

Nexus of Migration and Regional Economic Development: Evidence from Regions and Municipalities in Finland

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Abstract

Despite having the fourth lowest regional economic disparities among OECD countries, Finland's economic development has been largely contributed by the metropolitan Helsinki-centered growth, with the most regional disparities occurred in job indicator. This research examines whether the increasing immigration trends may change the landscape of the creation of new jobs disparities across the sub-national levels using the data of 19 regions and 311 municipalities during the period of 2013 to 2017. To do this, first we investigate the effects of foreign citizen shares upon the business establishment numbers nationwide, and secondly, we look at the migration effects upon total number of personnel and total turnover to see the magnitude of effects upon regional economic development. Employing spatial autoregressive (SAR) fixed-effects model, we found that foreign citizens contributed positively to the growth of nationwide enterprises, particularly in the number of manufacturing and construction establishments which are Finland's top industry sectors. However, further examination shows that enterprises in the migrant-concentrated regions tend to be associated with lower turnover. More regions should introduce policy measures towards the development of local capacity and the empowerment of local agents, including adopting policy actions aimed at fostering migrant entrepreneurship and attracting more highly-skilled foreign talents.

Keywords: regional development, immigration, regional disparities

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Introduction

International migration has been an important feature of both economic and population growth in the European Union (EU) (Van Der Gaag and Van Wissen 2001), but it still is considered as a recent phenomenon in Finland. Studies examining links between international migration and regional growth at the national level across EU countries, are prevalent (i.e. Williams (2009) and Rodríguez-Pose and Vilalta-Bufí (2005)). In the case of Finland however, analyzing these components at the national level may not sufficiently explain the intersection between international migration and regional growth. This is because different sectors experience growth or decline very differently across regions, with manufacturing and primary sectors seem to contribute the most disparities across regions (Kangasharju and Pekkala 2004). While OECD in 2018² reported that Finland has the fourth lowest regional economic disparities among OECD countries, the growth has primarily been fueled by the metropolitan Helsinki, which generated 50% of GDP growth over 2000 to 2016. The same document also highlighted that subnational government spent 51% of their budget on social protection and health, compared to the OECD average of 36% in 2016. At the same time, the country has only just recovered from a long recession since 2009, with the largest economic contraction of all Eurozone countries outside of the Southern member states (OECD 2018).

International migration to the sparsely-populated area in Finland may be one of the panaceas to propel regional development. Some of the theories supported this view. For instance, Lundborg and Segerstrom (2000, 2002) build a model showing association between immigration and R&D, that immigration is important to scale up the labor force employed in the R&D sectors, and at the same time increases population size. The human-capital based models (Zak et al. 2002) focus on the channels through which human capital formation may induce growth the way migration can influence growth via transmission of human capital from immigrant parents to their children. Presently, Finland has one of the largest employment rate gaps between immigrants and the natives at 21.2%, while EU average is as low as 4.3% across all skill level (Münz et al. 2007). At the policy-level debates, Finnish government has recently responded to these through the enactment of the Migration Policy Program to Strengthen Labor Migration on 4 January 2018³. The Program aims to support migration that strengthens employment and public finances, improves the dependency ratio and enhances the internationalization of the economy. Despite these recent initiatives, contribution of international immigration to the regional economy is not well-understood, particularly examination upon the magnitude of effects upon the employment and entrepreneurship indicators. Most of the studies linking immigration and regional development in Finland are largely based on case studies upon ethnic entrepreneurship (i.e. in Jumpponen et al. (2007), Quyen (2013), and Katila and Wahlbeck (2012)) or limited to a specific region of interest (i.e. Yeasmin (2016)).

This paper aims to provide more insights and overview regarding immigrants' contribution to minimize the regional economic disparities, thereby promoting regional development. Two main research questions are explored: first, to what extent immigration contributes to regional development in Finland through employment and entrepreneurship at the regional level. The examination incorporates question on what industry sectors in particular migrants seem to contribute, and to what extent migrants add value to the industry numbers and sizes. Secondly, whether this regional development translates into development at the smaller municipality level, which includes

² OECD Regions and Cities at a Glance 2018 –FINLAND <https://www.oecd.org/cfe/FINLAND-Regions-and-Cities-2018.pdf> accessed 25/07/2019

³ Work in Finland –Government Migration Policy Program to Strengthen Labor Migration <http://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/160518/05%202018%20SM%20Work%20in%20Finland.pdf> accessed 25/07/2019

examination on links between migrant-concentrated municipalities and the growth and stocks of enterprises. To serve the purpose, we combine the regional and municipality level dataset from Statistics Finland on key statistics and enterprises indicators by sectors, including total personnel and turnover, and the spatial dataset from National Land Survey to incorporate the spatial aspects of the regional and municipality characteristics. This way, we can employ spatial panel regression model which can take account of the unobservable effects across years therefore addressing spatial autocorrelation problems simultaneously. At the same time, we can examine the possible links between immigration and its contribution to the specific business sectors, as the data enables us to look deeper into the business indicators at the sectoral level.

Our contribution to the current field of study is twofold. First, current studies linking immigration phenomena and regional economic growth in Finland are lacking the understanding of the spatial aspects. Migration and development are a function of space and time, as relocation of people and the growth of business establishment depend on regions and its peripheral characteristics, thus examination without carefully taking account of the spatial aspects may be biased. Our study provides new insights on looking at migration effects at sub-national level, with a consideration of spatial aspects, at establishing the clear links between regional development and immigration. Second, few available studies exploring immigration and entrepreneurship mostly covered the case studies of ethnic entrepreneurship and therefore are lacking the bigger picture of to what extent immigration actually helps to propel regional growth at the smallest unit of municipalities. This research goes beyond the descriptive analysis to actually look at the sub-national heterogeneity and across sectors, providing clearer insights at migrants-propelled industry sectors and whether the contribution is significant at the country-level.

We found that foreign citizens contribute positively to the growth of nationwide establishments and enterprises at the regional and municipality levels, particularly in the number of manufacturing and constructions, as well as the fast-growing information and technology sectors. However, further examination upon the turnover shows that enterprises in the migrant-concentrated regions tend to be associated with lower turnover, indicating that immigrants tend to establish their profession in the low-profit firms or the smaller businesses. At the municipality level, while foreign citizens appear to have positive associations with the number of enterprises in general, they are also correlated negatively with the enterprises' opening although the effects are generally weak. This to some extent indicates that enterprises in the migrants-concentrated municipalities may be associated with the stagnancy or saturation.

While migrants may help to improve the job and entrepreneurship indicators at the regional and municipality levels, and therefore help to minimize the disparities to some extent, their roles have yet to be fully acknowledged. More regions should introduce policy measures towards the development of local capacity and the empowerment of local agents, including adopting policy actions aimed at fostering entrepreneurship in the sparsely-populated areas particularly for migrants. Efforts should also focus on the top sectors, such as healthcare, manufacturing, retailing, and construction.

Conceptual Frameworks

Several theoretical and empirical paper posited that regional disparities of per-capita GDP are a function of observable differences between labor productivity and the number or jobs i.e. see Kangasharju and Pekkala (2004). In-migration in particular has long been hailed as a factor to boost job creation and the hiring rates, which is consistent with the theories of new economic geography (see, for instance, Fujita et al. (2001)). Migration is particularly important force to equalize per-capita income and unemployment rate across region, because: first, which immigrants tend to flock to

prosperous area, therefore causing reallocation of the labor force and the competitiveness of the regions. This is especially relevant in the Finnish context, because there has been an increase in migration flows across regions during the recovery from the great slump of the early 1990s. Second, immigrants can contribute to the regional convergence through net-fertility, as they mostly belong to the younger age group, which can contribute to the larger population base --although at the same time might decrease the regional income per-capita. And third, in the developed regions with more proportion of ageing society such as Finland, immigrants can fill the labor shortage, especially in sectors such as manufacturing, construction, the fast-growing ICT, and healthcare industry.

In most case studies at the regional-level, linkages between in-migration and regional development can be attributed to the growth of migration-based entrepreneurship to some extent. Two following factors may explain. First, the entrepreneurship serves as an alternative to unemployment to migrants who oftentimes have difficulties in securing employment and therefore resorting to opening new businesses. This route may have multiplying effects in both reducing the numbers of unemployment and increasing regional competitiveness due to the increased number of establishments. Secondly, that migrant entrepreneurs tend to enter market with low barrier of entries, with comparatively lower productivity and wages compared to that of the local-owned. This generally lower capital set-up may enable migrant entrepreneur to quickly respond to the local demand and tailor their businesses accordingly. In the case of Finland however, these contributions of migrant entrepreneurship may not be significant, as companies with an immigrant background owner cover only a few 1% of companies in the corporate sector and 1% of the labor force (Maliranta and Nurmi 2019). Despite the considerably higher growth of job creation rates, immigrant-owned firms also tend to have the similar magnitude of job destruction rates with the native-owned, hence the effects may not be salient in the aggregate-level.

In this paper, we look at the regional development via the stocks of business establishments and enterprises, which are available at the region- and municipality-level. We did not specifically consider whether the business establishment ownerships belong to immigrant or are locally-owned. This way, we can genuinely look at the general contributions of immigration via both creation of new businesses and expanding business establishment, which include entrepreneurship and employment simultaneously. This is because previous studies, i.e. Davis et al. (2008) for the case of US, found that contraction and expansion of continuing establishment contributed to about two thirds of turbulence in the economy, and that more of one third of job creation in the country is due to the entry of new establishment. We have developed two hypotheses as follow:

Hypothesis 1: Regions with more shares of foreign citizens will have higher growth and size of business establishments

Hypothesis 2: Municipalities with more shares of foreign citizens will have higher growth of enterprises

Methodology

Data

We obtained the dataset from a longitudinal regional- and municipality-level database during the period of 2013 to 2017 (5 years) provided by National Statistics Finland (Tilastokeskus) as well as spatial and geographical database from National Land Survey of Finland. The municipalities tend to be small, and more than half have fewer than 6,000 residents. The country has 19 regions: 18 on the mainland and the autonomous province of Åland Islands situated at the country's southwest coast. In 2017, Finland has 311 municipalities, down from 448 in 2002.

Although migration of foreign citizens has been particularly recent across Finland compared to its neighboring Sweden or Denmark, immigration has been picking up significantly and quadrupled from 1988 to 1998 (Coppel et al. 2001), with a record high of almost 5% of the total in 2017 (Figure 1). Labor immigration in Finland tends to be demand-driven, with employers determining and deciding whether there is a need for foreign workers. Recent report from the Ministry of Interior⁴ estimated there were 140,000 foreigners working in Finland in 2017. Of these, about 90,000 are living and working in Finland permanently and 50,000 are temporary foreign workers. The top nationalities of foreign labor force living permanently in Finland are Estonia, Russia, Sweden, China, Thailand and Germany. Temporary EU workers are mainly from Estonia and other EU countries close to Finland. Most of these workers work in the construction sector.

(Figure 1 here)

According to the Statistics Finland, the number of workers with foreign citizenship has increased steadily over the previous years, from around 77,000 in 2012 to almost 90,000 in 2016. However, despite the increase in the foreign citizen share, share of entrepreneurs among the labor force remained stagnant across the year (Figure 2), as opposed to the private sectors employment which picked up gradually after the crisis in 1998. Fornaro (2018) found that while the entrepreneurship rate of migrants is very close to that of the natives, and has been stable over time, the number of foreign entrepreneurs has dramatically grown over the years from 2006 to 2014. This progress however, has seemingly yet to translate into growth at the national-level. In this paper, we set the boundary of immigrants as strictly people with foreign citizenship, hence second-generation immigrants or immigrants who have recently naturalized, despite their equally strong roles, are not included.

(Figure 2 here)

Table 1 shows the summary statistics of both the outcome and explanatory variables. Our main variables of interest are the shares of foreign citizen in each regions and municipality, followed by several explanatory variables related to employment and entrepreneurship at the regional level, namely degree of urbanization, shares of people aged 15-64 years old with secondary and tertiary education, unemployment rate, activity rate, and in the case of municipality, whether the municipalities constituted as rural or urban region.

(Table 1 here)

Figure 3 shows that healthcare sectors have taken over manufacturing as the top industry sector providing employment to almost 17% of Finland's employed in 2017, followed by manufacturing by 12% that is in declining ever since, and wholesale and retail. This sudden expansion in healthcare sector is probably due to the restructuring and privatization of many existing public activities, which result in the jobs from the public sector suddenly show up as being connected to new or existing business identification numbers (Deschryvere 2008); while declining manufacturing is contributed by the rising globalization that relocated majority of the industry plantation to the developing world. Administration works and construction have also picked up recently in the top 5 sectors, followed by education sectors that dipped since 2016.

(Figure 3 here)

At the regional-level, manufacturing sector still armed with the greatest number of personnel, followed by wholesale and retail, which are constantly dipping across the year (Figure 4).

⁴ Ministry of Interior Publications 25/2018 International Migration 2017-2018 –Report for Finland
https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/161174/25_2018_International_Migration_2017-2018.pdf?sequence=4 (accessed 24/07/2019)

Constructions, transportation, and administrative sectors seemingly gained an edge following as the top 5 industries with the greatest number of personnel, which numbers are slightly increasing recently. Looking at total turnover in Figure 5, manufacturing and wholesale and retail topped the total industry turnover, followed by construction with a high margin.

(Figure 4 here)

(Figure 5 here)

Empirical strategy

Immigration to selected regions and municipalities, as well as establishment of enterprises may occasionally be influenced by geographic proximity. This is because the flow of labor and human capital also occurred through the influence of their nearest neighboring regions or municipalities; and that migrants tend to cluster in the area which hosted their ethnic group the most. This spatial dependency leads to the spatial autocorrelation problem, which violates the standard regression techniques that assume independency amongst observations. The spatial dataset provided by National Land Survey of Finland comprise polygon coordinate location of the regions and municipalities so we are able to compute the distance-based spatial weight matrix. To check the spatial autocorrelation across variables, we utilized Moran's I global spatial autocorrelation test developed by Moran (1950) and Cliff and Ord (1981) Cliff and Ord (1981) as follow:

$$\frac{N}{\sum_i \sum_j w_{ij}} \frac{\sum_i \sum_j w_{ij} (X_i - \bar{X})(X_j - \bar{X})}{\sum_i (X_i - \bar{X})^2} \quad (1)$$

where N is the number of spatial units indexed by i and j; X is the variable of interest; \bar{X} is the mean of X; and w_{ij} is an element of a matrix of spatial weights. Values of I range from -1 to +1. Positive values indicate positive spatial autocorrelation and vice versa, while a zero value indicates a random spatial pattern. For statistical hypothesis testing, Moran's I values can be transformed to Z-scores. Results in Table 2 shows that majority of the variables are spatially correlated, hence, spatial econometrics model will be used to take account of the spatial autocorrelation.

(Table 2 here)

Econometric models for panel data with spatial error processes have been proposed by Kapoor et al. (2007), and Baltagi et al. (2013). The fixed effects specification has the advantage of robustness in that the fixed effects are allowed to correlate with included regressors in the model (Hausman, 1978). In this paper, we adopted fixed-effects spatial autoregressive (SAR) model that takes account of the spatial autocorrelation and time-invariant heterogeneity, as follow:

$$Y_{it} = \rho WY_{it} + \beta_1 X_{i(t-1)} + \mu + \varepsilon_{it} \quad t = 1, \dots, T \quad (2)$$

W is the $n \times n$ matrix of spatial weights for each period of t; Y_{it} is the $n \times 1$ column vector of the dependent variable; $X_{i,t-1}$ is the $n \times k$ matrix of regressors in time period t-1; and μ is the vector of spatial fixed-effects. In this estimation, we have several dependent variable Y for examination at the regional level, namely the total number of establishments, the total number of personnel, and total turnover. Total number of establishments is defined as "a production unit owned by one enterprise or quasi-corporate unit, located on one site, and producing goods or services of mainly one particular type". Establishments include, e.g., factories, shops, market stalls and kiosks. The total number of

personnel is defined as number of personnel employed by the establishment, while total turnover stands for turnover or gross revenue of the establishments in EUR 1000. At the municipality-level, the dependent variables are the stocks of enterprises, enterprises closures and openings, total retail establishments, and total turnover.

The list of explanatory variables X includes share of foreign citizen, or our variable of interest, as well as degree of urbanization, share of person age 15-64 in the population, activity rate, and the dummy of rural and urban municipalities. One limitation of the observational studies is the reflection problems, which occurred when the dependent variables simultaneously affected the independent variables in time t (also known as reverse causality). To deal with this problem, we employ the lag independent variables of $t-1$ to ensure that the independent variables may influence the dependent variables in the next year, but not vice versa.

For each cross-section, W describes the spatial arrangement of the n units and each entry w_{ij} of W is greater than zero if units i and j can be considered as neighbors. We compute the matrix in STATA using `spatsga` command introduced by F. Belotti et al. (2017) which allow the creation and management of inverse weight matrices. Then we run the spatial autoregressive model in STATA using `xsmle` command introduced by F Belotti et al. (2013). The command automatically takes care of the longitudinal nature of the data, hence users only need to provide the cross-sectional $n \times n$ weight matrix to estimate the model. Two methods of estimating spatial panel models have been categorized into GMM estimators, and Quasi-Maximum Likelihood (QML) estimators, and the `xsmle` can estimate the models that fall into the second category.

Results

Effects of foreign citizen shares upon economic development across regions

On total number of business establishment

We show the effects of having more shares of foreign citizen upon regional development using regions as unit of analysis, in Table 3. The results show the shares of foreign citizen in a region correspond positively to the total number of business establishment. Approximately, for every per cent of increase in foreign citizen share, there will be 2.9 new business establishment. The effects of immigrant share remained significant even after controlling for the degree of urbanization, and share of over 15 years old in the population with tertiary education. While we do not distinguish between immigrant workers and entrepreneurs, these two might complement each other in helping to converge the regional disparities through the employment indicators.

(Table 3 here)

Looking at heterogeneity across industries, significantly positive effects are also found within manufacturing and construction sectors, namely fast-growing sectors with the largest personnel and turnover nationwide, with additional 2.9 and 2.6 establishment for every one percent share of foreign citizens. Other sectors yielding gain from immigrant share is the arts, IT and communication, and services establishment, which corresponds to the increase of establishment by 11.5, 9.1, and 6 points consecutively. Immigrants seem to spur its positive effects in improving business and entrepreneurship indicators at the regional level, in the flagship industry such as manufacturing and construction, and even fast-growing ICT industry, and the non-fast-growing industry such as services establishment.

As is the case with the European Union in general, foreign workers tend to specialize in particular industries and occupations. For instance, in Germany, Italy, the Netherlands and Austria, more than

20 per cent of foreign employment is concentrated in mining, manufacturing and energy, and in Spain, 12 percent of them engaged in services and hospitality (Guardia and Pichelmann 2006). Generally, the proportion of foreigners with blue-collar jobs is generally much higher than that in white collar jobs in most countries, and a higher concentration of immigrants in blue-collar jobs is associated with their relatively lower educational levels and the problems of skills transferability. In this study, however, we found that foreign citizen has also significant contribution to the growing information and communication industry, though at the aggregate level, the number of establishments of this industry sector is small.

On establishment-level total turnover

We then examine the magnitude of immigration effects upon the total turnover, and found a counter-intuitive result in Table 4, that regions with one percent of foreign citizens share tend to have lower total annual turnover by 6,670 euro. The findings hold consistently across sectors such as manufacturing and electricity, by less 12,200 euro and 24,500 euro respectively. Two possible explanations may operate: that establishment in the more migrant-concentrated region tend to have less profitability, or that smaller-sized industries tend to employ more foreign citizens. It is also worth to note that nationwide trends on the enterprise size also experienced downsizing, with more small establishments dominating the economy. This finding is in line with Welter et al. (2008) who found a strong tendency of small business formation, characterized by low entry thresholds and low opportunities for growth but with fierce competition among the businesses, which results in less sustainable business model (e.g. household services, retail trade, catering). Nevertheless, immigrants tend to establish their businesses and professions in sectors with lower earning potential. Immigrant workers and entrepreneurs may lack the financial and human capital to establish their professions and business with more growth opportunities and higher earnings. For immigrant entrepreneurs, amongst the obstacles are probably the small savings and the declining purchase power of consumers in these localities, a lack of entrepreneurial skills, or a lack of social capital (Curran and Blackburn 1994; van den Berg et al. 2005).

(Table 4 here)

However, regions with more foreign citizens seem to have positive association with the growth of construction and sewage industries by 31,600 euro and 16,100 euro respectively, indicating that either more migrants are likely to be employed by big enterprises on these sectors – driven by their employment and entrepreneurship -- or that the presence of more foreign citizens in the region actually drive the growth of sewage and construction industry indirectly due to the increase in the population size, whilst not necessarily driven by migrants' employment or entrepreneurship. Construction is considered a high-growth firm and in the case of Finland, having possibly labor shortages, the former conjecture is more likely to apply. However, these jobs may have strong seasonal fluctuations or generally low pay and would not be offered to the natives.

On total number of personnel

Closer examination upon the personnel number across sectors in Table 5, shows that regions with larger share of migrants tend to have lesser personnel number in the retail and education industry. Regions with one percent of foreign citizens share in the region correspond to the 6.2 and 2.6 less personnel in the retail and the education sectors consecutively. The trend also occurred in the education sector, indicating that foreign citizen may not significantly serve as private education or training activity personnel or affect the growth of these industries at the regional-level. This is because majority of the education provider in Finland are public authorities, and that immigrants are more likely to enroll and be associated with vocational and tertiary education public institutions.

(Table 5 here)

However, regions with more foreign citizens tend to have more workers in sewerage, construction, real estate, with 18.6, 7.5, and 9 more personnel for each one share of foreign citizens, which may signal that the population increased due to migration may also drive the needs of more personnel in sewage, construction and housing business, or that foreign citizens may serve as employees in these lines of industries. In the construction sector in the capital region, for instance, the Finnish construction union estimates that a fifth of the workers are immigrants (Ristikari 2013). For these lines of industries however, the estimation number might be much lower than the actual employment, because persons from the EU countries working on a temporary basis do not have to apply for a working permit. In addition, the personnel number in arts sector seem to gain the most with almost 19 points for each one foreign citizen share, which may mean that migrants add the cultural diversity in the region by employing more arts sector personnel.

We found that while the findings supported the first hypothesis, that presence of immigrants tend to positively influence the growth of business establishment at the regional-level, the results should be regarded more cautiously. While immigrants tend flock to specialized industries such as manufacturing and construction sectors, they also started to gain foothold in the fast-growing information and communication industry. However, in general, immigrants still established their profession and entrepreneurial activities in the lower turnover firms or smaller establishments; although when delving deeper in the specific industry sectors, construction, sewerage, and real estate tend to grow as the migrant population increases.

Effects of foreign citizen shares upon economic development across municipality

On enterprises stocks

Table 6 shows the effects of foreign citizen share upon enterprises growth and stocks at the smaller municipality level. Our main interest is enterprise stocks variables, defined by Statistics Finland as "The total number of active enterprises at a given point in time. The number of enterprises is influenced by fluctuations in the availability of information about enterprise start-ups and closures". The data are published in the Business Register statistics on enterprise start-ups and closures. Even after controlling for unemployment rates, degree of urbanization, and the proportion of highly-skilled active population, immigrant share still contributes positively to the growth of enterprises at the smaller municipality level. Column 1 shows that every one percent of foreign citizen share in a municipality corresponds to approximately 0.4 point of enterprise stocks. This finding echoes the similar mechanism at the regional level, that larger base of foreign citizen share may possibly influence the enterprises stocks in two channels, first, as an additional consumer base that necessitates more resources hence more enterprises are created to cater to them, or second, as a producer who helps to develop the regional entrepreneurship through establishing more enterprises or as employees at the established companies. The significant effect of unemployment rate also indicates that unemployed people tend to resort to entrepreneurship at the smaller municipality level; and that urbanization rates, population growth and highly-skilled human capital significantly influence regional variation in new firm birth rates, which are consistent with Lee et al. (2004). Fornaro (2018) also found that in the poorer regions in Finland, immigrants tend to engage in self-employment due to limited opportunities and difficulties in finding employment, primarily in the service sectors; while in the richer regions, they tend to engage in employment due to availability of more options and larger consumer base.

(Table 6 here)

On enterprises dynamics

Looking at the enterprise dynamics, which proxied by the enterprises opening and closures in column 2 and 3, we found that each one percent of foreign citizen share is associated with less enterprises opening by approximately 7.2 point though no significant effects are found in the numbers of enterprise closures. This indicates that enterprise opening seems to decline in the more migrant-concentrated municipalities. In the previous section, we found that enterprises stocks always increased due to the opening of new businesses overtime, but at some point, they will reach stagnancy and saturation after certain numbers of enterprises are achieved. This finding is related to the previous section, despite the fact that migrants tend to engage in the low-profitability firms as entrepreneurs or workers, in the aggregate level, they do not necessarily cause in more business closures.

In addition, immigrants are clearly not positively correlated in the growth of retailing business, as shown in column 4 on the retail establishment results. This is in line with the regional-level findings in Table 5 column 1 on the personnel number in retail and wholesale sector. This is because retailing enterprises tend to experience a downsizing trend over the time, for instance, Home (2002) indicated that the number of rural stores in Finland in 2001 was only a third compared to 1985. In today's cases, the changing consumer trends, as well as a series of identified inadequacies in the retail form, such as operating costs, investment capital availability and supply problems are often identified as a key constraint (Paddison and Calderwood 2007). In this case, smaller retail firms are less likely to survive; additionally, the fact that immigrants tend to establish their business or profession in the smaller business makes the negative association between migrants' presence and growth of retailing businesses plausible.

These findings seem to support the second hypothesis, although variation in the enterprise dynamics at municipality-level yield a mixed interpretation. We find that at the smaller municipality-level, immigrants contribute positively towards the growth of enterprises via two interplays: first, immigrants tend to look for employment in the bigger cities, therefore this pool of labor may drive the creation of new businesses or new employees in existing enterprises; and second, they resort to self-employment in the smaller municipalities due to unemployment and lack of opportunities. However, we also found that municipalities with more migrants tend to experience stagnancy in the numbers of business openings. These municipality probably has reached a certain point at which a market is no longer generating new demand for a firm's products, due to competition, decreased need, obsolescence, or some other factors.

Conclusion and Discussion

This paper shows that while immigrants have significantly contributed to the growth of businesses in the key sectors such as manufacturing, construction, and ICT industries, their presence seems to be significant only in a SME-type of businesses. The results remained significant even after controlling for the degree of urbanization, and share of over 15 years old in the population with tertiary education. While immigrants appear to complement the natives in the new job creations i.e. the labor-intensive sectors such as construction or manufacturing, they are also found to have significant presence in the fast-growing information and communication industries despite the small contribution at the aggregate-level. Immigrants are not a magic bullet to revive stagnant economies, but highly-skilled immigrants are more likely to bring the scientific, technical and innovative skills that expand the production capabilities of the economy.

While some efforts to harness immigrant entrepreneurship may work in the larger regions, fostering the local entrepreneurship may simply not a viable strategy to be implemented in the sparsely populated municipalities in Finland. However, some studies e.g. in Purdue (2001), suggest that the

initiatives may work if social capital formation is pushed, to enhance collaboration between local authorities, local business communities, and the residents. Furthermore, local networks must be cultivated to include more heterogeneous actors in the business and across sectors, sizes, and experiences particularly between native-owned and immigrants-owned. This can ensure a better knowledge and even technology transfer, which may provide better opportunities for intersectoral partnership between firms, the government, and even the community.

At the national-level policy formulation, the government is encouraged to build an integrated chain of network of business promoters across different geographical scales, from regional- to municipality-level, which serves as basis of all networking activities. Especially trained specialists and high-skilled workers are needed to strengthen our domestic labour markets. The current level of work-based immigration is not enough to fulfill the need of employees in Finnish companies.

Our analyses are nevertheless hampered by some limitation on immigration profiles in each region or municipality. First, the skill or educational information of immigrants is not available at the regional and municipality-levels. Second, we do not take into account the illegal or seasonal workers that are prevalent in the construction or agricultural sectors.

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List of Table and Figures

Figure 1: Trends of immigration relative to the population in Finland

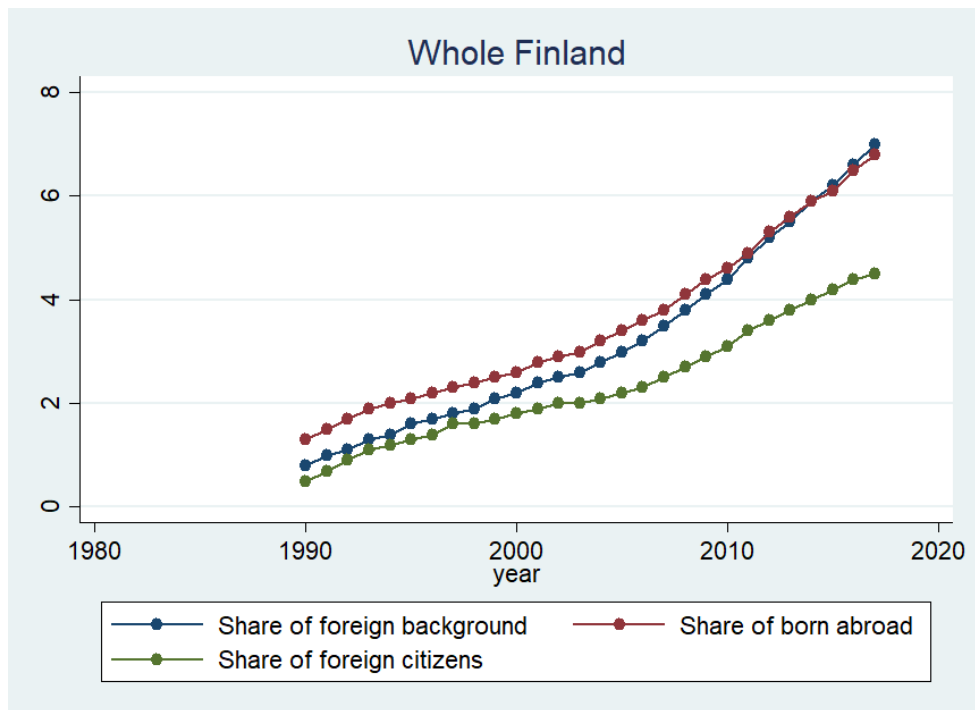


Figure 2: Trends of employment share in Finland

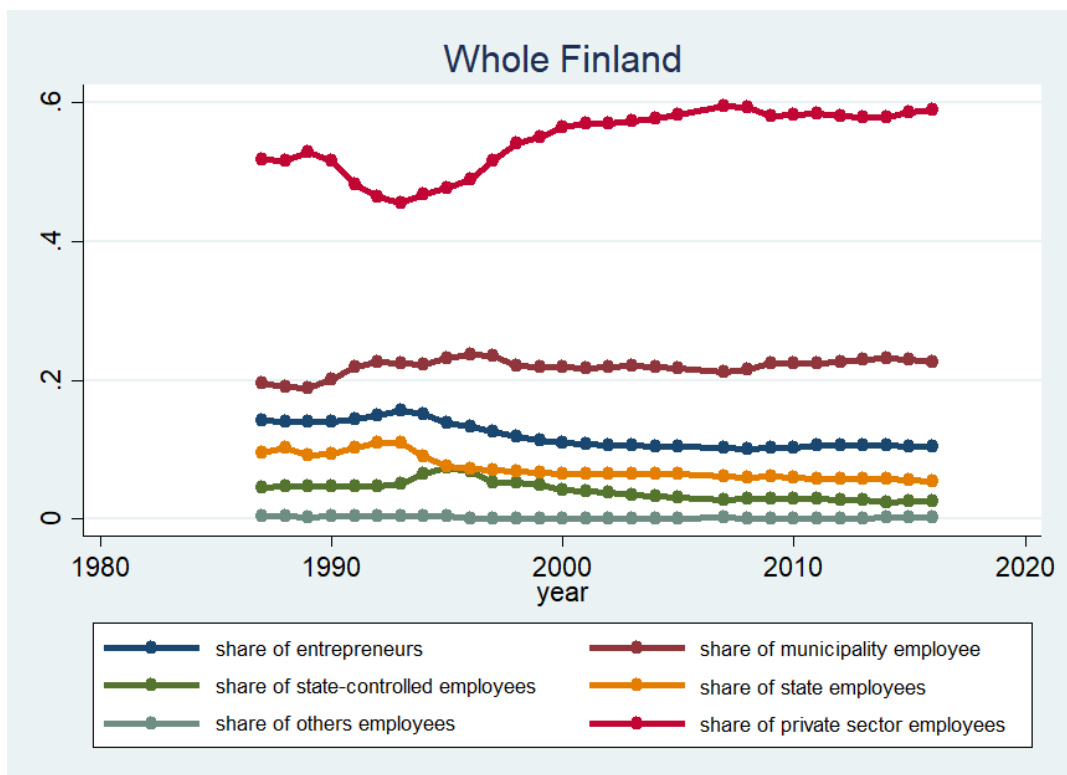


Figure 3: Share of employment by sector (%) in Finland

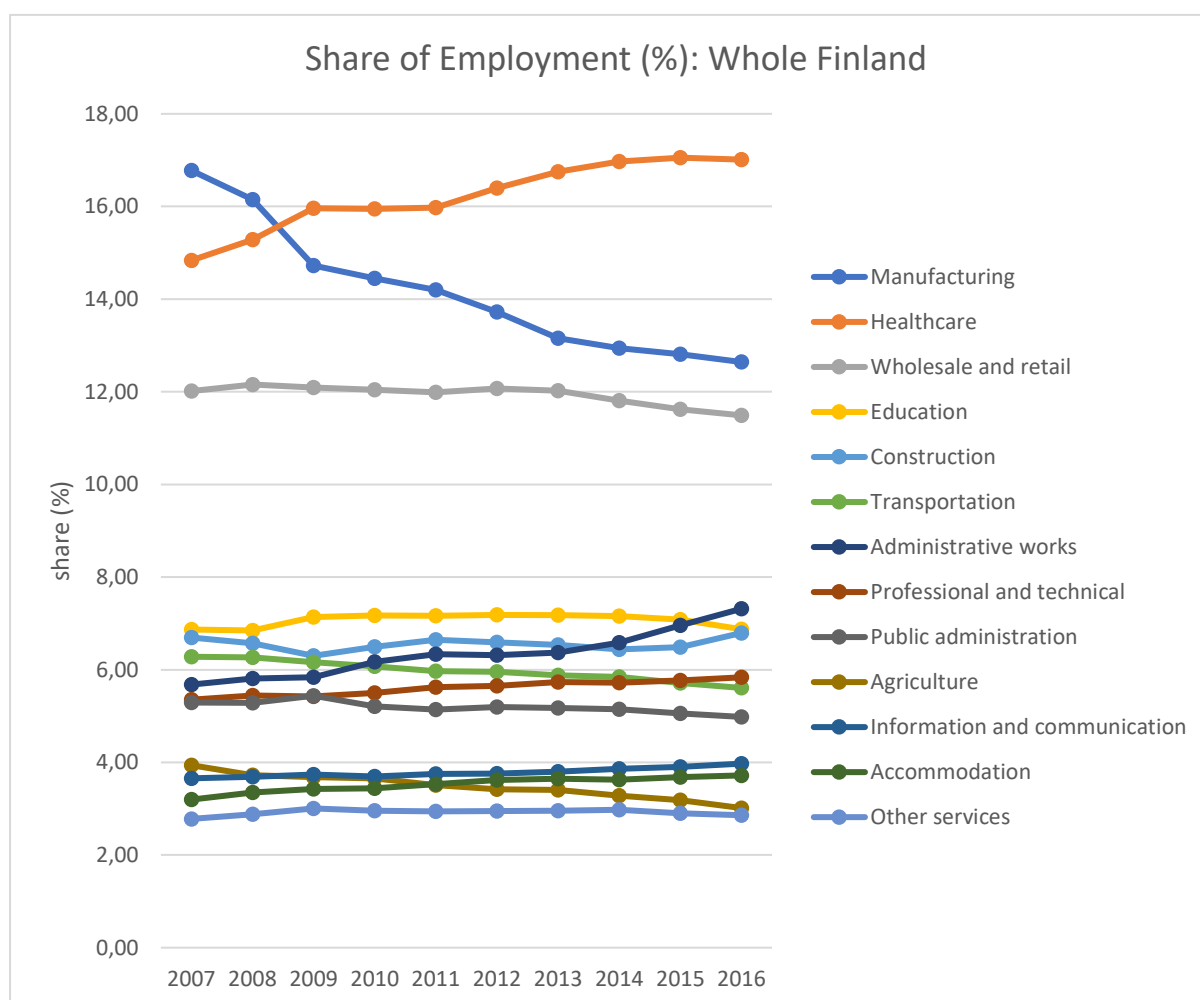


Figure 4: Total Establishment by Industry (Regional-level)

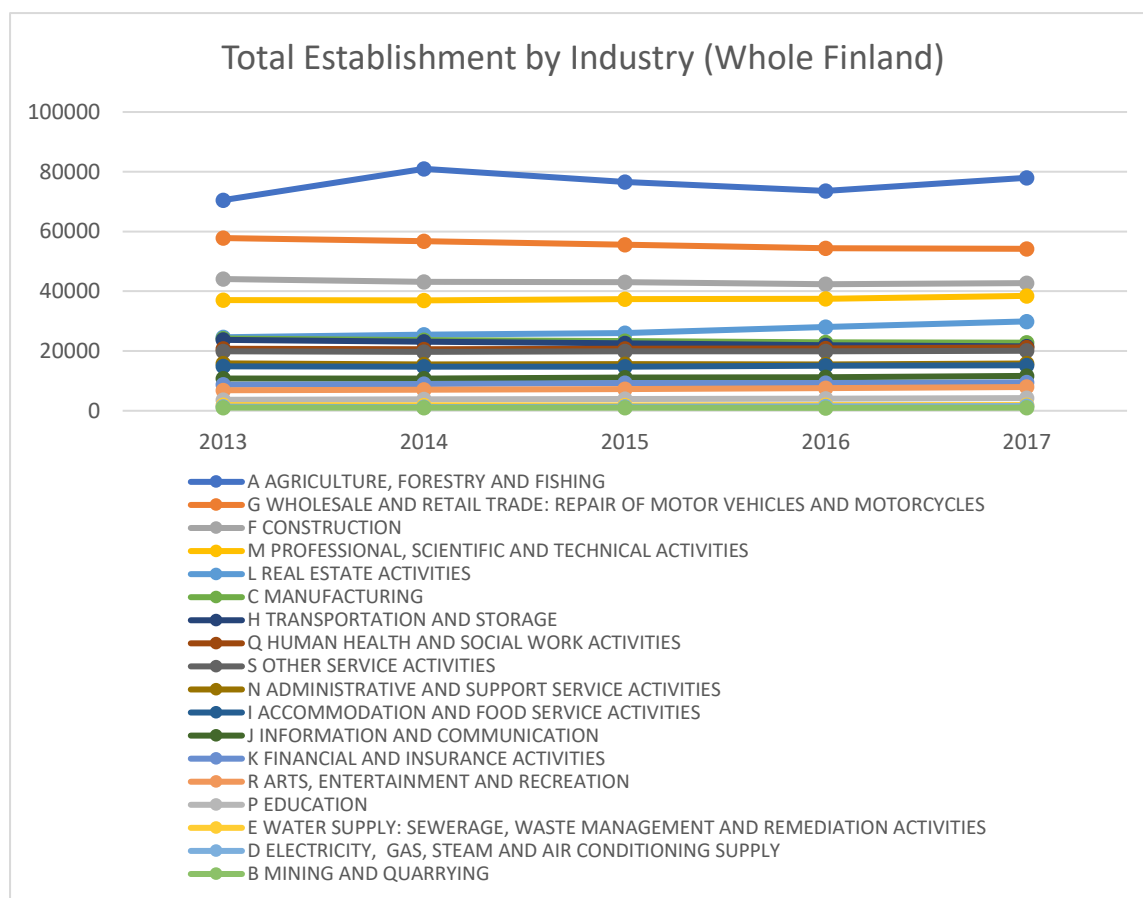


Figure 5: Total Personnel by Sectors (Regional-level)

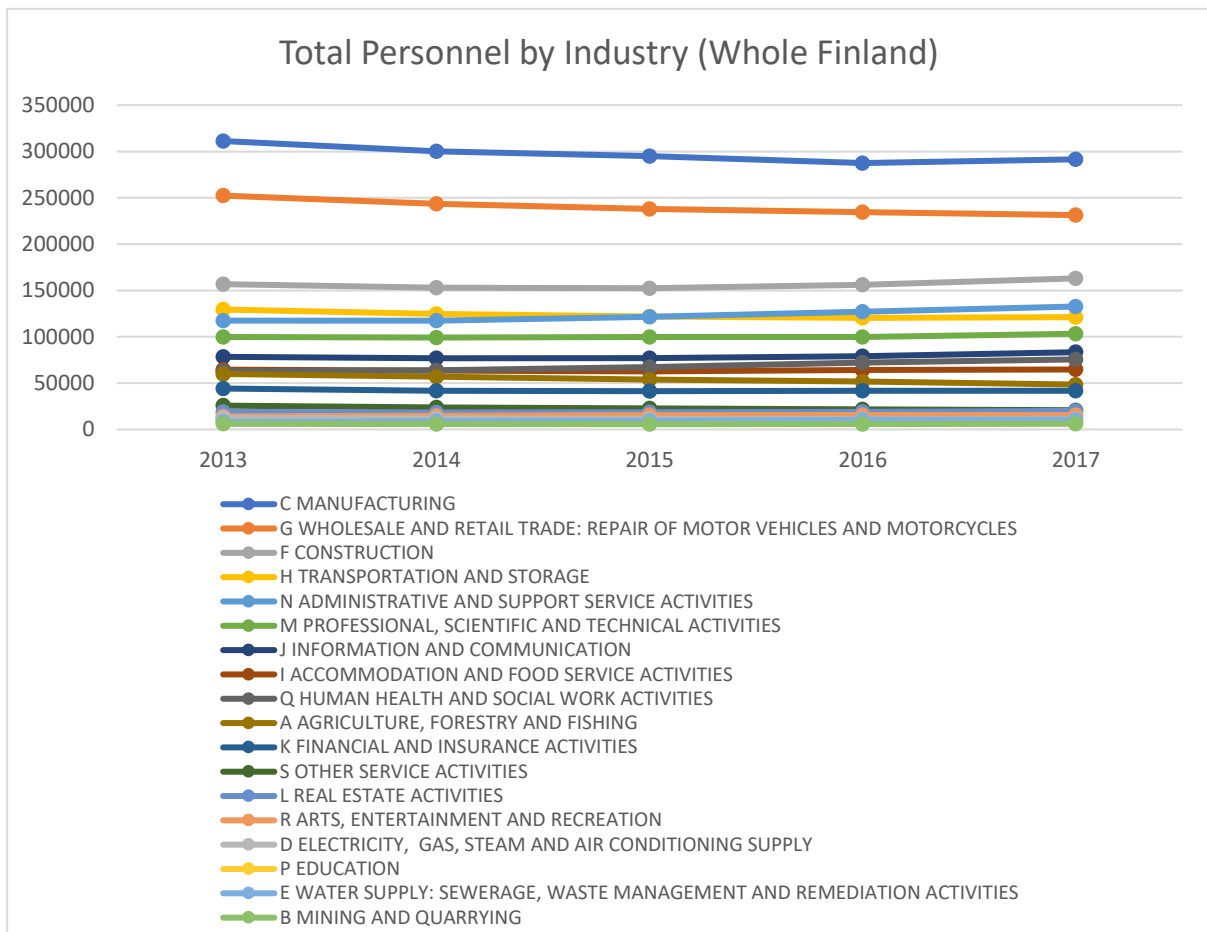


Figure 6: Total Turnover in Eur1000 by Sectors (Regional-level)

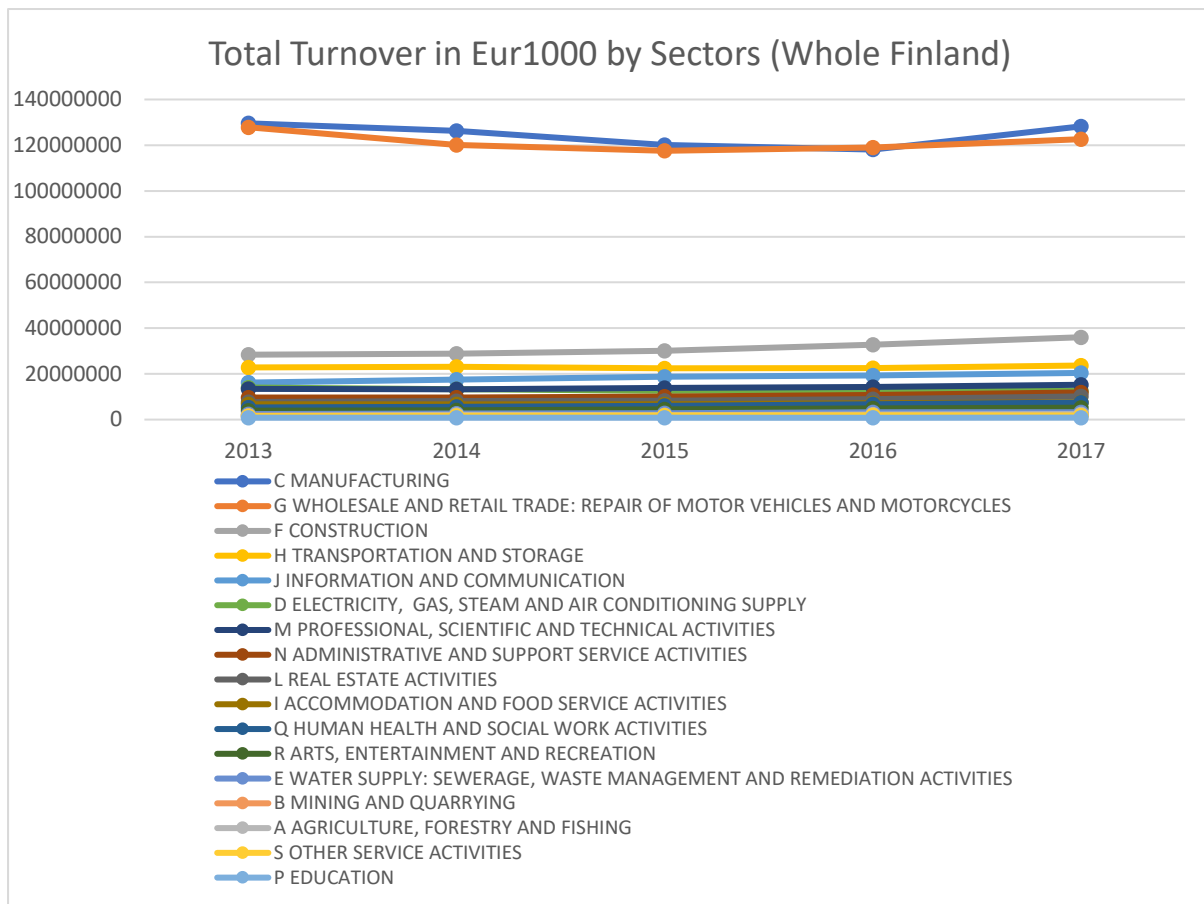


Figure 7: Enterprises Stocks (Municipality-level)

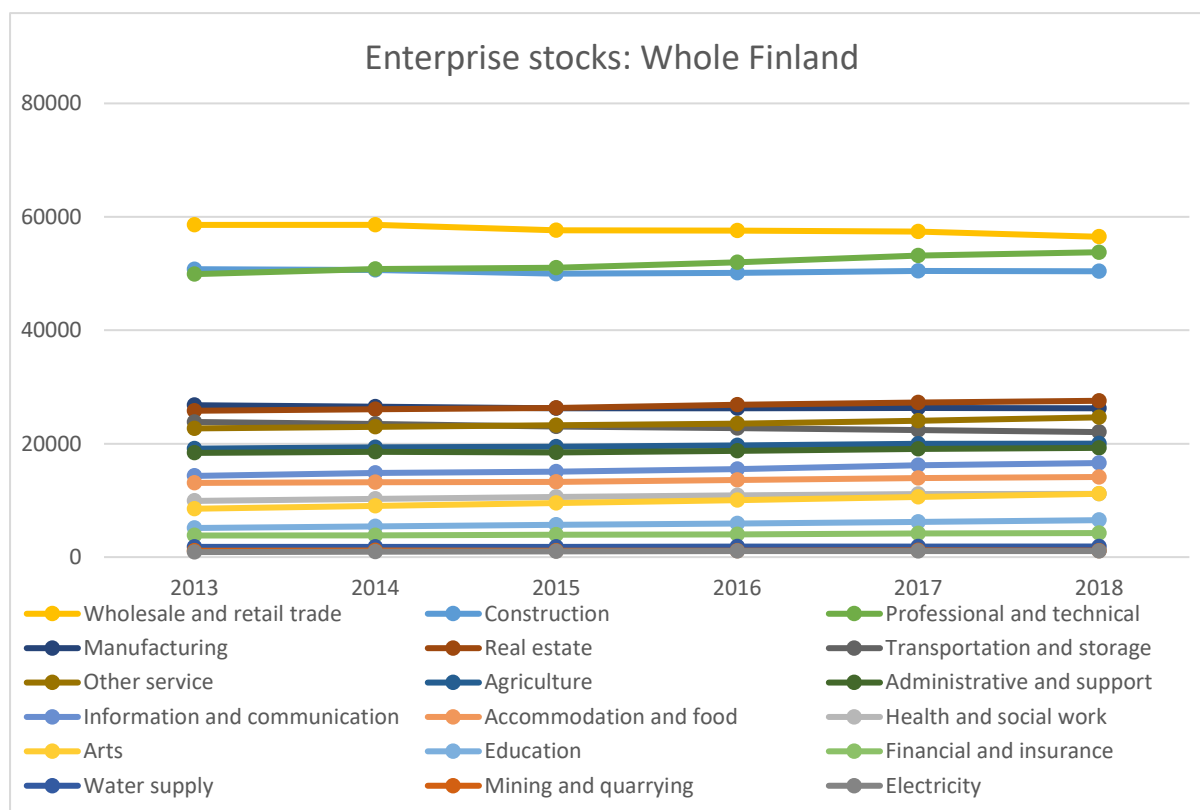


Figure 8: Opening of new enterprises (Municipality-level)

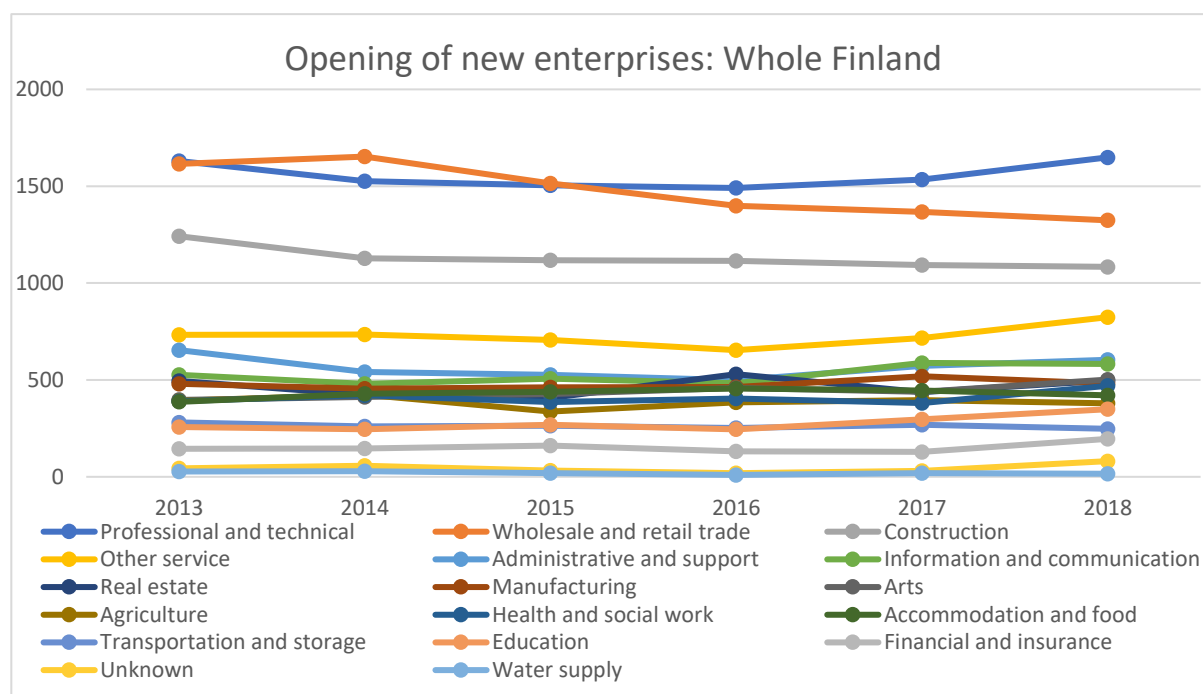


Table 1: Summary statistics

Region variables	Mean	SD
Share of foreign citizens	3.296	2.167
Degree of urbanisation, %	79.803	7.645
Population change from the previous year, %	-0.076	0.549
Intermunicipal migration gain/loss, persons	0.000	1584.263
Share of persons aged 15 or over with tertiary level qualifications, %	26.735	3.304
Share of persons aged 15 or over with at least upper secondary qualifications, %	69.606	2.424
Unemployment rate, %	8.949	2.399
Log of Total Establishment	9.587	0.779
Log of Information and Communication Establishment	5.528	1.068
Log of Financial and Insurance Establishment	5.510	0.924
Log of Administrative Establishment	6.253	0.866
Log of Education Establishment	4.690	0.977
Log of Arts Establishment	5.361	0.930
Log of Services Establishment	6.569	0.824
Log of Total Industry Turnover (in EUR1000)	16.188	0.956
Log of Manufacturing Industry Turnover (in EUR1000)	15.084	1.140
Log of Water Industry Turnover (in EUR1000)	11.514	0.941
Log of Construction Industry Turnover (in EUR1000)	13.769	0.928
Log of Motorized Trade Industry Turnover (in EUR1000)	14.840	1.013
Log of Service Industry Turnover (in EUR1000)	10.932	0.868
Observations	95	
Municipality variables	Mean	SD
Share of foreign citizens of the population, %	2.429	2.348
Degree of urbanisation, %	61.165	21.920
Intermunicipal migration gain/loss, persons	0.000	298.622
Share of persons aged 15 or over with at least upper secondary qualifications, %	65.544	5.403
Population change from the previous year, %	-0.648	1.201
Log of Enterprises Stocks	6.148	1.171
Log of Enterprise Closures	1.827	1.276
Log of Enterprise Openings	2.294	1.289
Log of Retail Establishment Number	3.611	1.335
Log of Retail Personnel Number	4.763	1.519
Log of Turnover (in EUR1000)	10.529	1.571
Log of Turnover/person (in EUR1000)	5.765	0.210
Observations	1568	

Table 2: Moran I's test results for global spatial autocorrelation

Variables	I	E(I)	SD(I)	Z score	p-value*
Municipality-level					
Log of enterprises stock	0.075	-0.003	0.005	15.046	0.000
Share of foreign citizens	0.206	-0.003	0.005	40.482	0.000
Degree of urbanisation, %	0.075	-0.003	0.005	15.039	0.000
Population change from the previous year, %	0.089	-0.003	0.005	17.615	0.000
Intermunicipal migration gain/loss, persons	0.022	-0.003	0.004	6.078	0.000
Share of persons aged 15 or over with at least upper secondary qualifications, %	0.059	-0.003	0.005	11.947	0.000
Household dwelling share	0.057	-0.003	0.005	11.637	0.000
Share of persons aged 15	0.117	-0.003	0.005	22.908	0.000
Rural (=1 if Yes)	0.044	-0.003	0.005	8.941	0.000
Urban (=1 if Yes)	0.036	-0.003	0.005	7.617	0.000
Region-level					
Share of foreign citizen	0.014	-0.056	0.032	2.184	0.014
Degree of urbanization, %	-0.015	-0.056	0.036	1.133	0.129
Population change from the previous year, %	-0.028	-0.056	0.036	0.758	0.224
Intermunicipal migration gain/loss, persons	-0.029	-0.056	0.026	1.029	0.152
Share of persons aged 15 or over with tertiary level qualifications, %	-0.045	-0.056	0.033	0.336	0.368
Share of persons aged 15 or over with at least upper secondary qualifications, %	-0.071	-0.056	0.036	-0.420	0.337
Unemployment rate, %	0.025	-0.056	0.037	2.171	0.015
Log of Total Establishment	-0.075	-0.056	0.035	-0.566	0.286
Log of Information and Communication Establishment	-0.058	-0.056	0.034	-0.078	0.469
Log of Financial and Insurance Establishment	-0.047	-0.056	0.033	0.260	0.397
Log of Administrative Establishment	-0.060	-0.056	0.035	-0.121	0.452
Log of Education Establishment	-0.043	-0.056	0.035	0.365	0.357
Log of Arts Establishment	-0.024	-0.056	0.034	0.916	0.180
Log of Services Establishment	-0.070	-0.056	0.035	-0.406	0.342
Log of Total Industry Turnover (in EUR1000)	-0.056	-0.056	0.033	-0.025	0.490
Log of Manufacturing Industry Turnover (in EUR1000)	-0.064	-0.056	0.035	-0.248	0.402
Log of Water Industry Turnover (in EUR1000)	-0.020	-0.056	0.037	0.984	0.163
Log of Construction Industry Turnover (in EUR1000)	-0.072	-0.056	0.035	-0.473	0.318
Log of Motorized Trade Industry Turnover (in EUR1000)	-0.057	-0.056	0.032	-0.037	0.485
Log of Service Industry Turnover (in EUR1000)	-0.050	-0.056	0.035	0.147	0.441

Table 3: Effects of immigration upon numbers of regional establishments by sectors

	(1) Log of Total Establishment	(2) Log of Manufacturing Establishment	(3) Log of Construction Establishment	(4) Log of Information and Communication Establishment	(5) Log of Arts Establishment	(6) Log of Services Establishment
Share of foreign citizens in t-1	0.0286* (2.49)	0.0291** (2.62)	0.0259** (2.64)	0.0910** (2.64)	0.115** (3.23)	0.0600*** (4.11)
Degree of urbanization in t-1	0.0169* (2.14)	0.0139 (1.87)	0.0303*** (4.48)	-0.00758 (-0.33)	0.0913*** (4.47)	-0.00538 (-0.57)
Share of person age 15-64 in the population in t-1	0.0117 (0.95)	-0.00589 (-0.51)	0.0345** (3.29)	-0.0238 (-0.67)	-0.0379 (-1.18)	-0.00175 (-0.12)
Unemployment rate in t-1	0.000650 (0.42)	0.000454 (0.32)	-0.00144 (-1.11)	-0.00322 (-0.75)	0.00822* (2.12)	-0.00117 (-0.65)
Share of over 15 with tertiary education in t-1	0.0725*** (4.83)	0.0610*** (4.39)	0.0218 (1.71)	0.0373 (0.87)	0.0796* (2.05)	0.0214 (1.18)
Share of over 15 with secondary education in t-1	-0.0470*** (-6.10)	-0.0504*** (-6.78)	-0.0289*** (-4.37)	-0.0195 (-0.85)	-0.0393 (-1.81)	-0.0244** (-2.63)
Activity rate in t-1	0.00100 (0.60)	0.00237 (1.52)	-0.00268 (-1.88)	-0.00670 (-1.41)	0.00619 (1.45)	0.00472* (2.37)
W * Y	0.727*** (9.82)	0.518** (3.17)	0.343* (2.00)	-0.0274 (-0.08)	-0.0849 (-0.27)	-0.963* (-2.02)
Variance sigma2_e	0.000128*** (6.11)	0.000111*** (6.11)	0.0000930*** (6.15)	0.00106*** (6.16)	0.000857*** (6.16)	0.000187*** (5.99)
N	76	76	76	76	76	76
R-squared	0.484	0.302	0.498	0.0870	0.629	0.00962

t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Note: Sectors that were not reported here yield non-significant results

Table 4: Effects of immigration upon regional business turnover by sectors

	(1) Log of Total Annual Turnover in EUR1000	(2) Log of Annual Manufacturing Turnover in EUR1000	(3) Log of Annual Electricity Turnover in EUR1000	(4) Log of Annual Water and Sewage Turnover in EUR1000	(5) Log of Annual Construction Turnover in EUR1000
Share of foreign citizens in t-1	-0.0667** (-2.94)	-0.122* (-2.54)	-0.245* (-2.22)	0.316*** (3.76)	0.161* (2.13)
Degree of urbanization in t-1	0.0275 (1.87)	0.0459 (1.46)	0.199** (2.68)	0.0795 (1.40)	0.0227 (0.47)
Share of person age 15-64 in the population in t-1	0.0448 (1.95)	0.0363 (0.74)	0.306** (2.60)	-0.0500 (-0.56)	-0.0175 (-0.24)
Unemployment rate in t-1	-0.00524 (-1.84)	-0.00810 (-1.34)	0.0317* (2.23)	-0.0146 (-1.33)	-0.0149 (-1.62)
Share of over 15 with tertiary education in t-1	0.0434 (1.54)	-0.0994 (-1.65)	0.142 (1.01)	0.418*** (3.88)	0.265** (2.91)
Share of over 15 with secondary education in t-1	0.000745 (0.05)	0.0804** (2.66)	-0.0939 (-1.31)	-0.184** (-3.18)	-0.0700 (-1.48)
Activity rate in t-1	0.00124 (0.40)	-0.000998 (-0.15)	-0.00102 (-0.06)	-0.00259 (-0.21)	0.00738 (0.73)
W * Y	0.702*** (6.51)	0.561*** (3.43)	-0.0967 (-0.31)	-1.701*** (-3.38)	-0.163 (-0.57)
Variance sigma2_e	0.000448*** (6.07)	0.00204*** (6.09)	0.0114*** (6.16)	0.00668*** (5.74)	0.00474*** (6.16)
N	76	76	76	76	76
R-squared	0.702	0.129	0.606	0.388	0.542

t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Note: Sectors that were not reported here yield non-significant results

Table 5: Effects of immigration upon regional personnel numbers by sectors

	(1) Log of Personnel Number in Retail and Wholesale Sector	(2) Log of Personnel Number in Education Sector	(3) Log of Personnel Number in Water and Sewage Sector	(4) Log of Personnel Number in Construction Sector	(5) Log of Personnel Number in Real Estate Sector	(6) Log of Personnel Number in Arts Sector
Share of foreign citizens in t-1	-0.0620*** (-3.58)	-0.256** (-2.99)	0.186* (2.17)	0.0747** (3.00)	0.0905*** (3.39)	0.189** (2.86)
Degree of urbanization in t-1	-0.0148 (-1.62)	-0.392*** (-7.02)	-0.0910 (-1.55)	-0.00668 (-0.39)	0.0331* (1.98)	0.275*** (6.02)
Share of person age 15-64 in the population in t-1	0.0321* (2.25)	0.110 (1.27)	-0.208* (-2.27)	0.0133 (0.50)	0.0466 (1.79)	0.0762 (1.08)
Unemployment rate in t-1	0.00247 (1.41)	-0.0239* (-2.19)	-0.00254 (-0.23)	-0.00470 (-1.43)	0.000378 (0.11)	-0.00669 (-0.78)
Share of over 15 with tertiary education in t-1	0.0138 (0.78)	0.207 (1.94)	0.466*** (4.08)	0.107*** (3.31)	0.182*** (5.73)	-0.349*** (-4.10)
Share of over 15 with secondary education in t-1	-0.0167 (-1.64)	0.0466 (0.88)	-0.208*** (-3.45)	-0.0541*** (-3.31)	-0.0751*** (-4.38)	0.0808 (1.79)
Activity rate in t-1	-0.00108 (-0.56)	0.0428*** (3.69)	0.0144 (1.15)	0.000753 (0.21)	0.00299 (0.85)	0.0388*** (4.13)
W * Y	-0.282 (-0.74)	-0.613 (-1.66)	-0.856 (-1.79)	0.235 (1.19)	-0.815* (-2.14)	-0.509 (-1.34)
Variance sigma2 e	0.000174*** (6.15)	0.00630*** (6.11)	0.00715*** (6.01)	0.000596*** (6.16)	0.000582*** (6.07)	0.00417*** (6.12)
N	76	76	76	76	76	76
R-squared	0.251	0.386	0.0437	0.211	0.533	0.191

t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ Note: Sectors that were not reported here yield non-significant results

Table 6: Effects of immigration upon enterprises stocks and turnover across municipalities

	(1) Log of Enterprises Stocks	(2) Log of Enterprise Openings	(3) Log of Enterprise Closures	(4) Log of Retail Establishment	(5) Log of Turnover (in EUR1000)
Foreign citizen share in t-1	0.00412** (0.00171)	-0.0724* (-2.04)	0.0421 (0.97)	-0.0280* (-2.39)	-0.00762 (-0.23)
Degree of urbanization in t-1	0.00159** (0.000723)	0.00435 (0.32)	0.00317 (0.19)	0.00119 (0.35)	0.00113 (0.19)
Population change in t-1	0.000386 (0.000745)	-0.00468 (-0.31)	0.00975 (0.50)	0.0155*** (4.21)	-0.0000375 (-0.00)
Share of over 15 with tertiary education in t-1	0.0103*** (0.00185)	0.0413 (1.10)	0.0621 (1.18)	0.00335 (0.36)	0.0147 (0.52)
Share of over 15 with secondary education in t-1	-0.00288*** (0.000899)	-0.0258 (-1.48)	-0.0122 (-0.53)	-0.00743 (-1.53)	-0.00308 (-0.27)
Unemployment rate in t-1	0.00115* (0.000616)	-0.00211 (-0.17)	0.0106 (0.70)	0.00559 (1.85)	-0.00450 (-0.64)
Dependency ratio in t-1	-0.000912*** (0.000156)	-0.000474 (-0.16)	-0.00449 (-1.11)	-0.00176* (-2.08)	-0.00201 (-1.17)
Urban in t-1	0.0209 (0.0180)	-0.0437 (-0.13)	0.110 (0.28)	-0.00357 (-0.04)	0.0717 (0.54)
Rural in t-1	-0.00399 (0.00677)	-0.252* (-1.99)	-0.0171 (-0.11)	-0.0254 (-0.80)	0.0206 (0.40)
W * Y	0.796*** (0.0771)	0.303 (1.64)	0.342 (1.96)	0.553*** (4.50)	0.264 (0.93)
Variance sigma ² e	0.000388*** (1.39e-05)	0.135*** (25.66)	0.184*** (26.13)	0.00856*** (24.69)	0.0214*** (11.01)
N	1555	1555	1555	1555	1555
R-squared	0.487				

t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For column 2, 3, 4, and 5, multiple imputation is performed to deal with missing data points.