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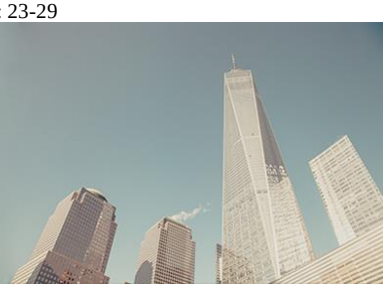

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The impact of trade openness and FDI on brain drain in developing countries

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Abstract
Purpose – The objective of this paper is to explore the impacts of trade openness and the inflows of FDI on brain drain in the case of developing world. This is a new strand as existing literature has focused on the relationship between trade openness, FDI and economic growth.
Design/methodology/approach - We utilized panel data of 56 developing countries of origin and 20 OECD host countries for 1985-2010 time period. Panel econometric techniques are utilized to check cointegration among the variables. Fully modified ordinary least squares and dynamic ordinary least squares methods are used to estimate coefficients of the variables. Similarly, pairwise granger causality test is carried out to check the direction of relationship.
Findings - Using panel cointegration techniques, the study reveals that both trade openness and FDI matters for brain drain. The results indicated that openness of trade has a positive and FDI has a negative impact on brain drain problem. Further, the empirical results revealed one way causality from FDI to trade openness and from brain drain to trade openness. Policy makers of the developing world are expected to be benefited from the results of the study and hence they would in turn be in a better position to make appropriate policies regarding both FDI and trade openness to overcome the problem of brain drain.
Originality/value – The findings of the paper are original as the available literature ignored the role of trade openness and FDI regarding the issue of brain drain.

Keywords: FDI, trade openness, brain drain, cointegration

1. Introduction
Trade openness and foreign direct investment (FDI hereafter) have contributed to the economic growth of many countries over the years. Both of these factors are the characteristics of open economies and are considered important from growth perspective. FDI either in the form of defacto or de jure is long lasting as compared to international trade which can vary from year to year as discussed in the report published by Pew Research Centre (PEW; 2014) [36]. Previous literature has mainly focused on the growth impacts of trade openness and FDI (Dollar, 1992; Sachs and Warner, 1995; Edwards 1998; Frankel and Romer, 1999, Carkovic and Levine, 2005; Adewumi *et al*., 2006; Chen, and Gupta, 2009; Arif and Hasnat, 2012; Melnyk and Kubatko and Pysarenko, 2014; Tahir and Khan, 2014; Tahir and Azid, 2015; Ould, 2015) [11, 34, 12, 14, 7, 1, 9, 2, 23, 38, 37, 28]. Both these factors in one way or the other contribute to economic output and development of countries. There are various channels such as transfer of advanced technologies and skills improvements by which international trade and FDI accelerates economic growth and development.
International migration is complicated phenomenon that snap on a plenty of economic, social and security aspects influence our daily lives in a globalized world as discussed by International Organization of Migration (IOM; 2018) [42]. According to Lee (1966) [24], "the decision to migrate is influenced by four factors such as factors related with area of origin, factors associated with place of destination, intermediating factors, and by personal factors." The number of international migrants is growing faster than the global population. The world in general is facing a serious issue of brain drain particularly the developing world. Brain drain could influence growth and economic health especially in poor countries and it may cause low employment, productivity and investment level. There could be numerous reasons responsible behind the rising brain drain problem. These includes conflicts, hostility, environmental deterioration and change, and lack of human security and opportunity as mentioned by International Organization of Migration (IOM; 2018) [42].

Besides, there could be some prominent macroeconomic factors that may influence the emigration in one way or the other. Uprety (2017) [41] demonstrated that one of the possible driving forces behind the prevailing brain drain is trade openness. Further he predicted that women's emigration is effected more by trade openness as compared to male emigration. However, very less attention is paid to examine the effect of trade openness and FDI on the problem of emigration which is known as the brain drain.

The current study deviates from the conventional literature and focuses on the developing economies to find out the impacts of both trade and FDI on brain drain. This is an under researched area and therefore, the contribution of this paper towards the literature would be substantial. We expect policy makers of the developing world to find the results of the study indeed useful so they would in a better position to make appropriate policies regarding both trade openness and FDI in order to impede the issue of brain drain which acts as a hurdle to their growth.

The article is organized as follows. The coming section presents literature review and sets out theoretical framework. Section 3 deals with descriptive statistics for the selected variables while the fourth section explains model, sample and data along with methodology for estimation. The penultimate section summarizes the results while concluding remarks are shown in last section.

2. Literature review

Existing empirical literature has investigated the relationship between migration and trade such as Uprety (2017) [41] who found that high-skilled migrants are expected to emigrate with higher trade. He suggested that trade could be one of the main determinant of brain drain. Fensore (2016) [13] looked at a link from migration to FDI stocks and found that migration could be responsible for the allocation of bilateral investment decisions. In the similar pattern Kondoh (2014) [22] showed that if country adopts optimally control immigration policy then skill formation is negatively impacted and the number of domestic unskilled workers rises.

Navaretti, *et al*. (2007) [27] analyzed the interaction between FDI and migration and concluded that there are various multiple levels at which FDI and migration is associated. There are various links at firm level that influences FDI. Moreover, Aubry *et al.* (2012) [5] demonstrated that both trade and FDI can be affected by emigration. He found that the brain drain has positive impact on trade. Similarly, at firm level migration and FDI are positively associated. Further, Narayan and Smyth (2006) [24] argued that difference in income, police power, quality of health services, transportation cost, democratic freedom are the major factors that contributes towards more migration from developing to developed countries.

Krugman (1979) [21] proposed a model for international trade in which patterns of trade is determined by innovation and technology transfer. He analyzed international trade in two goods (new and old goods). He demonstrates two countries equilibrium model in which advance countries innovate, manufacture and export products to developing nations. Subsequently, developing countries have production technology so they produce those goods and exporting to developed nations, so goods become old. When new goods become old, they become homogeneous instead of differentiated. Advanced countries, therefore, produce differentiated goods for this they demand high-skilled labor while developing countries produce homogeneous which do not require high skilled labor.

The recent report of United Nations (2017) shows that the number of international migrants reached to 258 million persons (of which majority are from developing world). International migrants are composed of 3.4 per cent of the global population currently as compared to 2.8 per cent in the year 2000. There is variation in growth rates of the overall population between the developed and the developing regions, in South growth rates of global migrants tends to increase frequently comparatively to the North.

2.1 Theoretical framework

In this paper we are interested to estimate the triangular relationship among trade openness, FDI inflows and brain drain in developing countries. Both trade openness and FDI inflows are linked with brain drain in various ways. Trade openness is of the instrument that impacts emigration causing brain drain. With more trade openness skilled labor force move towards advanced countries due to more job opportunities and to earn more wages. Existing literature has analyzed the impacts of trade openness on brain drain such as Uprety (2017) [41] who reported that with trade openness high-skilled labor force is encouraged to emigrate. Further, Tomohara (2017) [39] explained the interconnection between inward migration and FDI. His results reveal that both are negatively related to each other. According to the findings of Arun and Ulku (2011) [4] explained various factors that determines remittances such as income, job opportunities, education, interconnections between origin and host countries. Likewise, Gheasi, Nijkamp and Rietveld (2013) [17] demonstrated a positive association between migration and FDI outflows.

But previous studies have ignored the possible link from FDI to emigration specifically on issue of brain drain. However, FDI might have impact on emigration. As when there is more inward FDI in country, there is more production and hence more employment level so domestically people have more jobs and facilities so they would not have any desire to migrate. As a consequence, emigration would be reduced which increase production level due to skilled workers and advanced technologies. In other words, FDI is expected to reduce brain drain. Below the figure 1 demonstrates the casual relationship between trade openness, FDI and brain drain.

Hypothesis of the study

We construct the following hypothesis:

H1. Trade openness causes more brain drains.

H2. FDI negatively impacts brain drain in developing countries.

3. Descriptive Statistics

We have reported some basic statistics on emigration for the top 15 developing countries from the country of origin. Data has been averaged during the period 1985 to 2010. Below the Table 1 contains the descriptive statistics which shows the trends of migrants sending countries from developing world.

Table 1: Top 15 Migrants sending countries in 2010

Countries	Skilled Migrants	Total Migrants
Mexico	9368944	11632752
India	2764376	3255443
China	2223296	2834962
Philippines	2153728	2437437
Turkey	2079223	2770146
Vietnam	1637076	1795947
Morocco	1627334	1822532
Mauritius	1302967	2134200
Korea Rep	1080196	1359752
Romania	1065860	1414923
El Salvador	1043772	1214544
Colombia	989537	1140454
Jamaica	859288	983911
Dominican Republic	827496	984922
Pakistan	827473	1093212
Ecuador	817795	959525

Source: Institute of Employment Research (IAB)

According to the statistics presented in Table 1, the economy of Mexico is highly suffered from the problem of brain drain. Mexico has the largest share in emigrants from 1980-2010.Total migrants of Mexico were 11632752 and it has largest portion of skilled emigrants. India and China also faced the issue of brain drain as they are having largest number of emigrants after Mexico in skilled as well as in overall share i-e (2764376) and (2223296) respectively. These countries though are sparsely populated and hence their emigration rate is also high. Morocco and Mauritius also faced the problem of brain drain significantly as confirmed by the statistics reported. The economies of Pakistan and Ecuador are the countries less affected by brain drain. Share of skilled and total migrants is depicted in pie chart given in appendix section.

4. Modeling and Methodology

4.1Empirical model

The study uses the following panel data regression specification to explore the impacts of trade openness and FDI inflows on brain drain in developing countries.

$$EMIG_{it} = \beta_{\circ it} + \beta_1 FDI_{it} + \beta_2 TOP_{it} + \varepsilon_{it} \quad (1)$$

Where the term $\beta_\circ$ represents intercept while β_1, β_2 are the parameters associated with FDI and trade openness. Similarly, ε_{it} represents residual where subscript i denote the country and t denotes the years. Table 2 presents the variables description and sources of data.

Table 2: Variables description

Variable	Definition	Description	*Source*
EMIG	It refers to the Migrants. These are characterized as foreign-born individual's age 25 years and above.	It is the dependent variable.	Institute for Employment Research (IAB)
FDI	It is the net inflows of investment in a country.	It is the key explanatory variable that effect emigration.	WDI (World Development Indicators)
Trade openness	It is the aggregate of exports and imports divided by total population. It accounts for open economy.	It is the second important variable that influences migration.	WDI (World Development Indicators)

4.2 Data and sample

This paper gauge the relationship of trade, FDI and brain drain by using data set of 56 developing countries having six-year windows from 1985 to 2010 (i-e 25 years). We use the average values for two reasons first to match the frequency of data or comparability and secondly to mitigate the fluctuations in the data. List of developing migrants sending countries and 20 OECD migrants receiving countries is provided in appendix in Table 8 and 9. According to the IAB "(Employment Research Institute)" migrants are emigrants having age 25 years and older. Migrants are classified on the basis of gender (female and male migrants). Their education level is further categorized as lower level, medium education and higher level. Lower level migrants include those with only primary education. The one with medium education are individuals who carried out upper-secondary education and high skilled emigrants have done post-secondary education. Total skilled migrants are calculated by adding males and females skill wise (low skilled to high skilled).

4.3 Methodological techniques

We assess the link between trade openness, FDI and emigration using panel cointegration. In the first step, the study carried out the unit root testing using the test proposed by Pesaran (2007) [31]. In the next step, we employed the cross-section dependency test (CD test) that is conducted Breusch-Pagan LM (1980), Pesaran (2004) [34]. Further we conducted Granger causality test in order to figure out causal relationship among international trade, FDI and brain drain. We also applied Pedroni (2000) [30] and Kao Residual Cointegration Test in searching out cointegrating relationship among the variables.

4.3.1Panel cointegration tests

We will utilize following regression proposed by Pedroni (1999) [29]. The Pedroni cointegration approach is very popular among the researchers and therefore has been widely used in the literature (Al-Mulali and Sab, 2018).

$$y_{it} = \alpha_{it} + \gamma_{it} + \beta_1 x1_{it+} \beta_2 x2_{it} + \ldots\ldots + \beta_k xk_{it+} \varepsilon_{it} \quad (2)$$

In Eq. (2) t = 1, . . ., T; that denotes the number of observations i = 1, . . ., N; dependent and explanatory variables both are assumed to be integrated of order 1,i-e I (1). The αi and γi are cross section entity and time effects, respectively, if required these both parameters may be set to zero; k represents the regressors. Slope coefficients are β1, β2, and βk.

Under the null hypothesis of cointegration tests the error term εit will be non-stationary. For cointegration test we have to compute the residuals from Equation (2) and then check whether the residuals are I (1) or not by estimating regression for each cross-section.

$$\varepsilon_{it} = \rho_i \varepsilon_{it-1+} \mu_{it} \quad (3)$$

ρi denotes the coefficient of the lag values of residual in above equation. Pedroni proposed null hypothesis statistics for estimating cointegration, he argued that under the null hypothesis ρi is qual to 1 for all i. The cointegration statistics such as panel t-statistic, rho statistic, and group statistics are constructed from residual by using equation (3).

4.3.2 Granger causality test

We analyzed the long run casual nexus among trade openness, FDI and brain drain. Equation 3, 4 and 5 introduce causality model within same lag length.

$$\Delta \text{EMIG}_{it} = \beta o_{it+} \sum_{i=1}^{n} \varepsilon_{it} + \Delta EMIG_{it-1} + \sum_{i=1}^{n} \varphi_{it} \Delta \log(FDI)_{it-1+} \sum_{i=1}^{n} X_{it} \Delta_{\log}(\text{TOP})_{it-1+} \mu_{it} \quad (3)$$

$$\Delta \text{FDI}_{it} = \beta o_{it+} \sum_{i=1}^{n} \varepsilon_{it} + \Delta FDI_{it-1} + \sum_{i=1}^{n} \varphi_{it} \Delta \log(EMIG)_{it-1+} \sum_{i=1}^{n} X_{it} \Delta_{\log}(\text{TOP})_{it-1} + \mu_{it} \quad (4)$$

$$\Delta \text{TOP}_{it} = \beta o_{it+} \sum_{i=1}^{n} \varepsilon_{it} + \Delta TOP_{it-1} + \sum_{i=1}^{n} \varphi_{it} \Delta \log(EMIG)_{it-1+} \sum_{i=1}^{n} X_{it} \Delta_{\log}(FDI)_{it-1} + \mu_{it} \quad (5)$$

Where $delta\ \Delta$ shows the first difference, βo_{it} denotes constant and the parameters are ε_{it}, φ_{it}, x_{it} .while μ_{it} is error term.

5. Findings and discussions

5.1 Unit root testing

We used Im–Pesaran–Shin (2003) and Pesaran (2007) [31] in order to find out the order of integration of all variables. The results of the unit root test are reported in Table 3 which indicate that at level all variables are non-stationary while appears to be stationary by taking the first difference.

Table 3: Results of Pesaran (2007) [31] panel unit root test

Results of Pesaran (2007) [31] panel unit root test		
Variable	**Level**	**First difference**
EMIG	-1.217	-9.593***
TOP	0.888	-5.162***
FDI	-1.222	-10.030***

****indicates 1% significance level*

5.2 Cross-section-Dependence test

The outcomes of the cross-sectional dependency tests are presented in Table 4. The CD test is used by many researchers such as Bayar and Gavriletea (2017). We use three tests LM Breusch-Pagan (1980) [8], LM Pesaran and Pesaran (2004) [34]. The probability values of the cross-sectional dependency tests are significant therefore the null hypothesis (no cross-sectional dependency) is rejected at a 1% significance level. It implies that there is cross-sectional dependency among the selected variables.

Table 4: Results of Residual Cross-Section Dependence Test

Test	Statistic	D.f.	Prob.
Breusch-Pagan LM	5844.590***	1540	0.000
Pesaran scaled LM	76.554***		0.000
Pesaran CD	63.617***		0.000

****indicates 1% significance level*

5.3 Results of panel cointegration tests

Panel Cointegration techniques are used to examine long term relationship among selected variables. Panel cointegration takes into account time as well as cross section dimension. We examined cointegrating relationship among variables using Pedroni (1999) [29], Kao (1999) [19] residual cointegration tests. This test has been employed by several studies such as Seetaram (2009) [29], Nowbutsing (2014) [25] Bidirici and Bohur (2015) [6], and Guven (2016) [16]. By considering the probability values, the null hypothesis is rejected and it is concluded that there is a cointegrating relationship among trade, brain drain and FDI. Results of cointegration techniques are presented below in Table 5.

Table 5: Pedroni (1999) [29] Residual Cointegration Test

Ho:No Cointegration H1: Cointegration exists (within-dimension)				
REGRESSION	**Statistic**	**Prob.**	**Weighted Statistic**	**Prob.**
Panel v-Statistic	-3.3733	0.999	-1.1177	0.868
Panel rho-Statistic	4.7746	1.000	3.2617	0.999
Panel PP-Statistic	-5.9938***	0.000	-9.0189***	0.000
Panel ADF-Statistic	-3.3443***	0.000	-6.9193***	0.000
Alternative hypothesis: individual AR coefs. (between-dimension)				
REGRESSION	Statistic	Prob.		
Group rho-Statistic	6.5043	1.000		
Group PP-Statistic	-17.5735***	0.000		
Group ADF-Statistic	-13.7019***	0.000		
Results of Kao Residual Cointegration Test Null Hypothesis: No Cointegration				

	t-statistic	Prob	
ADF	4.2602***	0.000	
Residual Variance	6.08E+10		

***indicates 1%sinficance level

5.4 Long run coefficients

We have estimated the cointegrating coefficients' with the help of fully modified ordinary least squares (FMOLS) and dynamic ordinary least squares (DOLS). The cointegrating coefficients show that both trade and FDI are important factors responsible for the problem of brain drain. The results demonstrate that trade openness has positively and significantly impacted brain drain. According the point estimates based on FMOLS, 1% increase in trade openness would increase brain drain by 1.611% increase in outward skilled migration. These outcomes are consistent with findings of previous empirical literature such as Uprety (2017) [41]. Similarly, FDI has negatively affected the brain drain problem. This indicates that for 1% increase in FDI, brain drain would decrease by approximately 0.563%. Therefore, FDI should be encouraged to overcome the problem of brain drain. Further, the DOLS estimation method has also revealed simpilar findings. Results are shown in Table 6.

Table 6: Cointegrating model Estimation

Dependent Variable: Lnemig	LNFDI	LNTOP
Model: FMOLS	-0.563***	1.611***
Std. Error	0.177	0.031
Model: DOLS	-0.367**	1.615***
Std. Error	0.150	0..030

*** indicates 1% significance level respectively

5.5 Results of Granger causality test

We analyzed the causal relationship among the variables by using the Pairwise Granger causality tests. This test is used in previous literature such as (Ould; 2015) [28], Bidirici and Bohur (2015) [6]. We have formulated hypothesis for the causality analysis as given below. Results for the causality analysis are shown in Table 8.

FDI to EMIG $H_0: \alpha_{1i} = 0$
$H_1: \alpha_{1i} \neq 0$
EMIG to FDI $H_0: \alpha_{2i} = 0$
$H_1: \alpha_{2i} \neq 0$
TOP to EMIG $H_0: \alpha_{3i} = 0$
$H_1: \alpha_{3i} \neq 0$
EMIG to TOP $H_0: \alpha_{4i} = 0$
$H_1: \alpha_{4i} \neq 0$
Similarly,
TOP to FDI $H_0: \alpha_{5i} = 0$
$H_1: \alpha_{5i} \neq 0$
FDI to TOP $H_0: \alpha_{6i} = 0$
$H_1: \alpha_{6i} \neq 0$

Table 7: Pairwise Granger causality tests

H_0: No Causality	Observations	F-Statistic	P-values
FDI to EMIG (α_{1i})	280	0.1554	0.693
EMIG to FDI (α_{2i})		0.3973	0.529
TOP to EMIG (α_{3i})	280	0.3268	0.568
EMIGto TOP (α_{4i})		5.8607**	0.016
TOP to FDI (α_{5i})	280	0.0377	0.846
FDI to TOP (α_{16i})		3.8979**	0.049

First, we examined the causality between FDI and brain drain and then brain drain to FDI. The results exhibit no causality running from FDI to brain drain. In the second phase, we analyzed the causality between trade openness and brain drain. The results reveal the one-way causality running from brain drain to trade openness. Hence, in this scenerio we reject our null hypothesis at 5% significance level and accept H1. In the last phase, our results suggest that there is one-way causality between FDI and trade openness.

6. Concluding remarks

This paper attempted to gauge the relationship among trade openness, FDI and emigration in developing countries specifically on the issue of brain drain. This is new aspect as previous literature investigated the relationship between migration and FDI at a firm level. We utilized panel data of 56 developing countries of origin and twenty OECD host countries for time span of twenty-five years from 1985-2010. We employed panel cointegration techniques as well as Granger's causality tests. According to our empirical findings, both trade openness and FDI have strong significant impacts on brain drain. FDI has negative impact on brain drain whereas trade openness has positive impact on brain drain.

The main implication of our analysis clearly advocates policies for FDI and free trade to ensure reduction in brain drain. Policy makers of the developing countries should initiates significant measures to boost up FDI and revisit the trade openness policy in order to reduce emigration and ultimately the problem of brain drain would be addressed.

Appendix

Table 8: List of migrants sending countries

Algeria	cameroon	El salvador	Kenya	Morocco	Rwanda	Tunisia
Argentina	Colombia	Gabon	Korea, Rep.	Mozambique	Senegal	Turkey
Belize	Congo, dem republic	Guatemala	Madagascar	Namibia	Sierra Leone	uganda
Benin	congo	Honduras	Malaysia	Nicaragua	sudan	Uruguay
Bolivia	costa Rica	India	Mali	Nigeria	Swaziland	Venezuela, RB
Botswana	Dominca Rep	Indonesia	Mauritania	pakistan	Thailand	Vietnam
Brazil	Ecudor	Iran, Islamic Rep.	Mauritius	Panama	Togo	Zambia
Burkina faso	Egypt	Jordan	Mexico	Philippines	Trinidad and Tobago	Zimbabwe

Table 9: List of 20 OECD migrants hosting Countries

Australia	Finland	Luxembourg	Spain
Austria	France	Netherlands	Sweden
Canada	Greece	New Zealand	Switzerland
Chile	Germany	Norway	United Kingdom
Denmark	Ireland	Portugal	United States

References

1. Adewumi S, Hacker S, Dzansi J. The impact of FDI on growth in Developing Countries. An African Experience, Jonkoping international business school, 2006.
2. Arif A, Ahmad H. Impact of trade openness on output growth: co integration and error correction model approach. International Journal of Economics and Financial. 2012; 2(4):379.
3. Al-Mulali U, Che Sab CNB. Electricity consumption, CO2 emission, and economic growth in the Middle East, Energy Sources, Part B: Economics, Planning, and Policy 2018; 13:257-263. DOI: 10.1080/15567249.2012.658958
4. Arun T, Ulku H. Determinants of remittances the case of the South Asian community in Manchester. Journal of Development Studies. 2011; 47(6):894-912.
5. Aubry A, Kugler M, Rapoport H. Migration, FDI and the Margins of Trade. Boston: Center for International Development, Harvard University, 2012.
6. Bayar Y, Gavriletea MD. Peace terrorism and economic growth in Middle East and North African countries. Quality & Quantity, 2017, 1-20.
7. Bidirici M, Bohur E. Design and Economic Growth: Panel Cointegration and Causality Analysis. Procedia-Social and Behavioral Sciences. 2015; 210:193-202.
8. Breusch TS, Pagan AR. The Lagrange multiplier test and its applications to model specification in econometrics. The review of economic studies. 1980; 1,47(1):239-53.
9. Carkovic M, Levine R. Does foreign direct investment accelerate economic growth? Does foreign direct investment promote development, 2005, 195p.
10. Cherunilum F. International Economics. The Mc Graw Hill, Fifth Edition, chapter. 2008; 26:582.
11. Chen PP, Gupta R. An investigation of openness and economic growth using panel estimation. Indian Journal of Economics. 2009; 89(355):483.
12. DESA U. United Nations Department of Economic and Social Affairs/Population Division: World Population Prospects: The 2008 Revision, 2010. http://esa. un org/unpp (gelesen am 16).
13. Dollar D. Outward-oriented developing economies really do grow more rapidly: evidence from 95 LDCs, 1976-1985. Economic development and cultural change. 1992; 40(3):523-544.
14. Edwards S. Openness, productivity and growth: what do we really know? The economic journal. 1998; 108(447):383-398.
15. Fensore I. The Impact of Migration on Foreign Direct Investments, 2016.
16. Frankel JA, Romer DH. Does trade cause growth? American economic review. 1999; 89(3):379-399.
17. Gheasi M, Nijkamp P, Rietveld P. Migration and foreign direct investment: education matters. The annals of regional science. 2013; 51(1):73-87.
18. Güven S, Mert M. Panel cointegration analysis of international tourism demand: sample of antalya. The Online Journal of Science and Technology, 2016; 6(2).
19. Im KS, Pesaran MH, Shin Y. Testing for unit roots in heterogeneous panels. J Econom. 2003; 115(1): 53-74.
20. Institute of Employment Research.: http://www.iab.de/en/ueberblick.aspx.
21. Kao C. Spurious regression and residual-based tests for cointegration in panel data. Journal of econometrics. 1999; 90(1):1-44.
22. Kondoh K. Emigration, immigration, and skill formation: the case of a midstream country. In the Economics of International Immigration, Springer, Singapore, 2017, 213-228.
23. Krugman P. A model of innovation, technology transfer, and the world distribution of income. Journal of political economy. 1979; 87(2):253-266.
24. Lee ES. A theory of migration. Demography. 1966; 1,3(1):47-57.
25. Melnyk L, Kubatko O. Pysarenko S. The impact of foreign direct investment on economic growth: case of post communism transition economies. Problems and perspectives in Management. 2014; 12(1):1-24.
26. Narayan PK, Smyth R. What Determines Migration Flows from Low-Income to High-Income Countries? An Empirical Investigation of Fiji–Us Migration 1972-2001. Contemporary Economic Policy. 2006; 24(2):332-342.
27. Nowbutsing BM. The impact of openness on economic growth: Case of Indian Ocean rim countries. Journal of Economics and Development Studies. 2014; 2(2):407-427.
28. Navaretti GB, De Simone G, Sembenelli A. Migration and Foreign Direct Investment A review of the literature. Migrazione e mobilità di impresa: determinanti ericadutesulterritorio, research project, carried out by Centro Studi Luca d'Agliano within the framework of the Fondazione CRT/Progetto Alfieri project, 2007.
29. Ould L. An Investigation of the Impact of Foreign Direct Investment on Economic Growth: A Case Study of Mauritania. Int J Econ Manag Sci. 2015; 4(224):2.
30. Pedroni P. Fully modified OLS for heterogeneous cointegrated panels. In Nonstationary panels, panel cointegration, and dynamic panels Emerald Group Publishing Limited, 2001, 93-130.
31. Pedroni P. Critical values for cointegration tests in heterogeneous panels with multiple regressors. Oxford Bulletin of Economics and statistics. 1999; 61(S1):653-670.
32. Pedroni P. Fully modified OLS for heterogeneous cointegrated panels. In: Baltagi, B. (ed.) Advances in Econometrics, Bingley, Emerald. 2000; 15:93-130.
33. Pesaran MH. A simple panel unit root test in the presence of cross-section dependence. J. Appl. Econom. 2007; 22(2):265-312.
34. Pesaran MH. General Diagnostic Tests for Cross-Section Dependence in Panels. Cambridge Working Papers in Economics. No, 2004, 0435. http://www.econ.cam.ac.uk/dae/repec/cam/pdf/cwpe0435.pdf
35. Pesaran MH, Ullah A, Yamagata T. A bias-adjusted LM test of error cross-section independence. Econom. J. 2008; 11:105-127.
36. Sachs JD, Warner A, Åslund A, Fischer S. Economic

reform and the process of global integration. Brookings papers on economic activity. 1995; (1):1-118.
37. Seetaram, N, Dwyer L. Immigration and tourism demand in Australia: A panel data analysis. Anatolia, 2009; 20(1):212-222.
38. Stokes, B, Oates R. Faith and Skepticism about Trade, Foreign Direct Investment, Pew Research Center. 2014, 1-13. http://www.pewglobal.org/2014/09/16/faith-and-skepticism-about-trade-foreign-investment/
39. Tahir M, Azid T. The relationship between international trade openness and economic growth in the developing economies: Some new dimensions. Journal of Chinese Economic and Foreign Trade Studies. 2015; 8(2):123-139.
40. Tahir M, Khan I. Trade openness and economic growth in the Asian region. Journal of Chinese Economic and Foreign Trade Studies. 2014; 7(3):136-152.
41. Tomohara A. Does immigration crowd out foreign direct investment inflows? Trade-off between contemporaneous FDI-immigration substitution and ethnic network externalities. Economic Modelling. 2017; 64:40-47.
42. Uprety D. The impact of international trade on emigration in developing countries. The Journal of International Trade & Economic Development. 2017; 17; 26(8):907-23.
43. World Development Indicators https://datacatalog.worldbank.org/dataset/world-development-indicators
44. World migration report. The UN Migration Agency, International Organization for Migration, 2018. https://www.iom.int/