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Does a Foreign Degree Hold You Back? Immigrant Labor Market Integration in Finland

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This thesis investigates the employment outcomes of foreign degree holders in Finland using propensity score matching to estimate the average treatment effect on the treated (ATET). The findings show that individuals with foreign qualifications face employment penalties compared to those with Finnish degrees. On average, foreign-educated individuals are 4.4 percentage points less likely to be employed, and this disadvantage persists even after controlling for demographic and background characteristics. Notably, the employment penalty is even larger among those working in non-regulated occupations, where formal recognition is not required highlighting that structural barriers extend beyond credential validation. The analysis also reveals substantial heterogeneity. Short-term migrants experience greater disadvantages than long-term residents, indicating that time spent in Finland may aid labor market integration. Foreign-educated women face considerably steeper penalties than men across most models. Finally, employment outcomes vary widely across fields of education, with the largest disadvantages observed in Arts & Humanities, Business Administration & Law, and Engineering, Manufacturing & Construction.			
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Contents

1	Introduction	1
2	A Review of the Literature	3
2.1	Theoretical Background	3
2.2	Recent studies	4
3	Research Design	7
3.1	Data	7
3.2	Background Characteristics	7
3.3	Estimation Methods	8
3.4	Limitations	12
4	Results	13
4.1	Field-Specific Differences	14
4.2	Discussion	16
5	Conclusion	19
A	Appendix	21
	Bibliography	24

1. Introduction

Finland is currently facing a labor shortage driven by an aging population, which is placing increasing pressure on its labor market. At the same time, the country's strong reputation for social welfare and its educational system has attracted a growing number of people with a foreign background, particularly since the early 2000s. Although Finland has a relatively recent history of immigration, it has taken active steps to address the integration of immigrants into the labor market in response to both political and economic challenges.

Most recently, the reform of the Integration Act (681/2023), set to take effect in January 2025, aims to enhance the speed and efficiency of the integration process.[†] In particular, the reform seeks to strengthen the employment opportunities, work capacity, and language skills of highly educated foreign-born individuals, while also promoting their participation in Finnish society.

Despite these efforts, however, many highly educated immigrants continue to face barriers when entering the Finnish labor market. One potential explanation for these barriers is the undervaluation of foreign qualifications. Overqualification is a common issue among foreign-born individuals, many of whom are employed in roles that do not match their level of education or skill.[‡] This mismatch is often exacerbated by the non-recognition of foreign degrees and limited access to professional occupations.

The central objective of this thesis is to investigate how foreign qualifications affect the labor market outcomes of foreign-born individuals in Finland. To this end, the study addresses the following research questions: First, how do foreign qualifications influence

[†]Integration is defined by the Finnish Institute for Health and Welfare as a two-way process in which the goal is for immigrants to feel like full members of society. The process aims to equip immigrants with the necessary knowledge and skills to participate actively in society and to find employment, among other goals.

[‡]Among Finnish-born individuals with a higher university degree, only 5% were statistically overqualified, compared to 21% among foreign-born individuals with the same level of education. This finding is based on research conducted through interviews and surveys ($N \approx 3,000$). (Toivanen and Vaananen, 2018)

employment outcomes in comparison to domestic qualifications in the Finnish labor market? This question aims to assess the overall impact of holding a foreign degree on employment status. Additionally, the study examines whether this impact varies by other factors such as duration of stay in Finland, gender, field of study, occupational regulation and region of origin.

This paper's findings indicate that holding a foreign degree has a negative impact on employment outcome in Finland. The disadvantage is particularly pronounced among women and in certain fields, such as Arts & Humanities, Business Administration & Law, and Engineering, Manufacturing & Construction. The analysis also reveals that short-term migrants face greater employment penalties than long-term residents, suggesting that time spent in Finland may support labor market integration. Notably, the employment gap persists even larger in non-regulated occupations, where formal degree recognition is not required-implying that structural barriers extend beyond credential validation.

The remain of this thesis is structured as follows. Section 2 reviews the relevant literature. Section 3 describes the data and empirical strategy. Section 4 presents the results. Section 5 concludes with final remarks.

2. A Review of the Literature

2.1 Theoretical Background

The concept of the foreign degree penalty is rooted in foundational economic theories on human capital and labor market signaling. According to human capital theory (Becker, 1962), education enhances workers' productivity, which, in turn, improves their labor market outcomes. Education is viewed as an investment in skills and knowledge that yield returns in the form of higher wages and better employment opportunities. From this perspective, the country where education is obtained should, in principle, be irrelevant if the acquired skills are equally productive.

Signaling theory (Spence, 1978) introduces an important nuance by suggesting that education also functions as a signal to employers about a worker's potential productivity. Employers often lack complete information about an applicant's abilities and rely on educational credentials as proxies for productivity. In the case of foreign degrees, these signals may become weaker or noisier due to employers' unfamiliarity with foreign institutions, differences in educational standards, or concerns about the relevance of foreign-acquired skills to local labor market needs. This uncertainty can result in reduced employment prospects or earnings for individuals with foreign qualifications.

Beyond these two frameworks, statistical discrimination theory (S. Phelps, 1972) further elucidates the mechanisms behind foreign degree penalties. When faced with imperfect information, employers may use group-based stereotypes or heuristics to make hiring decisions. The origin of a degree may serve as one such heuristic, leading employers to systematically undervalue foreign education even in the absence of direct evidence about individual productivity. This theory highlights the role of cognitive biases and risk aversion in perpetuating labor market inequalities.

Credentialism theory (Murray, 1980) adds a sociological dimension by emphasizing that educational qualifications often serve more as mechanisms of social closure than as direct measures of skills. According to this perspective, degrees act as gatekeeping tools

that protect access to desirable jobs and social status. Local degrees are privileged not necessarily because they guarantee higher productivity, but because they are institutionally embedded in social and professional networks that confer legitimacy. Foreign degrees, by contrast, may be excluded from these networks, reinforcing barriers to labor market integration.

These theoretical frameworks collectively suggest that the valuation of foreign degrees in the labor market is shaped by a combination of human capital considerations, informational asymmetries, cognitive biases, and sociological barriers. Understanding these multifaceted dynamics is crucial for analyzing the persistent disadvantages faced by migrants with foreign qualifications and for designing policies aimed at promoting equitable labor market integration.

2.2 Recent studies

One of the earliest and most influential empirical studies focusing on foreign degree penalties among immigrants is Friedberg (2000), who analyzed data from the Israeli Labor Force Survey. Using OLS regression models, Friedberg compared immigrants who completed their education abroad with those who had studied in Israel, controlling for demographic and human capital variables. The results showed that foreign-acquired education was associated with significantly lower earnings, suggesting that education obtained abroad is not fully transferable to the Israeli labor market. Importantly, this and similar studies emphasize the comparison not between immigrants and natives, but between foreign-born individuals who obtained their degrees abroad versus those who obtained their degrees locally in the host country, highlighting the role of credential origin rather than immigrant status *per se*.

In the U.S., Bratsberg and Ragan (2002) employed data from the 1980 and 1990 U.S. Censuses to compare earnings among male immigrants based on whether their education was obtained domestically or abroad. Their regression analyses, which controlled for country of origin and time since migration, confirmed a consistent foreign education penalty, with U.S.-educated immigrants earning more than their foreign-educated peers.

Similarly, Zeng and Xie (2004) analyzed Asian immigrants using the 1990 U.S. Census. Through multivariate regression models controlling for age, English proficiency, and years since migration, they found that foreign-educated Asian immigrants had lower returns to education and that U.S.-obtained degrees were linked to better occupational attainment and earnings.

Further evidence is provided by Arbeit and Warren (2013), who utilized the 2003 National Survey of College Graduates (NSCG) to investigate labor market penalties associated with foreign degrees among college-educated immigrants in the United States. Their study employed OLS regression models to estimate wage differentials and logistic regression to assess the likelihood of working in a degree-related occupation. By controlling for variables such as age, gender, race/ethnicity, years since degree, field of study, English proficiency, and region of origin, they showed that immigrants with foreign degrees were less likely to work in jobs related to their highest degree and, particularly among women, faced substantial wage penalties.

From a broader theoretical perspective, Chiswick and Miller (2009) examined the international transferability of immigrants' human capital. They proposed a theoretical model suggesting that the transferability of education and work experience across borders is incomplete due to differences in language, culture, and institutional structures. Their work, supported by empirical evidence from multiple countries, found that the earnings returns to foreign education and work experience are lower compared to those acquired domestically, especially when the origin and host countries are highly dissimilar.

In the Nordic context, Nordin et al. (2010) utilized Swedish administrative data to explore income penalties related to education-occupation mismatch. They applied a mismatch framework comparing individuals' educational attainment with the typical requirements of their occupations. Their findings showed that foreign-educated individuals were more likely to be mismatched and suffered larger income penalties than native-educated counterparts, indicating that foreign education affects not only access to employment but also job quality.

Further evidence from Sweden is provided by Luik et al. (2016), who analyzed register data to examine employment gaps among immigrants. Their study emphasized the critical role of local human capital, finding that immigrants with Swedish education had better employment outcomes than those with foreign degrees. The study also revealed gender differences, with foreign-educated women facing compounded disadvantages linked to both educational background and caregiving responsibilities.

Collectively, these studies demonstrate a consistent pattern: foreign-born individuals who earned their degrees abroad tend to experience poorer labor market outcomes compared to those who obtained their qualifications in the host country. Methodologically diverse yet consistent in findings, this body of literature highlights how local educational credentials offer stronger labor market signals than foreign ones. While substantial evidence exists for countries like Israel, the U.S., and Sweden, studies that

specifically compare foreign- and Finnish-educated individuals remain relatively limited. By analyzing the effects of qualification origins on employment outcomes in Finland, this study aims to contribute new insights into how education credentials interact with labor market structures to shape high-skilled immigrants' integration trajectories.

3. Research Design

3.1 Data

In this paper, I utilize the Finnish longitudinal data from Statistics Finland. The FOLK dataset, the Finnish Longitudinal Study on individual-level administrative records, covers the entire population living in Finland between 1987 and 2022. The data used in this study specifically come from the 2022 module of the FOLK dataset, which is the most recent and comprehensive version available at the time of analysis. The combined FOLK datasets are renowned for their breadth and quality, offering detailed information on immigration status (e.g., year of migration), educational qualifications (including whether degrees were earned domestically or abroad), field of study, and level of qualification. Additionally, these datasets contain rich demographic and socioeconomic variables, such as age, sex, country of birth, marital status, and employment status, all of which are critical for a comprehensive understanding of labor market participation.

A notable advantage of using FOLK data is its administrative nature, which minimizes measurement error and reporting bias often present in survey-based data. Furthermore, the longitudinal structure of the dataset allows for tracking individuals' educational and employment trajectories over time. This comprehensive scope makes the FOLK dataset ideal for investigating the causal effect of foreign qualifications on labor market outcomes in Finland.

3.2 Background Characteristics

From the dataset, I extracted the foreign-born population who migrated to Finland between 2011 and 2019. This timeframe was selected to ensure that the individuals have had sufficient time to transition into the Finnish labor market while maintaining the relevance of their qualifications. The sample is restricted to individuals who completed at least a bachelor's degree, in order to focus the analysis on highly educated migrants

whose labor market integration is crucial for economic growth.

Individuals who held Finnish citizenship at the time of migration and those whose mother tongue is Finnish are excluded, aiming to reduce potential confounding effects linked to prior cultural familiarity or social networks in Finland.* To ensure comparability in labor market participation, I further restricted the analysis to individuals aged 65 or below who are not self-employed and are either employed or unemployed, excluding students, pensioners, and those outside the labor force. Table 3.1 describes the composition of the sample by degree type.

Table 3.1: Sample Composition by Degree Type

Total Sample	23,045
Treatment Group (Foreign Degree Holders)	10,345
Control Group (Finnish Degree Holders)	12,700

Given that regulated occupations in Finland, such as healthcare, law, and education, require domestic degrees or official recognition of foreign qualifications, I control for regulated occupations by excluding individuals working in these fields.† By focusing on non-regulated sectors, I analyze how foreign versus Finnish qualifications impact labor market outcomes in fields where employers have greater discretion in evaluating educational credentials. Appendix Table A.1 lists regulated occupations in Finland.

3.3 Estimation Methods

The primary goal is to estimate the causal effect of holding a foreign degree on employment outcomes in Finland. Specifically, I seek to determine how degree origin influences an individual’s likelihood of being employed, conditional on a set of observable characteristics.

I performed matching on key demographic characteristics including age, gender, years since migration, field of study, and region of origin. Matching on these variables allows us to better isolate the causal effect of holding a foreign degree on employment outcomes by ensuring comparability between treatment and control groups.

*Statistics Finland defines an immigrant as an individual who has moved to Finland from abroad and is registered in the Finnish Population Information System. This definition includes Finnish citizens born abroad, who are excluded from this analysis.

†Formal recognition of foreign credentials has been shown to improve immigrants’ chances of obtaining skilled jobs and to enhance wages and employment opportunities (Damelang et al., 2020; Brucker et al., 2021).

- **Age** (continuous variable)
- **Gender** (binary variable: male or female)
- **Years since migration** (continuous variable)
- **Field of study** (categorical variable, based on ISCED classification)
- **Region of origin** (categorical variable: e.g., North Europe, East Asia, South Americas)

For the matching itself, I employed kernel matching, which uses a weighted average of all individuals in the control group to construct the counterfactual outcome for each treated individual, assigning higher weights to observations with propensity scores closer to the treated unit. This method ensures efficient use of available data and smooths the treatment effect estimates. Compared to one-to-one nearest neighbor matching, kernel matching reduces sensitivity to poor matches and sampling variability by incorporating information from multiple observations rather than relying on a single closest neighbor. This is particularly useful in my dataset, where some treated observations have relatively few close counterparts in the control group.

The quality of matching is evaluated through the standardized mean differences of covariates before and after matching.* Table 3.2 presents the mean values of selected continuous covariates for the treatment and control groups, both before and after matching. Prior to matching, substantial differences existed between the groups, particularly in age, where the standardized mean difference was 63.9%. After matching, these differences were substantially reduced; for example, the bias in age decreased to -5.1%, achieving a 92.0% reduction. Similar improvements were observed for other continuous variables, such as "Years since migration" and "Gender," indicating that the matching process was effective in balancing key covariates between the groups. For categorical variables, such as "Field of Education" and "Region of Origin," standardized mean differences were also calculated based on the binary indicator variables representing each category. Overall, the post-matching balance statistics suggest that the Propensity Score Matching procedure substantially improved the comparability of the treatment and control groups on observed characteristics.

*Following Rosenbaum and Rubin (1985), the standardized mean difference (bias) is calculated as the difference in sample means between the treatment and control groups, divided by the square root of the average of the sample variances for each group, multiplied by 100. That is, $\text{Bias} = \left(\frac{\bar{X}_T - \bar{X}_C}{\sqrt{(s_T^2 + s_C^2)/2}} \right) \times 100$, where $\bar{X}_T$ and $\bar{X}_C$ denote the sample means and s_T^2 and s_C^2 the sample variances of the treated and control groups, respectively. Bias reduction is calculated as $\left(\frac{|\text{Bias before matching}| - |\text{Bias after matching}|}{|\text{Bias before matching}|} \right) \times 100$. This approach to calculating standardized bias and bias reduction is commonly used in Propensity Score Matching studies to assess the covariate balance after matching.

Table 3.2: Mean and Covariate Balance Before and After Matching

Variable	Treated (U)	Control (U)	Treated (M)	Control (M)	% Bias (U)	% Bias (M)	Bias Reduction	p-value (M)
Age	36.42	33.18	36.42	36.68	63.9	-5.1	92.0	0.009
Years since migration	6.44	6.59	6.44	6.46	-6.6	-0.7	89.2	0.703
Gender	1.50	1.48	1.50	1.51	4.3	-0.4	91.5	0.843
Field of Education								
Education	NA	NA	NA	NA	9.7	-1.1	88.9	0.583
Arts & Humanities	NA	NA	NA	NA	12.3	-0.5	96.2	0.819
Business & Law	NA	NA	NA	NA	-6.5	2.6	60.4	0.146
Natural Sciences	NA	NA	NA	NA	-5.2	2.5	52.0	0.165
Engineering & Construction	NA	NA	NA	NA	-13.6	-0.6	95.7	0.736
Health & Welfare	NA	NA	NA	NA	-5.2	8.1	-201.1	0.000
ICT	NA	NA	NA	NA	5.4	-1.1	80.3	0.608
Other Services	NA	NA	NA	NA	0.6	-3.5	-443.1	0.040
Region of Origin								
Northern Europe	NA	NA	NA	NA	10.6	-0.9	91.1	0.640
Eastern Europe	NA	NA	NA	NA	-2.7	8.1	-201.1	0.000
Asia (excl. Middle East)	NA	NA	NA	NA	10.3	-2.1	80.1	0.311
Middle East	NA	NA	NA	NA	-1.3	-3.4	-159.9	0.070
Africa	NA	NA	NA	NA	2.5	-4.6	-84.7	0.018
Latin America	NA	NA	NA	NA	-1.3	-1.1	-1.1	0.490
North America	NA	NA	NA	NA	-11.2	-2.2	80.2	0.146
Oceania	NA	NA	NA	NA	-5.9	1.8	69.2	0.060
Other	NA	NA	NA	NA	-7.2	-5.1	29.1	0.004

Note: "U" = unmatched sample, "M" = matched sample.

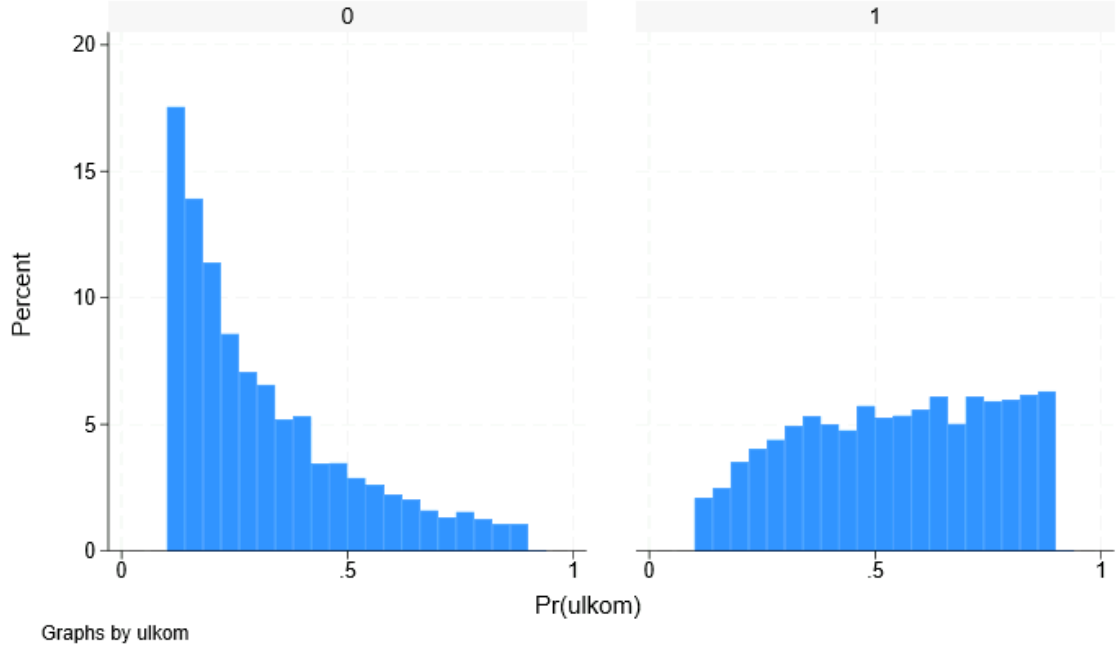


Figure 3.1: Distribution of estimated propensity scores by treatment status

To further assess the validity of the matching procedure, I examined the distribution of the estimated propensity scores for both the treatment and control groups. Figure 3.1 displays the histogram of propensity scores by treatment status.* The distributions indicate sufficient overlap, particularly within the range of approximately 0.2 to 0.8, supporting the assumption of common support. To ensure comparability and improve match quality, observations with propensity scores below 0.1 or above 0.9 were excluded from the analysis. This trimming step reduces the influence of extreme values where comparable matches are less likely to exist and potential estimation bias may arise.

Following matching, I estimate the effect of holding a foreign degree using the following regression model:

$$Y_i = \alpha + \beta \cdot \text{ForeignDegree}_i + \mathbf{X}_i' \gamma + \varepsilon_i \quad (3.1)$$

where Y_i denotes the employment outcome for individual i . Specifically, Y_i is a binary indicator equal to 1 if the individual is employed (either full-time or part-time) and 0 otherwise. The employment status is based on Statistics Finland's register-based classification and captures general labor market participation. ForeignDegree_i is a binary variable equal to 1 if the individual holds a foreign degree and 0 otherwise, and $\mathbf{X}_i$ is a vector of control variables including age, gender, years since migration, field of

*ulkom = 1: treated (foreign degree), ulkom = 0: control (domestic degree).

study, and region of origin. The coefficient β captures the Average Treatment Effect on the Treated (ATET), reflecting the causal impact of holding a foreign degree on employment probabilities.

3.4 Limitations

Several limitations must be acknowledged in this study. First, although PSM helps address selection on observables, it cannot control for unobservable characteristics that may influence both degree origin and employment outcomes. Unmeasured factors such as motivation, social networks, language proficiency, or employer's ethnic preference could bias the estimates.

Second, selection bias related to the foreign-born individual sample must be considered. Foreign-born individual who stay in Finland may differ systematically from those who leave. Those who remain are likely to be individuals who have successfully integrated into the labor market or possess greater resilience, potentially biasing the results toward a more optimistic view of foreign degree valuation. This type of selection bias has been extensively discussed in the migration literature (Borjas, 1987).

Finally, administrative data, while highly reliable for objective measures, often lack detailed information on subjective variables such as perceived discrimination, cultural capital, or informal social networks, which are increasingly recognized as influential in labor market integration.

Despite these limitations, the richness of the FOLK dataset, combined with robust statistical methods, provides a strong basis for investigating the impact of foreign qualifications on employment outcomes in Finland.

4. Results

The results are reported in Table 4.1. On average, individuals with foreign degrees are 4.4 percentage points less likely to be employed than those with Finnish degrees ($p < 0.01$). After adjusting for a broad set of covariates—including age, gender, years since migration, field of education, and region of origin—the estimated penalty remains statistically significant, though somewhat smaller, at 2.5 percentage points ($p < 0.01$). This suggests that differences in observed characteristics explain part, but not all, of the employment gap associated with holding a foreign qualification.

Table 4.1: ATET Estimates by Subgroups

Subgroup	No Controls	+Age	+Gender	+Years since Migration	+Field of Education	+Region of Origin	N
All Foreign degree	-4.4*** (0.000)	-3.0*** (0.000)	-3.3*** (0.000)	-3.0*** (0.000)	-2.6*** (0.001)	-2.5*** (0.008)	13,587
All Foreign degree - Non-Regulated Occupations Only*	-5.0*** (0.000)	-3.2*** (0.000)	-2.7*** (0.000)	-3.0*** (0.000)	-2.1** (0.019)	-2.8** (0.011)	12,366
Short-Term Migrants (≤ 5 years)	-5.9*** (0.000)	-4.8*** (0.000)	-4.7*** (0.000)	-4.2*** (0.000)	-4.3*** (0.001)	-2.4 (0.114)	5,202
Long-Term Migrants (> 5 years)	-3.6*** (0.000)	-2.2** (0.005)	-2.3*** (0.003)	-2.7*** (0.001)	-2.0** (0.026)	-2.2* (0.051)	8,385
Man	-0.5 (0.430)	0.9 (0.217)	—	1.1 (0.211)	1.6 (0.143)	0.6 (0.569)	6,904
Woman	-8.3*** (0.000)	-6.7*** (0.000)	—	-7.5*** (0.000)	-6.2*** (0.000)	-5.8*** (0.000)	6,683

* Individuals working in regulated occupations ($N=2198$) are excluded from the comparison.

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

When restricting the sample to non-regulated occupations, the penalty becomes even more pronounced. Initially, foreign-educated individuals are 5.0 percentage points less likely to be employed ($p < 0.01$). After adjusting for observed characteristics, the penalty remains at 2.8 percentage points ($p < 0.01$). This indicates that even in more flexible segments of the labor market, where formal recognition of degrees is not required, foreign qualifications are associated with substantial disadvantages in employment outcomes.

The analysis also reveals important heterogeneity based on migrants' duration of stay in Finland. Short-term migrants (those residing in Finland for five years or less) face a considerably larger employment penalty than long-term migrants. Specifically, the average treatment effect on the treated (ATET) indicates a 5.9 percentage point lower

employment probability for short-term migrants, compared to 3.6 percentage points for those who have stayed longer. This pattern is consistent across specifications and remains statistically significant, suggesting that time spent in Finland plays a critical role in facilitating labor market integration. Longer residence likely improves immigrants' host-country specific human capital, such as language skills, familiarity with institutional and workplace norms, and the development of professional networks, all of which are key to reducing employment disadvantages.

Regarding gender differences, the results show that the employment penalty is statistically significant among women with foreign degrees but not among men. In the fully adjusted model, women are 5.8 percentage points less likely to be employed compared to women with Finnish degrees ($p < 0.01$). For men, no statistically significant employment penalty is observed. These results suggest that gender may compound the challenges associated with holding a foreign qualification in the Finnish labor market, although the degree of disadvantage varies by sector.

4.1 Field-Specific Differences

Turning to field-specific analyses, Table 4.3 presents the ATET estimates by degree field and gender. Substantial heterogeneity across different fields of education is evident.

Foreign qualifications are associated with lower employment probabilities in most fields, with the largest and most statistically significant penalties observed in Arts & Humanities, Business Administration & Law, and Engineering, Manufacturing & Construction. In Arts & Humanities, foreign degree holders experience a disadvantage of -7.4 percentage points in the uncontrolled model, with women facing a penalty of -7.5 percentage points even after adjustment ($p < 0.05$). In Business Administration & Law, overall penalty is 6.8 percentage points without controlling, women experience a particularly severe penalty of -9.3 percentage points ($p < 0.01$) after adjusting for covariates. In Engineering, Manufacturing & Construction, the overall foreign degree penalty is -3.5 percentage points ($p < 0.01$) after adjustment, with women facing a much steeper penalty of -14.8 percentage points ($p < 0.01$).

In contrast, fields such as Natural Sciences, Mathematics & Statistics and ICT show either no statistically significant penalties or relatively minor disadvantages. For example, male foreign degree holders in Natural Sciences do not exhibit a significant employment penalty, and the estimated effects for women are also small and statistically insignificant in the uncontrolled model. In ICT, an initially positive effect for men becomes statistically insignificant after adjusting for covariates. However, it is

Table 4.2: ATET Estimates by Field of Education

Field of Education	No Controls	+Age	+ Gender	+Years since Migration	+Regulated Occupation	N
Arts & Humanities	-7.4*** (0.000)	-5.2** (0.023)	-4.7* (0.079)	-2.7 (0.410)	-1.7 (0.630)	1,347
Man	-1.1 (0.705)	0.7 (0.841)	- (0.510)	-2.4 (0.510)	- (0.510)	499
Woman	-10.7*** (0.000)	-7.6** (0.022)	- (0.048)	-7.5** (0.048)	- (0.048)	848
Business Administration & Law	-6.8*** (0.000)	-4.3*** (0.007)	-4.0** (0.032)	-6.1*** (0.002)	-5.8*** (0.002)	2,698
Man	-1.0 (0.603)	1.1 (0.610)	- (0.627)	1.4 (0.627)	- (0.627)	1,127
Woman	-11.0*** (0.000)	-7.7*** (0.010)	- (0.001)	-9.3*** (0.001)	- (0.001)	1,571
Engineering, Manufacturing & Construction	-3.5*** (0.001)	-1.5 (0.262)	-1.0 (0.479)	-2.8* (0.060)	-3.5** (0.012)	2,698
Man	0.1 (0.875)	3.0* (0.053)	- (0.414)	1.3 (0.414)	- (0.414)	1,857
Woman	-12.9*** (0.000)	-11.1*** (0.000)	- (0.000)	-14.8*** (0.000)	- (0.000)	841
Natural sciences, Mathematics & Statistics	0.4 (0.814)	2.3 (0.297)	1.7 (0.519)	-0.5 (0.817)	1.4 (0.589)	1,252
Man	4.7** (0.022)	7.1** (0.017)	- (0.350)	2.5 (0.350)	- (0.350)	707
Woman	-4.6 (0.129)	-5.3* (0.099)	- (0.007)	-9.4*** (0.007)	- (0.007)	545
ICT	-2.7*** (0.007)	-0.7 (0.601)	- (0.740)	-0.5 (0.740)	NA (0.740)	2,178
Man	-0.7 (0.469)	0.6 (0.616)	- (0.473)	1.3 (0.473)	- (0.473)	1,532
Woman	-7.9*** (0.001)	-4.0 (0.245)	- (0.734)	-1.6 (0.734)	- (0.734)	646
Education	-3.9 (0.201)	-2.7 (0.478)	-0.9 (0.823)	-0.4 (0.903)	0.3 (0.926)	582
Man	0.3 (0.946)	6.2 (0.462)	- (0.470)	5.6 (0.470)	- (0.470)	164
Woman	-5.6 (0.136)	-2.6 (0.603)	- (0.961)	-0.2 (0.961)	- (0.961)	418
Health & Welfare	-1.5 (0.214)	-0.7 (0.615)	-1.0 (0.438)	-0.9 (0.635)	-0.3 (0.843)	1,478
Man	-0.2 (0.888)	1.4 (0.554)	- (0.905)	0.2 (0.905)	- (0.905)	404
Woman	-2.3 (0.147)	-2.0 (0.224)	- (0.439)	-1.6 (0.439)	- (0.439)	1,074
Service	-0.02 (0.995)	2.7 (0.516)	1.0 (0.847)	1.3 (0.751)	0.3 (0.940)	379
Man	4.3 (0.337)	5.0 (0.463)	- (0.007)	0.6** (0.007)	- (0.007)	190
Woman	-4.8 (0.358)	-2.7 (0.689)	- (0.535)	-4.3 (0.535)	- (0.535)	189
Social sciences, Journalism & Information	-2.6 (0.308)	-1.5 (0.595)	-0.5 (0.848)	0.2 (0.965)	0.4 (0.927)	766
Man	-4.4 (0.261)	-2.2 (0.609)	- (0.472)	-3.9 (0.472)	- (0.472)	312
Woman	-1.3 (0.697)	0.1 (0.963)	- (0.469)	4.0 (0.469)	- (0.469)	454
Agriculture, Forestry, Fisheries & Veterinary	-5.6 (0.218)	-8.5** (0.037)	-5.9 (0.209)	9.7 (0.305)	-0.4 (0.954)	209
Man			NA due to small sample			
Woman			NA due to small sample			

Note: * p < 0.1, ** p < 0.05, *** p < 0.01.

worth noting that although the overall penalties in these fields appear small, foreign-educated women in Mathematics and Statistics still experience a substantial employment penalty of -9.4 percentage points after full adjustment, highlighting that gender disparities persist even in technical fields.

Interestingly, fields associated with regulated professions, such as Education and Health & Welfare, show relatively modest and statistically insignificant penalties for foreign qualifications. In Education, the initially observed overall disadvantage (-3.9 percentage points, $p < 0.05$) diminishes and becomes non-significant after full adjustment. Similarly, in Health & Welfare, the fully adjusted foreign degree penalty is only -0.3 percentage points, with significant differences observed for either gender. These findings suggest that structured credential recognition processes in regulated sectors may help reduce the disadvantage faced by foreign-educated professionals, although modest gaps still persist.

In Social sciences, Journalism & Information, and in Service, foreign degree holders face relatively mild employment penalties. The estimated employment gaps in these fields are smaller compared to areas such as Business Administration & Law, and often become statistically insignificant after adjusting for covariates. This suggests that while some disadvantage exists, it is less pronounced, and these sectors may offer somewhat more flexible pathways for foreign-educated individuals, possibly due to broader acceptance of diverse qualifications and less reliance on highly localized knowledge.

Regarding Agriculture, Forestry, Fisheries & Veterinary, results should be interpreted with caution. Due to the small number of observations in this field, estimates are likely to be imprecise and potentially biased. The observed penalties in Agriculture-related fields may not reliably reflect the true effect of foreign qualifications on employment outcomes in this sector.

4.2 Discussion

The findings of this study provide important insights into the mechanisms underlying the labor market integration of foreign-educated individuals in Finland. Several key patterns emerge from the analysis, and these results are largely consistent with the patterns reported in the previous literatures.

First, the distinction between short-term and long-term migrants is crucial. The significantly higher employment penalty for short-term migrants suggests that time spent in Finland is instrumental in improving labor market outcomes. This aligns closely

with human capital theory, which posits that country-specific skills such as Finnish or Swedish language proficiency, familiarity with workplace norms, and local professional networks are critical for labor market success (Chiswick and Miller, 2009). The result is also consistent with the argument by Friedberg (2000) that foreign-acquired human capital is not perfectly transferable and that migrants' labor market outcomes improve over time as they acquire more host-country specific skills.

Second, the gender disparity observed in the results points to an additional layer of disadvantage faced by foreign-educated women. While foreign-educated men do not experience a statistically significant employment penalty, women do. This pattern supports findings from previous studies such as Luik et al. (2016), who documented that foreign-educated women in Sweden face compounded disadvantages related to both educational background and family responsibilities. One potential explanation lies in the structure of family migration: many highly skilled male migrants move to Finland for work and are accompanied by their spouses, who may experience greater difficulties in accessing employment opportunities due to credential recognition issues, lack of networks, and caregiving responsibilities.

Third, sectoral differences highlight the importance of the nature of skills required in different fields. In STEM fields, particularly ICT and Mathematics, foreign qualifications do not lead to significant employment penalties. This finding is consistent with the arguments made by Arbeit and Warren (2013) and Chiswick and Miller (2009), who emphasized that technical fields relying on universal skills such as programming languages and quantitative analysis tend to be less sensitive to local credential recognition or language proficiency. Similarly, in fields such as Social sciences, Journalism & Information and Service, the observed employment penalties for foreign degree holders are relatively mild. This suggests that these sectors may offer more open or flexible labor market pathways for immigrants, possibly due to broader acceptance of diverse qualifications or lower dependency on host-country-specific cultural capital. Conversely, fields such as Arts & Humanities and Business Administration & Law require deeper cultural knowledge and localized communication skills, making it more challenging for foreign degree holders to compete with their locally educated counterparts.

Fourth, the differences between regulated and non-regulated occupations are noteworthy. The employment penalty is more pronounced in non-regulated occupations, suggesting that formal credential recognition processes in regulated professions may help mitigate some disadvantages associated with holding a foreign degree. This finding echoes previous observations by Bratsberg and Ragan (2002) and Nordin et al. (2010), who showed that structured credentialing and standardization can improve labor market outcomes for immigrants. In regulated fields such as healthcare and ed-

education, standardized qualification requirements may reduce employer discretion and bias, providing foreign-trained individuals with more transparent pathways to employment. This is particularly important given Finland's strong and growing labor demand in the healthcare sector, driven by demographic aging and persistent worker shortages. The institutional frameworks supporting credential recognition in healthcare thus play a dual role: facilitating the employment of foreign-educated individuals and helping to address critical national labor market needs. In particular, the field of Education presents an interesting case. Despite likely high demands for local language proficiency, cultural understanding, and familiarity with national education practices, the employment penalty for foreign degree holders is relatively small and becomes statistically insignificant after adjustment. This suggests that recognition of foreign qualifications is not the primary barrier to employment in this sector. Rather, the main challenges for foreign-born individuals likely lie in acquiring sufficient language skills and cultural competencies to function effectively within the Finnish education system. Therefore, in addition to credential recognition, targeted assistance to improve host-country language proficiency and support cultural integration could be crucial for facilitating the labor market entry of foreign-trained education professionals.

Overall, the results highlight that the employment value of foreign education is not uniform but shaped by a combination of individual factors, including time in the country and gender, and structural factors such as the field of education, the regulation of the occupation, and the degree of localization of required skills. These findings reinforce the insights from previous international studies and underline the importance of host-country specific human capital acquisition and institutional support in shaping migrants' integration trajectories.

5. Conclusion

This study has examined the employment outcomes of foreign-educated immigrants in the Finnish labor market, focusing on the causal effect of holding a foreign degree compared to a Finnish degree. Using high-quality longitudinal register data and employing a Propensity Score Matching (PSM) approach, the analysis aimed to isolate the role of educational origin in shaping labor market integration among immigrants.

The findings indicate that, on average, holding a foreign degree is associated with a significant employment penalty, even after adjusting for key demographic and socioeconomic factors. However, the results reveal important heterogeneity: the employment penalty is larger for short-term migrants than for long-term residents, highlighting the importance of host-country specific human capital acquisition over time. Moreover, the penalty is pronounced for foreign-educated women but not for men, suggesting a gendered dimension to the challenges of labor market integration. Sectoral differences are also evident: while fields show minimal employment penalties, substantial disadvantages persist in areas requiring deep cultural and institutional knowledge, such as Arts & Humanities, Business Administration & Law, and Engineering, Manufacturing & Construction. Finally, the study finds that foreign degrees are more penalized in non-regulated occupations, whereas regulated professions, such as healthcare and education, offer relatively more structured and transparent pathways for foreign-trained professionals.

Future research could extend this analysis by exploring wage outcomes, occupational matching, and career progression over time. Additionally, studies that incorporate qualitative data on foreign-born individuals' experiences with credential recognition processes and labor market barriers could provide a richer understanding of the mechanisms underlying observed employment gaps. Comparative analyses across different destination countries with varying institutional settings could also yield valuable insights into the role of policy environments in shaping immigrant integration.

Finally, the findings of this study offer important implications for policy. Efforts to facilitate faster and more transparent recognition of foreign qualifications, particularly

in non-regulated sectors, could help reduce employment gaps. In fields such as Education, where credential recognition processes function relatively well, targeted support to improve local language proficiency and cultural orientation for foreign-born individuals could further enhance integration. Additionally, tailored support for newly arrived immigrants, such as language training, mentoring programs, and employer engagement initiatives, may be particularly effective in strengthening early-stage labor market entry. Addressing gender-specific barriers, such as improving spousal employment support and accommodating family responsibilities, will also be critical for ensuring that highly educated foreign-born women can fully realize their labor market potential in Finland.

In sum, while foreign degrees remain associated with employment disadvantages in the Finnish labor market, the results of this study underline that these disadvantages are neither inevitable nor uniform. Rather, they are shaped by a complex interplay of individual characteristics, sectoral demands, institutional structures, and the accumulation of host-country specific human capital. Understanding and addressing these factors is essential to promoting a more inclusive and equitable labor market for all immigrants in Finland.

A. Appendix

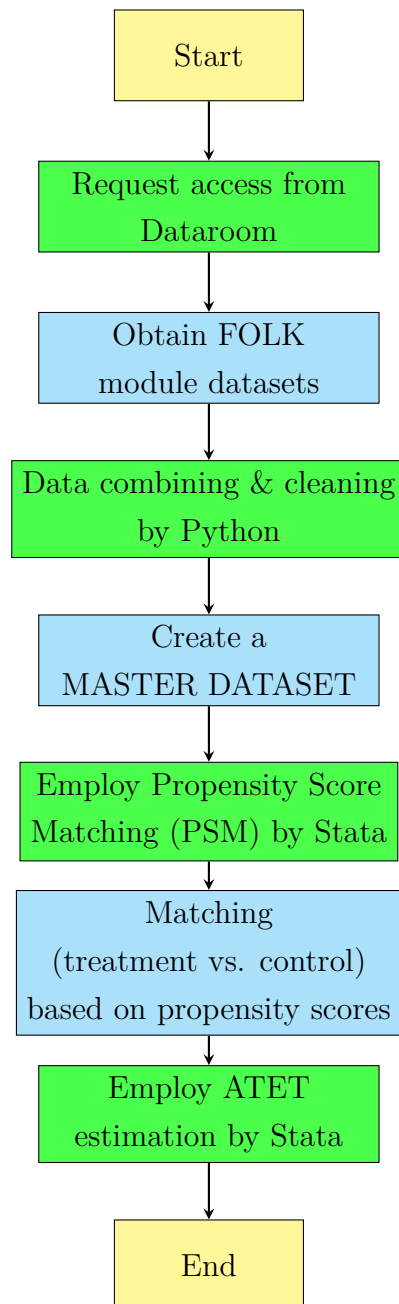


Figure A.1: Research Flowchart

Table A.1: Regulated Occupations in Finland

Health Professionals	Medical doctors
	Nursing and midwifery professionals
	Traditional and complementary medicine professionals
	Paramedical practitioners
	Veterinarians
	Other health professionals
Health Associate Professionals	Medical and pharmaceutical technicians
	Nursing and midwifery associate professionals
	Traditional and complementary medicine associate professionals
	Veterinary technicians and assistants
	Other health professionals
Teaching Professionals	Primary school and early childhood teachers
Legal Professionals	Legal professionals (Lawyers, Judges etc.)
Social Welfare Professionals	Elderly care professional
	Social worker
	School service professional
	Other social welfare professionals
Animals and Food safety	Animals and food safety professionals
Transport	Bus driver, Driving examiner, Driving instructor, Train driver, Truck driver, Vehicle inspector
Rescue and emergency services	Rescue and emergency service professionals

Regulated Occupations ($N = 2,198$)

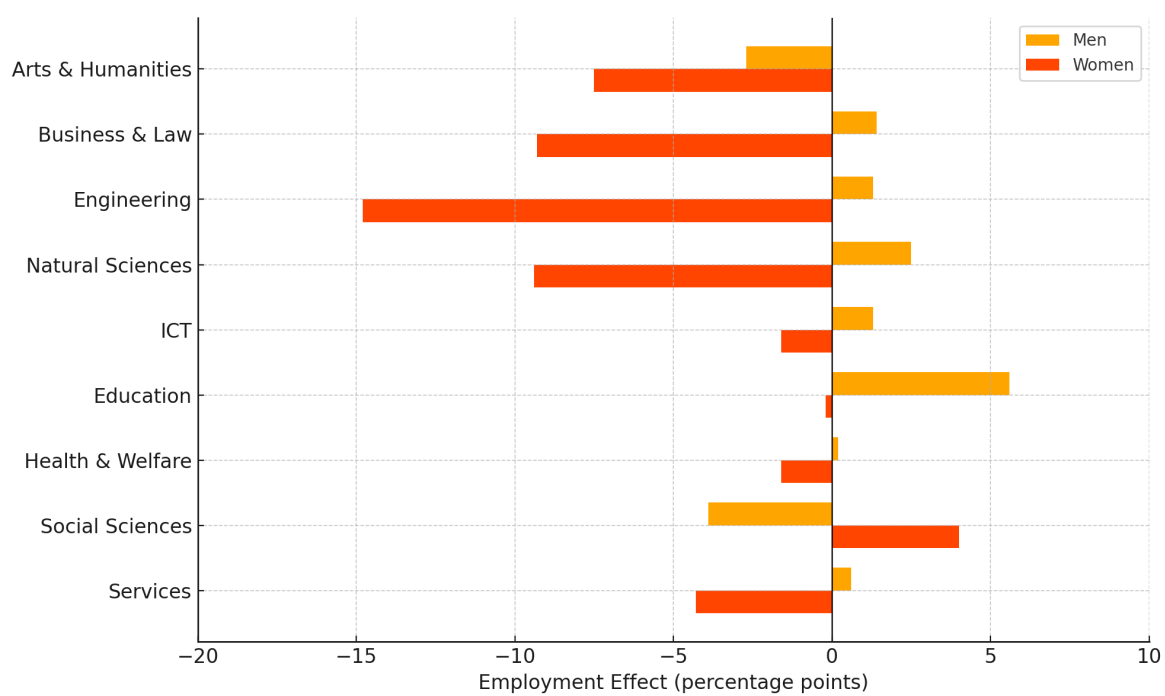


Figure A.2: Gender comparison after control

Bibliography

- Caren A. Arbeit and John Robert Warren. Labor market penalties for foreign degrees among college educated immigrants. *Social Science Research*, 42(3):852–871, May 2013.
- Gary S. Becker. Investment in Human Capital: A Theoretical Analysis. *Journal of Political Economy*, 70(5, Part 2):9–49, October 1962.
- George J. Borjas. Self-Selection and the Earnings of Immigrants, May 1987.
- Bernt Bratsberg and James F. Ragan. The Impact of Host-Country Schooling on Earnings: A Study of Male Immigrants in the United States. *Journal of Human Resources*, 37(1):63–105, 2002.
- Herbert Brucker, Albrecht Glitz, Adrian Lerche, and Agnese Romiti. Occupational Recognition and Immigrant Labor Market Outcomes. *Journal of Labor Economics*, 39(2):497–525, April 2021.
- Barry R. Chiswick and Paul W. Miller. The international transferability of immigrantsâ human capital. *Economics of Education Review*, 28(2):162–169, April 2009.
- Andreas Damelang, Sabine Ebensperger, and Felix Stumpf. Foreign Credential Recognition and Immigrantsâ Chances of Being Hired for Skilled Jobs \- Evidence from a Survey Experiment Among Employers. *Social Forces*, 99(2):648–671, November 2020.
- Rachel Friedberg. You Can't Take It with You? Immigrant Assimilation and the Portability of Human Capital. *Journal of Labor Economics*, 18(2):221–51, 2000.
- Marc-Andre Luik, Henrik Emilsson, and Pieter Bevelander. Explaining the Male Native-Immigrant Employment Gap in Sweden: The Role of Human Capital and Migrant Categories. *IZA Discussion Papers*, May 2016.
- Richard C. Murray. The Credential Society. *American Journal of Education*, pages 488–495, August 1980. Publisher: The University of Chicago Press.

- Martin Nordin, Inga Persson, and Dan-Olof Rooth. Education-occupation mismatch: Is there an income penalty? *Economics of Education Review*, 29(6):1047–1059, 2010. ISSN 0272-7757.
- Paul R. Rosenbaum and Donald B. Rubin. Constructing a Control Group Using Multivariate Matched Sampling Methods That Incorporate the Propensity Score. *The American Statistician*, February 1985. Publisher: Taylor & Francis Group.
- Edmund S. Phelps. The Statistical Theory of Racism and Sexism, 1972.
- Michael Spence. Job Market Signaling. In Peter Diamond and Michael Rothschild, editors, *Uncertainty in Economics*, pages 281–306. Academic Press, January 1978.
- Minna Toivanen and Ari Vaananen. Moni osaa! : tyopaikkaosaaminen monikulttuurisilla tyopaikoilla, 2018.
- Zhen Zeng and Yu Xie. Asian Americans Earnings Disadvantage Reexamined: The Role of Place of Education. *American Journal of Sociology*, 109(5):1075–1108, March 2004.