

Ditch or Bump? Foreign Direct Investment and Economic Growth: Evidence from the OECD Economies

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Abstract

Foreign Direct Investment (FDI) has a long standing history of contributing to economic growth of nations. Nations invest and get invested, however, focus has always been on investing or been invested but the impact created as a result of the two on the economies have not yet been examined. Whether the impact of the difference creates ditch or bump get investigated in this research work, employing an extended Cobb Douglas function. Our estimation methods were Fully Modified Least Square (FMOLS) and Auto-regressive Distributed Lag Models (ARDL). We conducted a preliminary test to avoid spurious regression results by using ARDL Bound test, Augmented Dickey-Fuller and Phillips-Perron unit root test for cointegration and stationerity test. We found that some economies saw ditches with the difference whilst others experienced bumps, however, others felt no impact with the difference.

Keywords: Foreign Direct Investment; economic growth; human capital; capital stock.

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Introduction

Economic growth is dependent of several factors and a better understanding of the actual sources of growth demands the examination of the growth indicators but not limited to foreign direct investment (FDI), human capital, capital, labour, population among others. Foreign Direct Investment (FDI) enhances growth. Investors are mostly attracted to a nation for a number of reasons which encompasses accessibility of resources for production, flexible operational rules of a host country, low taxes associated with production, cheap labour cost, (Hansson & Olofsdotter, 2014) among others thus benefiting from the scale effect. There is an increase in capital investment, export promotion and upgrade of labour force through training programs, (Su & Liu, 2016). As the labour market is expands for the host nation, the income gap is bridged. Again, sophisticated and advanced technologies, know-how and skills that come with FDI inflows improve the activities of the local industries. Thus, benefits that accompany FDI perk on both investor and host nations.

Economic theories purports that one reason for which education should influence economic growth positively is the ability of human capital to promote economic growth, (Barcenilla-Visús & López-Pueyo, 2018). Knowledge acquired through higher learning equips the human capital with both theoretical and practical solutions to problems. The cognitive skills develop. Human capital therefore ranks among the most important determinants of growth. Natural resources and human capital act together hence, impact economic growth (Zallé, 2018). Formal and informal education is still in progress to build on human capital to contribute to solutions of global issues. It is expected that the human capital would still remain relevant in the future when robots have taken over a greater percentage of human activities because human capital would be required to regulate their operations. Individuals privileged with more education turn to be more productive and innovative comparatively, steering the creation of new products and improving the productivity of other factors of production which includes labour.

Contributions of labour to economic growth cannot be side-lined. Human capital and labour play complimentary roles in economic building, (Prados de la Escosura & Rosés, 2010). Know-how is mostly exerted by human capital whereas labour accompanies the cognitive abilities of the human capital with requisite skills to execute task. However, the productivity of labour is declining due to the age structure of many developed economies. The age bracket of the labour force of some developed economies is composed of the aged hence lower productivity associated with labour. This endorses the statement of (Nakamura et al., 2018) who opined that economic growth associated with productivity of labor in major advanced countries has been encountering a slowdown in recent years.

To fully understand economic growth, it is also important to pay attention to capital and nontangible investments that enhance the productivity and quality of tangible capital, (Kendrick, 1994). Capital constraint is a plausible reason for floating stock to raise funds. There could arise the need for physical capital to carry out activities smoothly, nonetheless the financial positions incapacitate nations to embark on development projects. Disparities between growth and income among countries are normally mapped to either capital stock or total factor productivity, (Battisti et al., 2018). Should there be limitations caused by complete employment condition, there is no harm done if labor is substituted for capital or vice versa.



Economic growth is much associated with high degree of industrialization. The labour force hoping to earn better wages and salaries focus on joining industries thereby migrating to the cities from the agriculture sector to the industrial sectors, increasing the urban population. The aged whose productivity remains low remain in the agriculture sector, affecting negatively the agriculture sector. Notwithstanding, industrial goods and other services of other sectors are patronized by all categories of people which lead to economic growth. This implies that population irrespective of structure affects economic growth.

Much said, it cannot be overlooked that FDI, human, capital stock, labour, and a country's population growth has a bearing on its economic growth and increased FDI flows have become a global trend widely explored in the economic literature, (Wolff, 2007). OECD economies are highly developed consisting of prominent nations benchmarked for policies and much has been covered on FDI-growth nexus. However, none of these studies have examined the individual effect of the flows on economic growth of the both the host and visiting nations. This implies that there remain other aspects yet to be examined. We examine the individual effect of the direction of flows of FDI to economic growth. Secondly, to our best of knowledge, the impact created on economies that invest outside their home countries and have investors invest in their countries has not yet been examined, thus, home-host country impact on growth. Qualitatively and quantitatively, economies grow with FDI flows of people and ideas.

We therefore organize the remaining section of our paper as follows; we cover review literature next, then we discuss our data and methods to be used. We write our results and discuss the results obtained then we conclude factoring in policies that could be instituted in the OECDs concerning FDI based on our findings.

Literature Review

Economic growth is an imperative phenomenon to economies which has a long standing literature. The initial development economists focused mainly on the accrual of physical capital as the mainspring in economic growth, (Abdelbary & Benhin, 2018). Capital goes in hand with labour to enhance productivity. This is to say an effective labor input could vary by altering the number of employees and their workweek interval since it is expensive to amend the physical capital stock corresponded to each worker. Capital and economic growth still attracts attention, (Abdelbary & Benhin, 2018; Anița et al., 2013; Baudino, 2016; Hendrickson et al., 2018; Pablo-Romero & Sánchez-Braza, 2015). Specifically, these studies examined capital in relation to human capital, governance, economic growth, pollution diffusion and product variety. Mainly, they expressed that capital improves economic growth.

In addition to physical capital and economic growth, another essential growth factor broadly investigated is human capital. The role of human capital cannot be overlooked in economic growth because it must reflect the economic structure to stimulate economic growth, (Čadil et al., 2014). There exist a mutual correlation between growth, human capital and institutions as wealthier nations are able to acquire human capital and better capital, comparatively, (Murphy & O'Reilly, 2018). The strand of research that focused on the role of human capital and economic growth include that of (Ahsan & Haque, 2017; Fahimi et al., 2018; Ogundari & Awokuse, 2018; Ono & Uchida, 2018; Zallé, 2018) but with varied conclusions. Albeit, the mixed findings on the impact of human capital on economic growth continuously stirs up debate in economic growth literature, (Bane, 2018).



FDI engineers economic growth, (Pegkas, 2015) either outward or inward, vertical or horizontal. Economic integration is strengthened due to the stronger bonds formed between the countries, (Vechiu & Makhlof, 2014). FDI inflows comes in hand with investment in human capital, consequently improving the catch-up potential of the host nation, (Liu, 2008). This therefore has drawn some researchers to examine the effect of FDI on Human capital, (Cleeve et al., 2015; Dutta et al., 2017; Konara & Wei, 2018; Kottaridi & Stengos, 2010; Noorbakhsh et al., 2001; Su & Liu, 2016). Foreign firms usually possess higher productivity, advanced technologies and know-how, have easy access to international goods, comparatively, does better with risk management, have a pool of supply for internal funds and have access to capital markets, effective managerial skills, (Arnold & Javorcik, 2009; Vu et al., 2008; X. Liu et al., 2009). Thus there has been another strand of research focused on FDI in relation to capital.

FDI inflows boosts productivity in host countries, (Lee, 2009) and increases the supply of monies into the domestic coffers for investment by the host nation, (Belloumi, 2014). The effect of inflow FDI has thus been researched by (Magombeyi & Odhiambo, 2018; Sirin, 2017; Teixeira & Tavares-Lehmann, 2014; Temiz & Gökmen, 2014). FDI outflows on the other hand generate more foreign exchange for development of home country and grant investors the opportunity of combining their domestic production with foreign production in a way that cuts down costs, (Delgado & McCloud, 2017) thereby generating more revenue. On the other hand, (Ciesielska & Koltuniak, 2017; Fan et al., 2018; Gngangnon, 2018), examined the effect of outward FDI on economic growth. Nonetheless, outward or inward investment demands patronage of goods and service, labour to aid organizational activities so as to reap benefit of investment. In this regard, population growth has also been linked to economic growth, (Bucci et al., 2018; Chen et al., 2016; Chen & Kung, 2016; Van Cauwenberg et al., 2018).

Empirically, researchers found a positive impact of FDI on economic development, (Edwards et al., 2016; Feeny et al., 2014; Pegkas, 2015; Tuan et al., 2009), no significant relationship exist between FDI and economic growth, (Alvarado et al., 2017; Belloumi, 2014; Faria et al., 2016). FDI impact negatively on economic growth, (Ahmed, 2012). The strand of research that focused on human capital and economic growth established a positive impact of human capital on economic growth, (Boikos et al., 2013; Fleisher et al., 2010; Tzeremes, 2014). Also FDI and human capital have a slow growth impact, (Fadhil & Almsafir, 2015). A pool of researchers also established that, there is a positive impact of capital stock and population growth on economic growth.

Extant literature however accords room for further research. Researchers have focused on the effect of FDI on economies without considering the impacts created on economies that invest are get invested. Existing literature does not focus on the impressions created on economies regarding the difference. FDI flows with human capital, technologies, expertise, funds and other important resources migrate to other countries. Although other multinationals comes in with same resources as the resources transferred, these resources might not be able to fit in the holes created by the resources invested out of the home countries. Despite that fact that economies invest and get invested, it is likely the difference would create a ditch or bump on economies. Literature has failed to consider this effect on such economies hence we bridge this gap in literature.

Data and Methods

Data

Examining the impact of FDI on economic growth of the OECDs we gathered data on FDI, population, labour and GDP from World Development Indicators and that of capital stock and human capital from Penn World Data on 29 economies of the OECD for the period of 1990-2016 due to availability of data for the proposed models as well as consistency.

Methodology

Economic growth is from extant literature sources from labour and capital. Capital comes in different forms which include human capital, physical capital, financial capital and social capital. An examination of the effects of the sources of economic growth growth Cobb Douglas proposed a model called Cobb Douglas function. We therefore extend the Cobb Douglas function to examine the determinants of economic growth in the OECDs. Generally written as;

$$Y = f(AK^{\alpha}L^{\beta}e^{\mu}) \quad (1)$$

where, Y is output representing real gross domestic product; K is capital and L denotes labour.

Some researchers established that FDI inflows positively affect economic growth while others are of the view that it affect economic growth negatively. Again, FDI outflows contribute positively to economic growth. Irrespective of the direction of FDI flow others found no significant effect of FDI is established on host nation's growth. To this effect, we examine the individual effect of the direction of FDI on economic growth.

$$GDP = f(FK^{\alpha}L^{\beta}e^{\mu}) \quad (2)$$

where GDP is the output of capital and labour. F represents FDI, K represents capital, L represents labour and e , represents the error-term. Alpha, beta and mui represent the elasticity terms of the capital, labour and the error-term.

$$Y = f(IFDI^{\phi_1} OFDI^{\phi_2} K^{\phi_3} L^{\beta} e^{\mu}) \quad (3)$$

Equation three is substituted into equation 2 hence, the introduction of the two forms of FDI, changing the elasticity terms from alpha, beta and mui to phi. We proceed to take the logarithms of the variables hence we write the linear version of our Cobb–Douglas function as;

$$GDP_{it} = \alpha_{it} + \beta_1 hc_{it} + \beta_2 cs_{it} + \beta_3 lb_{it} + \beta_4 ofdi_{it} + \beta_5 ifdi_{it} + \beta_6 pop_{it} + U_{it} \quad (4)$$

where hc represents human capital, lb , represents labour, cs represents capital stock, $ofdi$ represents FDI outflows, $ifdi$ represents FDI inflows and pop represent population growth. gdp represents economic growth. The subscript i and t represent the country and period and the beta values represent the coefficients.

Some economies invest in other nations and receive investors into their countries too, thus, FDI goes and FDI comes. This is accompanied by both losses and gains to these economies. One of which could be related to the movements of human capital which has the potential to

create cross-country disparities in total factor productivity and wages. Our model 2 thus examines the impact of the difference on these economies.

$$GDP_{it} = \alpha_{it} + \beta_1 hc_{it} + \beta_2 cs_{it} + \beta_3 lb_{it} + (\beta_4 ofdi_{it} - \beta_5 ifdi_{it}) + \beta_6 pop_{it} + U_{it} \quad (4)$$

Hence we come up with equation 6 written as;

$$GDP_{it} = \alpha_{it} + \beta_1 hc_{it} + \beta_2 cs_{it} + \beta_3 lb_{it} + \beta_4 oifdi_{it} + \beta_5 pop_{it} + U_{it} \quad (6)$$

where oifdi represents the difference in the outflows and the inflows.

Estimating the short-run and long-run relationship between FDI and economic growth, we employed the ARDL approach to Cointegration. We came up with equation 7 substituting in all other variables except the difference in FDI flows. Equation 7 thus neglects *oifdi*.

$$\begin{aligned} \Delta GDP_{2t} = & \beta_0 + \sum_{i=1}^k \xi_1 \Delta GDP_{2t-i} + \sum_{i=1}^k \xi_2 \Delta IFDI_{t-i} + \sum_{i=1}^k \xi_3 \Delta OFDI_{t-i} + \sum_{i=1}^k \xi_4 \Delta HC_{t-i} + \\ & \sum_{i=1}^k \xi_5 \Delta LB_{t-i} + \sum_{i=1}^k \xi_6 \Delta POP_{t-i} + \lambda_1 CO_{2t-i} + \lambda_2 IFDI_{t-i} + \lambda_3 OFDI_{t-i} + \lambda_4 HC_{t-i} + \\ & \lambda_5 LB_{t-i} + \lambda_2 IFDI_{t-i} + \dots + U_t \end{aligned} \quad (7)$$

Here, the constant terms in front of the variables β (beta) is replaced with λ (lambda) and ξ to differentiate the changing stage of the variables. Variables with the Δ (delta) symbols as coefficient gives the short-run estimates and those with the λ (lambda) estimate the long-run relationship.

Results

Unit root test of results

For the avoidance of spurious regression result, Augmented Dickey Fuller and Phillips-Peron unit root test were conducted to test for the stationarity of the variables. Results reported in Table 1 suggest that all variables have no unit root. GDP and population passed the test at level hence integrated at the 1st order I(0). Variables that were not stationary at level became stationary at first difference. However the order of integration were both 1st order I(0) or second order I(1).

Table 1. Unit Root Test

Country	Variable	AT LEVEL		1ST DIFFERENCE		Order of Integration
		ADF	PP	ADF	PP	
AUSTRALIA	GDP	0.00	0.00	-	-	I (0)
	IFDI	0.84	0.82	0.00	0.00	I (1)
	OFDI	0.07	0.06	0.00	0.00	I (1)
	CS	0.99	1.00	0.00	0.09	I (1)
	HC	0.09	0.31	0.00	0.00	I(1)
	POP	0.00	0.00	-	-	I (0)

Country	Variable	AT LEVEL		IST DIFFERENCE		Order of Integration
		ADF	PP	ADF	PP	
	LABOUR	0.99	0.99	0.01	0.02	I (1)
	OIFDI	0.03	0.03	0.07	0.00	I(1)
AUSTRIA	GDP	0.00	0.00	-	-	I(1)
	IFDI	0.70	0.56	0.00	0.00	I(1)
	OFDI	0.00	0.00	-	-	I (0)
	CS	0.00	0.00	-	-	I (0)
	HC	0.42	0.42	0.08	0.00	I(1)
	POP	0.00	0.00	-	-	I(1)
	LABOUR	0.83	0.84	0.00	0.00	I(1)
	OIFDI	0.05	0.06	0.00	0.00	I(1)
BELGIUM	GDP	0.00	0.00	-	-	I(0)
	IFDI	0.38	0.38	0.00	0.01	I(1)
	OFDI	0.27	0.29	0.00	0.00	I(1)
	CS	0.22	0.04	0.54	0.00	I(1)
	HC	0.14	0.00	0.00	0.01	I(1)
	POP	0.00	0.00	-	-	I(1)
	LABOUR	0.88	0.90	0.00	0.00	I(1)
	OIFDI	0.14	0.19	0.01	0.00	I(1)
CANADA	GDP	0.00	0.02	0.00	0.00	I(1)
	IFDI	0.13	0.00	0.00	0.00	I(1)
	OFDI	0.38	0.43	0.00	0.00	I(1)
	CS	0.99	0.99	0.00	0.00	I(1)
	HC	0.13	0.00	0.00	0.01	I(1)
	POP	0.00	0.00	0.00	0.00	I(1)
	LABOUR	0.93	0.98	0.00	0.00	I(1)
	OIFDI	0.00	0.00	0.00	0.00	I(0)
CHILE	GDP	0.00	0.00	0.00	0.00	I(1)
	IFDI	0.48	0.48	0.00	0.00	I(1)
	OFDI	0.00	0.00	0.00	0.00	I(1)
	CS	0.36	0.52	0.00	0.00	I(1)
	HC	0.96	0.99	0.00	0.00	I(1)
	POP	0.00	0.04	0.00	0.00	I(1)
	LABOUR	0.97	0.98	0.00	0.00	I(1)
	OIFDI	0.00	0.00	0.00	0.00	I(1)
DENMARK	GDP	0.01	0.01	0.00	0.00	I(1)
	IFDI	0.10	0.10	0.00	0.02	I(1)
	OFDI	0.98	0.42	0.00	0.00	I(1)
	CS	0.41	0.61	0.05	0.04	I(1)
	HC	0.81	0.02	0.08	0.02	I(1)
	POP	0.00	0.00	0.01	0.00	I(1)
	LABOUR	0.50	0.54	0.00	0.00	I(1)
	OIFDI	0.03	0.03	0.00	0.00	I(1)

Country	Variable	AT LEVEL		IST DIFFERENCE		Order of Integration
		ADF	PP	ADF	PP	
FINLAND	GDP	0.00	0.00	0.00	0.00	I(0)
	IFDI	0.62	0.27	0.00	0.00	I(1)
	OFDI	0.09	0.09	0.00	0.00	I(1)
	CS	0.88	0.98	0.03	0.04	I(1)
	HC	0.84	0.99	0.00	0.00	I(1)
	POP	0.00	0.00	0.00	0.00	I(0)
	LABOUR	0.61	0.78	0.08	0.08	I(1)
	OIFDI	0.19	0.20	0.01	0.00	I(1)
	FRANCE	GDP	0.00	0.00	0.00	0.00
IFDI		0.14	0.16	0.00	0.00	I(1)
OFDI		0.63	0.55	0.03	0.03	I(1)
CS		0.50	0.11	0.02	0.02	I(1)
HC		0.99	1.00	0.00	0.00	I(1)
POP		0.00	0.00	0.00	0.00	I(0)
LABOUR		0.97	0.97	0.00	0.00	I(1)
OIFDI		0.03	0.03	0.06	0.00	I(1)
GERMANY		GDP	0.00	0.01	0.00	0.00
	IFDI	0.04	0.00	0.00	0.01	I(1)
	OFDI	0.17	0.16	0.00	0.00	I(1)
	CS	0.04	0.00	-	-	I(1)
	HC	0.16	0.94	0.00	0.00	I(1)
	POP	0.00	0.00	0.00	0.00	I(0)
	LABOUR	0.60	0.60	0.00	0.00	I(1)
	OIFDI	0.01	0.01	0.00	0.00	I(1)
	GREECE	GDP	0.00	0.00	0.00	0.00
IFDI		0.00	0.00	0.00	0.00	I(1)
OFDI		0.35	0.01	0.01	-	I(1)
CS		0.35	0.52	0.04	0.04	I(1)
HC		0.08	0.06	0.08	0.07	I(1)
POP		0.00	0.00	0.00	0.00	I(0)
LABOUR		0.10	0.09	0.02	0.01	I(1)
OIFDI		0.05	0.05	0.00	0.00	I(1)
ICELAND		GDP	0.00	0.00	0.00	0.00
	IFDI	0.25	0.16	0.00	0.00	I(1)
	OFDI	0.19	0.01	0.00	0.00	I(1)
	CS	0.64	0.72	0.09	0.09	I(1)
	HC	0.99	1.00	0.00	0.00	I(1)
	POP	0.00	0.00	0.00	0.00	I(0)
	LABOUR	0.71	0.70	0.01	0.01	I(1)
	OIFDI	0.30	0.34	0.00	0.00	I(1)
	IRELAND	GDP	0.00	0.00	0.00	0.00
IFDI		0.54	0.41	0.00	0.00	I(1)
OFDI		0.76	0.78	0.00	0.00	I(1)

Country	Variable	AT LEVEL		IST DIFFERENCE		Order of Integration
		ADF	PP	ADF	PP	
	CS	0.04	0.89	-	0.08	I(1)
	HC	0.98	1.00	0.00	0.00	I(1)
	POP	0.00	0.00	0.00	0.00	I(0)
	LABOUR	0.59	0.60	0.00	0.00	I(1)
	OIFDI	0.17	0.17	0.00	0.00	I(1)
ISRAEL	GDP	0.00	0.00	0.00	0.00	I(1)
	IFDI	0.02	0.01	0.00	0.00	I(1)
	OFDI	0.00	0.00	0.00	0.00	I(0)
	CS	0.80	0.11	0.00	-	I(1)
	HC	0.99	1.00	0.00	0.00	I(1)
	POP	0.00	0.00	0.00	0.00	I(0)
	LABOUR	0.54	0.00	0.01	0.00	I(1)
	OIFDI	0.00	0.00	0.03	0.00	I(1)
ITALY	GDP	0.33	0.34	0.01	0.01	I(1)
	IFDI	0.91	0.63	0.01	0.00	I(1)
	OFDI	0.05	0.05	0.00	0.00	I(1)
	CS	0.71	0.17	0.02	0.03	I(1)
	HC	0.49	0.01	0.00	-	I(1)
	POP	1.00	0.07	0.03	0.00	I(0)
	LABOUR	0.93	0.90	0.00	0.00	I(1)
	OIFDI	0.03	0.03	0.00	0.00	I(1)
JAPAN	GDP	0.02	0.10	0.00	0.02	I(1)
	IFDI	0.17	0.17	0.00	0.00	I(1)
	OFDI	0.96	0.79	0.00	0.00	I(1)
	CS	0.00	0.00	0.00	0.00	I(0)
	HC	0.19	0.00	0.00	-	I(1)
	POP	0.02	0.02	0.00	0.00	I(1)
	LABOUR	0.33	0.05	0.14	0.05	I(1)
	OIFDI	0.04	0.04	0.00	0.00	I(1)
KOREA	GDP	0.00	0.00	0.00	0.00	I(0)
	IFDI	0.49	0.40	0.09	0.00	I(1)
	OFDI	0.02	0.01	0.00	0.00	I(1)
	CS	0.03	0.00	-	-	I(1)
	HC	0.62	0.00	0.00	0.00	I(1)
	POP	0.00	0.00	0.00	0.00	I(1)
	LABOUR	0.68	0.66	0.00	0.00	I(1)
	OIFDI	0.68	0.03	0.00	0.00	I(1)
LUXEMBOURG	GDP	0.00	0.00	0.00	0.00	I(1)
	IFDI	0.26	0.24	0.00	0.00	I(1)
	OFDI	0.24	0.25	0.00	0.00	I(1)
	CS	0.86	0.87	0.04	0.04	I(1)
	HC	0.99	1.00	0.00	0.00	I(1)



Country	Variable	AT LEVEL		IST DIFFERENCE		Order of Integration
		ADF	PP	ADF	PP	
	POP	0.00	0.00	0.00	0.00	I(1)
	LABOUR	0.99	1.00	0.00	0.00	I(1)
	OIFDI	0.00	0.00	0.07	0.00	I(1)
MEXICO	GDP	0.00	0.00	0.00	0.00	I(0)
	IFDI	0.48	0.58	0.00	0.00	I(1)
	OFDI	0.64	0.01	0.00	0.00	I(1)
	CS	0.94	0.95	0.07	0.06	I(1)
	HC	0.25	0.00	0.00	0.64	I(1)
	POP	0.00	0.00	0.00	0.00	I(1)
	LABOUR	0.16	0.63	0.07	0.08	I(1)
	OIFDI	0.47	0.00	0.00	0.00	I(1)
NETHERLANDS	GDP	0.00	0.00	0.00	0.00	I(1)
	IFDI	0.73	0.69	0.00	0.00	I(1)
	OFDI	0.75	0.72	0.00	0.02	I(1)
	CS	0.26	0.06	0.04	0.86	I(1)
	HC	0.75	0.00	0.00	0.59	I(1)
	POP	0.00	0.00	0.00	0.00	I(1)
	LABOUR	0.08	0.13	0.13	0.00	I(1)
	OIFDI	0.00	0.00	0.00	0.00	I(1)
NEWZEALAND	GDP	0.00	0.00	0.00	0.00	I(0)
	IFDI	0.00	0.96	0.44	0.00	I(1)
	OFDI	0.00	0.00	0.00	0.00	I(0)
	CS	0.56	0.97	0.00	0.00	I(1)
	HC	0.03	0.39	0.52	0.00	I(1)
	POP	0.00	0.00	0.00	0.00	I(0)
	LABOUR	0.83	0.91	0.00	0.01	I(1)
	OIFDI	0.00	0.00	-	-	I(1)
NORWAY	GDP	0.00	0.00	0.00	0.00	I(0)
	IFDI	0.31	0.34	0.00	0.00	I(1)
	OFDI	0.28	0.09	0.00	0.00	I(1)
	CS	0.99	0.99	0.01	0.07	I(1)
	HC	0.72	0.98	0.00	0.00	I(1)
	POP	0.00	0.00	0.00	0.00	I(0)
	LABOUR	0.87	0.87	0.04	0.04	I(1)
	OIFDI	0.00	0.00	0.00	0.00	I(0)
POLAND	GDP	0.00	0.00	0.00	0.00	I(0)
	IFDI	0.00	0.44	0.03	0.00	I(1)
	OFDI	0.54	0.47	0.01	0.02	I(1)
	CS	0.96	0.99	0.00	0.26	I(1)
	HC	0.00	0.00	-	-	I(0)
	POP	0.00	0.00	-	-	I(0)
	LABOUR	0.95	0.93	0.01	0.01	I(0)
	OIFDI	0.94	0.99	0.04	0.00	I(0)

Country	Variable	AT LEVEL		IST DIFFERENCE		Order of Integration
		ADF	PP	ADF	PP	
PORTUGAL	GDP	0.00	0.00	0.00	0.00	I(1)
	IFDI	0.94	0.07	0.00	0.00	I(1)
	OFDI	0.14	0.00	0.13	0.00	I(1)
	CS	0.03	0.04	0.99	0.97	I(1)
	HC	0.61	0.39	0.00	0.00	I(1)
	POP	0.00	0.00	-	-	I(0)
	LABOUR	0.00	0.63	0.66	0.04	I(1)
	OIFDI	0.00	0.05	0.79	0.00	I(1)
	SPAIN	GDP	0.00	0.00	-	-
IFDI		0.22	0.22	0.00	0.00	I(1)
OFDI		0.65	0.65	0.00	0.00	I(1)
CS		0.49	0.67	0.05	0.09	I(1)
HC		0.97	0.05	0.06	0.07	I(1)
POP		0.01	0.02	0.00	0.00	I(1)
LABOUR		0.20	0.73	0.00	0.34	I(1)
OIFDI		0.41	0.41	0.00	0.00	I(1)
SWEDEN		GDP	0.04	0.00	0.02	0.00
	IFDI	0.01	0.01	0.00	0.00	I(1)
	OFDI	0.24	0.24	0.00	0.00	I(1)
	CS	0.99	0.99	0.00	0.00	I(1)
	HC	0.87	0.99	0.00	0.00	I(1)
	POP	0.00	0.00	-	-	I(1)
	LABOUR	0.99	0.99	0.01	0.00	I(1)
	OIFDI	0.01	0.00	0.00	0.00	I(1)
	SWITZERLAND	GDP	0.00	0.00	-	-
IFDI		0.78	0.03	0.00	0.00	I(1)
OFDI		0.82	0.46	0.02	0.00	I(1)
CS		0.37	0.41	0.03	0.09	I(1)
HC		0.88	0.99	0.00	0.00	I(1)
POP		0.00	0.00	-	-	I(0)
LABOUR		0.99	1.00	0.00	0.00	I(1)
OIFDI		0.00	0.00	-	-	I(0)
TURKEY		GDP	0.00	0.00	-	-
	IFDI	0.81	0.81	0.00	0.00	I(1)
	OFDI	0.07	0.04	0.00	0.00	I(1)
	CS	0.86	0.78	0.00	0.09	I(1)
	HC	0.92	0.99	0.99	0.00	I(1)
	POP	0.00	0.00	0.00	0.00	I(0)
	LABOUR	0.99	0.99	0.00	0.08	I(1)
	OIFDI	0.07	0.13	0.00	0.00	I(1)
	UNITED KINGDOM	GDP	0.00	0.00	0.00	0.00
IFDI		0.10	0.11	0.00	0.00	I(0)

Country	Variable	AT LEVEL		IST DIFFERENCE		Order of Integration
		ADF	PP	ADF	PP	
	OFDI	0.15	0.15	0.00	0.00	I(1)
	CS	0.25	0.48	0.00	0.01	I(1)
	HC	0.11	0.00	0.00	0.00	I(1)
	POP	0.00	0.00	-	-	I(0)
	LABOUR	0.99	0.99	0.08	0.09	I(1)
	OIFDI	0.00	0.00	0.04	0.00	I(1)
USA	GDP	0.00	0.00	-	-	I(0)
	IFDI	0.58	0.58	0.00	0.00	I(1)
	OFDI	0.18	0.24	0.00	0.00	I(1)
	CS	0.01	0.48	0.47	0.09	I(1)
	HC	0.52	0.10	0.00	0.00	I(1)
	POP	0.00	0.00	-	-	I(1)
	LABOUR	0.00	0.00	-	-	I(1)
	OIFDI	0.02	0.02	0.00	0.00	I(1)

ADF augmented Dicker-Fuller, PP Phillips-Perron unit root tests

ARDL Bound test results

To test for the existence of co-integration and long-run relationship among the variables, the ARDL bound test was used and results displayed in Table 2. Results on Denmark, Ireland and Netherlands showed no existence of cointegration therefore, no long-run relationship exist between economic growth and FDI.

Table 2. ARDL Bound Test for Cointegration

Countries	F Statistics	Conclusion	Decision
Australia	7.34	Cointegration	Long-Run Relationship Exist Among The Variables
Austria	7.72	Cointegration	No Long-Run Relationship Exist Among The Variables
Belgium	2.90	Cointegration	Long-Run Relationship Exist Among The Variables
Canada	3.69	Cointegration	Long-Run Relationship Exist Among The Variables
Chile	5.62	Cointegration	Long-Run Relationship Exist Among The Variables
Denmark	0.66	No Cointegration	No Long-Run Relationship Exist Among The Variables
Finland	3.48	Cointegration	Long-Run Relationship Exist Among The Variables
France	4.04	Cointegration	Long-Run Relationship Exist Among The Variables
Germany	8.57	Cointegration	Long-Run Relationship Exist Among The Variables

Greece	4.61	Cointegration	Long-Run Relationship Exist Among The Variables
Iceland	3.86	Cointegration	Long-Run Relationship Exist Among The Variables
Ireland	2.38	No Cointegration	No Long-Run Relationship Exist Among The Variables
Israel	4.02	Cointegration	Long-Run Relationship Exist Among The Variables
Italy	6.10	Cointegration	Long-Run Relationship Exist Among The Variables
Japan	5.39	Cointegration	Long-Run Relationship Exist Among The Variables
Korea	35.43	Cointegration	Long-Run Relationship Exist Among The Variables
Luxembourg	2.94	No Cointegration	Long-Run Relationship Exist Among The Variables
Mexico	22.54	Cointegration	Long-Run Relationship Exist Among The Variables
Netherlands	2.59	No Cointegration	No Long-Run Relationship Exist Among The Variables
New Zealand	5.34	Cointegration	Long-Run Relationship Exist Among The Variables
Norway	4.15	Cointegration	Long-Run Relationship Exist Among The Variables
Poland	28.77	Cointegration	Long-Run Relationship Exist Among The Variables
Portugal	3.80	Cointegration	Long-Run Relationship Exist Among The Variables
Spain	23.47	Cointegration	No Long-Run Relationship Exist Among The Variables
Sweden	7.04	Cointegration	Long-Run Relationship Exist Among The Variables
Switzerland	11.68	Cointegration	Long-Run Relationship Exist Among The Variables
Turkey	4.94	Cointegration	Long-Run Relationship Exist Among The Variables
United Kingdom	5.56	Cointegration	Long-Run Relationship Exist Among The Variables
Usa	37.85	Cointegration	No Long-Run Relationship Exist Among The Variables

Critical Values for the ARDL Bound Test (Pesaran et al 2001 Critical Values): Low bound: 5.15, 3.79, 3.17; High Bound 6.36, 4.85, and 4.14 at 1%, 5% and 10% respectively

Table 3. Results of FDI and Human capital on economic growth



	R ²	Constant	POP	IFDI	OFDI	HC	CS	LABOUR
Australia	0.99	4.44(8.68)	1.00(0.01)***	0.01(0.01)	0.01(0.01)*	2.32(0.57)***	0.91(1.95)*	-0.62(0.93)
Austria	0.99	1.53(5.03)	1.00(0.00)***	-0.01(0.01)	0.02(0.01)***	-1.68(1.56)	1.00(0.26)***	-0.23(0.27)
Belgium	0.99	8.45(2.48)	1.00(0.00)***	0.01(0.01)	0.01(0.01)	1.53(0.54)***	0.36(0.21)	-0.32(0.31)
Canada	0.99	-14.50(3.38)	1.00(0.01)***	0.01(0.01)***	-0.01(0.01)	3.69(0.79)***	-1.12(0.16)***	2.23(0.32)***
Chile	0.99	5.94(4.46)	0.99(0.00)***	0.02(0.02)	-0.02(0.02)	-1.95(2.52)	0.70(0.20)***	0.16(0.33)
Denmark	0.99	17.80(7.58)	1.01(0.00)***	-0.01(0.01)	0.02(0.01)*	4.80(2.00)**	-0.37(0.48)	-0.40(0.69)
Finland	0.99	-25.82(7.94)	1.01(0.01)***	0.02(0.01)***	-0.01(0.01)	14.09(3.85)***	-3.81(1.27)	4.83(1.14)***
France	0.99	-10.36(4.83)	1.00(0.00)***	0.03(0.01)***	0.01(0.01)**	-0.85(0.67)	0.37(0.17)**	0.89(0.36)**
Germany	0.99	-27.09(9.02)	1.00(0.0)***	0.00(0.01)	0.01(0.01)	-6.53(3.99)	1.43(0.57)**	1.28(0.40)***
Greece	0.99	-41.43(7.08)	1.00(0.00)***	0.01(0.01)	0.04(0.01)***	-7.30(0.87)***	1.88(0.36)***	2.07(0.55)**
Iceland	0.99	5.48(2.30)	1.00(0.0)***	0.01(0.01)***	0.01(0.01)	-2.35(0.57)***	1.11(0.15)***	0.03(0.27)
Ireland	0.99	-26.45(10.02)	1.01(0.01)***	0.09(0.02)	-0.05(0.04)	8.13(4.06)*	-1.95(0.80)	3.71(1.16)***
Israel	0.99	5.77(2.14)	1.00(0.00)***	0.03(0.01)***	-0.01(0.01)	0.88(0.44)*	0.06(0.16)	0.25(0.30)
Italy	0.99	74.38(11.64)	-2.74(11.64)***	0.01(0.01)**	0.01(0.00)**	-0.37(1.14)	1.01(0.43)**	0.29(0.20)
Japan	0.99	7.34(8.71)	0.99(0.00)***	-0.01(0.01)*	0.04(0.01)***	-0.99(0.85)	0.30(0.10)***	-0.02(0.52)
Korea	0.99	7.34(6.66)	1.00(0.00)***	-0.02(0.01)***	-0.03(0.01)*	2.23(0.71)***	0.44(0.09)***	0.02(0.45)
Luxembourg	0.99	-6.73(1.97)	1.00(0.00)***	-0.01(0.00)***	0.01(0.0)***	-5.08(0.56)***	1.32(0.07)***	0.66(0.22)***
Mexico	0.99	11.55(7.56)	1.00(0.00)***	0.01(0.03)	0.01(0.83)	1.72(1.67)	-0.21(0.29)	0.09(0.62)
Netherlands	0.99	-16.28(1.70)	1.00(0.00)***	0.01(0.01)	0.00(0.01)	-3.22(1.47)**	0.65(0.36)*	1.30(0.22)***
New Zealand	0.99	-11.01(1.98)	1.00(0.00)***	-0.00(0.00)**	0.01(0.00)**	4.29(0.73)***	0.12(0.53)	1.03(0.32)***
Norway	0.99	-2.11(9.68)	0.99(0.01)***	0.01(0.01)	0.05(0.02)**	-4.39(3.23)	1.11(0.83)	0.34(0.99)
Poland	0.99	-3.72(8.59)	1.00(0.00)***	0.01(0.02)	0.01(0.00)	0.47(1.82)	0.90(0.35)**	0.04(0.63)
Portugal	0.99	-12.03(1.72)	1.00(0.00)***	-0.01(0.01)	0.01(0.00)	0.51(0.22)**	-0.06(0.08)	1.43(0.14)***
Spain	0.99	-7.11(1.77)	1.00(0.00)***	0.06(0.01)***	0.01(0.00)**	3.35(0.86)***	-1.30(0.29)***	2.00(0.30)***
Sweden	0.99	-17.62(23.33)	1.01(0.01)***	-0.00(0.01)	0.03(0.02)	-5.16(6.15)	2.51(1.32)*	0.04(1.05)
Switzerland	0.99	-13.06(6.10)	1.00(0.00)***	0.00(0.00)	0.02(0.01)**	-2.98(3.94)	-0.03(0.31)	1.84(0.55)***
Turkey	0.99	-6.52(3.57)	0.99(0.01)***	0.05(0.02)***	0.00(0.02)	-0.74(1.11)	0.48(0.33)	0.56(0.28)*
United Kingdom	0.99	-0.13(5.20)	1.00(0.00)	0.03(0.01)***	-0.00(0.01)	-4.34(3.18)	3.44(1.71)*	-2.29(1.31)
USA	0.99	-27.79(4.24)	1.00(0.00)***	0.01(0.01)	-0.00(0.00)	-5.22(0.54)***	0.62(0.10)***	1.82(0.31)***

*, **, *** denotes significance at 1%, 5% and 10% respectively. The parenthesis () denotes standard error

Foreign Direct Investment (FDI), Human Capital and Economic growth

Table 3 presents the result of the FMOLS results of the influence of FDI both inflow and outflow on economic growth in the OECD. Results showed that population growth contributes positively to economic growth at 1% significance level in all the economies studied except for Italy which experienced a decline in economic growth by 2.74% per an increase in population size also at 1% significance level. FDI inflows stimulates economic growth in Canada, Iceland and Italy by 1%, Finland by 2%, France, Israel and United Kingdom by 3%, Spain by 6%, and in Turkey by 5% all at 1% significance level. On the other hand, FDI inflows turns to have a negative effect economic growth in Japan and Luxembourg where the economy deteriorates by 1% per a percentage increase in FDI attraction into the economy. The economic growth rate of Korea also drops by 2% in connection with FDI inflows.

FDI outflows improve the economies of Australia, France, Italy, Luxembourg, New Zealand and in Spain by 1%, Austria, Denmark and Switzerland by 2%, by 4% in Greece and Japan, and 5% in Norway. Decision to invest outside Korea by Korean investors does not improve the economy of Korea rather decrease economic development by 3%.

Human capital in Australia promote economic development by 2.32%, Belgium by 1.53%, Canada by 3.69%, Denmark by 4.80%, Finland by 14.09%, Korea by 2.23%, New Zealand by 4.29%, Portugal by 51% and in Spain by 3.35%. The reverse is true in the case of Greece, Iceland, Luxembourg and the US where human capital negatively affect economic growth by 7.30%, 2.35%, 5.08% and 5.33% respectively.

Capital stock improves the economies of Australia, Austria, Chile, France, Germany, Greece, Iceland, Italy, Japan, Korea, Luxembourg, Poland, Sweden, the UK and US. A unit increase in capital stock activities generates 0.91%, 1.00%, 0.70%, 0.37%, 1.43%, 1.88%, 1.11%, 1.01%, 0.30%, 0.44%, 1.32%, 0.65%, 0.90%, 2.51%, 3.44% and 0.62% respectively. This is consistent with the findings of (Satti et al., 2014). Also, Canada and Spain's economic growth has a negative relationship with Capital stock in that a unit increase in capital stock activities worsens economic growth by 1.12% and 1.30% respectively.

Economic growth in relation to a unit increase in labour is positive in Canada when an increase of 2.23% is experienced. In Finland, 4.83% increase in economic growth experienced. France gets to improve its economy by 0.89%, Germany by 1.28%, Greece by 2.07%, 3.71% by the Ireland, Luxembourg by 0.66%, Netherlands by 1.30%, New Zealand by 1.03%, Portugal by 1.43%, Spain by 2.00%, Switzerland by 1.84%, Turkey and the US by 0.56% and 1.82% respectively.



Table 4. Results of the difference in FDI outflows and inflows on economic growth

	R ²	Constant	POP	OIFDI	HC	CS	LABOUR
Australia	0.99	1.78(9.97)	1.00(0.01)***	-0.01(0.01)*	2.29(0.65)***	0.83(0.54)	-0.36(1.07)
Austria	0.99	-0.32(1.95)	1.00(0.00)***	-0.01(0.01)	-0.32(1.95)	0.95(0.33)***	-0.65(0.32)*
Belgium	0.99	6.60(3.67)	0.99(0.01)***	0.01(0.01)	1.93(0.61)***	0.23(0.26)	-0.11(0.43)
Canada	0.99	-11.35(3.46)	1.00(0.00)***	0.01(0.00)**	5.24(0.60)**	-1.19(0.18)***	2.01(0.34)***
Chile	0.99	5.61(3.44)	0.99(0.00)***	0.02(0.01)***	-2.21(1.74)	0.72(0.12)***	0.17(0.27)
Denmark	0.99	17.42(7.50)	1.01(0.00)***	-0.01(0.01)	6.78(1.90)***	-0.81(0.46)	-0.13(0.68)
Finland	0.99	-26.31(7.97)	1.02(0.00)***	0.02(0.01)***	18.06(3.02)***	-5.20(1.01)***	5.84(1.04)***
France	0.99	-26.12(10.09)	1.00(0.00)***	-0.00(0.01)	-4.77(0.95)***	1.03(0.29)***	1.46(0.79)*
Germany	0.99	-23.53(8.55)	1.00(0.00)***	-0.00(0.01)	-4.36(3.77)	1.14(0.56)*	1.19(0.40)**
Greece	0.99	-62.09(11.37)	1.00(0.01)***	0.01(0.01)	-10.13(1.36)***	2.88(0.64)***	2.70(1.06)**
Iceland	0.99	7.79(1.47)	1.00(0.00)***	0.01(0.00)	-0.28(0.76)	0.89(0.19)***	-0.13(0.20)
Ireland	0.99	-32.87(5.70)	1.00(0.00)***	0.08(0.03)***	8.28(4.08)*	-2.12(0.71)***	4.33(0.78)***
Israel	0.99	3.67(2.70)	1.00(0.01)***	0.01(0.01)	0.38(0.54)	0.06(0.21)	0.44(0.39)
Italy	0.98	58.85(12.91)	-2.29(0.61)***	0.00(0.00)	-2.34(1.16)*	1.78(0.43)***	0.11(0.24)
Japan	0.99	-5.51(10.43)	0.99(0.00)**	0.00(0.00)	1.64(0.72)**	0.00(0.10)	0.79(0.61)
Korea	0.99	-0.10(6.39)	1.00(0.00)***	-0.01(0.01)	1.35(0.69)*	0.37(0.08)***	0.57(0.42)
Luxembourg	0.99	-7.10(2.03)	1.00(0.00)***	-0.00(0.01)	-5.20(0.58)***	1.34(0.06)**	0.67(0.23)***
Mexico	0.99	14.04(6.33)	1.00(0.00)***	-0.01(0.01)	2.46(1.21)*	-0.27(0.30)	-0.04(0.57)
Netherlands	0.99	-16.85(2.01)	1.00(0.00)***	0.02(0.01)	-3.19(1.73)*	0.72(0.43)	1.28(0.25)***
New Zealand	0.99	-10.37(2.33)	1.00(0.00)***	-0.01(0.01)	4.82(0.90)***	0.22(0.22)	0.86(0.38)**
Norway	0.99	-22.29(6.91)	0.99(0.01)***	-0.07(0.03)**	-5.06(3.84)	0.80(0.94)	2.09(0.78)**
Poland	0.99	-0.31(9.64)	1.00(0.00)***	0.00(0.01)	1.12(2.14)	0.86(0.44)*	-0.17(0.77)
Portugal	0.99	-10.47(2.15)	1.00(0.00)***	-0.01(0.01)	0.36(0.24)	0.00(0.09)	1.29(0.19)***
Spain	0.99	-3.47(2.81)	1.00(0.00)***	-0.05(0.01)***	-1.37(1.65)	0.18(0.53)	0.71(0.53)
Sweden	0.99	-41.23(25.12)	1.01(0.01)***	0.01(0.01)	-12.39(6.49)*	4.43(1.28)***	0.38(1.18)
Switzerland	0.99	-2.56(8.86)	1.00(0.00)***	-0.00(0.01)	-2.24(6.34)	0.42(0.48)	0.79(0.76)
Turkey	0.99	-7.50(4.33)	1.00(0.01)***	0.03(0.01)***	-1.07(1.3)	0.74(0.35)**	0.41(0.29)
United Kingdom	0.99	6.09(6.94)	1.00(0.00)***	0.02(0.01)	-9.92(4.20)**	6.81(2.18)***	-5.35(1.56)***
USA	0.99	-28.80(2.44)	1.00(0.00)***	0.01(0.00)*	-5.13(0.44)***	0.59(0.07)***	1.90(0.18)***

*, **, *** denotes significance at 1%, 5% and 10% respectively. The parenthesis () denotes standard error

Difference in FDI outflows and FDI inflows on economic growth

Economic growth as marked by the difference in both FDI inflows and outflow on the economies of OECD is examined and results displayed in Table 4. Findings reveal an upward growth trend in relation to population growth in all the OECD economies except Italy whose economic growth is negatively affected by 2.29%. Considering the difference in the two flows of FDI, it can be said that Canada's economy still develops by 0.01%, Chile's and Finland's by 0.02%, Ireland's by 0.08%, Turkey's by 0.03% and the US by 0.01%. However, Australia's economic growth is negatively affected by 0.01%, Norway's by 0.07%, and that of Spain by 0.05%.



From Table 4, it could also be seen that human capital positively influences economic growth in Australia, Belgium, Canada, Denmark, Finland, Ireland, Japan, Korea and New Zealand. The corresponding percentage increases are 2.29%, 1.93%, 5.24%, 6.78%, 18.06%, 8.28%, 0.38%, 1.64%, 1.35%, 2.46%, and 4.82%, respectively. France, Greece, Italy, Luxembourg, Netherlands, Sweden, the UK and US on the other hand have their human capital impacting negatively on their economies by 4.77%, 10.13%, 2.34%, 5.20%, 3.19%, 12.39%, 9.92% and 5.13% correspondingly.

Capital stock improves Austria's economy by 0.95%, Chile's by 0.72%, France's by 1.03%, Germany's by 1.14%, Greece's by 2.88%, Iceland's by 0.89%, Italy's by 1.78%, Korea's by 0.37%, Luxembourg's by 1.34%, Poland's by 0.86%, Sweden's by 4.43%, Turkey's by 0.74%, the UK by 6.81% and the US by 0.59%. Canada's economic growth on the other hand devalues by 1.19%, Finland's by 5.20%, and Ireland by 2.12%.

Labour improves the economies of Canada by 2.01%, Finland by 5.84%, France by 1.46%, Germany by 1.19%, Greece by 2.70%, Ireland by 4.33%, Luxembourg by 0.67%, Netherlands by 1.28%, New Zealand by 0.86%, Norway by 2.09%, Portugal by 1.29%, and the US by 1.90%. The reverse is true in Austria and the UK where labour decelerate economic growth by 0.65% and 5.35% respectively.

Table 5. Results of the ARDL Co-integration short-run estimate

	obs	Model selection	CointEq(-1)	IFDI	OFDI	HC	CS	LABOUR	POP
Australia	18	(2, 1, 1, 1, 1, 0, 1)	-0.70(0.20)	-0.00(0.00)	0.01(0.01)	-3.38(1.02)**	2.24(0.67)**	-0.70(0.31)*	1.00(0.01)***
Austria	21	(1, 0, 0, 1, 1, 0, 1)	-0.84(0.12)	-0.01(0.01)***	0.01(0.00)	-1.88(0.91)*	6.22(0.96)***	-0.02(0.15)	1.00(0.01)***
Belgium	23	(1, 0, 1, 1, 1, 1, 0)	-0.99(0.00)	0.01(0.01)**	-0.00(0.00)	0.96(0.52)*	5.04(1.58)***	0.14(0.37)	0.99(0.00)**
Canada	22	(2, 1, 0, 1, 1, 0, 1)	-0.65(0.18)	0.01(0.01)**	-0.01(0.01)	-5.66(4.52)	2.36(1.00)**	0.34(0.50)	1.00(0.00)***
Chile	21	(2, 1, 1, 1, 1, 1, 1)	-0.82(0.20)	-0.01(0.02)	0.01(0.01)	-38.33(18.18)*	2.56(0.55)*	-0.63(0.33)*	1.00(0.00)***
Denmark	17	(1, 1, 0, 1, 1, 1, 0)	-1.00(0.00)	0.01(0.00)	0.00(0.01)	-7.77(7.63)	4.28(0.80)***	0.14(0.51)	1.00(0.00)***
Finland	23	(1, 1, 1, 1, 0, 1, 0)	-1.00(0.00)	0.01(0.01)***	-0.00(0.01)	30.79(12.76)**	5.58(1.19)***	0.74(0.81)	1.00(0.00)***
France	22	(2, 1, 1, 1, 1, 0, 0)	-0.99(0.00)	0.01(0.01)	0.00(0.01)	2.04(4.03)	6.25(1.10)***	-0.62(0.37)	1.00(0.00)***
Germany	19	(1, 1, 1, 1, 0, 1, 1)	-0.99(0.16)	-0.00(0.01)	-0.02(0.01)	-17.44(7.14)**	9.09(1.95)***	1.06(0.39)**	1.00(0.00)***
Greece	20	(2, 1, 0, 1, 0, 0, 1)	-0.20(0.44)	0.00(0.01)	0.00(0.01)	75.30(46.85)	3.02(1.73)	0.44(0.33)	1.00(0.00)***
Iceland	22	(1, 1, 0, 0, 0, 1, 1)	-0.81(0.39)	0.01(0.01)	0.00(0.00)	3.64(23.08)	0.57(0.43)	0.02(0.39)	1.00(0.00)***
Ireland	20	(1, 1, 0, 1, 0, 1, 1)	-0.63(0.34)	0.03(0.02)	-0.01(0.02)	45.68(26.03)	1.78(1.19)	0.82(0.68)	1.00(0.00)***
Israel	23	(1, 0, 0, 1, 0, 0, 1)	-0.47(0.15)	0.01(0.01)	0.01(0.01)*	-0.01(0.31)	2.52(0.53)	-0.13(0.21)	1.00(0.00)***
Italy	21	(2, 1, 0, 1, 0, 0, 0)	-1.50(0.24)	0.01(0.01)	0.01(0.01)*	12.78(8.76)	3.89(0.96)***	0.23(0.24)	-1.75(0.57)***
Japan	18	(2, 0, 1, 1, 1, 1, 1)	-0.50(0.32)	-0.00(0.00)	0.03(0.02)	0.38(1.79)	3.61(1.20)**	-2.35(2.39)	1.00(0.00)***
Korea	22	(2, 1, 1, 1, 1, 1, 1)	-1.25(0.11)	0.01(0.01)	0.02(0.02)	-5.46(4.65)	3.26(0.47)***	-0.88(0.31)*	1.00(0.00)***
Luxembourg	23	(1, 1, 1, 1, 0, 0, 0)	-1.00(0.00)	-0.01(0.00)	0.00(0.00)	4.51(3.57)	2.98(1.02)***	-0.27(0.44)	1.00(0.00)***
Mexico	22	(2, 0, 1, 1, 0, 0, 1)	-1.24(0.09)	0.01(0.01)	-0.00(0.00)	1.48(0.65)**	3.90(0.41)***	-1.18(0.44)**	1.00(0.00)***
Netherlands	23	(1, 0, 0, 1, 0, 0, 0)	-0.99(0.00)	0.00(0.01)	0.00(0.01)	-3.05(0.93)***	3.36(0.56)***	0.86(0.16)***	1.00(0.00)***

New Zealand	21	(2, 1, 1, 1, 1, 0, 0)	-1.00(0.00)	-0.00(0.00)	-0.00(0.00)	-0.07(1.30)	3.72(1.21)***	0.32(0.38)	1.00(0.00)***
Norway	21	(1, 0, 1, 0, 0, 0, 1)	-0.09(0.09)	0.01(0.00)	0.01(0.01)	-1.11(1.47)	0.21(0.40)	0.63(0.34)*	1.00(0.00)***
Poland	21	(2, 1, 1, 0, 1, 1, 1)	-0.06(0.14)	0.01(0.01)*	-0.00(0.00)	5.48(1.86)**	-0.59(0.13)	0.71(0.40)	1.00(0.00)***
Portugal	22	(1, 0, 0, 1, 0, 0, 0)	-1.00(0.00)	0.00(0.00)	-0.00(0.00)	-0.46(0.23)*	4.93(1.00)	-0.26(0.35)	1.00(0.0)***
Spain	22	(2, 1, 0, 1, 1, 0, 1)	-0.56(0.06)	0.01(0.00)**	0.01(0.00)*	-1.01(2.05)	2.68(0.37)***	-0.12(0.14)	1.00(0.00)***
Sweden	22	(2, 1, 1, 1, 1, 1, 1)	-0.76(0.20)	-0.01(0.00)*	0.02(0.01)*	7.32(3.74)*	7.46(1.82)***	0.07(0.62)	1.00(0.00)***
Switzerland	22	(1, 0, 1, 0, 0, 0, 1)	-1.43(0.19)	-0.01(0.00)***	0.01(0.00)*	-2.02(0.41)***	0.53(0.08)***	0.62(0.06)***	1.00(0.00)***
Turkey	23	(1, 1, 1, 1, 1, 1, 0)	-1.00(0.00)	0.00(0.01)	0.03(0.01)**	3.02(1.90)	2.99(0.23)***	0.21(0.14)	1.00(1.00)**
United Kingdom	23	(1, 1, 0, 1, 0, 0, 1)	-0.25(0.13)	0.00(0.01)	0.00(0.00)	-1.11(3.51)	1.04(1.35)	0.22(0.77)	0.99(739.92)***
USA	22	(2, 1, 0, 1, 1, 1, 1)	-1.27(0.11)	-0.00(0.00)	0.01(0.00)**	2.29(1.38)	6.36(0.49)***	-0.81(0.33)**	1.00(0.00)***



Long-run estimate

	Constant	IFDI	OFDI	HC	CS	LABOUR	POP
Australia	-3.69(4.28)	-0.01(0.00)	-0.01(0.01)	2.17(0.24)***	0.34(0.22)	0.43(0.45)	1.00(0.00)***
Austria	-4.35(3.44)	-0.01(0.01)***	0.03(0.01)***	-2.23(1.14)	1.23(0.18)***	0.03(0.18)	1.00(0.00)***
Belgium	7.81(2.58)	0.01(0.01)	0.01(0.01)	0.96(0.51)*	0.66(0.23)***	-0.53(0.32)	0.99(0.00)***
Canada	5.77(7.87)	0.01(0.01)**	-0.03(0.03)	6.58(2.23)**	-0.77(0.22)***	0.53(0.66)	1.01(0.01)***
Chile	26.95(10.23)	-0.09(0.06)	0.04(0.02)	3.50(4.65)	0.96(0.34)**	-1.72(0.84)**	0.98(0.01)***
Denmark	6.06(6.85)	0.01(0.01)	-0.01(0.37)	2.33(1.46)	0.13(0.37)	0.14(0.51)	1.00(0.00)***
Finland	-3.02(4.03)	0.02(0.01)***	-0.01(0.01)	-0.29(2.29)	1.00(0.76)	-0.12(0.70)	1.00(0.00)***
France	5.27(4.60)	0.01(0.01)	-0.01(0.01)	-3.14(0.75)***	1.57(0.20)***	-0.99(0.33)**	1.00(0.00)***
Germany	-21.46(16.52)	0.00(0.01)	-0.02(0.01)	2.98(6.02)	0.32(0.79)	1.29(0.79)	1.00(0.00)***
Greece	36.91(142.91)	0.02(0.04)	0.01(0.03)	18.61(55.69)	-5.93(19.43)	2.23(4.87)	1.00(0.04)***
Iceland	8.16(4.44)	0.01(0.01)	0.00(0.00)	-0.72(0.82)	0.71(0.25)**	0.02(0.48)	1.00(0.01)***
Ireland	-3.49(7.73)	0.06(0.02)	-0.01(0.03)	11.81(5.14)**	-1.39(0.89)	1.30(0.94)	1.00(0.01)***
Israel	6.01(3.17)	0.01(0.01)	0.03(0.02)	-0.02(0.65)	0.71(0.27)**	-0.28(0.45)	0.99(0.01)***
Italy	54.71(5.42)	0.00(0.00)	0.00(0.00)	0.68(0.71)	0.55(0.28)*	0.15(0.15)	-1.17(0.33)***
Japan	25.17(54.04)	-0.02(0.02)	-0.04(0.07)	0.76(3.63)	1.07(0.95)	-1.84(3.67)	1.00(0.02)***
Korea	10.31(5.89)	0.02(0.01)*	0.00(0.02)	3.06(0.65)***	0.35(0.09)***	-0.16(0.43)	1.00(0.00)***
Luxembourg	-4.67(2.92)	-0.01(0.00)***	0.00(0.00)	-4.72(0.90)	1.27(0.10)***	0.50(0.29)	1.00(0.00)***
Mexico	8.79(2.50)	0.01(0.00)	-0.00(0.01)	1.20(0.53)**	-0.12(0.15)	0.19(0.24)	0.99(0.00)***
Netherlands	-13.68(1.30)	0.00(0.01)	0.00(0.01)	-3.05(0.94)***	0.93(0.22)***	0.86(0.16)***	1.00(0.00)***
New Zealand	2.59(5.39)	-0.00(0.00)	-0.00(0.00)	1.50(1.05)	0.74(0.33)**	-0.22(0.62)	1.00(0.00)***
Norway	15.78(31.23)	0.01(0.03)	0.13(0.11)	-12.49(17.20)	2.39(4.30)	-1.42(4.00)	0.98(0.03)***
Poland	22.88(105.87)	0.04(0.11)	0.07(0.16)	56.10(133.77)	-10.04(26.19)	3.95(8.22)	1.01(0.05)***
Portugal	2.78(3.15)	0.00(0.01)	-0.00(0.01)	-0.47(0.22)*	0.79(0.17)***	-0.26(0.35)	1.00(0.00)***
Spain	8.75(2.06)	0.01(0.01)**	0.01(0.00)***	2.20(0.65)***	0.15(0.21)	-0.21(0.27)	1.00(0.00)***
Sweden	19.22(18.58)	-0.01(0.01)	0.034(0.02)	3.75(3.93)	0.31(0.90)	-1.03(1.18)	1.01(0.01)***
Switzerland	8.88(1.578)	-0.01(0.01)***	0.01(0.02)*	-1.41(0.23)**	0.37(0.12)***	0.58(0.04)***	1.00(0.00)***
Turkey	-1.75(1.28)	0.03(0.01)***	0.04(0.01)***	1.82(0.43)***	-0.24(0.13)	0.76(0.09)***	1.01(0.00)***
United Kingdom	28.87(18.83)	0.00(0.03)	0.02(0.03)	8.56(10.05)	-2.80(5.06)	0.87(3.36)	1.00(0.01)***
USA	6.49(4.14)	0.01(0.01)*	0.01(0.00)***	-0.34(0.71)	0.94(0.04)***	-0.64(0.29)*	1.00(0.00)***

*, **, *** denotes significance at 1%, 5% and 10% respectively. The parenthesis () denotes standard error

ARDL Cointegration short-run and long-run estimates

To acquire valuable astuteness into the long-run and short-run dynamics between economic growth and FDI, human capital, capital stock, labour and population growth, ARDL approach to cointegration was employed. Findings displayed in Table 5 show that in the short-run, FDI inflows swells economic growth by 1% in Belgium, Canada, Finland, Poland and Spain. Also, Austria's economy as well as Sweden's and Switzerland's are downturned by 1% attraction of FDI as host nations. Albeit, investing outside the home countries of Israel, Italy, Spain, Switzerland, the US, Sweden, and Turkey generate 0.01%, 0.02% and 0.03% respectively in the short-run.

In the short-run, human capital is estimated to improve the economies of Belgium by 0.96%, 30.79% in Finland, 1.48% in Mexico, Poland by 5.48% and Sweden by 7.32%. Quite the contrary is experienced in Australia, Austria, Chile, Germany, Netherlands, and Switzerland where a unit improvement in human capital is estimated to deteriorate economic growth in the short-run by 3.38%, 1.88%, 38.33%, 17.44%, 3.05%, 0.46% and 2.02% respectively. Capital stock in the short-run develops the economies of Australia by 2.24%, Austria by 6.22%, Belgium by 5.04%, Canada by 2.36%, Chile by 2.56%, Denmark by 4.28%, Finland by 5.58%, France by 6.25%, Germany by 9.09%, Italy by 3.89%, Japan by 3.61%, Korea by 3.26%, Luxembourg by 2.98%, in 3.90% increase is experienced in Mexico, Netherlands, 3.36%, 3.72% in New Zealand, 2.68% in Spain, 7.46% in Sweden, 7.46% in Sweden, 0.53% in Switzerland, Turkey experiences 2.99% increase in economic growth in the short-run and then 6.36% in the US.

Nonetheless, the short-run estimate of labour's impact on economic growth is positive in Germany where labour betters the economy by 1.06%. Netherlands economy is estimated in the short-run to improve by 0.86%, 0.63% in Norway, 0.62% and Switzerland. Notwithstanding, labour in the short-run is estimated to have a negative impact of economic growth by 0.70% in Australia, 0.63% in Chile, 0.88% in Korea, 1.18% in Mexico and 0.81% in the US.

Inversely, the long-run estimate of economic growth on FDI shows that the inflows would contribute to economic growth positively in Canada by 0.01%, Finland by 0.02%, Korea's economy is estimated to be enhanced by 0.02% to unit attraction of FDI inflows. Spain and the US economic growth is estimated to be increased by 0.01% and 0.03% respectively. Australia, Austria, Luxembourg and Switzerland's economic growth are estimated to dwindle by 0.01% per percentage attraction of foreign direct investors. FDI outflow in the long-run is estimated to heighten economic growth in Austria by 0.03%, Spain, Switzerland and the US are estimated to have 0.01% increase in economic growth. Turkey earns 0.04% growth in its economy by a unit increase in its investment outside their home country.

Human capital is estimated to upturn the economies of Australia, Belgium, Canada, Ireland, Korea, Mexico, Spain, and Turkey in that an increase in human capital would increase economic growth by 2.17%, 0.96%, 6.58%, 11.81%, 1.20% and 2.20% correspondingly. Negative return is observed as a result of a unit increase in human capital however, in France, Netherlands and Switzerland by -3.14%, -3.05%, and 1.41%

respectively. Capital stock also have a positive returns on the economies of Austria, Belgium, Chile, France, Iceland, Israel, Korea, Luxembourg, Netherlands, New Zealand, Portugal, Switzerland and the US correspondingly by 1.23%, 0.66%, 0.96%, 1.57%, 0.71%, 0.55%, 0.35%, 1.27%, 0.93%, 0.79%, 0.37% and 0.94%. Labour is estimated to enhance economic growth in Netherlands, Switzerland, and Turkey but deteriorate the economy of Chile, France and the US by 0.86%, 0.58%, 0.76% and 1.72%, 0.99%, and 0.64% respectively.

Economic growth, FDI inflow and FDI outflow trend



Fig. 1 CANADA

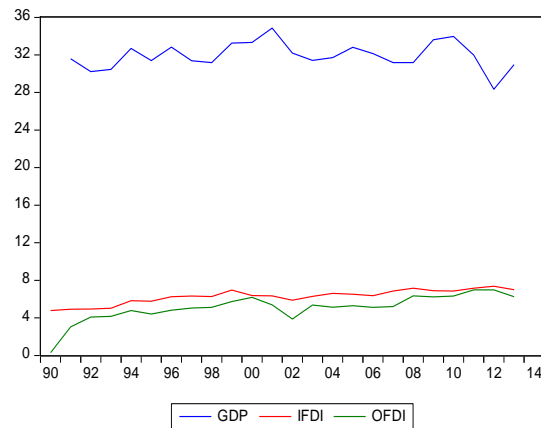


Fig 2 CHILE

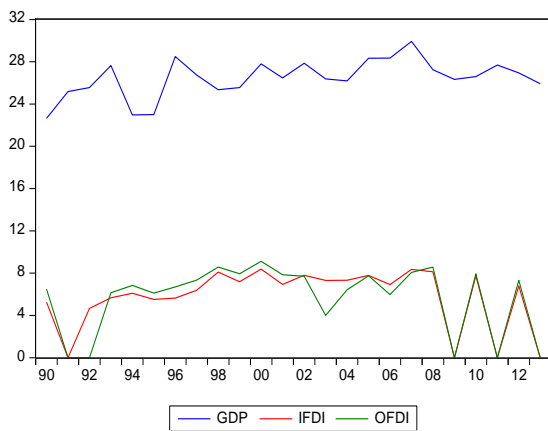


Fig 3 FINLAND

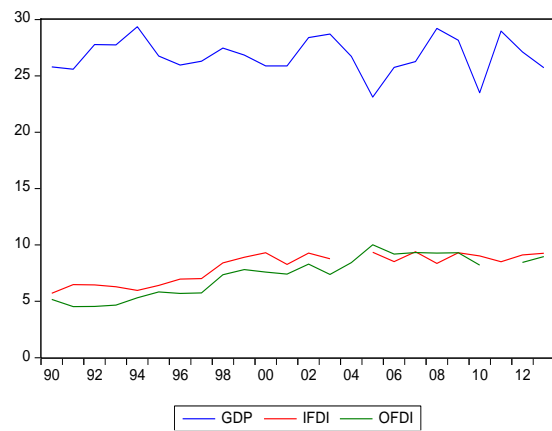


Fig 4 IRELAND

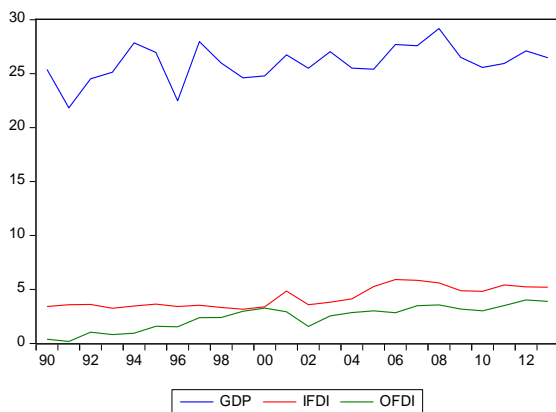


Fig 5 TURKEY

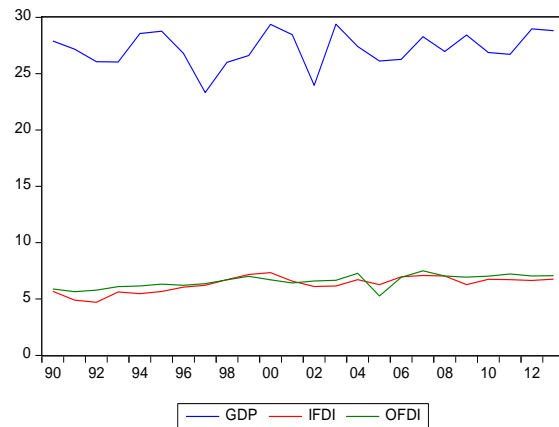


Fig 6 USA

Economic growth, FDI inflow and FDI outflow trend

Results from model 2 shows that Canada, Chile, Finland, Ireland, Turkey and the US economies are not negatively affected by the flow of technologies, human capital, financial capital and other factors that goes with FDI flows. The growth trend of these economies reflects in the graph. In all graphs, it could be seen that economic growth increased throughout the period in spite of the flows.

Canada experienced a sharp decline in FDI inflows 1990 to 1992 while investors from Canada invested in other economies but at a slower pace from 1990 to beginning of 1994 when they invested at an increasing rate. Canada attracted FDI inflows at an increasing rate which fell drastically in 2004 while their FDI outflows increased at a slower rate and drops at some point hence a wavy curve for the outflow type. Beyond 2004, activities of foreign investors increased in Canada at an increasing rate hence down-turned the outflows. It declined again from 2007 to 2010 during which economic growth fell a sharp pace. The three began to increase beyond this point.

Chile's FDI inflows from 1990 to 2013 kept increasing at a slower pace however, investments by Chileans always fell below the ones they received. Finland on the other hand from 1990 experienced a fall in FDI flows up until 1991 where they started investing and got investors as well. In 2002, Finland slowed down FDI outflows during which the attraction of investors into Finland stabilized. Outflows by Finland increased again and both types of FDI flows have been wavy experiencing sharp rise and fall since 2008. The economies of Ireland and Turkey both experienced sturdy growth with regards to FDI outflows and inflows. Consistently, both economies have attracted more foreign investors than they have invested in other economies however, Turkey throughout the study period attract more foreign investors. Ireland did not receive FDI inflows between 2003 to last 2005 hence a break in the inflows for that people. They also paused investing outside their home country in the period of 2010 to 2012. A reflection of this break is visible in the movement of the growth curve. The US invested and attracted investors internationally. From 1990 to 1998, they invested more than they received into their country. The year 2000 and a little beyond that period saw more inflows than outflows. After 2004 FDI

outflows in the US fell and increased again. US has since invested more than it has been invested.

Discussion

Findings from our research shows that population irrespective of structure enhances economic development in the OECDs, hence a positive significant relationship between population growth and economic growth in all the models used.

The difference in FDI inflows and outflows only positively influence a few economies. It can be said that these economies are not affected by the negative impact that comes with these two flows. Although both flows come with its own disadvantages to both the host and visiting nations, such as high tax associated with operational cost associated with the inflow type, transfer and development of human capital from and in visiting to and in host nations associated with the outflow types, among others comes at a cost to nations. FDI outflow to nations with higher wages tends to be favorable on domestic employment, and investment industries. Notwithstanding, the opportunity cost of both turns out to be profitable to these economies. However, the quality and quantity of the flow determines its impact on economic growth.

Interestingly model 3 indicated a negative impact of human capital on economic growth of Sweden. Possibly, this could be attributed to the quality of human capital presently. Notwithstanding, in comparing human capital across countries, it is important to assume that the same amount of studies get imparted for every year in all countries hence the disparities in human capital's contribution to economic growth. Again, the negative effect of human capital on growth can be attributed to high income tax brackets and the compositional change in population.

The negative impact of labor on economic growth could be attributed to the decreasing supply of steady-state labour. For instance, Japan's rapid aging and reduction in population has and will continue to reduce labor input and slump its economic growth rate.

Conclusion and policy implications

FDI has been marked as a determinant for economic growth. We therefore examined the effect of FDI inflows and outflows on the economies of OECD. We factored in some control variables which are human capital, labour, population and capital stock and employed the fully modified least square estimator to examine the relationship using different models. Our study revealed that Population growth expands economic growth in all the economies except for Italy. Labour, capital stock and human capital improved some economies while worsening the others. Also, economic growth in Canada, Iceland, Italy Finland, France, Israel United Kingdom, Spain and Turkey can be explained by attraction of foreign investors. The reverse is found in Japan and Luxembourg. On the other hand Australia, Austria, Denmark, France, Greece, Italy, Japan, Luxembourg, New Zealand, Norway, Spain and Switzerland's economic growth can be explained by their decision to invest out of their home country. Korea's investment outside their home country does not improve the economy. Again, we found that Canada, Chile, Finland,

Ireland, Turkey and the US are not negatively affected if they invest and get invested but Australia, Spain and Norway does. We also found that FDI inflows have a long-run positive relationship with economic growth in Canada, Finland, Korea, Spain and the US. Australia, Austria, Luxembourg and Switzerland's economies have a negative long-run relationship with FDI inflows. FDI outflow in the long-run positively affected the economies of Austria, Spain, Switzerland, Turkey and the US. In Australia, Belgium, Canada, Ireland, Korea, Mexico, Spain, and Turkey, human capital has a positive long-run relationship with economic growth. The contrary is found on France, Netherlands and Switzerland concerning human capital and economic growth.

Based on our findings, we propose that policy makers and governments of Canada, Chile, Finland, Ireland, Turkey and the US encourage continuous investment of their firms and nationals out of their home country and open doors for more foreign investors into their home country. We suggest that Korea controls investment outside their home country. Canada, Iceland, Italy Finland, France, Israel United Kingdom, Spain and Turkey should open their doors to foreign investors, passing less stringent rules that make it conducive for them to invest. Japan and Luxembourg should revisit rules governing FDI inflows and make amendment where necessary. Australia, Austria, Denmark, France, Greece, Italy, Japan, Luxembourg, New Zealand, Norway, Spain and Switzerland should invest more in order economies since it improves their economies. Economies that experienced decline in economic growth in relation to human capital should re-examine their educational system and encourage students with motivational packages that would make them un-reluctant to study. We conclude that FDI meaningfully impact on the economies in spite of the odds associated with it hence must be encouraged.

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