

INVESTIGATING THE ECONOMIC IMPACT OF IMMIGRATION ON THE HOST COUNTRY: THE CASE OF NORWAY

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Abstract:

This article aims at investigating the nature of the causal relationship between immigration and economic development measured by GDP *per capita* in Norway using Granger causality test. The results on the unit root test indicate that all the series are non-stationary and are 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 the level of immigration increases, GDP *per capita* also increases. It has also been found that immigration has no impact on unemployment, and *vice versa*.

Keywords: economic development, immigration, unemployment, cointegration

JEL Classification: J6, F41, O11, O14, O24

1. Introduction

As is the case for many developed nations, Norway faces the challenges of an ageing population. The combination of the demographic effects of the baby booms that marked the immediate post-war period, the fall in fertility rates that began from the late 1960s, and longer life expectancy have led to a very marked acceleration of the population ageing process in Norway. This had serious implications for the sustainability of the pension and benefit systems and for labour market equilibrium. With more elderly persons and fewer young persons, Norway is expected to experience a fall in the labour supply within the next few decades. This will have to be accompanied by an increasing number of persons of foreign origin entering the labour market. Inflow of aliens into the country in the last decade has made immigration and immigration policy a major public issue in Norway. Norwegian people are concerned that immigration reduces employment opportunities for the existing work force, depresses wage rates in already low-wage labour markets, and financially strains taxpayers *via* their receipt of transfer payments and use of social service programmes. 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. The present study aims at filling this gap in the literature through investi-

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gating the nature of the causal relationship between immigration and two macroeconomic indicators, GDP *per capita* and unemployment using Granger causality tests based on Norwegian data during the period between 1983 and 2003. The rest of the 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 3 provides a theoretical framework through which immigration may have an impact on the economy of the host countries. Section 4 provides data and methodology and section 5 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 labour 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 1983 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* modelling 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. work force. 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 shows that undocumented immigration has not caused any substantial increases in joblessness among the presumably most vulnerable groups in U.S. work force, 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 labour 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%.

In a recent study, Feridun (2004) investigated the link between immigration and two macroeconomic indicators, GDP *per capita* and unemployment in Sweden. He found that there was a one-way causality running from stock of foreign population to GDP *per capita* growth. The present study follows the same methodology and conducts the same experiment for another Scandinavian country, Norway.

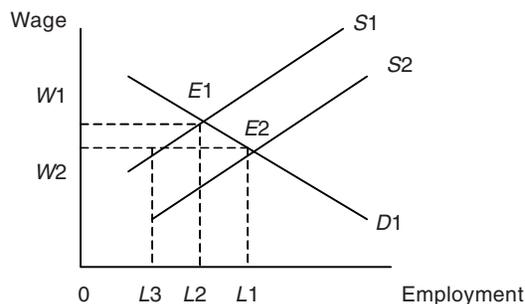
3. Theoretical Framework

This section presents the theoretical framework through which immigration may affect the labour market in the host country. Effects of immigration on the income of the host country's citizens can be studied in two ways, namely supply side effects and demand side effects. In the supply side effects, inputs, *i.e.* foreign labour force and domestic labour 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 labour supply through increased immigration in a given labour 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 labour for the native worker since the former is cheaper. This competition for jobs in the local labour 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 labour 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 labour 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 labour market and the effects are shown in Figure 1. I assume that the labour supply curve for natives is upward sloping, shown by the line S_1 , and ($L_2 - L_3$) immigrants enter the labour market shifting the labour supply curve to the right to S_2 . I further assume that the demand for labour is fixed with or without entry of immigrants. The market wage rate falls from W_1 to W_2 and that $L_1 - L_3$ amount of native workers will be displaced by immigrants.

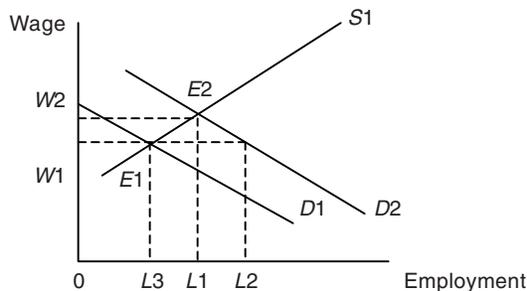
Figure 1



Source: Adopted from Feridun, M. (2004), pp. 44.

In the case of complementary inputs, immigration flows could lead to increased wages for native workers. If there are skill shortages in the host country and immigrants relieve these bottlenecks, it would expand job opportunities in general, resulting in an increased demand for labour and eventually leading to higher wages of native-born workers. In this case immigrants and native workers are employed in two distinct labour markets and they are complementary inputs in production. When they are complements in production, then an increase in the demand for labour 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



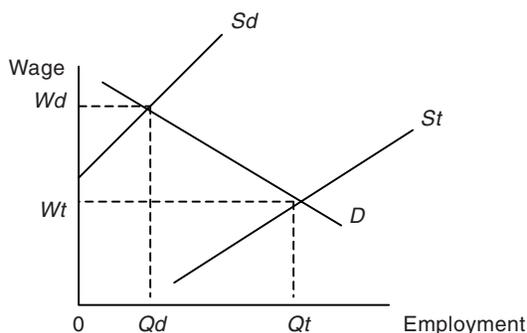
Source: Adopted from Feridun, M. (2004), pp. 45.

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 labour. 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 labour will shift to a less extent than the supply of labour 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 exists 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.

D is the typical labour curve, S_d portrays the labour supply of domestic workers, S_t reflects the total supply of domestic and immigrant workers. Given the presence of the illegal workers, the market wage and level of employment are W_t and Q_t . The presence of the immigrants increases the total number of jobs in the market. With

Figure 3



Source: Adopted from McConnell *et. al.* (1987), pp. 295.

the illegal migration, the number of jobs is Q_t . Without the inflow it is Q_d . Therefore, it can be said that native employment would increase by the amount Q_d upon the deportation of Q_t 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. Data and Methodology

This study uses data that consist of annual observations spanning the period between 1983 and 2003. All data are obtained from the World Bank's 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 *IMMG*, is measured by the size of foreign or foreign-born residents as a percentage of total population. *GDP per capita*, denoted by *GDP*, is calculated as gross domestic product divided by mid-year population.

Table 1
Descriptive Statistics

	IMMG	UNEM	GDP
Mean	26.6002	35.9001	4.1471
Median	10.3169	4.1132	6.2715
Maximum	18.1591	35.3916	8.8479
Minimum	2.6668	1.9662	2.6216
Std. Dev.	2.8702	1.5368	0.3051
Skewness	0.0226	0.4746	0.0565
Kurtosis	3.3561	3.2092	2.5651
Jarque-Bera	1.7628	2.9719	1.8645
Probability	0.6102	0.4972	0.4859
Sum Sq. Dev.	15.3002	0.2825	17.3681

Unemployment, denoted by UNEM, refers to the percentage of the total labour force that is without work but available for and seeking employment.

Table 1 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 favour 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 2.

Table 2
Correlation Matrix

	GDP	UNEM	IMMG
GDP	1	0.2465	0.3245
UNEM		1	0.2356
IMMG			1

4.1 ADF Unit Root Tests

The first necessary condition to perform Granger-causality tests is to study the stationarity of the time series under consideration and to establish the order of integration present. The Augmented (see 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:

$$\Delta y_t = \beta_1 y_{t-1} + \beta_2 \Delta y_{t-1} + \beta_3 \Delta y_{t-2} + \beta_4 + \beta_5 t \quad (1)$$

The test for a unit root is conducted on the coefficient of y_{t-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,

Table 3
Augmented Dickey-Fuller Unit Root Test Results

	Test with an intercept		Test with an intercept and trend		Test with no intercept or trend	
	Levels	1 st differences	Levels	1 st differences	Levels	1 st differences
IMMG	2.0240	-13.3055	4.3240	-14.398	0.4255	-8.5790
GDP	2.3690	-7.9810	3.2775	-8.4410	2.9670	-12.9260
UNEM	2.0355	-6.4745	4.0825	-7.2795	1.5180	-11.8680
<i>CV</i> (1%)	-4.0135	-4.6345	-6.3825	-6.4975	-3.1510	-3.0360
<i>CV</i> (5%)	-3.8755	-4.0250	-4.2320	-4.3240	-2.2080	-2.1505

* McKinnon Critical Value

The lag length was determined using Schwartz Information *Criteria* (SIC).

i.e. it 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 3 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 $I(1)$.

4.2 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 trend. 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:

$$\Delta z_t = \Pi_1 \Delta z_{t-1} + \dots + \Pi_{k-1} \Delta z_{t-k} + \mu + \varepsilon_t; \quad t = 1, \dots, T \quad (2)$$

where Δ is the first difference operator, z denotes vector of variables, $\varepsilon_t \sim \text{niid}(0, \Sigma)$, μ is a drift parameter, and Π is a $(p \times p)$ matrix of the form $\Pi = \alpha\beta'$, where α and β are both $(p \times r)$ matrices of full rank, with β containing the r cointegrating relationships and α 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 p th 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

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

where $\hat{\lambda}_i$ are the estimated eigenvalues $\lambda_1 > \lambda_2 > \lambda_3 > \dots > \lambda_k$ 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 λ_{\max} ; we denote it as $\lambda_{\max}(r_0)$. This is closely related to the trace statistic but arises from changing the alternative hypothesis from $r \geq r_0 + 1$ 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 λ_{\max} test statistic is

$$\lambda_{\max}(r_0) = -T \ln(1 - \lambda_i) \text{ for } i = r_0 + 1 \quad (4)$$

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 4 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 4
Johansen Cointegration Test Results

Null Hypothesis	Trace Statistic	5% Critical Value	Maximum eigenvalue Statistic	5% Critical Value
$r = 0$	41.4018	48.8802	23.7021	28.6467
$r < = 1$	16.8756	29.7906	13.0011	26.3835
$r < = 2$	5.1168	12.8535	7.7859	14.0712

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

4.3 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, I assume a particular autoregressive lag length k (or p) and estimate equation (5) and (6) by *OLS*:

$$X_t = \lambda_1 + \sum_{i=1}^k a_{1i} X_{t-i} + \sum_{j=1}^k b_{1j} Y_{t-j} + \mu_{1t} \quad (5)$$

$$Y_t = \lambda_2 + \sum_{i=1}^p a_{2i} X_{t-i} + \sum_{j=1}^p b_{2j} Y_{t-j} + \mu_{2t} \quad (6)$$

F test is carried out for the null hypothesis of no Granger causality $H_0: b_{11} = b_{12} = \dots = b_{1k} = 0, i = 1, 2$ 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 (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 cannot apply the fundamental Granger method for variables of $I(1)$.

The classical approach to deal with integrated variables is to differentiate them to make them stationary. Hassapis *et al.* (1999) show that in the absence of cointe-

gration, 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:

$$\Delta X_t = \lambda_1 + \sum_{i=1}^k a_{1i} \Delta X_{t-i} + \sum_{j=1}^k b_{1j} \Delta Y_{t-j} + \mu_{1t} \quad (7)$$

$$\Delta Y_t = \lambda_2 + \sum_{i=1}^p a_{2i} \Delta X_{t-i} + \sum_{j=1}^p b_{2j} \Delta Y_{t-j} + \mu_{2t} \quad (8)$$

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 5 shows the results of these regressions.

Table 5
Granger Causality Test Results

Null Hypothesis	F – Statistics			
	Lag 1	Lag 2	Lag 3	Lag 4
Immigration does not granger cause GDP <i>per capita</i>	67.9722**	3.2103	0.0042	0.9223
GDP <i>per capita</i> does not granger cause immigration	1.2921	1.4312	0.5511	0.4227
Immigration does not granger cause unemployment	1.7281	1.2121	1.3334	0.5414
Unemployment does not granger cause immigration	1.0012	0.2992	1.5316	3.8132

* 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 1 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 not rejected in any lag at the 5% level. Again, results show no evidence of reverse causation either.

5. Conclusions and Policy Implications

The aim of this paper is to assess the impact immigration has on economic development and unemployment in the Norway. 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 immigration has no impact on unemployment, and *vice versa*.

A number of policy implications emerge from the study. As the analysis has shown, the future development of the Norwegian society will depend among other things on whether the country is capable of securing a successful integration of foreigners. This includes not only the residing foreigners in the country but also those that are expected to immigrate in the future. A number of actions should be taken in

order to cope with the expected decline of the labour force. For instance, Norway may choose to mobilize the latent labour supply among various target groups such as the ageing population, inactive and unemployed youth, inactive adults and inactive and unemployed foreign born residents. As evident from their positive impact on GDP *per capita* growth, immigrants and their children will be a great asset to Norway in the future. Therefore, taking care of immigrants' basic requirements and making Norway 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. Norway 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.

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