

# Language, Economic Development and Economic Globalization: The Case of OECD Countries

Asst. Prof. Dr. Gülşen Torusdağ<sup>1</sup> Asst. Prof. Dr. Mustafa Torusdağ<sup>2\*</sup>

<sup>1</sup> Van Yüzüncü Yıl University, Faculty of Letters, Department of Linguistics, Van, Turkey

<sup>2</sup> Van Yüzüncü Yıl University, Faculty of Economics and Administrative Sciences, Department of Economics,  
Van, Turkey

\*Email of the corresponding author: [mustafatorusdag@yyu.edu.tr](mailto:mustafatorusdag@yyu.edu.tr)

## Abstract

Although the relation between economic development and economic globalization has been examined in the literature, the relation between linguistic diversity, economic development and economic globalization index has not been discussed much in the literature. With this aspect of the study, it is aimed to contribute to the literature. In this study, the relationship between linguistic diversity, economic globalization and economic development for 20 OECD founding countries between 1995 and 2018 was determined by Pesaran (2008) cross-section dependency test, Durbin-Hausman (2008) panel cointegration test and Emirmahmutoğlu and Köse (2011) panel causality tests. According to the panel causality test results of Emirmahmutoğlu and Köse (2011), it was found that there is a bidirectional causality relationship between linguistic diversity and economic development in OECD countries, a bidirectional causality relationship between economic development and economic globalization, and a unidirectional causality relationship from linguistic diversity to economic globalization.

**Keywords:** Language diversity, economic development, economic globalization, panel causality test.

**DOI:** 10.7176/JLLL/71-07

**Publication date:** August 31<sup>st</sup> 2020

## 1. Introduction

Today, the increasing international relationships make insufficient for nations to communicate with their native languages, and make a necessity for nations to learn the languages of different countries. With the increasing international integration, the increasing importance of communication between people in the globalized world economy draws attention to the study of the relationship between language and economy as an interdisciplinary field. Language is of universal importance as a determinant of economic consequences. In 1965, the concept ‘the economics of language’ was introduced into the literature from an economic perspective, which considers language as a preferred object, with the article published by Jacob Marshack in the field of behavioral science. The concept ‘the economics of language’ has been studied in the literature by Grin (1996b, 2003), Vaillancourt (1983) and Grin, Sfreddo, and Vaillancourt (2011).

Theory of human capital and economics of education play a role in the development of the field of economics of language (Zhang and Grenier, 2012). The relationship between language and development, the way language affects economic development concerns individuals working in various disciplines.

Although many definitions of economic development are included in the literature, the human development index, which is presented as an alternative by the UNDP (United Nation Development Index), which primarily aims to measure GDP per capita and development, is accepted. In addition, as a development index, indicators such as mother-infant mortality, access to clean drinking water, prevalence of communicable diseases, empowerment of women, literacy and enrollment rates, access to adequate calorie and protein intake, etc. are among the indicators of economic development. However, per capita GDP is accepted as a universal parameter (Arcand and Grin, 2015: 4, 5).

## **2. Language and Development**

According to Krauss (1995) and Breton (1998), approximately 90% of more than 6,000 languages spoken in the world are under threat. Based on this situation, it is stated that the cultural diversity in the world is also under threat. One of the reasons for the decline in language diversity in the world is thought to be economic growth and development. The relationship between economic development and language is highly complex. This situation arises from the bidirectional causality relationship between language and economic development. Economic development is based on specialization and trade, so individuals who specialize and trade develop the use of a common language as a common communication tool. Common language usage intensifies commerce as it facilitates communication. The common result obtained from the studies of Eichengreen and Irwin (1998), Helliwell (1998), and Mélitz (2005) also supports this statement. In the studies, it was concluded from empirical analysis that there is a causality relationship from common language to trade. In other words, it can be concluded that countries using a common language tend to trade more than countries that do not use a common language. It can be concluded that international trade provides both economic growth and development, and the use of a common language leads to more growth and development. However, the use of common languages puts pressure on local languages and in the long run, economic development will cause a decrease in the number and variety of languages (Grauwe, 2006: 2, 3).

Although the role of language in socio-economic development is not emphasized much, there is no development where language is absent. Although the main purpose of language is communication, language assumes the role of a tool to achieve the determined goals and facilitates socio-economic development. Development is possible with the existence of a unifying language (Mkwinda-Nyasulu, 2014: 213).

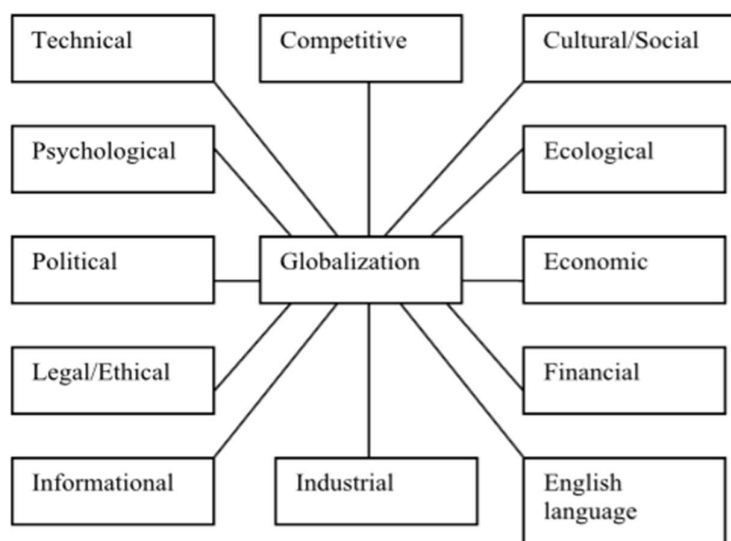
Learning one or more languages provides economic benefits and is considered an investment in human capital. In many empirical studies such as Carliner, 1981; Shapiro and Stelcner, 1981; Grenier (1987), McManus (1985), Chiswick and Miller (1995, 1998, 1999, 2003, 2007), and Trejo (1997), results that support the critical role performed by language, which is seen as human capital in economic gain have been reached. (Chiswick, 1991; Carnevale et al., 2001; Zhang and Grenier, 2012: 7).

Linguists such as Seargeant and Earling (2011) often argue that language has a role in economic development as a means of communication and cultural transmission (Chaudenson and de Robillard, 1990; Abou and Haddad,

1997). Again, according to Breton (1978), Vaillancourt (1980) and Greiner (1982), it is claimed that learning a language is a part of the investment made for human capital.

In his study, Gonzales examined the relationship between language, and national development / economic development in terms of variables such as national development, balance of wealth distribution, per capita income, perceived security and welfare of citizens, as well as the protection of legal and mother tongue rights offered by the state. He dealt with the socio-economic development of the country by associating it with the language welfare index. Analysis findings suggested that there is a correlation - causality relationship - between literacy and socio-economic development, but there is no relationship between national language and socio-economic development. However, he claims that developed nations are more linguistically homogeneous. According to Lieberson (1980: 12), there is no causality relationship between the development of a nation and linguistic homogeneity level. It also suggests that multilingualism has a role in minimizing ethnic and regional conflicts (Stroud, 2002: 37, 51).

**Figure 1. Dimension of Globalization**



Source: Šliburytė ve Masteikienė, 2010: 289.

As seen in Figure 1, the dimensions of globalization are expressed. According to the United Nations (UN - United Nations, 2004: 4-5), the concept of globalization is defined as the spread of ties between societies. Globalization is expressed as the integration of a country's economic systems with international markets and institutions, under the influence of international liberalization, through technological transformation of foreign investments and capital flows, knowledge transfer, and worldwide use of production factors. According to Caselli, there are three different dimensions of globalization as economic, political and social globalization (Altner et al.2018: 120, 121).

Osterhammel J. and Petersson (2005) explain the concept of globalization as the increasing integration of economies and societies across the world beyond the borders of the nation state through international trade, capital, information and human flow, culture and technology transfer. According to Dreher et al. (2007), the liberalization

of capital movements through the reorganization of financial services, enabling the markets to open to trade and investment causes an increase in competition. The role of information and communication technologies (ICT) is to contribute to the globalization process (Šliburytė and Masteikienė, 2010: 289).

### **3. Literature Review**

Since the 1960s, a specialization area under the name of “the economics of language” has emerged. In the literature and economic analyzes, more emphasis is placed on economic approaches such as the effects of language skills on labor income and the choice of language policies (Lamberton, 2002; Grin, 1996, 2003). Although not much attention has been paid to language in the field of development economics, linguists have mostly argued that languages should play a role in economic development (Seargeant & Earling, 2011).

Considering the relationship between language and economy, it is seen that there are not many studies in the field. Most of the research in the economics of language remains at the microeconomic level. In this study, it is aimed to contribute to the literature by analyzing the causality relationship between economic development, language diversity and economic globalization. In the literature, the causality relationship between economic development and linguistic diversity is bidirectional. While economic development decreases language diversity, the existence of a common language increases economic development. It is due to the fact that residents of countries with little linguistic diversity can communicate better and thus increase the scope of trade and specialization. In this study, it is tested whether there is a causality relationship between economic development, economic globalization and linguistic diversity.

### **4. Econometric Application**

In the study, it is aimed to examine the relationship between language diversity, economic globalization and economic development by making empirical analysis for the 20 founding countries of the OECD (Organization for Economic Co-operation and Development) for the period 1995-2018. In the application part of the study, “linguistic diversity index”, “economic development” and “economic globalization” variables are taken as variables, and the relationship between variables is set out. The aim of this study is to examine the relationship between the variables as well as the causality connections between economic development and language proposed by Arcand (1996). For this purpose, the economics of language is mentioned in the theoretical context.

#### *4.1. Econometric Analysis and Findings*

In this study, for 20 OECD founding member countries (USA, Germany, Austria, Belgium, England, Denmark, France, Netherlands, Ireland, Spain, Sweden, Switzerland, Italy, Iceland, Canada, Luxembourg, Norway, Portugal, Greece and Turkey) the relationship between language diversity, economic development, and economic globalization is aimed to investigate. In the study, econometric analysis is performed by using the variables such as economic globalization index, language diversity index, and economic development index (human development index). In the econometric analyzes Gauss 10 program was used.

Economic globalization index was accessed from the database ‘[www.theglobaleconomy.com](http://www.theglobaleconomy.com)’; linguistic diversity index was accessed from the database ‘<https://knoema.com>’; and human development index, as an indicator of economic development, was accessed from OECD statistics database. In the study, the cross section dependency of variables and models was tested with Breusch and Pagan (1980) test, and homogeneity of variables was tested

with Pesaran and Yamagata (2008) Swamy test. Later, the variables that were the subject of the study were analyzed with Westerlund's Durbin-Hausman (2008) panel cointegration method and Emirmahmutoğlu and Köse (2011) panel causality tests.

In panel data analyzes, which are performed using data from multiple countries, homogeneity tests are applied to determine whether the coefficients of the data belonging to countries are homogeneous or heterogeneous and to determine the cointegration and causality tests to be used in econometric analysis. In the models of homogeneity tests used in the analyzes " $\beta_i$  is expressed as slope coefficients equal to  $\beta$ , which is a single slope coefficient." In the heterogeneity test, it is expressed that the slope coefficient of at least one of the slope coefficients  $\beta_i$  in econometric models is different. Homogeneity of the coefficients is interpreted with the  $\tilde{\Delta}$  (delta\_tilde) ve  $\widetilde{\Delta}_{adj}$  (delta\_tilde\_adj) statistics obtained from Pesaran and Yamagata (2008) homogeneity tests, and econometric cointegration and causality tests are determined and applied according to the homogeneity or heterogeneity of the coefficients (Gül and İnal, 2017: 70-82). In addition, Breusch and Pagan (1980) LM, Pesaran (2004) LM and CD and Baltagi, Feng and Kao (2012) LM cross-section dependency tests were applied to variables and models, and the existence of four different cross-section dependencies was examined for each variable and model.

Westerlund's Durbin - Hausman (2008) panel cointegration test is an econometric test to test the long-term cointegration relations of variables that are not stationary and have a horizontal cut dependency. This test is preferred when the dependent variable is not stationary and some of the explanatory variables are stationary. In addition, another feature of this test is that it is used to calculate the test statistics of hypotheses that take into account panel homogeneity and panel heterogeneity (Westerlund, 2008: 196-199). Durbin-Hausman (2008) panel cointegration test group statistics is based on the panel's assumption of heterogeneity and is tested with the following hypotheses (Acaravci et al., 2015: 124, 125):

$H_0$ : *There is no cointegration for all units*

$H_1$ : *There is cointegration for some units*

The Durbin-Hausman panel statistics is based on the assumption of homogeneity in the panel. Common fixed and trend variables are used for the countries that forming the panel. It is tested with the following hypotheses (Acaravci et al., 2015: 124, 125):

$H_0$ : *There is no cointegration in the whole panel*

$H_1$ : *There is cointegration for the panel*

According to the Durbin-Hausman group statistics, which assume that the panel data are heterogeneous in nature, the  $H_0$  hypothesis expressed as "There is no cointegration for all units" for each model is rejected. Therefore, it is accepted that there is a cointegration relationship between variables for both models (Acaravcı et al., 2015: 124, 125).

Emirmahmutoğlu and Köse (2011) panel causality test is accepted as the panel data analysis version of the causality test developed by Toda and Yamamoto (1995). The test developed for heterogeneous panel models is a causality test that is valid in cases where the cointegration degree of the Toda-Yamamoto (1995) causality test and the

cointegration are uncertain, although the possible errors that can be seen in traditional cointegration tests are transferred to the causality test. As a statistical analysis developed by Fisher (1932) in Emirmahmutoğlu and Köse (2011) test, the following VAR model is estimated for each cross section (Gözbaşı, 2015: 277):

$$Y_{it} = \mu_i + A_{1i}Y_{i(t-1)} + \dots + A_{pi}Y_{i(t-pi)} + \dots + A_{(p+d)i}Y_{i(t-pi-di)} + \varepsilon_{it} \quad (1)$$

In equation 1, while  $Y_{it}$  defines the vector of intrinsic variables, and  $\mu_i$  defines  $P$  dimensional constant effects vector,  $P_i$  defines the optimum delay length and  $d_i$  defines the max. degree of integration. Zero hypothesis: If,  $H_0$  is "No Granger causality", the alternative hypothesis  $H_1$  means "Granger causality exists". It is tested by placing zero restrictions on the first  $P$  parameters in the light of these hypothesis. The obtained test statistics (modified Wald) have asymptotic chi-square distribution with  $p$  degrees of independence. Fisher statistics were developed for the panel to test the hypothesis expressed as "no Granger causality" (Gözbaşı, 2015: 277, 278):

$$\lambda = -2 \sum_{i=1}^N \ln(\pi_i) \quad (2)$$

In Equation 2,  $\pi_i$  defines the probability value for the modified Wald statistic. Fisher statistics has an asymptotic chi-square distribution with  $2N$  degrees of independence. In the last stage of the analysis, the direction of causality between variables is investigated. The panel causality test developed by Emirmahmutoğlu and Köse (2011) was used in the study. This test is a causality test that can be used when the series are not stationary at the same level, that is, when some of the series are stationary at  $I(0)$  and some are stationary at  $I(1)$  level and there is no cointegration relationship between variables (Özyıldız vd., 2018: 349; Emirmahmutoğlu ve Köse, 2011: 872)

**Table 1. Cross Section Dependency Test Results for Variables**

Variables	LDI		Glob		Hdi	
	Test Statistic	Probability Value (p)	Test Statistic	Probability Value (p)	Test Statistic	Probability Value (p)
Cd Lm1 (Breusch,Pagan 1980)	951.984	0.000*	747.280	0.000	919.727	0.000*
cd LM2 (Pesaran 2004 CDlm)	39.089	0.000*	28.588	0.000	37.434	0.000*
cd LM (Pesaran 2004 CD)	-2.208	0.014*	-1.993	0.023	-1.776	0.038*
Bias-adjusted CD test	37.195	0.000*	30.455	0.000	40.475	0.000*

Note: \*\*\*, \*\*, \* denotes heterogeneity according to the 10%, 5% and 1% significance levels, respectively. Dev: Economic development, Ldi: Linguistic diversity index and Glob: Economic globalization index.

In Table 1, various cross-section dependency tests were applied to variables, including Breusch and Pagan (1980) LM, Pesaran (2004) LM and CD and Baltagi, Feng and Kao (2012) LM cross-section dependency tests. The cross-section coefficients of the variables used in the analyzes, probability for each variables when probability values are less than  $p < 0.05$  for all variables used in the analysis, the coefficients of  $\beta_i$  are not homogeneous.

**Table 2. Test Results for Cross Section Dependence of Models**

Tests	Model 1		Model 2		Model 3	
	Ldi= f(Dev)		Dev= f(Ldi)		Ldi= f(Glob)	
	Test Statistics	Probability Value	Test Statistics	Probability Value	Test Statistics	Probability Value
Cd Lm1 (Breusch,Pagan 1980)	1722.575	0.000	2166.263	0.000	1639.240	0.000
cd LM2 (Pesaran 2004 CDlm)	78.619	0.000	101.380	0.000	74.344	0.000
cd LM (Pesaran 2004 CD)	37.277	0.000	44.809	0.000	36.202	0.000
Bias-adjusted CD test	41.973	0.000	41.933	0.000	51.579	0.000
Tests	Model 4.		Model 5.		Model 6.	
	Glob =f(Ldi)		Glob= f(Dev)		Dev= f(Glob)	
	Test Statistics	Probability Value	Test Statistics	Probability Value	Test Statistics	Probability Value
Cd Lm1 (Breusch,Pagan 1980)	2359.827	0.000	1685.282	0.000	1570.553	0.000
cd LM2 (Pesaran 2004 CDlm)	111.310	0.000	76.706	0.000	70.821	0.000
cd LM (Pesaran 2004 CD)	46.772	0.000	36.246	0.000	34.712	0.000
Bias-adjusted CD test	51.365	0.000	54.467	0.000	54.650	0.000

Note: \*\*\*, \*\*, \* denotes heterogeneity according to the 10%, 5% and 1% significance levels, respectively. Dev: Economic development, Ldi: Linguistic diversity index and Glob: Economic globalization index.

In Table 2, cross-section dependency test was applied to the models in which each variable is taken as dependent variable and other variables respectively as independent variable and the homogeneity coefficients of the models used in the analysis for each model. Since probability values are less than  $p < 0.05$  for all model used in the analysis, the  $\beta_i$  coefficients of each model established are not homogeneous.

**Table 3. Homogeneity Test Results of the Models**

Tests	Model 1.		Model 2.		Model 3.	
	Dev = f(Ldi)		Ldi = f(Dev)		Ldi = f(Glob)	
	Test Statistic	Probability Value (p)	Test Statistics	Probability Value (p)	Test Statistics	Probability Value (p)
Delta_tilde	4.960	0.000**	9.931	0.000**	13.248	0.000**
Delta_tilde_adj	5.288	0.000**	10.587	0.000**	14.122	0.000**
Tests	Model 4.		Model 5.		Model 6.	
	Glob = f(Ldi)		Dev = f(Glob)		Glob = f(Dev)	
	Test Statistics	Probability Value (p)	Test Statistics	Probability Value (p)	Test Statistics	Probability Value (p)
Delta_tilde	13.191	0.000**	12.795	0.000**	13.261	0.000**
Delta_tilde_adj	14.061	0.000**	13.640	0.000**	14.136	0.000**

Note: \*\*\*, \*\*, \* denotes heterogeneity according to the 10%, 5% and 1% significance levels, respectively. Dev: Economic development, Ldi: Linguistic diversity index and Glob: Economic globalization index.

As seen in Table 3, Pesaran and Yamagata (2008) homogeneity test findings are expressed. According to the homogeneity coefficients of each model in which each variable is taken as the dependent variable, respectively, the  $\beta_i$  coefficients are not homogeneous since probability values are less than  $p < 0.05$  for each model.

In Table 4, according to the findings of Durbin-Hausman (2008) panel cointegration analysis, since the probability value is  $p < 0.05$ , the  $H_0$  null hypothesis, which is expressed as "there is no cointegration relationship between the horizontal section units that forming the panel" is rejected. Therefore, the variables of economic development, economic globalization index and linguistic diversity index, respectively, were taken as dependent variables and other variables as independent variables between all cross-section units that forming the panel, and cointegration analysis was performed for each different model. For each model, it has been determined that there is a long-run cointegration relationship between the variables.



**Table 4. Durbin - Hausman (2008) Panel Cointegration Test Result**

Model	Test Statistics	Probability (P-Value)
<b>Model 1: Dev = f(Ld)</b>		
Durbin-H Group Statistics	468.566	0.000*
Durbin-H Panel Statistics	88.523	0.000*
<b>Model 2: Ld = f(Dev)</b>		
Durbin-H Group Statistics	520.530	0.000*
Durbin-H Panel Statistics	14.202	0.000*
<b>Model 3: Glob = f(Ld)</b>		
Durbin-H Group Statistics	2439.908	0.000*
Durbin-H Panel Statistics	46.530	0.000*
<b>Model 4: Ld = f(Glob)</b>		
Durbin-H Group Statistics	527.953	0.000*
Durbin-H Panel Statistics	4.354	0.000*
<b>Model 5: Dev = f(Glob)</b>		
Durbin-H Group Statistics	234.597	0.000*
Durbin-H Panel Statistics	21.291	0.000*
<b>Model 6: Glob = f(Ld)</b>		
Durbin-H Group Statistics	68.960	0.000*
Durbin-H Panel Statistics	16.420	0.000*

Note: \*\*\*, \*\*, \* denotes heterogeneity according to the 10%, 5% and 1% significance levels, respectively. Dev: Economic development, Ldi: Linguistic diversity index and Glob: Economic globalization index.

**Table 5. Emirmahmutoğlu ve Köse (2011) Panel Causality Test Results**

Causality Direction	Panel Fisher	P-val	Causality
Ldi → Dev	70.888	0.002**	Var
Dev → Ldi	88.574	0.000**	Var
Ldi → Glob	64.311	0.009**	Var
Glob → Ldi	46.275	0.229	Yok
Dev → Glob	68.493	0.003**	Var
Glob → Dev	79.918	0.000**	Var

Note: \*\*\*, \*\*, \* denotes heterogeneity according to the 10%, 5% and 1% significance levels, respectively. Dev: Economic development, Ldi: Linguistic diversity index and Glob: Economic globalization index.

In Table 5, panel causality test results are expressed for panel general. For 20 OECD founding member countries variables, it has been determined that there is a bidirectional causality relationship between linguistic diversity and economic development, and a bidirectional causality relationship between economic development and economic globalization. In addition, it is stated that there is a unidirectional causality relationship from linguistic diversity to economic globalization.

**Tablo 6. Emirmahmutoğlu ve Köse (2011) Panel Causality Test Result**

Ldi to Dev				Dev to Ldi		
i	Lag	Wald	p-val	Lag	Wald	p-val
1 Turkey	4.000	4.801	0.308	4.000	12.504	0.014*
2 Italy	4.000	4.694	0.320	4.000	24.660	0.000*
3 England	4.000	5.909	0.206	4.000	8.523	0.074**
4 Norway	1.000	0.032	0.858	1.000	0.001	0.979
5 USA	1.000	0.074	0.786	1.000	0.062	0.803
6 Germany	4.000	10.286	0.036*	4.000	1.706	0.790
7 Austria	4.000	18.027	0.001*	4.000	0.818	0.936
8 Belgium	4.000	3.352	0.501	4.000	1.539	0.820
9 Denmark	4.000	2.886	0.577	4.000	11.856	0.018*
10 France	4.000	5.588	0.232	4.000	12.877	0.012*
11 Netherland	3.000	19.258	0.000*	3.000	0.459	0.928
12 Iceland	4.000	3.425	0.489	4.000	2.536	0.638
13 Ireland	1.000	1.104	0.293	1.000	1.990	0.158
14 Spain	1.000	0.626	0.429	1.000	2.762	0.097**
15 Sweden	1.000	0.297	0.586	1.000	2.774	0.096**
16 Switzerland	4.000	2.227	0.694	4.000	5.280	0.260
17 Canada	2.000	1.054	0.590	2.000	4.272	0.118
18 Luxembourg	1.000	0.244	0.621	1.000	4.117	0.042*
19 Protugal	1.000	0.205	0.651	1.000	3.929	0.047*
20 Greece	3.000	12.129	0.007*	3.000	5.015	0.171
Panel Fisher : 70.888				Panel Fisher : 88.754		
p-value : 0.002*				p-value : 0.000*		

Note: \*\*\*, \*\*, \* denotes heterogeneity according to the 10%, 5% and 1% significance levels, respectively. Dev: Economic development, Ldi: Linguistic diversity index and Glob: Economic globalization index.

In Table 6, according to the panel causality test results, the causality relationship analysis findings from linguistic diversity to economic development and from economic development to linguistic diversity were analyzed on the basis of countries, respectively. There is a bidirectional causality relationship in OECD countries, since it is significant ( $p\text{-value} < 0.05$ ) for the overall panel. When the causality relationship between linguistic diversity and economic development is examined on the basis of countries ( $p\text{-value} < 0.05$ ), unidirectional causality relationship from linguistic diversity to economic development is valid for Germany, Austria, the Netherlands and Greece; unidirectional causality relationship is valid from economic development to the linguistic diversity for Turkey, Italy, Britain, Denmark, France, Spain, Sweden, Luxembourg and Portugal.

**Table 7. Emirmahmutoğlu ve Köse (2011) Panel Causality Test Result**

<b>Ldi to Glob</b>				<b>Glob to Ldi</b>		
i	Lag	Wald	p-val	Lag	Wald	p-val
1 Turkey	1.000	0.901	0.342	1.000	0.434	0.510
2 Italy	1.000	0.979	0.323	1.000	0.750	0.387
3 England	4.000	4.289	0.368	4.000	10.375	0.035*
4 Norway	4.000	6.042	0.196	4.000	12.037	0.017*
5 USA	1.000	1.624	0.203	1.000	1.201	0.273
6 Germany	1.000	1.897	0.168	1.000	1.435	0.231
7 Austria	1.000	0.484	0.486	1.000	1.221	0.269
8 Belgium	1.000	0.762	0.383	1.000	2.097	0.148
9 Denmark	1.000	4.466	0.035*	1.000	0.059	0.809
10 France	1.000	4.181	0.041*	1.000	0.340	0.560
11 Netherland	1.000	8.106	0.004*	1.000	0.288	0.592
12 Iceland	1.000	9.489	0.002*	1.000	0.001	0.971
13 Ireland	1.000	0.147	0.701	1.000	0.001	0.973
14 Spain	1.000	0.374	0.541	1.000	0.290	0.590
15 Sweden	2.000	0.578	0.749	2.000	3.112	0.211
16 Switzerland	1.000	0.180	0.671	1.000	1.877	0.171
17 Canada	1.000	0.084	0.772	1.000	0.509	0.476
18 Luxembourg	1.000	0.346	0.556	1.000	0.005	0.946
19 Portugal	1.000	0.378	0.539	1.000	0.055	0.815
20 Greece	1.000	0.782	0.377	1.000	2.019	0.155
Panel Fisher : 64.311				Panel Fisher : 46.275		
p-value : 0.009*				p-value : 0.229		

Note: \*\*\*, \*\*, \* denotes heterogeneity according to the 10%, 5% and 1% significance levels, respectively. Dev: Economic development, Ldi: Linguistic diversity index and Glob: Economic globalization index.

In Table 7, according to the panel causality test results, the causality relationship analysis findings from linguistic diversity to globalization and from globalization to linguistic diversity were analyzed on the basis of countries, respectively. As for the panel in general (p-value <0.05) is significant, there is a unidirectional causality relationship from linguistic diversity to globalization in OECD countries. When the causality relationship between linguistic diversity and globalization is examined on the basis of countries since it is significant (p-value <0.05), the causality relationship from linguistic diversity to globalization is valid for Denmark, France, the Netherlands and Iceland; One way causality from globalization to linguistic diversity is valid for England and Norway.

**Table 8. Emirmahmutoğlu ve Köse (2011) Panel Causality Test Result**

Dev to Glob				Glob to Dev		
i	Lag	Wald	p-val	Lag	Wald	p-val
1 Turkey	1.000	3.332	0.068	1.000	4.704	0.030*
2 Italy	1.000	2.804	0.094**	1.000	4.202	0.040*
3 England	1.000	2.126	0.145	1.000	4.206	0.040*
4 Norway	1.000	0.017	0.897	1.000	0.069	0.793
5 USA	1.000	0.000	0.997	4.000	7.178	0.127
6 Germany	1.000	0.007	0.933	4.000	1.656	0.799
7 Avustria	1.000	0.161	0.688	4.000	1.436	0.838
8 Belgium	1.000	4.966	0.026*	1.000	0.066	0.798
9 Denmark	1.000	6.783	0.009*	1.000	0.003	0.959
10 France	1.000	4.729	0.030*	1.000	0.001	0.974
11 Netherland	1.000	4.854	0.028*	1.000	0.010	0.921
12 Iceland	1.000	1.225	0.268	1.000	0.000	0.989
13 Ireland	1.000	1.802	0.179	4.000	5.999	0.199
14 Spain	1.000	1.246	0.264	4.000	6.736	0.151
15 Sweden	1.000	0.159	0.690	4.000	21.531	0.000*
16 Switzerland	1.000	0.002	0.965	4.000	10.605	0.031*
17 Canada	1.000	0.108	0.742	3.000	11.029	0.012*
18 Luxembourg	3.000	6.043	0.110	3.000	6.172	0.104
19 Portugal	3.000	8.203	0.042*	3.000	6.429	0.093**
20 Greece	1.000	0.577	0.447	1.000	3.137	0.077**
Panel Fisher : 68.493				Panel Fisher : 79.918		
p-value : 0.003*				p-value : 0.000*		

Note: \*\*\*, \*\*, \* denotes heterogeneity according to the 10%, 5% and 1% significance levels, respectively. Dev: Economic development, Ldi: Linguistic diversity index and Glob: Economic globalization index.

In Table 8, according to the panel causality test results, the causality relationship analysis findings from economic development to economic globalization and from economic globalization to economic development are examined on the basis of countries, respectively. There is a bidirectional causality relationship between economic development and economic globalization in OECD countries since it is significant (p-value <0.05) for the overall panel. When the causality relationship between economic development and economic globalization is examined on the basis of countries since (p-value <0.05) is significant, the causality relationship from economic development to economic globalization is valid for Italy, Belgium, Denmark, France, the Netherlands and Portugal; from economic globalization to economic development unidirectional causality relationship is valid for Turkey, Italy, England, Sweden, Switzerland, Canada, Portugal and Greece.

## 5. Conclusion

Along with globalization, which is also expressed as the internationalization of economic relations, increases in human mobility, capital mobility, information flow and technology level cause the involuntary disappearance of geographical borders and the integration of world economies. In 1945, after World War II, international organizations such as IMF (International Monetary Found), World Bank, GATT (General Agreement on Tariffs

and Trade) and OECD, which were established under the leadership of the USA constitute the starting point of globalization. Especially with the financial and economic liberalization period seen in the world economy after 1980, the concept of globalization gained momentum for the world economy and the internationalization of the world economy proves that globalization has an economic purpose.

Emirmahmutoğlu-Köse (2011), when the panel causality test results are interpreted for overall the panel, it is stated that there is a bidirectional causality relationship between linguistic diversity and economic development in 20 OECD founding member countries, and a bidirectional causality relationship between economic development and economic globalization. It was also found that there is a unidirectional causality relationship from linguistic diversity to economic globalization.

When causality relationships between linguistic diversity and economic development are evaluated on the basis of countries, there is causality relationship from the linguistic diversity to economic development in Germany, Austria, Netherlands and Greece and unidirectional causality relationship from economic development to linguistic diversity in Turkey, Italy, Britain, Denmark, France, Spain, Sweden, Luxembourg and Portugal. In OECD countries such as Germany, Austria, Netherlands and Greece, linguistic diversity leads economic development while in the countries such as Turkey, Italy, Britain, Denmark, France, Spain, Sweden, Luxembourg and Portugal, the level of economic development leads linguistic diversity.

It is seen that there is a causality relationship from linguistic diversity to economic globalization in Denmark, France, Netherlands and Iceland. The increasing language diversity in these countries makes easier for countries to establish foreign trade connections with each other and increases the terms of trade of these countries. Thus, foreign trade terms, which increase due to linguistic diversity, lead these countries to become globalized economically. In England and Norway, it was found a unidirectional causality relationship from economic globalization to linguistic diversity. Economic globalization that emerged with financial liberalization causes an increase in linguistic diversity.

There is a causality relationship from economic development to economic globalization in countries such as Italy, Belgium, Denmark, France, the Netherlands and Portugal. In the 1980s, with the increasing globalization, in the countries such as Turkey, Italy, England, Sweden, Switzerland, Canada, Portugal, and Greece located between developed and developing countries in the industry, it was found unidirectional causality relationship from economic globalization to economic development. It is appropriate to say that the production and capital increase accelerated in these countries due to the increasing industrialization, and accordingly, globalization gained speed with the integration of the world countries with each other.

## References

- Abou, S. and Haddad, K. (eds) (1997). *La diversité linguistique et culturelle et les enjeux du développement* (coll. L'Actualité scientifique). Montréal: AUPELF-UREF and Beirut: Université Saint-Joseph.
- Altiner, A., E., Bozkurt, Y., Toktaş (2018). Globalization and Economic Growth: An Application for Emerging Market Economies. *Finance Political & Economic Comments*, 639, 117-162.

- Arcand, J.-L. (1996). Development economics and language: the earnest search for a mirage?. *International Journal of the Sociology of Language* 121, 119-157.
- Arcand, J., L., and Grin, F. (2013). Language in economic development: Is English special and is linguistic fragmentation bad?. In E. J. Erling & P. Seargeant (Eds.), *English and Development. Policy, Pedagogy and Globalization* (243–266). Bristol: Multilingual Matters.
- Breton, A., & Mieszkowski, P., (1977). The Economics of Bilingualism, in Oates, W. (ed.), *The Political Economy of Fiscal Federalism*, Lexington: D. C. Heath: 261-273.
- Breton, A., 1998, *Economic Approaches to Language and Bilingualism*, Department of Public Works and Government Services, Canada.
- Carnevale, A., Fry, R. & Lowell, L., (2001). Understanding, Speaking, Reading, Writing, and Earnings in the Immigrant Labor Market. *American Economic Review*, 91 (2): 159-163.
- Carliner, G., 1981, “Wage Differentials by Language Group and the Market for Language Skills in Canada”, *Journal of Human Resources*, 16: 384-399.
- Chaudenson, R. and de Robillard, D. (1990). *Langues, économie et développement*. AixMarseilles: Institut d’études créoles et francophones, Université de Provence.
- Chiswick, B., (1991). Speaking, Reading, and Earnings among Low-Skilled Immigrants. *Journal of Labor Economics*, 9 (2): 149-170.
- Chiswick, B. and Miller, P., (1995). The Endogeneity between Language and Earnings: International Analyses. *Journal of Labor Economics*, 13 (2): 246-288.
- Chiswick, B. and Miller, P., 1998, “English Language Fluency among Immigrants in the United States”, *Research in Labor Economics*, Vol.17.
- Chiswick, B. and Miller, P., (1999). Language Skills and Earnings Among Legalized Aliens. *Journal of Population Economics*, 12: 63-89.
- Chiswick, B. and Miller, P., (2003). The Complementarity of Language and Other Human Capital: Immigrant Earnings in Canada. *Economics of Education Review*, 22 (5): 469-480.
- Chiswick, B. and Miller, P., (2007). *The Economics of Language: International Analyses*, Routledge.
- Dreher, Axel (2006). Does Globalization Affect Growth? Evidence from a New Index of Globalization. *Applied Economics*, 2006(38), 1091-1110.
- Eichengreen, B., and Irwin, D., (1998), *The Role of History in Bilateral Trade Flows*, in Frankel, J., ed., *The Regionalisation of the World Economy*, Chicago University Press, 33-57.
- Emirmahmutoğlu, Furkan and Köse, Nezir (2011). Testing for Granger Causality in Heterogeneous Mixed Panels. *Economic Modelling*, 28(3), 870–876.
- Gonzalez, L., (2005). Nonparametric Bounds on the Returns to Language Skills. *Journal of Applied Econometrics* 20 (6): 771-795.

- Gözbaşı, O. (2015). Stock Market Development and Economic Growth Interaction: Developing countries example. *Eskişehir Osmangazi University Journal of FEAS*, 10 (2), 269-284.
- Gül, E., Inal, V. (2017). The Relationship between Air Pollution and Economic Growth: A Time-Changing Panel Causality Analysis. *Sakarya Journal of Economics*, 6 (2), 70-82.
- Grauwe, P. De, (2006). ‘Language Diversity and Economic Development’, Manuscript, Katholieke Universiteit Leuven.
- Grenier, G., (1982). Language as Human Capital: Theoretical Framework and Application to Spanish-Speaking Americans, PhD Dissertation, Princeton University.
- Grenier, G., (1987). Earnings by Language Group in Quebec in 1980 and Emigration From Quebec Between 1976 and 1981. *Canadian Journal of Economics*, 20: 774-791.
- Grin, F., (1996b). The Economics of Language: Survey, Assessment, and Prospects. *International Journal of the Sociology of Language*, 121: 17-44
- Grin, F., (2003). Language Planning and Economics. *Current Issues in Language Planning*, 4 (1): 1-66.
- Grin, F., Sfreddo, C. and Vaillancourt, F., (2011). *The Economics of the Multilingual Workforce*, Routledge.
- Helliwell, J., (1998). *How Much Do National Borders Matter?*, Brookings Institution, Washington, D.C.
- Krauss, M., (1995). Endangered Languages: Current Issues and Future Prospects, Keynote Address, Dartmouth college, Hanover, NH, 3 February.
- Lieberson, S. (1980). Procedures for improving sociolinguistic surveys of language maintenance and language shift, *International Journal of Social Language*, 25: 11-27.
- McManus, W., (1985). Labor Market Costs of Language Disparity: An Interpretation of Hispanic Earnings Differences. *American Economic Review*, 75 (4): 818-827.
- Melitz, J., (2008). Language and Foreign Trade. *European Economic Review*, 52: 667–699.
- Mkwinda-Nyasulu, B. (2013). Role of Language in Socio–Economic Development: The Semiotics are Right. *Journal of Humanities*, 23(1), 213-230.
- Osterhammel J. and Petersson (2005). *N. P. Globalization: a short history*. Upper Saddle River: Prentice Hall.
- Özyıldız, T., Utlü Koçdemir, S., ve Çütçü, I. (2018). Ticari Dışa Açıklığın Enflasyon ve Büyüme ile İlişkisi: Yükselen Piyasa Ekonomilerinde Panel Veri Analizi Uygulaması. *Uluslararası Yönetim İktisat ve İşletme Dergisi*, 14 (2), 335-356.
- Pesaran, M. Hashem and Yamagata, Takashi (2008). Testing Slope Homogeneity in Large Panels. *Journal of Econometrics*, 142(1), 50-93.
- Shapiro, D. and Stelcner, M., (1981). Male-female earnings differentials and role of language in Canada, Ontario and Quebec, 1970. *Canadian Journal of Economics*, 14: 341-348.

- Šliburytė, Laimona and Rūta Masteikienė; (2010), Impacts of Globalization On Lithuanian Economic Growth. *Economics and Management*, 2010 (15), 288-294.
- Stroud, C. (2002). *Towards a Policy for Bilingual Education in Developing Countries*. Stockholm: Swedish International Development Authority.
- Trejo, S., (1997). Why do Mexican Americans Earn Low Wages?. *Journal of Political Economy*, 105: 1235-1268.
- United Nations (2004). *Globalization and the State: Challenges for Economic Growth and Human Development*, United Nations Department of Economic and Social Affairs Division for Public Administration and Development Management, New York.
- Vaillancourt, F. (1980). Differences in Earnings by Language Groups in Quebec, *1970*, International Centre for Research on Bilingualism, Quebec.
- Vaillancourt, F., (1983). The Economics of Language and Language Planning. *Language Problems and Language Planning*, 7: 162-178.
- Westerlund, Joakim (2008). Panel Cointegration Tests of the Fisher Effect. *Journal of Applied Econometrics*, 23(2), 193-233.
- Zhang, W., Grenier, G. (2013). How can language be linked to economics? A survey of two strands of research. *Language Problems and language Planning*, 37 (3), 203-226.