*
			Rest of the Country		
Estonianhome	-0.059	-0.058	-0.062	0.002	-0.023
	0.036	*0.064*	*0.039*	*0.047*	*0.054*
Estonian1	-0.144***	-0.232**	-0.080.	-0.114**	-0.159***
	0.041	*0.081*	*0.046*	*0.043*	*0.045*
Estonian2	-0.105**	-0.060	-0.075.	-0.140**	-0.073
	0.041	*0.077*	*0.041*	*0.046*	*0.061*
Estonian3	-0.045	-0.076	-0.030	-0.012	-0.032
	0.044	*0.086*	*0.043*	*0.055*	*0.062*

Table 5: Estimated language parameters for years 2000–2009. Standard errors in italics. Individuals living in the capital area.

In conclusion, in none of these three different areas could we identify any important assotiationship between Estonian as a second language, and icome.

6.3 Income decomposition

Here we present the decomposition results for ethnic Estonians and Russians for different subgroups.

First, we look at those who report being able to write Estonian (ethnic Russians) or Russian (ethnic Estonians). Table 6 ...

	2005-7		2000-		domestic language	
quantile	effect	stde	effect	stde	effect	stde
0.1	-0.000	0.038	-0.092		-0.069	
0.2	0.020	0.042	-0.113		-0.032	
0.3	-0.000	0.044	-0.135		-0.001	
0.4	-0.095	0.029	-0.155		0.026	
0.5	-0.108	0.032	-0.172		0.051	
0.6	-0.118	0.041	-0.202		0.067	
0.7	-0.194	0.036	-0.254		0.057	
0.8	-0.203	0.038	-0.309		0.064	
0.9	-0.403	0.046	-0.394		0.086	
# obs E	3122		9862		351	
R	488		1330		834	
year dummies						
language skills	√		√			
indiv. characteristics			√			
region			√			
industry, occupation						
job characteristics						

Table 6: Income decomposition analysis

7 Discussion and Policy Implications

We have shown that the skills of Estonian, the sole official language of the country, are not related to income premium for the male minority workers besides the low end of the income distribution. Below, we argue that the most suitable explanation for this result is (lack of) social integration, as opposed to structural integration in terms of education and labor market position (Snel, Engbersen, and Leerkes, 2006).

First, we have seen, that Estonian skills are only weakly related to income, mainly at the lower end of the income distribution. This is in a striking contrast with the outcome for Russian, and especially for English language. This fact strongly suggests that the lack of fluency in the official language is not the main reason behind the ethnic income disparities. Although the skills premium is quite different than what is typically found in the literature, the residual income gap after controlling for language skills (about 10-15%) is not.

Second, it is often found that foreign human capital is less valued on the labor market (Friedberg, 2000). However, we cannot talk about "foreign" human capital in case of a former Sovier republic. All the Russian-speaking immigrants have educational background (originating from the same Soviet education system) similar to same-aged members of the Estonian community. There is no evidence of immigrants being worse adapt to the Estonian economy in 1980s. Rather, the disparities arose because Russians were unable to keep pace with the development in the early 1990s, either on political or economic reasons. This indicates that lack of intergroup social contact may have been an issue. It is also confirmed by the fact that immigrant Russians have no lower income, and hence immigrants are no worse equipped for the labor market.

Third, Estonian as a domestic language has positive and significant impact

on the minority income. Speaking Estonian at home is in most cases related to interethnic marriages. Mixed families are much better equipped for integration to the mainstream economy as the access to information, networks and learning about more subtle aspects of culture are easily available.

Fourth, there is independent evidence that minority labor market disparities are related to social network integration (Toomet, van der Leij, and Rolfe, 2009).

Unfortunately we cannot directly analyse workplace segregation at plant level in our data. However, evidence from the literature suggests that such a segregation is widespread elsewhere (Åslund and Skans, 2005).

What are the mechanisms behind the observed pattern of language coefficients and ethnic disparities?

The first possible mechanism is co-worker discrimination on promotion and hiring at the upper occupational level. In Estonian media, language skills are often reported as the main obstacle for hiring Russians. However, the results above indicate that the reason may rather be more subtle aspects of culture, such as political views or (lack of) common cultural bacground. Underlying probles may be similar to unfavorable treatments of other minorities, which are fluent in the local language, such as blacks in the US (Bertrand and Mullainathan, 2004) or Latin-American immigrants in Spain (Bosch, Carnero, and Farré, 2010). Individuals originating from inter-ethnic families seem to (at least partially) have overcome this obstacle. It is also possible that avoidance of Russians in the white-collar jobs is not related to preferences but productivity. However, if the Russians poorly fit to the Estonian-speaking office, it is also an indicator of (missing) social integration.

The result also indicates that Estonian skills are neither tightly related to general ability. In Chiswick (2009) model, this outcome can be explained if for high-skilled jobs, ethnic Estonian and "mainstream" skills are virtually interchangeable and different from those of the Russian minority. This puts the minority group in a disadvantaged position, if it's cultural background is sufficiently different from the that of the majority one.

There is some evidence that hostility toward the minority group harms the mental health and productivity of the members (Jasinskaja-Lahti, Liebkind, Jaakkola, and Reuter, 2006; Hurtado, Han, Sáenz, Espinosa, Cabrera, and Cerna, 2007) while contact theory predicts that inter-group social contacts breeds more positive attitudes (Semyonov and Glikman, 2009). These results suggests another potential link, and idicate that lack of social contacts is more important at the upper end of skill distribution.

The results also (weakly) suggest that while competencies for integration (in terms of language, education) are there, the opportunities are not. This may be related to taste-based discrimination by the majority group. However, there is also some evidence that because of perceived discrimination, the members of the minority community are not willing to participate in the mainstream society. Evidence from Quebec indicates that compulsory French training may be perceived as a hindrance and not as an advantage by the immigrants (Allen, 2006).

Our results have important policy implications. Although the current study analyses a small bilingual economy after enormous economic and political changes, there is little doubt that social integration plays a role elsewhere as well.

Perhaps the easiest step, a policymaker can do, is to identify the institutions which support social integration. The results above suggest that workplace, it means to have a job, only brings limited benefits here. Hence, in the light of current results, labor market integration of immigrants still leaves an important gap between the population groups.

Unfortunately we cannot give recommendation for supporting the institutions we do not know what they are. However, anecdotal evidence suggests that compulsory military service and boarding schools may be of help. At the opposite end, one may suspect the segregated schooling system plays a role. Evidence from Sweden indicates that later entry to the host country leads to substantially lower degeree of social integration (Åslund, Böhlmark, and Skans, 2009), and segregated schools can to a certain extent be viewed as postponing "entry" to the country.

Second, as the different political views may be a hurdle to integration, the policymakers should be careful here and perhaps focus more on inclusinve issues (Chiswick, 2009).

8 Conclusions

We analyse the income and employment effect of the official language skills for the ethnic minority men in Estonia. We show that the skills of Estonian (the official language) are only weakly associated to income premium. In particular, all the corresponding regression coefficients are small on largely insignificant. A clearly different case is speaking the language domestically. The long-period analysis suggests that the picture has been roughly similar since 1995. The results for unemployment show a different picture, better Estonian skills are clearly associated to lower unemployment.

Quantile regression analysis indicates that Estonian language matters mostly at the low end of the income distribution, reconciliating in this way the opposite outcomes for income and unemployment. However, fluency in English is more important for high-income men, and Russian language (for ethnic Estonians) is associate with positive wage premium over most of the conditional distribution. These results point toward importance of social networks and deeper cultural knowledge for immigrants. The possible mechanism may work through discrimination in promotion and hiring at high-end jobs. We also provide a number of policy recommendations.

An extremely important direction for future research is analysing the institutions behind the social integration. Unfortunately, data availability is a major obstacle here, as we are aware of no data source where there is any information about when and in which situation friendship ties are formed. Commonly available data also includes little information about inter-ethnic contacts. The results also indicate that more should be done analysing segregation at workplace level, and that high-skilled immigrants may be subject to integration problems as well.

A Full Data Description

Table 8: Complete descriptive statistics

	Estonians			Non-Estonians		
	2000	2005	2009	2000	2005	2009
Workforce status (all males 20-60 years old)						
Employed	0,74	0,78	0,75	0,74	0,75	0,69
Unemployed	0,12	0,06	0,11	0,15	0,10	0,19
Inactive	0,14	0,17	0,14	0,11	0,14	0,12
Language skills (only economically active 20-60 years old males)						
EsonianHome	0,98	0,97	0,98	0,10	0,06	0,08
Estonian1	0,00	0,00	0,00	0,17	0,23	0,20
Estonian2	0,00	0,01	0,00	0,18	0,14	0,17
Estonian3	0,01	0,01	0,01	0,11	0,20	0,23
English1	0,13	0,15	0,14	0,06	0,10	0,08
English2	0,14	0,20	0,23	0,06	0,09	0,11
English3	0,12	0,22	0,28	0,06	0,11	0,20
Individual characteristics (only economically active 20-60 years old males)						
Age1	0,10	0,09	0,08	0,09	0,08	0,11
Age2	0,31	0,29	0,30	0,26	0,27	0,26
Age3	0,38	0,40	0,41	0,46	0,44	0,36
Age4	0,20	0,19	0,19	0,18	0,20	0,24
EduPrimary	0,26	0,20	0,20	0,17	0,17	0,22
EduSecondary	0,59	0,61	0,60	0,70	0,63	0,59
EduTertiary	0,15	0,19	0,20	0,13	0,20	0,19
Immigrant	0,01	0,01	0,00	0,35	0,25	0,20
Married	0,70	0,68	0,64	0,75	0,71	0,59
Kids	0,24	0,22	0,27	0,20	0,21	0,21
Geographical location (only economically active 20-60 years old males)						
LocCapital	0,33	0,37	0,33	0,50	0,52	0,59
LocNorthEast	0,03	0,03	0,03	0,33	0,34	0,30
LocSouthEast	0,13	0,14	0,15	0,06	0,05	0,03
Industry and occupation (20-60 years old males)						
IndustryA	0,13	0,09	0,07	0,02	0,01	0,02
IndustryB	0,01	0,01	0,00	0,02	0,01	0,01
IndustryC	0,01	0,01	0,01	0,05	0,04	0,04
IndustryD	0,21	0,22	0,20	0,28	0,27	0,26
IndustryE	0,02	0,02	0,02	0,06	0,04	0,03
IndustryF	0,12	0,15	0,20	0,13	0,16	0,18
IndustryG	0,14	0,12	0,12	0,09	0,09	0,10
IndustryH	0,02	0,01	0,02	0,01	0,02	0,02
IndustryI	0,11	0,11	0,12	0,22	0,19	0,16
IndustryJ	0,02	0,01	0,01	0,01	0,00	0,01
IndustryK	0,07	0,09	0,09	0,06	0,07	0,08
IndustryL	0,07	0,08	0,07	0,03	0,03	0,02
IndustryM	0,02	0,03	0,05	0,02	0,01	0,02
IndustryN	0,01	0,01	0,01	0,01	0,02	0,01

Table 8 – continues...

Table 8 – continued

	2000	2005	2009	2000	2005	2009
IndustryO	0,04	0,03	0,03	0,01	0,02	0,03
Occupation0	0,01	0,02	0,01	0,00	0,01	0,00
Occupation1	0,18	0,18	0,19	0,11	0,13	0,10
Occupation2	0,08	0,11	0,11	0,05	0,06	0,09
Occupation3	0,09	0,08	0,09	0,09	0,06	0,07
Occupation4	0,02	0,02	0,03	0,02	0,05	0,01
Occupation5	0,06	0,05	0,05	0,04	0,06	0,06
Occupation6	0,06	0,04	0,02	0,01	0,01	0,00
Occupation7	0,22	0,24	0,23	0,34	0,32	0,37
Occupation8	0,20	0,19	0,22	0,24	0,22	0,21
Occupation9	0,07	0,07	0,05	0,09	0,08	0,07
Job and workplace characteristics (20-60 years old males)						
Networks	0,29	0,35	0,49	0,38	0,49	0,43
Entrepreneur	0,14	0,06	0,06	0,04	0,03	0,05
Tenure	5,06	5,37	5,38	6,22	5,63	5,38
PartTime	0,05	0,05	0,06	0,04	0,02	0,06
FirmSize1	0,34	0,30	0,28	0,18	0,21	0,19
FirmSize2	0,51	0,54	0,54	0,45	0,51	0,51
FirmSize3	0,15	0,16	0,18	0,37	0,27	0,28
Government	0,19	0,16	0,16	0,25	0,15	0,14
PrivateEst	0,70	0,69	0,61	0,64	0,68	0,61
PrivateFor	0,10	0,14	0,22	0,10	0,16	0,24

Table 7: Description of the variables

	Language skills
Estonian, English	language skills: 1, understanding; 2, speaking; 3, speaking and writing; *Home*, one of the domestic languages
	Individual characteristics
Age	age groups: 1, less than 25; 2, 25-34; 3, 35-49; 4, 50 or more
Edu	Education: *Primary*, less than high-school, *Secondary*, high-school; *Tertiary*, college degree
Immigrant	immigrated after age 7
Married	married or co-habitating
Kids	presence of children below age 17 in the household
	Region of residence
Loc	*Capital* : capital region; *NorthEast* : residence in industrial Northern-East; *SouthEast* : residence in second largest city region
	Job-specific information
Industry	A : agriculture, hunting and forestry; B : fishing; C : mining and quarrying; D : manufacturing; E : electricity, gas and water suppl; F : construction; G : wholesale and retail trade; repair of motor vehicles, Motorcycles and personal and household goods; H : hotels and restaurants; I : transport, storage and communication; J : Financial intermediation; K : real estate, renting and business activities; L : public administration and defence; compulsory social security; M : education; N : health and social work; O : other community, social and personal service activities;
Occupation	*0* : armed forces; *1* : legislators, senior officials and managers; *2* : professionals; *3* : technicians and associate professionals; *4* : clerks; *5* : service workers and shop and market sales workers; *6* : skilled agricultural and fishery workers; *7* : craft and related trade workers; *8* : plant and machine operators and assemblers; *9* : elementary occupations;
Networks	Found job by relatives or friends
Entrepreneur	Found job by starting own business/farm
Tenure	experience in company, in years
Tenure2	Tenure squared
PartTime	Working part-time, less than 35 hours per week (conventionally 40 hours)
FirmSize1	1-10 employees at the firm
FirmSize2	11-99 employees at the firm
FirmSize3	100 and more employees at the firm
Government	employed by central or local government
PrivateEst	employed by Estonian private firm
PrivateFor	employed by foreign private firm

B Full Model Coefficients

Table 9: Estimated parameters for years 2000–2009. OLS.

	Model				
	1	2	3	4	5
Year01	0.144***	0.147***	0.137***	0.159***	0.171***
	(0.032)	(0.031)	(0.031)	(0.029)	(0.026)
Year02	0.180***	0.182***	0.172***	0.202***	0.189***
	(0.042)	(0.042)	(0.041)	(0.039)	(0.037)
Year03	0.256***	0.267***	0.263***	0.288***	0.281***
	(0.034)	(0.033)	(0.033)	(0.031)	(0.029)
Year04	0.410***	0.418***	0.417***	0.431***	0.430***
	(0.036)	(0.035)	(0.034)	(0.031)	(0.030)
Year05	0.584***	0.587***	0.588***	0.602***	0.578***
	(0.034)	(0.033)	(0.033)	(0.030)	(0.030)
Year06	0.733***	0.747***	0.748***	0.762***	0.733***
	(0.032)	(0.032)	(0.031)	(0.028)	(0.027)
Year07	0.954***	0.976***	0.973***	0.978***	0.942***
	(0.031)	(0.032)	(0.032)	(0.029)	(0.028)
Year08	1.147***	1.166***	1.162***	1.175***	1.136***
	(0.032)	(0.032)	(0.032)	(0.029)	(0.028)
Year09	1.028***	1.065***	1.063***	1.082***	1.071***
	(0.042)	(0.039)	(0.039)	(0.035)	(0.035)
Estonianhome	0.100***	0.100***	0.075*	0.085**	0.084***
	(0.038)	(0.036)	(0.041)	(0.035)	(0.032)
Estonian1	0.090***	0.080***	0.050**	0.033	0.027
	(0.026)	(0.025)	(0.025)	(0.024)	(0.023)
Estonian2	0.064**	0.066***	0.018	0.007	-0.004
	(0.025)	(0.025)	(0.027)	(0.026)	(0.024)
Estonian3	0.059*	0.056*	0.005	0.017	-0.010
	(0.031)	(0.031)	(0.033)	(0.031)	(0.030)
English1	0.084**	0.061*	0.040	0.046	0.045
	(0.036)	(0.036)	(0.036)	(0.032)	(0.030)
English2	0.169***	0.150***	0.115***	0.071**	0.068**
	(0.038)	(0.039)	(0.039)	(0.033)	(0.031)
English3	0.263***	0.193***	0.146***	0.106**	0.112***
	(0.046)	(0.045)	(0.045)	(0.042)	(0.042)
Age1		-0.158***	-0.150***	-0.103***	-0.029
		(0.036)	(0.036)	(0.033)	(0.032)
Age2		-0.021	-0.017	-0.004	0.010
		(0.024)	(0.024)	(0.022)	(0.022)
Age4		-0.094***	-0.095***	-0.088***	-0.081***
		(0.025)	(0.025)	(0.022)	(0.022)
EduPrimary		-0.095***	-0.113***	-0.087***	-0.077***
		(0.026)	(0.026)	(0.024)	(0.023)
EduTertiary		0.174***	0.190***	0.097***	0.090***
		(0.030)	(0.030)	(0.029)	(0.029)

Table 9 – continues...

Table 9 – continued

	1	2	3	4	5
Immigrant		0.001	-0.020	-0.013	-0.024
		(0.022)	(0.022)	(0.020)	(0.019)
Married		0.133***	0.139***	0.103***	0.097***
		(0.024)	(0.024)	(0.021)	(0.021)
Kids		0.017	0.013	0.007	0.015
		(0.019)	(0.019)	(0.017)	(0.016)
LocCapital			0.061**	0.065**	0.065***
			(0.028)	(0.025)	(0.023)
LocNorthEast			-0.088***	-0.121***	-0.178***
			(0.029)	(0.027)	(0.025)
LocSouthEast			-0.164***	-0.162***	-0.176***
			(0.046)	(0.043)	(0.036)
IndustryA				-0.720**	1.669***
				(0.298)	(0.348)
IndustryB				-0.290	2.018***
				(0.318)	(0.369)
IndustryC				-0.185	2.053***
				(0.285)	(0.342)
IndustryD				-0.479*	1.772***
				(0.284)	(0.341)
IndustryE				-0.364	1.880***
				(0.285)	(0.341)
IndustryF				-0.413	1.921***
				(0.285)	(0.342)
IndustryG				-0.641**	1.768***
				(0.286)	(0.342)
IndustryH				-0.654**	1.776***
				(0.294)	(0.348)
IndustryI				-0.404	1.860***
				(0.284)	(0.341)
IndustryJ				0.000	2.249***
				(0.000)	(0.444)
IndustryK				-0.638**	1.719***
				(0.285)	(0.342)
IndustryL				-0.498*	1.780***
				(0.286)	(0.343)
IndustryM				-0.793***	1.616***
				(0.287)	(0.345)
IndustryN				-0.838***	1.559***
				(0.299)	(0.352)
IndustryO				-0.793***	1.582***
				(0.293)	(0.335)
IndustryP				-3.079***	0.000
				(0.439)	(0.000)
IndustryQ				0.000	0.000
				(0.000)	(0.000)
Occupation1				0.045	0.281**

Table 9 – continues...

Table 9 – continued

	1	2	3	4	5
				(0.074)	(0.132)
Occupation2				-0.026	0.177
				(0.077)	(0.132)
Occupation3				-0.185***	0.026
				(0.068)	(0.131)
Occupation4				-0.225***	-0.000
				(0.079)	(0.134)
Occupation5				-0.360***	-0.176
				(0.064)	(0.131)
Occupation6				-0.135	0.000
				(0.154)	(0.000)
Occupation7				-0.283***	-0.064
				(0.065)	(0.126)
Occupation8				-0.260***	-0.040
				(0.065)	(0.126)
Occupation9				-0.465***	-0.237*
				(0.067)	(0.127)
Occupation0				0.000	0.193
				(0.000)	(0.141)
Tenure					0.013***
					(0.003)
Tenure2					-0.000***
					(0.000)
PartTime					-0.620***
					(0.058)
FirmSize1					-0.157***
					(0.032)
FirmSize3					0.065***
					(0.018)
PrivateEst					-0.045*
					(0.026)
PrivateFor					0.094***
					(0.030)
Constant	7.854***	7.780***	7.815***	8.578***	6.069***
	(0.026)	(0.037)	(0.044)	(0.293)	(0.362)
R-squared	0.399	0.432	0.443	0.512	0.566
# of obs.	8417.000	8417.000	8400.000	8397.000	8104.000

Table 10: Estimated parameters for years 2000–2009. Quantile regression.

	quantile				
	0.1	0.2	0.5	0.8	0.9

Table 10 – continues...

Table 10 – continued

	0.1	0.2	0.5	0.8	0.9
Year01	0.313***	0.218***	0.094***	0.027	0.028
	(0.032)	(0.028)	(0.020)	(0.022)	(0.030)
Year02	0.302***	0.276***	0.201***	0.125***	0.107***
	(0.033)	(0.029)	(0.020)	(0.022)	(0.031)
Year03	0.479***	0.360***	0.239***	0.192***	0.174***
	(0.033)	(0.030)	(0.020)	(0.023)	(0.031)
Year04	0.612***	0.506***	0.410***	0.303***	0.286***
	(0.035)	(0.031)	(0.021)	(0.024)	(0.033)
Year05	0.862***	0.717***	0.541***	0.445***	0.426***
	(0.035)	(0.031)	(0.021)	(0.024)	(0.032)
Year06	1.016***	0.908***	0.690***	0.616***	0.572***
	(0.032)	(0.028)	(0.019)	(0.022)	(0.030)
Year07	1.246***	1.116***	0.933***	0.831***	0.818***
	(0.031)	(0.027)	(0.019)	(0.021)	(0.029)
Year08	1.418***	1.300***	1.079***	0.988***	0.997***
	(0.031)	(0.027)	(0.019)	(0.021)	(0.029)
Year09	1.271***	1.189***	1.000***	0.925***	0.940***
	(0.037)	(0.033)	(0.023)	(0.026)	(0.035)
Estonianhome	0.131***	0.025	0.026	0.041*	0.053*
	(0.032)	(0.028)	(0.019)	(0.022)	(0.030)
Estonian1	0.080***	0.055***	0.032**	0.025	0.021
	(0.023)	(0.021)	(0.014)	(0.016)	(0.022)
Estonian2	0.095***	0.043*	-0.002	-0.067***	-0.047*
	(0.025)	(0.023)	(0.016)	(0.018)	(0.024)
Estonian3	0.013	0.028	0.032*	-0.033*	-0.040
	(0.027)	(0.024)	(0.017)	(0.020)	(0.027)
English1	-0.085***	-0.017	0.049***	0.076***	0.124***
	(0.029)	(0.026)	(0.018)	(0.020)	(0.028)
English2	0.073**	0.014	0.035*	0.149***	0.145***
	(0.031)	(0.027)	(0.019)	(0.022)	(0.030)
English3	-0.022	0.008	0.119***	0.233***	0.237***
	(0.036)	(0.031)	(0.022)	(0.025)	(0.034)
Age1	-0.018	-0.055*	-0.116***	-0.132***	-0.145***
	(0.032)	(0.029)	(0.020)	(0.023)	(0.032)
Age2	0.055**	0.025	0.000	-0.024	-0.050**
	(0.022)	(0.019)	(0.013)	(0.015)	(0.020)
Age4	-0.089***	-0.095***	-0.073***	-0.051***	-0.057***
	(0.022)	(0.020)	(0.013)	(0.015)	(0.020)
EduPrimary	-0.118***	-0.127***	-0.094***	-0.071***	-0.036*
	(0.022)	(0.019)	(0.013)	(0.015)	(0.021)
EduTertiary	0.148***	0.173***	0.182***	0.185***	0.233***
	(0.026)	(0.023)	(0.016)	(0.018)	(0.024)
Immigrant	-0.016	-0.031*	-0.026**	-0.024*	0.009
	(0.019)	(0.017)	(0.012)	(0.013)	(0.018)
Married	0.129***	0.138***	0.139***	0.149***	0.162***
	(0.023)	(0.020)	(0.014)	(0.015)	(0.021)
Kids	-0.009	-0.002	0.022**	0.057***	0.042**

Table 10 – continues...

Table 10 – continued

	0.1	0.2	0.5	0.8	0.9
	(0.018)	(0.016)	(0.011)	(0.012)	(0.017)
LocCapital	0.038	0.052**	0.063***	0.053***	0.036
	(0.025)	(0.022)	(0.015)	(0.017)	(0.024)
LocNorthEast	-0.013	-0.124***	-0.120***	-0.140***	-0.134***
	(0.026)	(0.023)	(0.016)	(0.019)	(0.026)
LocSouthEast	-0.104**	-0.202***	-0.238***	-0.224***	-0.132***
	(0.047)	(0.042)	(0.029)	(0.032)	(0.044)
Constant	7.037***	7.419***	7.881***	8.251***	8.419***
	(0.038)	(0.034)	(0.024)	(0.027)	(0.037)
R-squared					
# of obs.	8400.000	8400.000	8400.000	8400.000	8400.000

References

Adsera, A., and B. Chiswick (2007): "Are there gender and country of origin differences in immigrant labor market outcomes across European destinations?," *Journal of Population Economics*, 20, 495–526.

Albouy, D. (2008): "The wage gap between francophones and anglophones: a Canadian perspective, 1970 o 2000," Working Paper 14203, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138, USA.

Allen, D. (2006): "Who's in and who's out? Language and the integration of new immigrant youth in Quebec," *International Journal of Inclusive Education*, 10(2-3), 251–263.

Altonji, J. G., and R. M. Blank (1999): "Race and gender in the labor market," in *Handbook of Labor Economics*, ed. by O. C. Ashenfelter, and D. Card, vol. 3, part 3, pp. 3143–3259. Elsevier Science Publishers B.V.

Aptekar, S. (2009): "Contexts of exit in the migration of Russian speakers from the Baltic countries to Ireland," *Ethnicities*, 9(4), 507–526.

Bertrand, M., and S. Mullainathan (2004): "Are Emily and Greg More Employable Than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination," *American Sociological Review*, 94(4), 991–1013.

Blackaby, D., D. Leslie, P. Murphy, and N. O'Leary (2005): "Born in Britain: How are native ethnic minorities faring in the British labour market?," *Economics Letters*, 88, 370–375.

Bleakley, H., and A. Chin (2004): "Language skills and earnings: Evidence from childhood immigrants," *Review of Economics and Statistics*, 86(2), 481–496.

Blinder, A. S. (1973): "Wage discrimination: Reduced form and structural estimates," *Journal of Human Resources*, 8(4), 436–455.

Bosch, M., M. A. Carnero, and L. Farré (2010): "Information and discrimination in the rental housing market: Evidence from a field experiment," *Regional Science and Urban Economics*, 40(1), 11 – 19.

Boyd, M., and X. Cao (2009): "Immigrant Language Proficiency, Earnings, and Language Policies," *Canadian Studies in Population*, 36(1-2), 63–86.

Carlsson, M., and D.-O. Rooth (2006): "Evidence of Ethnic Discrimination in the Swedish Labor Makret Using Experimental Data," Discussion Paper 2281, IZA, P.O.Box 7240, 53072 Bonn, Germany.

Chiswick, B. R. (2008): "The Economics of Language: An Introduction and Overview," Discussion Paper 3568, IZA, P.O.Box 7240, 53072 Bonn, Germany.

Chiswick, B. R., A. T. Le, and P. W. Miller (2008): "How Immigrants Fare across the Earnings Distribution in Australia and the United States," *Industrial and Labor Relations Review*, 61(3), 334–373.

Chiswick, B. R., and P. W. Miller (2002): "Immigrant earnings: Language skills, linguistic concentrations and the business cycle," *Journal of Population Economics*, 15, 31–57.

——— (2003): "The complementarity of language and other human capital: Immigrant earnings in Canada," *Economics of Education Review*, 22, 469–480.

——— (2007): "Matching Language Proficiency to Occupation: The Effect on Immigrants' Earnings," Discussion Paper 2587, IZa, P.O.Box 7240, 53072 Bonn, Germany.

Chiswick, C. U. (2009): "The economic determinants of ethnic assimilation," *Journal of Population Economics*, 22, 859–880.

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.

Hurtado, S., J. C. Han, V. B. Sáenz, L. L. Espinosa, N. L. Cabrera, and O. S. Cerna (2007): "Predicting transition and adjustment to college: biomedical and behavioral science aspirants' and minority students' first year of college," *Research in Higher Education*, 48(7), 841–887.

Jasinskaja-Lahti, I., K. Liebkind, M. Jaakkola, and A. Reuter (2006): "Perceived Discrimination, Social Support Networks, and Psychological Well-being Among Three Immigrant Groups," *Journal of Cross-Cultural Psychology*, 37(3), 293–311.

Koenker, R., and G. Bassett, Jr (1978): "Regression quantiles," *Econometrica*, 46(1), 33–50.

Korts, K., and R. Kõuts (2002): "Inter-ethnic communication in Estonian media (in Estonian)," in *Estonia and Estonians in comparative perspective (in Estonian)*, ed. by A. Valk, pp. 234–245. Tartu University Press, Tiigi 78, Tartu 50410, Estonia.

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

Leslie, D., and J. Lindley (2001): "The Impact of Language Ability on Employment and Earnings of Britain's Ethnic Communities," *Economica*, 68(272), 587–606.

Machado, J. A. F., and J. Mata (2005): "Counterfactual decomposition of changes in wage distribution using quantile regression," *Journal of Applied Econometrics*, 20, 445–465.

Oaxaca, R. L. (1973): "Male-Female Wage Differentials in Urban Labor Markets," *International Economic Review*, 14(3), 693–709.

Rooth, D.-O., and J. Saarela (2007): "Native language and Immigrant Labour Market Outcomes: An Alternative Approach to Measuring the Returns for Language Skills," *International Migration & Integration*, 8, 207–221.

Semyonov, M., and A. Glikman (2009): "Ethnic Residential Segregation, Social Contacts, and Anti-Minority Attitudes in European Societies," *Eur Sociol Rev*, 25(6), 693–708.

Snel, E., G. Engbersen, and A. Leerkes (2006): "Transnational involvement and social integration," *Global Networks*, 6(3), 285–308.

Toomet, O., M. van der Leij, and M. Rolfe (2009): "Social Networks and the Economic Performance of Minorities," paper presented at EEA-ESEM 2009 meeting, Barcelona.

Tubergen, F. v., I. Maas, and H. Flap (2004): "The Economic Incorporation of Immigrants in 18 Western Societies: Origin, Destination, and Community Effects," *American Sociological Review*, 69(5), 704–727.

Uusitalo, R. (2010): "Return to foreign language skills," VATT, Helsinki.

Åslund, O., A. Böhlmark, and O. N. Skans (2009): "Age at migration and social integration," Working Paper 2009:21, IFAU, P.O. Box 513, 751 20 Uppsala, Sweden.

Åslund, O., and O. N. Skans (2005): "Will I see you at work? Ethnic workplace segregation in Sweden 1985-2002," Working Paper 2005:24, IFAU, P.O. Box 513, 751 20 Uppsala, Sweden.