Immigration and Economic Growth: The Case of Greece



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Abstract In the aftermath of the recent economic and migration crisis, Greece was found facing questions such as whether immigration is advantageous for the economy of the country or whether the benefits of immigration outweigh its economic cost. During a recession, immigration usually attracts general attention due to the competition for scarce job vacancies and social provisions. Consequently, countries tend to respond reactively by adopting more restrictive immigration policies. However, the economically rational response to the immigrant inflows is the effective labor market integration, which eventually leads to a successful social inclusion of the immigrants. This chapter focuses on displaying the potential gains of immigration for Greece by presenting the "immigration surplus," that is the economic benefits due to immigration. A neoclassical growth model is used assuming a competitive, market-clearing framework to measure the impact of immigrants in natives' earnings from 2001 to 2018. Moreover, the chapter aims at exploring whether there is a long-run relationship between immigration and growth in Greece and estimate it using the dynamic least squares method.

1 Introduction

Greece, being at the crossroads of Europe, Asia, and Africa, started attracting immigrants in the late 1980s and the early 1990s. Immigrants' proportion to the total population was increasing gradually since the outburst of the financial crisis in 2009, as it is presented in Table 1, with the ratio of immigrants to the total labor force being higher than their ratio to the total population. Therefore, it could be suggested that immigrants have contributed to GDP growth in Greece during the last decades.

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| Year | Total population | Natives |
|------|------------------|-----------|
| 1987 | 9714.50 | 9659.40 |
| 1988 | 9739.20 | 9672.40 |
| 1989 | 9752.80 | 9690.50 |
| 1990 | 9843.60 | 9777.00 |
| 1991 | 9919.00 | 9839.80 |
| 1992 | 9942.70 | 9838.70 |
| 1993 | 10,118.20 | 10,002.70 |
| 1994 | 10,206.00 | 10,080.90 |
| 1995 | 10,238.00 | 10,107.50 |
| 1996 | 10,254.30 | 10,120.90 |
| 1997 | 10,265.60 | 10,097.10 |
| 1998 | 10,389.60 | 10,095.20 |
| 1999 | 10,437.10 | 10,146.80 |
| 2000 | 10,471.90 | 10,176.30 |
| 2001 | 10,813.30 | 10,453.00 |
| 2002 | 10,852.10 | 10,416.10 |
| 2003 | 10,887.50 | 10,399.30 |
| 2004 | 10,925.40 | 10,361.30 |
| 2005 | 10,963.30 | 10,383.70 |
| 2006 | 10,999.10 | 10,424.90 |
| 2007 | 11,034.90 | 10,405.90 |
| 2008 | 11,059.40 | 10,346.80 |
| 2009 | 11,061.30 | 10,215.80 |
| 2010 | 11,028.80 | 10,188.10 |
| 2011 | 10,998.30 | 10,208.20 |
| 2012 | 10,967.20 | 10,202.90 |
| 2013 | 10,921.10 | 10,198.60 |
| 2014 | 10,880.50 | 10,181.20 |
| 2015 | 10,831.70 | 10,204.10 |
| 2016 | 10,783.20 | 10,221.10 |
| 2017 | 10,730.70 | 10,216.80 |
| 2018 | 10,673.40 | 10,178.80 |

Table 1Population inGreece by citizenship(thousands)

Source: Hellenic Statistical Authority (2019)

The numbers reported in Table 1 refer to the legal immigrant population in Greece. One of the challenges of immigration for the Greek state though has been the large number of undocumented immigrants and their occupation in the informal sector of the economy which has expanded it to become one of the largest informal economies in Europe (Arango and Baldwin-Edwards 2014). Greek immigration policy reform followed the influx of illegal immigrants and immigration gradually became an issue of political debate. The majority of the immigrant population in Greece used to consist of Albanians according to the 2011 census of the Hellenic Statistical Authority and they were concentrated mostly in urban areas like the

capital city of Athens (Hellenic Statistical Authority 2011). Albanians massively left their country after the fall of the Communist bloc searching to improve their standards of living and find well-paid jobs. In fact, the target of the immigration policy reform launched in Greece in 1991 was the deportation of Albanians who had entered Greece illegally and the prevention of further illegal immigration (Manou et al. 2019).

It has been supported that initially immigrants had not been competitive to natives except from low-skilled sectors (Nikas and King 2005). On the contrary, a big part of the latent demand which was created in Greece by the rising living standards, the rigidities of the local labor market, and the EU-funded investments during the aforementioned time period was met by the immigrant population (Nikas and King 2005). As such, the gaps created due to the new needs and the mobility of the native labor force to upgraded job positions were covered by the immigrant inflows (Lyberaki 2008). Moreover, the labor supply shock created by low-paid immigrant workers helped family businesses and small traditional manufacturing units to be viable instead of closing despite the fact that, at the same time, it contributed to minimum modernization and innovation initiatives in manufacturing and industrial sectors in Greece (Triantafyllidou 2007).

Following the global financial crisis, Greece entered a period of deep recession. Furthermore, during the economic downturn, Greece was found in the front line of the refugee crisis which was triggered by the Syrian civil war. As a result, immigrants already integrated into the Greek labor market started to compete with the natives for the limited job places, while there were also the newcomers who entered the labor force searching for employment opportunities. During a recession, immigration usually attracts general attention due to the competition for scarce job vacancies and social provisions (Hatton 2014). Consequently, countries tend to respond reactively by adopting more restrictive immigration policies. However, the economically rational response to the immigrant inflows is the effective labor market integration, which eventually leads to a successful social inclusion of the immigrants (Zimmermann 2017).

The aim of this chapter is to elucidate the economic benefits of immigration in Greece and relate immigration with the economic growth. Toward this purpose, Borjas' formula (1995), implemented in the case of the United States to compute the amount of the immigration surplus, is utilized. The use of this calculation presumes an oversimplified economy which is actually not the case for Greece. Nevertheless, even the estimation of the upper bound of the amount of the national income accruing to the native population due to immigration could stimulate the assessment of the advantages of immigrants' presence in Greece, so as the appropriate immigration policies to be implemented in order to capitalize on it. Moreover, this chapter seeks to explore whether there is a long-run relationship between immigration and GDP growth using a dynamic ordinary least squares model with quarterly data from 2001 onward.

The rest of the chapter is divided into five parts. The following section gives a brief theoretical perspective on the impact of migration on the countries involved in the migration process. The review of the most relevant literature follows in order to establish the framework in which this chapter contributes. The empirical part of the chapter is divided into two sections. The first section is dedicated to the description of Borjas' model and the estimation of the immigration surplus in Greece. Next, the econometric testing of the available data follows to search for the cointegration between immigration and GDP growth. Last but not least, the main conclusions of the chapter are produced.

2 A Theoretical Perspective on the Impact of Migration

The motives for the mobility of people vary from economic to political, environmental, or personal. For example, the low-income level, the low pay wages, the GDP decline, the harsh working conditions, and the level of unemployment usually induce migration outflows. Moreover, authoritarian regimes, conflicts, war, or climate change could also provoke emigration (Christodoulou and Nikas 2012). On the other hand, a high index of economic welfare, high salaries, labor demand, and loose immigration policy could attract immigrants toward a country (Christodoulou and Nikas 2012). It is definitely the age, the gender, and the origin of a migrant that defines his/her decision to migrate (Nikas and King 2005, p. 246; King and Vullnetari 2009, pp. 28–30). But other features such as education, foreign language qualification, working experience, family status, and human capital investment also play a role in the decision to migrate. Thus, migration is a constant challenge for the countries involved even if they are the source countries of the migrants, the transit countries in the migratory route, or the host countries.

Migration generates several positive and negative economic and social consequences for the migrants themselves and for the countries that send and host them. With regard to the country of the migrants' origin, there is a decrease in the unemployment rate due to the outflow of labor. There is also an increase in financial inflows in the form of migrant remittances and foreign direct investment. Remittances, apart from their use for consumption purposes, they are also a potential pool of savings and investment capital for future investment and capital formation (Nikas 1991). Knowledge diffusion, which helps narrowing the technological gap between the country of origin and the destination country, is another benefit of the migration process, which eventually results in the reduction of emigration and the increase of emigrants' repatriation in the long run (Dos Santos and Postel-Vinay 2003, p. 163). Along with the findings that positively relate past migration with business ownership (Kilic et al. 2007, p. 23) and the repatriation of migrants with the productivity level of the source country (Leon-Ledesma and Piracha 2004, p. 77), migration could be considered as a developmental tool. The question of whether migration leads to development and reduces poverty in the migrants' country of origin has actually caught the attention of the researchers. In the literature, there are studies favoring the growth potential of migration through certain channels like enhancing the asset positions and the productivity levels of poor households via migrants' remittances and overseas savings or the human capital accumulation of the return and the circular migration (Kilic et al. 2007, pp. 2–3). However, there is a whole different issue concerning the effect of migration on the inequalities and the redistribution of income.

As far as the social outcomes of migration are concerned, there is much attention on the permanent phenomenon which deprives the country of origin of population growth, since the migrants are usually young and they belong to the country's labor force. The loss in human capital has been a controversial issue especially due to its long-run consequences (Christodoulou and Nikas 2012). Migration results in a considerable loss of labor force upon which the sending country invested. However, as it was mentioned above, this could also work vice-versa, in the way that part of the sending country's unskilled labor force finds the opportunity to acquire qualifications and useful knowledge abroad and affects their home country through imitation and knowledge diffusion (Dos Santos and Postel-Vinay 2003, pp. 162–163). In general, the migration cost, the adaptation difficulties, the racial and social racism migrants face, make the policymakers skeptical on the appropriate measures that could relieve the migrant population (Christodoulou and Nikas 2012).

The migration process affects the labor supply and consequently the levels of employment and wages in the destination country as well. Migrants' host countries benefit as they cover their gaps with qualified or unskilled labor (Zhao and Kondoh 2007, p. 347) and improve their growth rates. The increase in the labor supply helps covering the shortages in the labor market of the host countries relieving it from the upward pressure on the wages. The employment of immigrants in job positions with low skills can exert negative pressure on the wages of the host country, but it could also lead the locals in better positions pushing in this way wages to rise (Franz et al. 1994, p. 224). It is the immigrants' skill composition that defines the wage adjustments and the gains and the losses for the natives. Immigration affects, for example, the wages of the native labor force with different skill composition to the immigrants', under the assumption of a perfectly elastic capital (National Academies of Sciences, Engineering, and Medicine 2017, pp. 165–196). When assuming for an imperfect elasticity of capital, the capital owners are going to receive some of the gains of immigration. According to the Solow model, a permanent migration flow will reduce per capita income in the short run, when immigrants are less skilled than the natives. If, on the other hand, the supply shock comes from highly qualified workers, then it could trigger long-term economic growth (National Academies of Sciences, Engineering, and Medicine 2017, pp. 165–196). Changes in the output mix of the economy or a technology modification are alternative mechanisms of adjustment to the labor supply shock in the migrants' host country (Dustmann et al. 2008).

3 Literature Review

The relationship between immigration and growth in migrants' host countries has challenged the researchers, enriching the literature with several case studies based on various approaches which lead to diverse results, offering still plenty of evidence to build on and stimulating further analysis. Boubtane et al. (2013) using a panel VAR for 22 OECD countries found that immigration positively affects GDP per capita and is affected by the host country's economic conditions. In 2016, Boubtane et al. (2016) reaffirmed with their research the positive impact of the migrant's human capital on the GDP per capita and the high growth impact of immigration even in the case of host countries with nonselective migration policies. On the contrary, Bashier and Siam (2014), using the Fully Modified Ordinary Least Squares approach in a Cobb–Douglas production function economic model for Jordan, ended up with a positive but insignificant impact of immigration on economic growth.

Morley (2006), in his study on the cases of Australia, Canada, and USA, used an ARDL bounds testing approach to examine the causality between economic growth and immigration and much as he found a long-run causality running from the per capita GDP toward immigration, there was no evidence proving the relationship the other way round. Feridun's results in the case of Finland provided no evidence of causality between the two variables (Feridun 2004). In the research of Gonzalez-Gomez and Giraldez (2011), even the results of the causality testing between immigration and growth for two traditional destination countries for immigrants in Europe, Germany, and Switzerland, have been contradictory. In the case of Germany, the per head number of foreigners causes economic growth, while in Switzerland it does not.

As regards the influential work of Borjas and his concept of "immigration surplus," there is plenty of research built on it, like Altonji and Card (1991) Peri and Ottaviano (2005), Drinkwater et al. (2007), and Ben-Gad (2008) pointing out various aspects of the impact of immigration on the labor market of the host country.

There are several papers searching for the impact of immigration on native workers in the case of Greece too. Chassamboulli and Palivos (2013) allowed for skill heterogeneity and differential unemployment income between immigrants and natives and supported that skilled natives gain from immigration in terms of employment and wages. Chletsos and Roupakias (2012) studied the direction of causality between migration and two macroeconomic variables, real GDP and unemployment, and though they detected that GDP growth as well as unemployment Granger cause migration, there was no evidence for the reverse causality. Dritsakis (2008) also examined the causal relationship between migration and economic growth, revealing a long run bidirectional causality. Tzougas (2013) reaffirmed the long-run bidirectional causality between immigration and GDP per capita.

Relevant literature about the "immigration surplus" for other European countries has been available as well. Amuedo-Dorantes and De la Rica (2013), assessing the impact of immigration in Spain, showed that the amount of the immigrant surplus is larger when considering the imperfect substitutability between immigrant and native

workers. The benefits of migration are pointed out for the Visegrad group of countries by the empirical research of Bilan and Strielkowski (2016). Kim et al. (2010) focusing on the UK labor market recommended that migration increases the world growth rate except for the case of unskilled migration.

In the aforementioned framework, this chapter searches for the cointegration between immigration and GDP growth in the case of Greece following the Stock and Watson (1993) DOLS approach, which has been found to be superior to other long-run model estimators, using available quarterly data from 2001 to 2018. Moreover, part of the empirical research is dedicated to estimate the immigration surplus in Greece using longitudinal data and following Borjas' calculation formula.

4 Immigration Surplus in Greece

Borjas (1995) tried to shed light on the benefits that natives receive due to immigration in the USA and established that the short-run immigration surplus is on the order of 0.1% of the US GDP. Emphasizing on the production complementarities between immigrant workers and other factors of production, he provided evidence that natives do benefit from immigration. For the purpose of Borjas' study, the following assumptions have been made:

- A single consumption good is produced.
- The elasticities of capital and labor supply is 0.
- All workers are substitutes in production.
- Natives own the capital.
- The negative impact of immigration on the wage is spread over the entire economy.
- There is no structural unemployment.

Borjas' research led to the following suggestions:

- The complementarities that exist between capital and labor produce the immigration surplus through the fall in the native wage.
- Apart from the efficiency gains, there are distributional issues arising due to the transfer of wealth away from workers.
- A small immigration surplus could mean small or even negative economic benefits due to the fiscal cost of immigration which should be taken into account when defining the optimal size and skill composition of immigrant flow.

The calculation formula for the short-run immigration surplus as a fraction of national income based on the aforementioned simple economic model which Borjas used is as follows (Eq. 1):

$$\Delta Qn/Q = -\frac{1}{2} * s * e * m^{2}$$
 (1)

where

s = labor's share of national income e = elasticity of factor price for labor m = foreign-born fraction of the labor force

In the case of Greece, half of the total national income is paid as employee compensation. As for the elasticity of factor price for labor, assuming a linear homogeneous Cobb–Douglas production function, it is derived as follows: e = s - 1 (or else e = capital's share of income). Labor force, in this study, refers to the fraction of the working age population 15–64 years old. The data are available from the ILOSTAT (2019) and Eurostat (2019) webpages.

Following Borjas' calculations, we intend to create longitudinal immigration surplus data for Greece from 2001 to 2018. The experience of Greece as a destination country for migrants originated from the Balkans and the Eastern European countries and as a transit country for migrants originated from the MENA countries could provide us with quantitative data to describe whether natives benefit from immigration. It should be noted that the aforementioned methodology is a static one, used for small temporary immigrant inflows. Therefore, it does not account for the immigrant stock and the adjustment of the capital over the years. However, the implementation of such a simple model, though it may not capture the exact quantitative effect of immigration in Greece but rather the upper limits of it, it could still provide us with useful policy suggestions on the benefits of immigration on growth.

Using longitudinal data for Greece from 2001 to 2018, this study suggests that the immigration surplus in Greece, as depicted in Table 2 varies between 0.02 and 0.12% of GDP. Though it seems as a small amount, considering the absolute values it is between 35 and 283 million euros. It peaked in 2009–2010, when the labor share of income and the foreign-born fraction of the workforce in the country received their largest values. This is attributable to the fact that during these years, in the aftermath of the global financial crisis and the beginning of the Greek government-debt crisis, the total active labor force in Greece started to decrease due to the flea of many Greek emigrants abroad to search for better job opportunities.

This "textbook" model, as Borjas mentions it (2006, p. 10), illustrates the plausible dynamics of immigration in the case of the Greek labor market. Such an outcome, no matter how small it seems relative to the overall economy, it is enlightening of the potentials of immigration in Greece and crucial for the planning of a more immigration friendly policy.

| Year | Immigration surplus % GDP | Immigration surplus (€) |
|------|---------------------------|-------------------------|
| 2001 | 0.02 | 35,007,000.69 |
| 2002 | 0.04 | 59,382,056.10 |
| 2003 | 0.04 | 77,009,449.29 |
| 2004 | 0.05 | 101,961,359.57 |
| 2005 | 0.06 | 116,348,839.86 |
| 2006 | 0.06 | 121,097,226.24 |
| 2007 | 0.06 | 150,913,491.26 |
| 2008 | 0.08 | 204,018,257.33 |
| 2009 | 0.12 | 283,459,965.86 |
| 2010 | 0.12 | 270,377,749.23 |
| 2011 | 0.11 | 219,838,908.82 |
| 2012 | 0.10 | 184,640,804.59 |
| 2013 | 0.09 | 162,637,650.85 |
| 2014 | 0.09 | 157,054,172.95 |
| 2015 | 0.07 | 119,858,750.81 |
| 2016 | 0.06 | 101,182,734.99 |
| 2017 | 0.05 | 85,434,072.08 |
| 2018 | 0.04 | 79,653,033.04 |

Table 2 Immigration surplus in Greece

Source: Author's calculations

5 The Relationship Between Immigration and Economic Growth

For the purpose of defining the relationship between immigrant inflows in Greece and GDP growth, the generalized Cobb–Douglas type production function presented below (Eq. 2) will be utilized to capture the contribution of the immigrant labor force in the gross domestic output as follows:

$$\mathbf{\tilde{Y}} = \mathbf{b} \, \mathbf{K}^{a1} \mathbf{L} \mathbf{n}^{a2} \mathbf{L} \mathbf{f}^{a3} \mathbf{\tilde{Z}}$$

where

$$\begin{split} Y &= \text{output} \\ K &= \text{capital} \\ \text{Ln} &= \text{native labor force} \\ \text{Lf} &= \text{foreign labor force} \\ \text{b} &= \text{efficiency parameter, a1, a2, a3} = \text{elasticity parameters} \end{split}$$

Quarterly data from 2001 to 2018 have been used in logarithms. The economic variables are the real gross domestic product (Y = GDP), the gross fixed capital formation (K = GFCF), the native labor force (Ln = NAT), and the foreign labor force (Lf = FOR). The data are available from the Hellenic Statistical Authority (2019). The main concern of this chapter is to verify whether there is a long-run

| | GDP | FOR | NAT | GFCF |
|--------------|----------|------------|-------------|----------|
| Mean | 5.28E+10 | 355,873.6 | 4,521,168.0 | 9.42E_09 |
| Median | 5.16E+10 | 338,150.0 | 4,514,050.0 | 1.05E+10 |
| Maximum | 6.33E+10 | 509,800.0 | 4,653,400.0 | 1.75E+10 |
| Minimum | 4.56E+10 | 189,500.0 | 4,395,200.0 | 4.38E+09 |
| Std. dev. | 6.04E+09 | 79,658.57 | 69,756.56 | 3.57E+09 |
| Skewness | 0.338481 | 0.082595 | 0.202710 | 0.154178 |
| Kurtosis | 1.601212 | 2.241411 | 2.026063 | 1.900784 |
| Jarque-Bera | 7.244651 | 1.808234 | 3.338755 | 3.910077 |
| Probability | 0.026720 | 0.404899 | 0.188364 | 0.141559 |
| Sum | 3.80E+12 | 25,622,900 | 3.26E+08 | 6.78E+11 |
| Sum S. dev. | 2.59E+21 | 4.51E+11 | 3.45E+11 | 9.04E+20 |
| Observations | 72 | 72 | 72 | 72 |

 Table 3 Descriptive statistics

Table 4 Unit root test

| Variables | Phillips–Perron <i>t</i> -test statistic | Test critical value 5% level |
|-----------|--|------------------------------|
| LGDP | -0.958620 | -2.902953 |
| ΔLGDP | -7.083470 | -2.903566 |
| LFOR | -2.548438 | -2.902953 |
| ΔLFOR | -6.186378 | -2.903566 |
| LNAT | -0.959146 | -2.902953 |
| ΔLNAT | -6.734211 | -2.903566 |
| LGFCF | -1.493730 | -2.902953 |
| ΔLGFCF | -16.06225 | -2.903566 |

relationship between immigration and economic growth and estimate it with the DOLS method which includes lagged and led values in the change of the regressors to deal with simultaneity and small sample size issues.

In Table 3 the descriptive statistics of the series are depicted. The standard deviation of the foreign labor force series is higher than that of the native labor force while as it was expected the mean of the latter is higher than the mean of the former. Skewness is around 0 while kurtosis is around 2. The Jarque–Bera test indicates a normal distribution of the series except from the GDP series for which the null hypothesis of a normal distribution is rejected at the 5% significance level but not for the 1%.

The first part of the analysis includes the stationarity tests to avoid spurious regression problems. Table 4 presents the results of the Phillips–Perron unit root test (Phillips and Perron 1988) for the presence of a unit root in the time series. Since all the variables are integrated of order (I) the appropriate lag length of the model is computed and the Johansen cointegration test (Johansen and Juselius 1990) is conducted to determine the number of cointegrating vectors.

Before proceeding with the Johansen cointegration test which is subject to the sensitivity of the lag length, the VAR lag order selection criteria have been used.

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|-----|----------|-----------------------|-----------------------|-----------------|------------------------|-----------------|
| 0 | 365.5154 | NA | 2.83e-10 | -10.63281 | -10.50225 | -10.58107 |
| 1 | 669.2709 | 562.8411 | 5.99e-14 | -19.09620 | -18.44341 ^a | -18.83754^{a} |
| 2 | 682.6661 | 23.24462 | 6.50e-14 | -19.01959 | -17.84456 | -18.55401 |
| 3 | 701.6691 | 30.74020 | 6.02e-14 | -19.10792 | -17.41064 | -18.43540 |
| 4 | 724.1175 | 33.67251 ^a | 5.11e-14 ^a | -19.29757^{a} | -17.07806 | -18.41814 |

Table 5 Lag order selection criteria

^aValue indicates lag order selected by the criterion

Table 6 Results of Johansen cointegration test

| Trace test | | | | | |
|------------------------------|------------|-----------------|---------------------|--------|--|
| Hypothesized number of CE(s) | Eigenvalue | Trace statistic | 0.05 critical value | Prob. | |
| None* | 0.436620 | 62.37959 | 47.8561 | 0.0012 | |
| At most 1 | 0.197463 | 23.36110 | 29.79707 | 0.2288 | |
| At most 2 | 0.114178 | 8.402647 | 15.49471 | 0.4234 | |
| At most 3 | 0.002326 | 0.158359 | 3.841466 | 0.6907 | |
| Maximum eigenvalue test | | | | | |
| Hypothesized number of CE(s) | Eigenvalue | Trace statistic | 0.05 critical value | Prob. | |
| None [*] | 0.436620 | 39.01849 | 27.58434 | 0.0011 | |
| At most 1 | 0.197463 | 14.95845 | 21.13162 | 0.2918 | |
| At most 2 | 0.114178 | 8.244288 | 14.26460 | 0.3544 | |
| At most 3 | 0.002326 | 0.158359 | 3.841466 | 0.6907 | |

^{*}Denotes rejection of the hypothesis at the 0.05 value, MacKinnon-Haug-Michelis *p*-values (MacKinnon et al. 1999)

Table 7Estimated DOLSmodel

| Variable | Coefficient | Std. error | t-statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| LFOR | 0.153852 | 0.019631 | 7.836987 | 0.0000 |
| LNAT | 3.036740 | 0.555489 | 5.466791 | 0.0000 |
| LGFCF | 0.167097 | 0.026708 | 6.256509 | 0.0000 |
| С | -27.64136 | 8.011807 | -3.450078 | 0.0011 |

Included observations = 69 after adjustments, $R^2 = 0.981038$, Automatic leads and lags specification: 2 leads, 0 lags based on AIC, Long-run variance estimate: Bartlett kernel, Newey–West fixed bandwidth = 4.0000 potentials

Two of the criteria suggest one optimum lag and the rest of them favor four lags for the model, as it is portrayed in Table 5. However, the diagnostics for the model with four lags perform better.

The Johansen cointegration trace test indicates one cointegrating vector at the 0.05% significance level as also indicated by the maximum eigenvalue. The results of the Johansen tests are presented in Table 6.

Having established the existence of one cointegrating vector, the DOLS approach is utilized to establish the long-run relationship between the variables which is presented in Table 7. The maximum lag length is set up at four following the Akaike criterion. The long-run coefficient of the immigrant labor force is indicative of a positive and significant (*p*-value = 0.0000) relationship. The results of the DOLS estimator portray that an increase of 1% in the immigrant labor force boosts GDP growth by 0.15% providing further evidence in the existing literature that immigration could be beneficial for the economic growth of the host country. The largest coefficient in the regression is the native labor force's estimator which is indicative of a ratio relationship between economic growth and native labor force in the order of 1:3 confirming the labor-intensive production in Greece. With regard to the capital's coefficient in the regression, it is smaller than the native labor's and larger than the foreign labor's ones. Still, it is positive and significant as expected.

6 Conclusion

In a period when immigration in Europe has been questioned, this chapter unveils the relationship of immigration and growth for Greece. Apart from the immigrant flows in the country, which peaked in 2015, Greece has also faced a deep economic recession that altered its labor market. However, the economically rational response toward immigration is the successful labor market integration.

This chapter provides evidence that immigration could be beneficial for the native population in Greece following a targeted immigration policy. The results of this study offer indication that the immigration surplus in Greece, that is the economic benefits from immigration, has varied between 0.02 and 0.12% of GDP, which could prove a valuable contribution to the natives' earnings in a period of recovering from a deep economic recession. Moreover, the results of the econometric tests illustrate a long-run positive relationship between immigration and growth which provides further evidence of the immigrants' contribution in the GDP growth in Greece. In particular, the findings of the empirical testing suggest that a 10% increase in the immigrant labor force could increase the output by 1.5%. Considering that the projections of the Bank of Greece for the GDP growth in the next years do not exceed 2%, it could easily be derived that proper selective immigration and effective integration policies that would capitalize on the immigrants' human capital could strengthen the developmental potentials of the Greek economy.

Hence, the importance of a targeted immigration and integration policy has become even more evident. In a period of recovery from a deep recession and restructuring of the Greek economy which has lost a considerable part of the young and highly skilled native labor force due to the economic crisis, the enlightenment of the potentials of the immigrants' presence in Greece is a first step toward their effective integration in the labor market and their social inclusion in the Greek society.

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