DOES IMMIGRATION HAVE AN IMPACT ON ECONOMIC DEVELOPMENT AND UNEMPLOYMENT? EMPIRICAL EVIDENCE FROM FINLAND (1981 – 2001)

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Abstract

This study aims at investigating the nature of the causal relationship between immigration and two macroeconomic indicators, GDP per capita and unemployment using Granger causality tests based on Finnish data during the period between 1981-2001. Results indicate that the null hypotheses of immigration does not granger cause GDP per capita is rejected in 2-year lag, at the 5% level. Results show no evidence of reverse causality. On the other hand, the null hypotheses of immigration does not granger cause unemployment is rejected in 2-year lag at the 5% level. Again, results show no evidence of reverse causation.

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1. Introduction

Finland is commonly reputed as having a high level of living standard, well-developed social welfare system, and a welcoming attitude towards immigrants. This reputation has made this country the center of attraction for the immigrants from less developed countries from all around the world. Finland's another striking feature is its ageing population. It is estimated that low fertility rates, demographic effects of the baby booms, and high life expectancy rates will lead to a fall in the labor supply in this country constituting a risk of insufficient manpower in the next few years (Wallin and Kvam 2000). This has serious implications for not only the sustainability of the pension and benefit systems but also for the

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labor market where employers will have to replace domestic employees with immigrants.

Inflow of aliens into Finland in the last decade has made immigration and immigration policy a major public issue in this country. People are concerned that immigration reduces employment opportunities for the existing workforce, depresses wage rates in already low-wage labor markets, and financially strains taxpayers via their receipt of transfer payments and use of social service programs.

In this respect, it is essential to assess the impact of foreign workers on GDP per capita and unemployment to assist policy-makers in designing policies regarding immigration. International migration and the role that it plays in the economies of the originating and receiving countries has frequently been a topic of interest. However, such study does not exist in the literature particularly for Finland. The present study aims at filling this gap in the literature through investigating the nature of the causal relationship between immigration and two macroeconomic indicators, GDP per capita and unemployment using Granger causality tests based on Finnish data during the period between 1981-2001.

This paper is structured as follows. Next section reviews some of the existing studies on the impacts of foreign workers on the economy and unemployment. Section III provides a theoretical framework through which immigration may have an impact on the economy of the host countries. Section IV provides information regarding the immigration in Finland. Section V reviews the data and presents the results obtained. Last section provides conclusions and policy implications that emerge from the study.

2. Literature Review

Literature on the economic impact of immigration focuses primarily on the effects of immigration on the unemployment of domestic workers. Marr and Siklos (1994) studied the relationship between immigration and unemployment in Canada using quarterly data for the period 1962-1990. They used Granger causality and found that before 1978, changes in immigration levels did not affect the Canadian unemployment rate, but after 1978 immigration rates contributed to changes in the unemployment rate.

Marr and Siklos (1995) investigated the relationship between immigration and unemployment in Canada using annual data from 1926 to 1992. They used both Granger causality tests between unemployment and immigration and the unrestricted VAR approach involving time series regression of unemployment, immigration, wage (per capita total labor income), and real GDP. The Granger causality tests revealed that immigration was not caused by past unemployment; however, past immigration did cause unemployment. Evidence also suggested that immigration and unemployment rates were inversely related and the past unemployment rate had a quantitatively smaller impact on immigration than past immigration had on current level of unemployment. Konya (2000) tested the Granger causality between immigration and long-term unemployment in Australia in the period between 1981 and 1998. Using quarterly, both seasonally adjusted and unadjusted data, she found that there was a negative unidirectional Granger causality, both between the seasonally unadjusted and adjusted series, running from immigration to long-term unemployment.

Akbari and DeVoretz (1992) analyzed Canadian data to assess the impact of immigrant workers on the employment of Canadian-born workers for 125 Canadian industries using 1980 data. They used translog specification of the production function. The estimated cross elasticities suggested no economy-wide displacement of Canadian-born workers by immigrants.Withers and Pope (1993) studied Australian data spanning the period between 1861 and 1991 using both structural disequilibrium modeling and causality testing. They found that unemployment caused immigration no evidence in the opposite direction. They also found structural breaks in the relationship that originated from government policy changes.

Withers and Pope (1985) studied quarterly Australian unemployment and immigration data from 1948 to 1982. They used both statistical causality techniques and conventional structural models to investigate the relationship between immigration and unemployment. They run Granger causality tests on quarterly data with twelve lags and reached the conclusions that there was no evidence of causality from immigration to unemployment, unemployment did influence subsequent immigration, immigration did not significantly affect structural unemployment; and migrants created as least as many jobs as they filled.

Winegarden and Khor (1991) investigated whether undocumented immigration caused any substantial increases in joblessness among the vulnerable groups in U.S workforce. They used 1980 U.S. census data on the state distribution of the alien population to analyze the relationship between this population and unemployment among youth and minority workers. They also estimated a simultaneous equation model involving unemployment and immigration as endogenous variables. Evidence show that undocumented immigration has not caused any substantial increases in joblessness among the presumably most vulnerable groups in U.S workforce, although small amounts of displacement were detected. Gross (1997) used Canadian data and analyzed the ability of a regional market, British Columbia, to absorb the growing flows of immigrant workers with declining levels of skills in times of relatively high unemployment. He found that immigration is positively related to unemployment in the short-run and negatively related to unemployment rate in the long run. He also found that higher average skill level among immigrants makes them more competitive in the short-run.

Marr (1973) examined the relationship between immigration and unemployment rate for Canada for the period 1950 to 1967. He found a significant negative relationship between immigration flows and the Canadian unemployment rate and argued that a high unemployment rate led to a lower flow of immigrants. But when total flows were disaggregated by sending area, he found that higher unemployment rate led to lower immigration except for immigration flows from Asia, Central America and South America. Altonji and Card (1991) studied the effects of immigrants on less-skilled natives in 1970 and 1980 data on U.S. cities. They found little evidence that inflows of immigrants are associated with large or systematic effects on the employment or unemployment rates of less skilled natives.

There exists a vast empirical literature on the effects of immigration on the income of the host country citizens. Laryea (1998a) analyzed the impact of foreign-born labor on wages in Canada using data from Labour Market Activity Survey for the period 1988-1990. They used a random effects model to analyze the wage impacts by broad industry groups and also by gender. Results from the regressions show that for the total sample, foreign-born and native born were complements in production. The relationship also held for the male and female sub-samples. However, when the data was disaggregated by industry, wage suppression by immigrants was detected in the primary, transport and storage, wholesale and retail trade industries.

Laryea (1998b) employed a generalized Leontief production function to analyze substitutability or complementarity relationships between Canadian, old foreign-born and new foreign-born workers, using data from the 1991 census. He also extended the analysis to broad occupational groups. The results showed that Canadian and new foreign-born workers were substitutes in production with adverse impacts on Canadian-born wage. The earlier immigrants, on the other hand, were found to be complements to Canadian-born workers. In case of occupational group, professionally trained immigrants and unskilled Canadian-born workers were found to be substitutes. However, the relationship between unskilled immigrants and Canadian professionals and skilled Canadian workers were found to be complementary. Gruen (1986) studied the per capita growth rates in the OECD countries using cross-country regressions and found that high rates of population growth are negatively associated with per capita GDP growth where 1% growth in the immigration rate as a proportion of the population leads to a 0.7% fall in per capita growth in GDP. On the other hand, Jolley (1971) examined the impact of migration on Australia's economic growth using a neoclassical production function, adjusted for cyclical demand-driven fluctuations. The results suggested that immigration had raised GDP but had slightly lowered GDP per capita.

Easton (1990) attempted to appraise the growth performance of the New Zealand economy using descriptive statistics. He concluded that one of the reasons behind the relatively poor post-war economic growth performance was a high rate of population growth. On the other hand, Grossman (1982), using cross sectional U.S. data, found that a 10% rise in migration causes a 0.8% fall in native employment and the long run wage elasticity suggests that the same rise in immigration will reduce natives' wages by 1%.

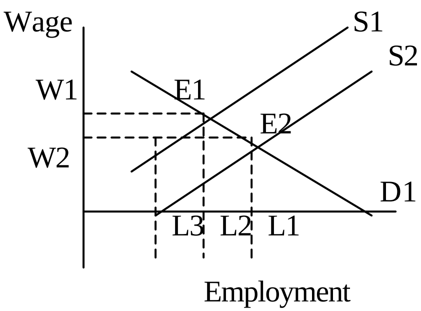
3. Theoretical Framework

This section presents the theoretical framework through which immigration may affect the labor market in the host country. Effects of immigration on the income of the host country citizens can be studied in two ways, namely supply side effects and demand side effects. In the Supply side effects, inputs, i.e. foreign labor force and domestic labor force, can be either substitutes or complements. When two inputs are substitutes in production, an increase in the supply of an input will decrease the demand for its substitute.

An increase in the labor supply through increased immigration in a given labor market will lead to an increased competition for jobs among immigrants. This would reduce the market wage for immigrants. Depending upon their skill requirements, employers are likely to substitute immigrant labor for the native worker since the former is cheaper. This competition for jobs in the local labor market between natives and immigrants would reduce the earnings of natives. If variation in the number of immigrants relative to the native born workers across selected labor market demonstrates that a higher ratio of foreign-born to native-born worker is associated with a lower wage rate of native born, then immigrants and native born are substitutable labor inputs in production. In this case, foreign-born workers would affect the earnings and job opportunities of native workers adversely.

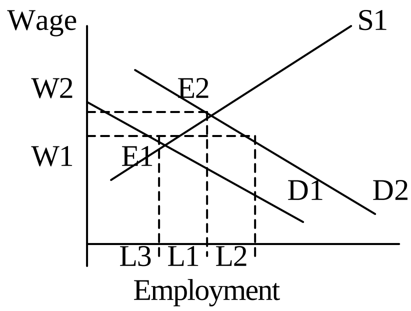
When immigrants and native workers are perfect substitutes, they compete for jobs in the same labor market and the effects are shown in Figure 1. We assume that the labor supply curve for natives is upward sloping, shown by the line S1, and (L2 – L3) immigrants enter the labor market shifting the labor supply curve to the right to S2. We further assume that the demand for labor is fixed with or without entry of immigrants. The market wage rate falls from W1to W2 and that L1-L3 amount of native workers will be displaced by immigrants.

Figure 1



In the case of complementary inputs, immigration flows could lead to increased wages for native workers. If there are skill shortage in the host country and immigrant relieve these bottlenecks, it would expand job opportunities in general, resulting in an increased demand for labor and eventually leading to higher wages of native-born workers. In this case immigrants and native workers are employed in two distinct labor markets and they are complementary inputs in production. When they are complements in production, then an increase in the demand for labor can increase the wage rate of indigenous workers. When foreign-born and the native born are complements in production, an inflow of foreign-born worker would augment the productivity of native workers. Therefore, the demand for native-born workers goes up, as shown by the shift in the demand curve from D1 to D2 in Figure 2. These will cause an increase in the wage rate from W1 to W2.

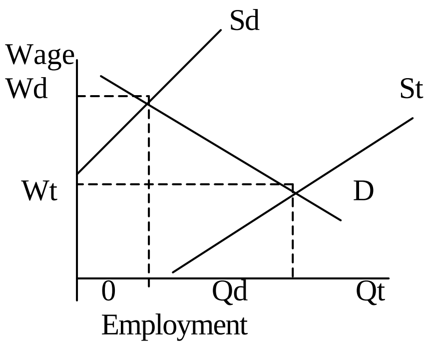
Figure 2



When we study demand side effects, we assume that the product demand is fixed. However, immigration has both demand and supply side effects in goods market. Immigrants demand goods and services, make expenditure and therefore the expenditure generated by the inflow of immigration causes the demand curve for goods and services to shift rightward. This will, in turn, cause an increase in the demand for labor. When both demand and supply effects are present, the net effect on the native would depend on the immigrants' marginal propensity to spend and the chance of getting job relative to natives. If, for example, immigrants' relative expenditure is less than their relative employment, then the demand for labor will shift to a less extent than the supply of labor and therefore some natives will lose their jobs.

Impact of immigration on the level of unemployment in the host country can be studied through two perspectives. Some people contend that the employment of immigrants decreases the employment of domestic workers on a one-for-one basis. They argue that a given number of jobs exist in the economy and that if one of these positions is taken by an immigrant, then that job is no longer available for a legal resident. At the other extreme is the claim that immigrants only accept work that resident workers are unwilling to perform and thus take no jobs from native workers. According to McConnell et al (2003), immigration does cause some substitution of illegal aliens for domestic workers but the amount of displacement is most likely less than the total employment of immigrants.

Figure 3



D is the typical labor curve, Sd portrays the labor supply of domestic workers, St reflects the total supply of domestic and immigrant workers. Given the presence of the illegal workers, the market wage and level of employment are Wt and Qt. The presence of the immigrants increases the total number of jobs in the market. With the illegal migration, the number of jobs is Qt. Without the inflow it is Qd. Therefore, it can be said that native employment would increase by the amount Qd upon the deportation of Qt immigrants.

In light of this theoretical background, this study aims at testing two null hypotheses. The first hypothesis assumes that the immigrants and the native workers are perfect substitutes, and states that immigration will lead to decreased per capita income in the host country. The second hypothesis states that immigration leads to unemployment in the host country.

4. Immigration in Finland

Finland became a country of immigration in the 1990s after losing more than a million people through emigration during the 20th century. Today, the majority of immigrants in Finland are the returnees from Sweden and the former Soviet Union. Returnees from the former Soviet Union are referred to as Ingrians, and immigrated to Finland as a result the disintegration of USSR. Other major immigrant flows were the spontaneous refugee crowds that came from Somalia, Estonia, and Iraq (Koivukangas, 2003). During the period between 1990 and 2002, net immigration to Finland was around 69,000. Today, Finland has about 152,000 immigrants, constituting roughly 2 percent of the population. Majority of Finland's foreign community is from the former Soviet Union. Of this group about 25,000 are Ingrians and 10,000 are Estonians. The next largest group consists of Swedish citizens, of whom there are around 8,000 (Koivukangas, 2003). Table 1 indicates major immigrant countries of origin in Finland.

According to Isbom (2003), a labor shortage has been predicted to strike nearly all fields in Finland in the next few years, and as high as 20,000 new employees will be needed due to the changes in the population’s age structure (Isbom, 2003). The need will be particularly severe in the fields of health, construction, industry and transportation. According to Isbom (2003), construction and engineering industries already face difficulties in finding suitable workers on the domestic labor market and employ mainly foreign labor. Commercial farms also use foreign labor, mainly short-term migrant workers from the former Soviet Union, mostly for strawberry picking (Isbom, 2003).

The increase of immigration since 1990s has created a number of problems in Finland leading to an increase in the negative attitudes and xenophobia towards foreigners. The main reason for this is the period of economic recession experienced in the 1990s that was accompanied by high unemployment (Söderling, 2003). The withdrawal of the large post-war age groups from the labour market has led to demands for change in the migration strategy with the new concept being an active migration policy aiming at integrating immigrants to the society and to the labor market (Söderling, 2003). In order to increase tolerance towards immigrants and refugees by integrating them into Finnish society, the Act on the Integration of Immigrants and Reception of Asylum Seekers became effective in 1999.

Table 1. Major Immigrant Countries of Origin (in thousands)

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Russian F.	2.9	2.2	1.9	2.0	2.0	2.4	2.5	2.2	2.5
Sweden	2.1	0.4	0.6	0.6	0.6	0.7	0.8	0.7	0.7
Estonia	0.1	1.7	1.4	0.1	0.1	0.6	0.7	0.6	0.7
Yugoslavia	0.2	0.4	0.1	0.2	0.5	0.2	0.4	0.4	0.3
Iraq	0.2	0.9	0.1	0.1	0.2	0.5	0.3	0.3	0.2
USA	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2
UK	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2
China	0.3	0.1	0.6	0.6	0.6	0.7	0.8	0.2	0.2
Germany	0.1	0.2	1.4	0.1	0.1	0.6	0.7	0.1	0.2
Somalia	0.3	0.2	0.1	0.2	0.5	0.2	0.4	0.1	0.2
Thailand	0.1	2.0	0.1	0.1	0.2	0.5	0.3	0.3	0.2
Iran	1.4	0.1	0.1	0.6	0.7	0.6	0.8	0.2	0.3
Ukraine	…	0.2	0.5	0.2	0.4	0.4	0.7	0.1	0.2
Turkey	0.1	1.4	0.1	0.1	0.6	0.7	0.6	0.7	0.2
Vietnam	0.1	0.1	0.2	0.5	0.2	0.4	0.4	…	0.2
Other countries	0.1	0.1	0.1	0.2	0.5	0.3	0.3	0.2	0.2
Total	10.4	10.9	7.6	7.3	7.5	8.1	8.3	7.9	9.1

5. Data and Methodology

This study uses data that consists of annual observations spanning the period between 1982 and 2002. All data are obtained from the World Bank World Development Indicators database and were transformed into logarithmic returns in order to achieve mean-reverting relationships, and to make econometric testing procedures valid. Immigration, denoted by FIN_IM, is measured by the size of foreign or foreign-born residents as a percentage of total population. GDP per capita, denoted by FIN_GDP, is calculated as gross domestic product divided by midyear population. Unemployment, denoted by FIN_UN, refers to the percentage of the total labor force that is without work but available for and seeking employment.

Table 2 presents the descriptive statistics of the logarithmic transformations of time series data. The measures of skewness and kurtosis as well as the probabilities of the Jarque-Berra test statistic provide evidence in favor of the null hypothesis of a normal distribution for all data sets. In addition, simple correlations are estimated for the first differences of the series for each country and no evidence of correlation was found as can be seen in table 3.

Table 2. Descriptive Statistics

	FIN_IM	FIN_UN	FIN_GDP
Mean	8.566667	1.599804	1.732471
Median	8.100000	1.626435	3.484800
Maximum	10.90000	1.689819	5.985100
Minimum	7.300000	1.452550	-6.779900
Std. Dev.	1.299038	0.064276	4.166479
Skewness	0.874034	-0.900930	-0.927812
Kurtosis	2.272194	2.911790	2.572340
Jarque-Bera	1.344542	2.847668	1.662022
Probability	0.510548	0.240789	0.435609
Sum Sq. Dev.	13.50000	0.082627	173.5954

Table 3. Correlation Matrices

Finland			
	FIN_GDP	FIN_UN	FIN_IM
FIN_GDP	1	0.242112	0.235643
FIN_UN		1	0.122567
FIN_IM			1

5.1 ADF Unit Root Tests

The first necessary condition to perform Granger-causality tests is to study the stationary of the time series under consideration and to establish the order of integration present. The Augmented Dickey-Fuller (ADF) (1979) unit root test is used in examining the stationarity of the data series. It consists of running a regression of the first difference of the series against the series lagged once, lagged difference terms, and optionally, a constant and a time trend. This can be expressed as:

$$\Delta yt = \beta_1 y_{t-1} + \beta_2 \Delta y_{t-1} + \beta_3 \Delta y_{t-2} + \beta_4 + \beta_{5t} \quad (1)$$

The test for a unit root is conducted on the coefficient of yt-1 in the regression. If the coefficient is significantly different from zero then the hypothesis that y contains a unit root is rejected. Rejection of the null hypothesis implies stationarity. If the calculated ADF statistic is higher than McKinnon's critical value then the null hypothesis is not rejected and it is concluded that the considered variable is non-stationary, i.e. has at least one unit root. Then, the procedures are re-applied after transforming the series into first differenced form. If the null hypothesis of non-stationarity can be rejected, it can be concluded that the time series is integrated of order one, *I*(1).

Table 4. Augmented Dickey-Fuller Unit Root Test Results

	Test with an intercept		Test with an intercept and trend		Test with no intercept or trend	
	Levels	1st differences	Levels	1st differences	Levels	1st differences
FIN_IM	1.8312	-4.3669	2.5944	-11.6758	0.2344	-6.5435
FIN_GDP	2.0076	-7.5654	2.8655	-8.3423	2.6634	-11.3232
FIN_UN	1.8634	-5.7543	1.5665	-7.3452	1.7853	-11.6575
CV* (1%)	-3.8573	-3.9203	-4.5715	-4.6678	-2.6997	-2.7175
CV (5%)	-3.0403	-3.0655	-3.6908	-3.733	-1.9614	-1.9644
* McKinnon Critical Value						
The lag length was determined using Schwartz Information Criteria (SIC)						

Table 4 summarizes the results of the ADF unit root tests on levels and in first differences of the data. Strong evidence emerges that all the time series are $I(1)$.

5.2. Cointegration Tests

Next, we perform cointegration analysis. Cointegration analysis helps to identify long-run economic relationships between two or several variables and to avoid the risk of spurious regression. Cointegration analysis is important because if two non-stationary variables are cointegrated, a VAR model in the first difference is misspecified due to the effect of a common tend. If cointegration relationship is identified, the model should include residuals from the vectors (lagged one period) in the dynamic Vector Error Correcting Mechanism (VECM) system. In this stage, Johansen cointegration test is used to identify cointegrating relationship among the variables. Within the Johansen multivariate cointegrating framework, the following system is estimated:

$$\Delta z_t = \Gamma_1 \Delta z_{t-1} + \ldots + \Gamma_{k-1} \Delta z_{t-k-1} + \Pi z_{t-1} + \mu + e_t: \quad t = 1, \ldots, T \quad (2)$$

Where Δ ?is the first difference operator, z denotes vector of variables, $e_t \sim$ niid $(0,\Sigma)$, μ is a drift parameter, and ? is a *(p * p)* matrix of the form ? = *aß'*, where *a* and *ß* are both *(p * r)* matrices of full rank, with *ß* containing the *r* cointegrating relationships and *a* carrying the corresponding adjustment coefficients in each of the *r* vectors. The Johansen approach can be used to carry out Granger causality tests as well. In the Johansen framework the first step is the estimation of an unrestricted, closed *pth* order VAR in *k* variables. Johansen (1995) suggests two tests statistics to determine the cointegration rank. The first of these is known as the trace statistic

$$trace(r_0 / k) = -T \sum_{i=r_0+1}^{k} \ln(1 - \hat{\lambda}_i) \quad (3)$$

where $\hat{\lambda}_i$ are the estimated eigenvalues $l_1 > l_2 > l_3 > \ldots > l_k$ and r_0 ranges from *0* to *k-1* depending upon the stage in the sequence. This is the relevant test statistic for the null hypothesis $r \leq$?r_0 against the alternative $r \geq r_0 + 1$. The second test statistic is the maximum eigenvalue test known as ?max; we denote it as ?max (r_0). This is closely related to the trace statistic but arises from changing the alternative hypothesis from r ≥ ?r_0 + 1 ?to r = ?r_0?+ 1. The idea is to try and improve the power of the test by limiting the alternative to a cointegration rank which is just one more than under the null hypothesis. The ?max test statistic is

$$l\ \max(r_0) = -T \text{ in } (1- l_i) \text{ for } i = (r_0) + 1 \qquad (4)$$

The null hypothesis is there are r cointegrating vectors, against the alternative of r + 1 cointegrating vectors. Johansen and Juselius (1990) indicated that the trace test might lack the power relative to the maximum eigenvalue test. Based on the power of the test, the maximum eigenvalue test statistic is often preferred. Table 6 presents results from the Johansen cointegration test among the data sets. Neither maximum eigenvalue nor trace tests rejects the null hypothesis of no cointegration at the 5% level.

Table 5. Johansen Cointegration Test Results

	Null Hypothesis	Trace Statistic	5% Critical Value	Maximum eigenvalue Statistic	5% Critical Value
Finland	r = 0	37.8004	42.97	22.3125	29.68
	r < = 1	13.4727	25.07	8.5145	23.41
	r < = 2	5.0381	12.76	5.0135	15.76

r is the number of cointegrating vectors under the null hypothesis.
A linear deterministic trend is assumed.

5.3. Granger-causality Tests

According to Granger (1969), Y is said to "Granger-cause" X if and only if X is better predicted by using the past values of Y than by not doing so with the past values of X being used in either case. In short, if a scalar Y can help to forecast another scalar X, then we say that Y Granger-causes X. If Y causes X and X does not cause Y, it is said that unidirectional causality exists from Y to X. If Y does not cause X and X does not cause Y, then X and Y are statistically independent. If Y causes X and X causes Y, it is said that feedback exists between X and Y. Essentially, Granger's definition of causality is framed in terms of predictability. Granger (1969) originally suggested the Granger test, which was improved by Sargent (1976). To implement the Granger test, we assume a particular autoregressive lag length *k (or p)* and estimate Equation (5) and (6) by OLS:

$$X_t = l_1 + \sum_{i=1}^{k} a_{1i} X_{t-i} + \sum_{j=1}^{k} b_{1j} Y_{t-j} + m_{1t} \tag{5}$$

$$Y_t = l_2 + \sum_{i=1}^{p} a_{2i} X_{t-i} + \sum_{j=1}^{p} b_{2j} Y_{t-j} + m_{2t} \tag{6}$$

F test is carried out for the null hypothesis of no Granger causality $H_0 : b_{i1} = b_{i2} = \cdots = b_{ik} = 0, i = 1,2.$ where *F* statistic is the Wald statistic for the null hypothesis. If the *F* statistic is greater than a certain critical value for an *F* distribution, then we reject the null hypothesis that *Y* does not Granger-cause *X* (equation (1)), which means Y Granger-causes X. A time series with stable mean value and standard deviation is called a stationary series. If d differences have to be made to produce a stationary process, then it can be defined as integrated of order d. Granger (1981, 1983) proposed the concept of cointegration, and Engle and Granger (1987) made further analysis. If several variables are all I(d) series, their linear combination may be cointegrated, that is, their linear combination may be stationary. Although the variables may drift away from equilibrium for a while, economic forces may be expected to act so as to restore equilibrium, thus, they tend to move together in the long run irrespective of short run dynamics. The definition of the Granger causality is based on the hypothesis that *X* and *Y* are stationary or I(0) time series. Therefore, we can not apply the fundamental Granger method for variables of I(1). The classical approach to deal with integrated variables is to difference them to make them stationary. Hassapis et al. (1999) show that in the absence of cointegration, the direction of causality can be decided upon via standard *F*-tests in the first differenced VAR. the VAR in the first difference can be written as:

$$\Delta X_t = l_1 + \sum_{i=1}^{k} a_{1i} \Delta X_{t-i} + \sum_{j=1}^{k} b_{1j} \Delta Y_{t-j} + m_{1t} \qquad (7)$$

$$\Delta Y_t = l_2 + \sum_{i=1}^{p} a_{2i} \Delta X_{t-i} + \sum_{j=1}^{p} b_{2j} \Delta Y_{t-j} + m_{2t} \qquad (8)$$

Since, maximum eigenvalue and trace tests do not reject the null hypothesis of no cointegration at the 5% level, aforementioned VAR method can be used. Table 6 shows the results of these regressions.

Table 6. Granger Causality Test Results

	F - Statistics			
Null Hypothesis	Lag 1	Lag 2	Lag 3	Lag 4
Immigration does not granger cause GDP per capita	3.54	65.82**	0.44	0.22
GDP per capita does not granger cause immigration	1.88	1.79	0.43	0.47
Immigration does not granger cause unemployment	1.83	44.54**	1.54	0.46
Unemployment does not granger cause immigration	1.34	0.65	1.45	3.23

* Reject the null hypothesis at the 10% level.
** Reject the null hypothesis at the 5% level.
*** Reject the null hypothesis at the 1% level.

Results of Granger-causality test show that the null hypotheses of immigration does not granger cause GDP per capita is rejected in 2 year lag, at the 5% level. Results show no evidence of reverse causality. On the other hand, the null hypotheses of immigration does not granger cause unemployment is rejected in 2 year lag at the 5% level. Again, results show no evidence of reverse causation.

6. Conclusions and Policy Implications

The aim of this paper is to assess the impact immigration has on GDP and unemployment in Finland. The results on the unit root test indicate that all the series are non-stationary and in $I(1)$ process. The Johansen cointegration test reveals that there is no cointegration among the data sets. The Granger causality test shows that when level of immigration increases, GDP per capita also increases. It has also been found that increased immigration results in increased unemployment. A number of policy implications emerge from the study.

As evident from their positive impact on GDP per capita growth, immigrants and their children will be a great asset to Finland in the future. Therefore, taking care of immigrants' basic requirements and making Finland attractive to foreign employees must be a priority for the policy makers. Policies should be developed to educate domestic societies to tolerate the temporary and permanent presence of an increasing number of people with foreign background. However, authorities should determine how many and what type of immigrants are needed. Finland has to define clear goals and guidelines for their immigration and integration policies. In this respect, restricting the immigration of people with low qualifications to prevent integration difficulties and the negative impact on the economy can be considered as a policy option. Another important policy implication that emerges from this study is the necessity of well-designed immigration regulations and policies to tackle the negative social impacts of immigrants that primarily arise from their segregation from the rest of the society. What Finland needs at this point is no longer an immigration policy, but an integration policy.

The focus must be on educational, employment and housing issues. Besides, the public sector should treat the immigration issue as an integral element of larger social issues rather than a separate problem. Segregation of immigrants is not mainly an ethnic problem, but also an economic problem. As long as immigrants cannot land jobs, do not speak Finnish, and do not participate in the Finnish institutions and organizations, segregation will be a problem.

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