



# The Relationship Between Net Migration and Selected Macroeconomic Variables: A VAR Model for Canada

**Burak SEYHAN**

Gumushane Univ., Dept. of Economics, Res.Assist., burakseyhan@gumushane.edu.tr

**Nazlı SEYHAN**

Gumushane Univ., Dept. of Management Information Systems, Assoc.Prof., nazliarik@gumushane.edu.tr

## Abstract

Throughout human history, in addition to forced migration due to reasons such as disasters, wars and internal turmoil, it has been observed that economic reasons such as employment, unemployment, education, income, poverty etc. have also had an effect on migration, and that the social and economic structure of the countries has an effect on migration, as well as many effects on the countries from which migration occurs and the countries that receive migration. For this reason, the phenomenon of migration has been at the center of many studies as it affects the changes in the economic, political and social structures of countries. When the migration literature is examined, it is seen that economic factors such as inflation, employment and income, as well as the attitudes, behaviors and policies of the administration and society of the country accepting the immigrant, are effective in immigrants' preference for that country. This study examines the economic factors that cause immigration to Canada, a country that attracts attention with its multicultural structure and receives frequent and large amounts of immigration. In the study, the relationship between net immigration and economic growth, inflation and unemployment was evaluated using time series analysis for the research period 1998-2022. The findings obtained as a result of the analysis show that macroeconomic variables, especially unemployment, are effective on migration.

**Keywords:** Migration, Macroeconomic Indicators, Time Series Analysis, Vector Auto Regression, Canada.

## Net Göç ile Seçilmiş Makroekonomik Değişkenler Arasındaki İlişki: Kanada İçin VAR Modeli

### Özet

İnsanlık tarihinde afetler, savaş ve iç karışıklıklar gibi sebeplerle yaşanan zorunlu göçün yanında istihdam, işsizlik, eğitim, gelir, yoksulluk vb ekonomik sebeplerin de göç üzerinde etkili olduğu görülmektedir. Yaşanan göçe ülkelerin sosyal ve ekonomik yapısının etkisi olduğu gibi bu durumun göç edilen ve göç alan ülkelerde de birçok etkisi olduğu görülmüştür. Bu sebeple, göç olgusu, ülkelerin ekonomik, siyasi ve sosyal yapılarındaki değişimleri etkilemesiyle çoğu araştırmanın merkezinde yer almıştır. Göç literatüründeki çalışmalar incelendiğinde, göç sebepleri olan etmenler

arasında; göç kabul eden ülke yönetiminin ve toplumunun sergileyeceği tutum, davranış ve politikaların yanında enflasyon, istihdam, gelir gibi ekonomik faktörlerin etkili olduğu da görülmektedir. Bu çalışmada çok kültürlü yapısıyla dikkat çeken, sık ve büyük miktarlarda göç alan ülkelerden biri olan Kanadanın göç almasına sebep olan ekonomik faktörleri ele alınmıştır. Çalışmada, net göç ile ekonomik büyüme, enflasyon ve işsizlik ilişkisi 1998-2022 araştırma dönemi için zaman serileri analizi kullanılarak değerlendirilmiştir. Analiz sonucu elde edilen bulgular başta işsizlik olmak üzere makroekonomik değişkenlerin göç üzerinde etkili olduklarını göstermektedir.

**Anahtar Kelimeler:** Göç, Makroekonomik Göstergeler, Zaman Serisi Analizi, Vektör Oto Regresyon, Kanada.

## **1.Introduction**

The phenomenon of migration is one of the issues that many countries have focused on with the internal and external effects of the economic, social and political migration phenomenon in the past and today. The economic reflections experienced together with the social changes that occur with migration have brought about many social, political and economic questions and problems in both countries that send and receive migration. The relationship of migration with important economic indicators such as income, employment, unemployment and inflation are frequently discussed topics in the literature. In this context, the relationship of Canada, known for its large and frequent immigration in international migration, with these indicators is a matter of curiosity, especially considering its multicultural structure. In this study, the relationship between the country and the net migration variable, which are the leading economic factors affecting net migration in the literature, with inflation, employment, unemployment, economic growth and poverty variables, was evaluated with current data and time series analysis.

When the migration phenomenon is evaluated with its reasons and the results it has emerged, it has been frequently the subject of multidisciplinary fields of study by being addressed in the fields of political science, economics, law, international relations, sociology, psychology, etc. In international migration, states have to build the economic structure as well as the social structure of the country. When we look from the past to the present, it is seen that migration theories are based on economic reasons, primarily factors (such as climate, war, natural disasters). Individuals' desire to meet their basic needs and continue their lives with better income and better living conditions has directed studies on labor migration. Indeed, when we look at the relationship between migration and economic growth, high per capita income in economically more developed countries, employment opportunities and individuals' desire to reach better living standards affect the tendency of individuals to migrate (Gomez, Giraldez, 2017: 8).

In the economic migration theories, which are among the first systematic theories put forward in international migration, regional differences and the labor market supply-demand relationship are addressed (Kritz et al., 2018: 8). In international migration, according to the differences in labor supply and demand, while wages are lower in labor-intensive countries, it is seen that there are higher wages with less labor in capital-intensive countries. This wage difference, which arises from the imbalance of production factors, directs individuals to migrate to a high-wage country, and this situation leads to a decrease in wages with an increase in labor supply in the country receiving the migration flow; and to a pressure on wages to increase in the country sending the migration, leading to a balancing of wages between countries (Massey et al., 1993: 433). Generally speaking, it is noteworthy that the factors that trigger migration are wage differences, employment and expected income in the regions at the basis of neoclassical migration theories.

The desire of individuals to meet their basic needs in order to sustain their lives, as well as their desire to sustain their lives with better living conditions, makes the economic factors affecting the decision to migrate important. It can be said that in addition to low wages being the primary economic factor that leads to migration economically, there are many other economic factors that affect the process. The devaluation of the national currency, economic imbalances (inflation, interest, etc.), tax injustice, income imbalance, poverty, employment problems, poverty, living conditions, future expectations (anxiety), career expectations, legal restrictions, etc., are among the factors that cause migration over time, even if they do not create large waves of migration, such as war, climate, natural disasters. The individual's decision to migrate is influenced by the comparative evaluation of the economic conditions, income opportunities and life expectations between the place they are in and the place they are going to. Basically, the motivation is to have insufficient income and better job and life opportunities (Parasız, Bildirici, 2002: 146).

In the relationship between employment and migration, the effects of migrants on the labor markets in the countries of migration have been one of the controversial issues frequently discussed in the literature. The expansion of networks in international markets due to the effect of globalization and the increase in wage differences in the competitive environment are among the reasons that accelerate migration (Skuflic, Vuckovic, 2018: 1826). However, low income, unemployment, increases in the prices of goods and services, namely living costs, etc. (push factors) and the motivation of people experiencing financial difficulties to earn high incomes, new employment

opportunities, etc. (pull factors) accelerate the migration flow to economically better countries (Thet, 2014: 13; Bozdağ, Atan, 2009: 163). In the relationship between poverty and migration, Skeldon (2002) states that the existing and unrelieved level of poverty is the most important factor that forces migration.

## **2.Theoretical Framework and Empirical Literature**

Lee (1969) in his work titled *A Theory of Migration* defined the concept of migration as “a permanent or semi-permanent change of place of residence” (Lee, 1969: 285). Özcan (1997) on the other hand, considered it as “people leaving their place of residence and moving to another place where they will live permanently”. With this definition, Lee approached migration in a general sense and did not evaluate it in terms of necessity, distance, internal and external migration. Özcan, on the other hand, evaluated it according to place and time factors.

The International Organization for Migration defines migration as “the movement of a person or a group of people across an international border or within the borders of a state.” It evaluates all kinds of displacement actions carried out by people, regardless of the distance and reason, within this scope and evaluates their purposes as compulsory and economic (Perruchoud, Redpath-Cross, 2011: 62-63).

For the European Commission (2019), migration is defined as "residence in the territory of an EU Member State, or the expectation of residence in another Member State or a third country for at least 12 months" (European Commission, 2019). According to the United Nations, migration is defined as "living outside one's own country for a year or more" and short-term movements are not considered within the concept of migration (UN, 2012).

Adam Smith, in his work titled “*The Wealth of Nations* (1776)”, evaluated the migration phenomenon from an economic perspective and pointed out that migration potentially resulted from regional imbalances in labor markets. Hicks (1932) argued that differences in net economic advantages, primarily wage differences, were the primary cause of migration. E.G.Ravenstein’s (1885) article titled “*The Laws of Migration*” was the starting point of migration studies (Lee, 1966: 47).

Migration is classified differently in many ways. In terms of purpose, economic and non-economic migration; in terms of triggering factors, voluntary and involuntary migration; in terms of duration,

temporary and permanent migration; in terms of legal status, legal and illegal migration and in terms of the characteristics of the migrant, qualified and unqualified migration are the main categories.

It has been observed that different political, economic and social factors have a direct or indirect effect on the phenomenon of migration from time to time. It is seen that migration theories are periodically affected by economic and political practices. Neoclassical migration theories after the 1960s have also examined individual factors in accordance with the conditions of the period. In this theory, it is emphasized that migration occurs as a result of individual initiatives and that regional imbalances can be eliminated by the supply-demand balance in labor. However, in the 1970s, economic crises and labor exploitation, the fact that international migration is directed according to the interests of central countries came to the fore and the world system theory emerged. The dual labor market theory of these periods also put forward that the informal sector needs a high level of migrant labor force due to the insecure and cheap labor force based on the distinction between primary (skilled) and secondary (unskilled) labor in rich countries. After the 1990s, the perspective on migration changed with the effects of globalization on economy, transportation and communication, and the effects of cultural, ethnic and social structures on the migration process were evaluated (Güllüpinar, 2012: 57).

### **2.1. Migration and Inflation**

In the migration phenomenon from past to present, the effect of income changes has been observed, and the increase in living costs and inflation along with income have also been included in the scope of the study (Renas, Kumar, 1978: 96). It has been emphasized that living costs should be taken into account as an important component of migration along with other economic factors, and that more realistic results will be obtained when they are taken into account (Bell, 1991; Saraçoğlu, Roe, 2018: 975).

It should always be predicted that immigrants will change the employment structure in the target country by actively taking part in production and service areas, and that they can change the balances between immigrants who are included in employment and those who are not. Indeed, the presence of unemployed immigrants will affect wage prices in the labor market, lowering existing wages, and will also cause the prices of consumed goods and services to increase (Macmillen, 1982: 256).

According to another view, immigrants will cause manufacturing companies to lower prices due to their free time and cost constraints, and will turn to cheap products. In addition, it has been emphasized that immigrants will turn to labor-intensive sectors due to job concerns, lower employee wages, and reduce current price increases with cheap labor supply. However, it has been stated that the increase in demand experienced with the arrival of immigrants will initially cause an increase in inflation through different channels (Zachariadis, 2012: 298).

## **2.2. Migration and Unemployment**

It is seen that immigrants have many effects on the economy of the country they migrate to with the emergence of labor supply. It is possible to evaluate the effects of the increase in labor supply from different perspectives. For example, if there is difficulty in reaching people with the desired characteristics and skills in the country of immigration, this situation will have positive contributions to the country's employment and production and in economic terms. In countries with a large elderly population, the need for young individuals to be employed due to the decrease in the number of individuals in working life is met by immigrants, which helps the country receiving immigrants regain dynamism. Another effect of immigrants on the labor market is that the labor supply increases and wages decrease. In addition, the employment of immigrants in unskilled jobs and the employment of local workers in more qualified jobs will cause an increase in the wages of those working in qualified jobs (Kabaklarlı, 2016; Konuk, Engin, 2023: 292). Along with all these, there are many studies in the literature examining the relationship between migration, employment and unemployment.

In one of the pioneering studies, Grossman (1982) concluded that a 10% increase in the number of legal immigrants employed in the US would cause a 1% decrease in local wages. Card (1990), in his study examining the relationship between immigration and employment rates in the period 1979-1985, suggests that the Miami labor market had no effect on the employment of unskilled workers and that this was due to the ability of the region to rapidly absorb immigrants. Simon et al. (1993) investigated the relationship between the immigration rate and the unemployment level and change in different years and cities in the US between 1960-1997 using regression analysis, and stated that there was little or no increase in total local unemployment due to immigration in the study findings. Rios-Avila and Canavire-Bacarreza (2016) stated that immigration had no

effect on local unemployment in the US with monthly data in the period 2001-2013, but that immigration affected mostly young and less educated unemployed citizens.

In studies conducted in European countries, Pischke and Velling (1997) examined the effect of increased immigration on employment outcomes of natives in Germany at the district level during the period 1985-1989 and found that immigration had no negative effects. Bonin (2005) examined the relationship between immigration and the labor market for Germany in the period 1975-1997 in terms of gender, education level and experience. In light of the study findings, it was stated that immigration did not have a significant negative effect on the earnings and employment opportunities of native men, and that the negative effects were for less qualified and older workers. Bauer et al. (2013) did not find evidence that immigration had negative effects on the labor market for Germany, but stated that immigration had a positive effect on the employment opportunities of highly qualified natives. Fromentin (2013) examined the VECM Cointegration relationship with the variables of Net migration rate, GDP, unemployment rate and wages in France in the period 1970-2008 and found that there was no relationship between migration and unemployment in the long run and that migration had a small effect on unemployment and wages in the short run. D'Amuri and Peri (2014) examined the relationship between migration and employment with data from 15 Western European countries in the period 1996-2010. The study stated that migrants preferred more routine jobs and that this situation led natives to work in more complex jobs, and that this situation caused a 0.7% increase in native wages with a doubling of the number of migrants. Espinosa and Díaz-Empananza (2021) analyzed the relationship between international migration and unemployment for Spain in the period 1981-2016, and obtained that unemployment and migration were cointegrated and that migration caused unemployment.

In studies conducted for Canada, Islam (2007) examined the relationship between GDP per capita, unemployment and immigration for Canada and found that immigration did not have a significant effect on unemployment, that past unemployment caused (less) immigration in the short term, and that there was a positive relationship between GDP per capita, immigration rate and real wages in the long term. Fuller, S. (2011) examined the relationship between immigration and employment in the context of work, permanent-temporary jobs, unemployment and labor force withdrawal periods by using Cox regression from panel data compiled from Canada's Survey of Labour and Income Dynamics (SLID). The findings indicated that while migration had more negative



consequences at the level of temporary jobs, this situation did not increase inequalities in gender and immigration status. Latif (2015) examined the relationship between the variables of per capita income, net immigration rate and unemployment rate for Canada in the period 1983-2010 using Panel VECM analysis, and found that immigration had a negative effect on unemployment in the short term, while it had an insignificant negative effect in the long term. Green, et al. (2016) stated that immigrants in Canada are entrepreneurs, and that although immigrant business ownership rates are low immediately after entering the country, after spending four to eight years in Canada, they are higher but smaller than those in the comparison group, who were mostly Canadian-born.

In OECD countries,

Longhi, et al. (2006) examined the relationship between migration and employment of domestic workers in a meta-analysis study conducted with 9 studies for various OECD countries. The study findings indicated that a 1% increase in the number of immigrants would lead to a decrease in domestic employment of 0.024%, and that this effect was slightly greater in women in terms of gender.

Jean and Jimenez (2007) stated that migration did not have a permanent effect on domestic unemployment in 18 OECD countries, and that a migration flow that did not affect the labor force share could not affect unemployment in the short term, but could have a temporary and delayed effect on domestic unemployment. Kılıç et al. (2019) stated that migration and unemployment had a significant negative effect on 23 OECD countries for the period 2000-2015. Sarı et al. (2019) examined the relationship between migration, employment and unemployment rates in their study conducted in 25 OECD countries for the period 2008-2018 using Hausman Kao Cointegration and Granger Causality tests. In the study findings, while there was no short-term causality, it was determined that there was a causal relationship from migration to unemployment in the long term.

### **2.3. Migration and Economic Growth**

When human capital and knowledge accumulation are considered, the migration of people from one place to another will cause different effects at the country level, both socially and economically. The level of the effect is affected by the social and economic development of the country that sends and receives immigrants, and it also affects this level. Of course, the labor supply of the country that receives immigrants and the migration of qualified labor will contribute



positively to the economic growth of the country. At the same time, it can be said that meeting the labor demand in labor-intensive markets where the local labor force does not want to work with immigrants will have positive contributions to production and economic activity. The effect of migration on economic growth according to the quality of the labor force varies according to factors such as education, demographic factors, and fertility level (Göv and Dürrü, 2017: 492).

When we look at the studies conducted so far, it is seen that economic factors have direct and indirect effects that lead to migration. As long as there are differences in regional and international development and welfare levels in countries, migration will be an inevitable result of this situation. In underdeveloped countries, economic welfare, democratization and improvement in social factors will cause migration mobility to slow down and decrease (Kanbir, 2022: 363).

Walz (1993) proposed a model to analyze the growth effects of migration in the host and source countries. In the model where long-term effects on human capital are evaluated in terms of skills, it is stated that migration increases the growth rate in both regions under certain conditions.

Dolago, Goriho and Ichino (1994) investigated the relationship between migration, economic and human growth by emphasizing the Solow growth model in 23 OECD countries for the period 1960-1985. It was emphasized that the effects of migration on growth will be higher the higher the human capital of the migrant compared to the native population.

Jennisen (2003) examined the relationship between net migration and per capita GDP, unemployment and education level variables for Western European countries in the period 1960–1998 using time series and cross-sectional data. The study concluded that per capita GDP had a positive effect on net migration and unemployment had a negative effect. Brüzker and Schröder (2006) examined the migration stocks, per capita GDP and employment relationship for Germany in the period 1967–2009 and found that there was a cointegration relationship between the variables. Brüzker and Schröder (2006) examined the macroeconomic determinants of migration for Germany in the period 1967–2009 and determined a cointegration relationship between the variables using the migration stocks, per capita GDP, employment rate and interstitial migration stocks variables.

Morley (2006), Kanada'nın da içinde bulunduğu sık göç alan ülkeler üzerinde 1990-2002 dönemi için, göç ile kişi başına GSYİH arasındaki ilişkiyi ele alarak kişi başına GSYİH dan göçe doğru uzun vadeli nedensellik olduğunu tersi ilişkinin olmadığı bulgusuna ulaşmıştır.

Maria and Lazarova (2012), in their study examining the relationship between economic growth, human capital and migration in 130 developing countries for the period 1990-2000, found that migration has a significant effect on human capital and economic growth.

Boubtane, Dumont and Rault (2014), in their study examining the relationship between migration and economic growth for 20 OECD countries for the period 1986-2006, found that migration has a positive contribution to economic growth. Göv and Dürrü (2017) investigated the relationship between economic growth and migration for 7 OECD countries for the period 2000-2016 and found that there is a one-way causality between migration and economic growth.

#### **2.4. Canada and Migration**

With the discovery of the new continent, Canada was ruled by the French (1660-1715) and the British (1763-1837) due to the lack of settlement efforts due to the lack of valuable minerals, and later, in terms of leather trade, fishing and other commercial activities, it was ruled by the French (1660-1715) and the British (1763-1837). Until the 1867 constitution, the influence of the turmoil in America, England and France was intense in the country, and it is seen that the foundations of today's Canada were laid with the 1867 North British American Agreement (Özensel, 2012: 62).

Canada is one of the largest countries in the world in terms of area. With a population of 40.7 million, a GDP exceeding US\$2.1 trillion (2023) and an annual income per capita of US\$53,550 (2023), Canada is among the most prosperous countries in the world and is a member of the G-7 and G-20. Over the last century, growth in manufacturing, mining and service sectors has driven the Canadian economy; timber and oil exports have come to the fore; the country has become a net energy exporter. Canada is among the world's major suppliers of wheat and canola. It is one of the world's largest producers of zinc and uranium. It also ranks first in the world in terms of oil and natural gas reserves (Ministry of Foreign Affairs of the Republic of Turkey).

With its decisions and implementations on multicultural policies, Canada has become one of the leading countries in the world. Considering the country's historical past and social structure, it has led the country to make some strict decisions on multiculturalism in order to ensure stability and

solve problems. In this country, which is famous for its high immigration, the harmonious coexistence of different cultures and races has brought some problems with it. As a country that constantly works to ensure that differences live together without any problems and implements these works without any problems, Canada is one of the countries that exemplify the whole world on how multiculturalism is implemented in a healthy way (Başaran, 2017: 245). Pierre Trudeau, who served as prime minister for four terms between 1968 and 1984, is seen to have a major role in the promotion and formation of the country's multicultural structure by liberalizing immigration to the country and with the Charter of Rights and Freedoms. In Canada, with its multicultural social structure, a magic formula was sought for individuals with different religions, languages and ethnic structures to live together in peace and tranquility with these differences, and this problem was partially solved with the system of "multicultural single state" understanding. In this process, four basic decisions that are famous in multiculturalism were made in 1971. "a. It allows and helps every group that wants to continue its own identity and difference. b. It helps every group to develop its culture and at the same time to be a part of Canadian society. c. It shows creativity by keeping the society together. d. It helps immigrants to teach the languages in Canada" (Mahtani, 2004: 2; Özensel, 2012: 64). With these decisions, multiculturalism was accepted by law in 1971. The aim of multiculturalism is not to exclude different cultures but to keep them together in respect and harmony. The main purpose of Canada's understanding of national identity is to establish a policy that is compatible with the understanding of social participation, multiculturalism, equality and national unity by protecting different cultures and identities (Erzurumlu, 2008: 60).

It is possible to see cultural diversity in the structure of every society. The homogeneous structure of society has changed over time due to many reasons such as globalization and developments in communication technologies, the decrease in local differences in the economy and the interconnected lifestyles of different ethnic elements and communities (Yanık, 2012: 40). With these benefits of globalization, the need to re-establish cultural identities and national values has emerged. Multiculturalism is a phenomenon that emerged to meet this need. However, the idea that minorities should both be respected for their differences and be able to act on equal terms with the majority has been a subject of debate from different perspectives. According to some views, multiculturalism, which points to the existence of different cultural groups living under the same state, has been evaluated as a political project, an ideological and normative attitude (Konak, 2020: 54-55)

With the declaration of its ethno-cultural policy in 1971, Canada ensured that ethnic groups were integrated into society and had equal participation rights. With the federal government allocating serious budgets to these issues, first the Directorate of Multiculturalism and then the Ministry of Multiculturalism were established in order to carry out the process more systematically. The Multicultural Advisory Council, established in 1973, consisting of representatives of 47 ethnic groups, also aims to carry out multicultural policies correctly and systematically (Demirbaş, 2022: 82).

Canada, one of the strongest economies, must manage its multicultural structure well and maintain a certain level of human capital quality in order to maintain and increase its economic power. In addition to the financial resources in the country, the fact that low-income immigrants can also have physical assets due to the high purchasing power makes immigration to this country attractive. In addition, Canada has aimed to attract qualified individuals to the country by implementing various policies from the past to the present and has implemented practices that encourage them to stay in the country in order to maintain economic stability.

Different categories of immigrants are accepted in Canada according to the needs felt in the country. This classification can be generally divided into 4 groups, including independent immigrants with professional qualifications selected for the development of the country's economy. These groups are qualified immigrants, entrepreneurs and investors, close relatives supported by Canadian citizens (dependent immigrants), and refugee-asylum seeker immigrants. In this group, qualified immigrants, investors and entrepreneurs have priority for the development of economic development (Çelik, 2021: 48).

Canada, which has been evaluating immigrants with a point system in order to prevent discrimination since 1967, is one of the first countries to introduce a point system in immigration. The aim of the point system is to evaluate people based on their qualifications rather than discriminating based on ethnicity, without racist and unequal policies. With this system, it is also difficult for inexperienced and unqualified immigrants to be accepted into the country (Demirbaş, 2022: 83).

The points system includes factors such as experience, skills, age, education level, and language skills. Individuals who have previously studied, worked, and have certain knowledge in Canada have priority in immigration applications. In education, which is the most important factor in

immigration, +1 point is taken for each year of education, resulting in a total of 20 points. In addition, the most demanded occupational groups are evaluated out of 15 points. In the age factor, a maximum of 10 points are taken up to the age of 35, while 1 point is deducted for each year over the age of 35. Those who receive an offer from a workplace in Canada receive +10 points. The language factor is at the discretion of the person evaluating based on French or English language skills. Immigrant candidates are evaluated out of 100 points, and this system is applied to all qualified immigration recruitments. Among the programs implemented for skilled immigrants, the Express Entry Program (Federal Skilled Worker (FSW), Federal Skilled Trades (FST), Canadian Experience Class (CEC)), State (provincial) Nominee Program and Modified Employer Opinion program are implemented with 3 different program areas (Çelik, 2021: 49-51).

Canada is one of the countries that receives the most immigration and is preferred due to the wages paid, wide range of work opportunities, support given to immigrants, consideration of cultural and ethnic differences, etc. The country has also become famous for its immigration policies. This country, which accepts immigration at a certain rate of its population, is usually immigrated for employment purposes. It accepts not only highly qualified individuals but also individuals with low and medium level qualifications as immigrants (Günay et al, 2021: 46).

### **3. Methodology and Empirical Findings**

Annual data for the period 1998–2022 was used in the study. In the model, NETMIGRATION representing net migration was used as the dependent variable, GDPPEREMP gross domestic product per person employed representing economic growth, INFDEFLATOR representing INFLATION DEFLATOR and UNEMPLOYADV representing unemployment with advanced education. All variables are in logarithm form so that elasticities can be interpreted directly. EViews 9.0 econometric softwares were used in the analysis.

Kwiatkowski-Phillips-Schmidt-Shin Stationarity test was used to test the stationarity of the variables.

Table 1. Kwiatkowski-Phillips-Schmidt-Shin Unit Root Test

<b>Variables</b>	<b>KPSS test values</b>	<b>KPSS %5 critical values</b>
NETMIGRATION	0.365680	0.463000
GDPPEREMP	0.232223	0.463000
INFDEFLATOR	0.157351	0.463000
UNEMPLOYADV	0.263756	0.463000
Δ NETMIGRATION	0.474283*	0.463000
Δ GDPPEREMP	0.724762*	0.463000
Δ INFDEFLATOR	0.493044*	0.463000
Δ UNEMPLOYADV	0.500000*	0.463000

The KPSS test, unlike the ADF and PP tests, states that the series is stationary under the null hypothesis. The KPSS statistics depend on the error terms obtained from the regression of the time series with exogenous variables. The findings obtained as a result of the KPSS test are consistent with the general results of the ADF and PP tests. The series become stationary when the first differences are derived.

As a result of the applied unit root tests, it was determined that the series were not stationary, and stationarity was achieved when their first differences were taken. When moving to the cointegration analysis stage, the existence of cointegration is first tested with cointegrating regression estimation.

Table 2. Cointegrating Regression

<b>Dependent variable: NETMIGRATION</b>		
<b>Method: Cointegrating Fully Modified Least Squares (FMOLS)</b>		
<b>Sample: 1998-2022</b>		
<b>Variables</b>	<b>Coefficients</b>	<b>t stat (prob. value)</b>
GDPPEREMP	3.669331	0.0007
INFDEFLATOR	-0.046562	0.0487
UNEMPLOYADV	-0.188934	0.0081

As a result of the regression estimate, it was determined that the GDPPEREMP coefficient has a positive sign, while the INFDEFLATOR and UNEMPLOYADV coefficients have a negative sign, compatible with the macroeconomic theoretical expectations and all of them are statistically significant. As a result of the regression estimation, a significant relationship was detected in the short run and the next stage, the Johansen System Cointegration Test, was started.

In order for there to be a long-term relationship (causality) between two economic variables as indicated by the theory, the variables must be integrated at the first level so that the estimated error term can be stationary. In other words, even if the variables are not stationary, the difference between them can be stationary over time. Therefore, there is a mechanism that prevents the difference between the two variables from widening over time (error correction mechanism) and these variables move together over time. Deviations from equilibrium are corrected by the error correction mechanism.

Engle and Granger (1987) call this the Granger Representation Theorem: If there is cointegration, the error correction mechanism works between the variables. If the error correction mechanism works, the variables are cointegrated. Accordingly, if the variables are cointegrated, there is also a causality between them that works in at least one direction.

Table 3. Johansen System Cointegration Test

<b>Unrestricted Cointegration Rank Test (Trace)</b>			
<b>Hypothesized Number of CEs</b>	<b>Eigenvalue</b>	<b>Trace Statistic</b>	<b>0.05 Critical Value</b>
None *	0.699384	56.96083	40.17493
At most 1 *	0.524713	30.51855	24.27596
At most 2 *	0.309604	14.15416	12.32090
At most 3 *	0.238817	6.003394	4.129906
<b>Unrestricted Cointegration Rank Test (Maximum Eigenvalue)</b>			
<b>Hypothesized Number of CEs</b>	<b>Eigenvalue</b>	<b>MaxEigen Statistic</b>	<b>0.05 Critical Value</b>
None *	0.699384	26.44228	24.15921
At most 1	0.524713	16.36439	17.79730
At most 2	0.309604	8.150766	11.22480



At most 3 *	0.238817	6.003394	4.129906
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According to the results of both trace and maximum eigenvalue tests, there are at least one cointegrated vectors in the long run. In the table denotes rejection of the null hypothesis at the 0.05 level, which suggests that there is no cointegration relationship.

At this point, Vector Auto Regression Estimation, the most important component of the analysis, was performed.

Table 4. Vector Auto Regression

<b>Variables</b>	<b>Coefficients</b>	<b>t stats</b>
NETMIGRATION	1.051477	3.57701
GDPPEREMP	1.009896	4.03842
INFDEFLATOR	-0.077910	-2.52620
UNEMPLOYADV	-0.241063	-2.30751
R <sup>2</sup> = 0.749484, Adj. R <sup>2</sup> = 0.595320, F= 4.861612		

The findings obtained from the VAR model estimation reveal that the t statistics of all variables are significant and their signs are consistent with theoretical expectations.

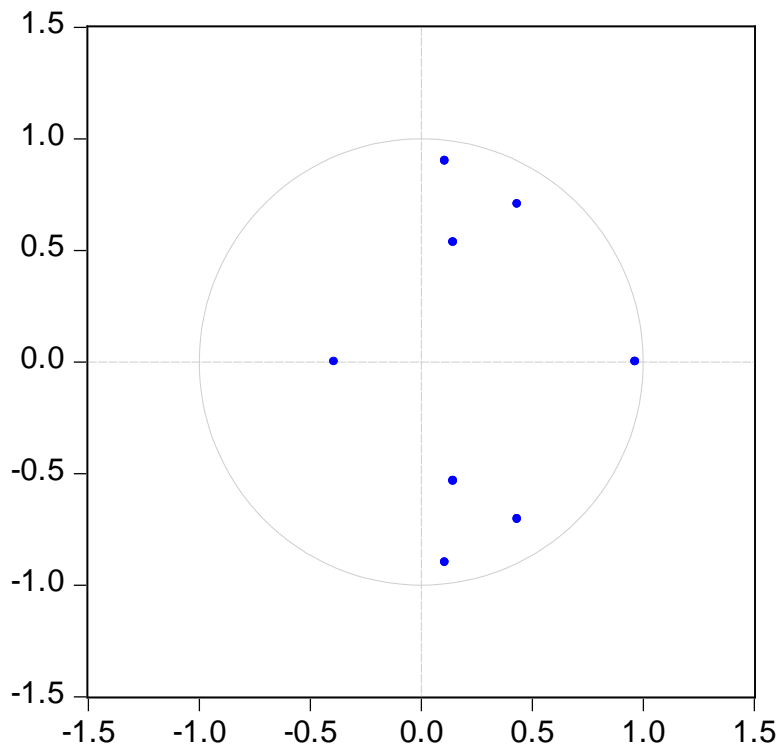
Table 5. AR Roots Modulus Table

<b>Roots</b>	<b>Modulus</b>
0.965844	0.965844
0.109182 - 0.899638i	0.906239
0.109182 + 0.899638i	0.906239
0.435003 - 0.705132i	0.828516
0.435003 + 0.705132i	0.828516
0.145778 - 0.534697i	0.554213
0.145778 + 0.534697i	0.554213
-0.390990	0.390990

Auto regressive residual tests were performed to determine whether the VAR model operated satisfied the structural stability conditions. Table 5 gives the modulus of the AR Polynomial. It is

seen from the Table.5 that all modulus values are below 1. According to figure 1, all equation roots are within the characteristic circle. No root lies outside the unit circle.

Figure 1. AR Characteristic Polynomial Circle  
Inverse Roots of AR Characteristic Polynomial



VAR satisfies the stability conditions.

Table 6. Variance Decomposition

<b>Period</b>	<b>S.E.</b>	<b>NETMIGRATIO N</b>	<b>GDPPEREM P</b>	<b>INFDEFLATO R</b>	<b>UNEMPLAD V</b>
1	0.15077 3	100.0000	0.000000	0.000000	0.000000
2	0.18372 4	90.97057	0.939335	0.251058	7.839035
3	0.22029 6	80.57381	1.420507	4.165502	13.84018
4	0.26933 7	81.64402	1.164994	7.926292	9.264695

5	0.27728 5	77.37873	1.863059	7.843858	12.91436
6	0.29008 3	77.09970	3.225382	7.619389	12.05553
7	0.29734 2	73.66704	3.388548	7.438260	15.50615
8	0.31451 5	69.54490	3.130303	10.09164	17.23316
9	0.31970 6	68.66009	3.038615	11.59834	16.70296
10	0.32272 1	67.69578	3.671799	11.38943	17.24299

Finally, variance decomposition was performed to determine which variable caused the change in the long term and to what extent. According to the results of variance decomposition of VAR analysis, 67.69 percent of the fluctuations in net migration in the long run originate from NETMIGRATION itself, 3.67 percent originate from GDPPEREMP, 11.38 percent originate from INFDEFLATOR and 3.01 percent originate from UNEMPLADV. This result reveals that for Canada, unemployment with advanced education has a greater importance than inflation deflator and economic growth in case of short and long-term shocks.

#### **4. Conclusion**

The findings obtained from the analysis of the sample created for Canada reveal that in the long term, economic growth, inflation and unemployment are among the macroeconomic determinants of net migration other than social and cultural variables. This study examines the economic factors that cause immigration to Canada, which is notable for its multicultural structure and is one of the countries that receive frequent and large amounts of immigration. In the study, the relationship between net migration and economic growth, inflation and unemployment was evaluated using time series analysis for the 1998-2022 research period. In the empirical application section, first KPSS unit root test was applied to the series of variables and it was determined that they all were non-stationary at levels and stationary at their first differences. As a result of the cointegrating regression and cointegration estimation performed afterwards, it was determined that the series

were cointegrated. As a result of the VAR model estimation, it was concluded that the vector auto regression mechanism worked properly and the t statistics and signs of all variables were significant. After determining that the structural stability conditions were consistent, variance decomposition was started. The findings obtained from variance decomposition show that the biggest source of change in the event of a possible shock in net migration is again the imbalances in migration, followed by unemployment, inflation and growth, which are the factors affecting the functioning of the system, respectively.

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