

# Foreign Capital Inflows and Economic Growth of Iran

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Nowadays, Foreign Capital Inflows (FCIs) are considered as a catalyst for economic development and an important source of transferring technology and foreign exchange earnings from developed to developing countries. The purpose of this paper is to estimate the impact of FCIs (which include foreign direct investment, personal remittances and official development investment) on economic growth in Iran. An Autoregressive Distributed Lag (ARDL) approach is used over the period 1992-2016. The results indicate that all the three of foreign capital inflows have positive and significant impacts on economic growth in the short-run and long-run. However, Foreign Direct Investment (FDI) and Public Relations (PR) have more effects than Official Development Assistant (ODA) on economic growth of Iran. The study suggests the design and implementation of appropriate fiscal, monetary and trade policies to complement the flow of foreign capital inflows to realize of its full impact on growth.

**Keywords:** Economic Growth, Foreign Direct Investment, Personal Remittances, Official Development Investment.

**JEL Classification:** C33, E22, H54, O11, O47

## 1 Introduction

The developing countries can accelerate the speed of economic growth through the transfer of advanced technology and innovations of developed countries and attract various forms of FCIs. Most economists confirm a positive relationship between FCIs and economic growth. Of course, the effect of FCIs varies from one country to the others and from one group countries or region to the others; and it depends on the economic environment and governments' policies (Mah, 2010; Adusah-Poku, 2016).

The different forms of FCIs are Foreign Direct Investment (FDI), Personal Remittance (PR), Official Development Assistance (ODA) and Foreign Portfolio Investment. Among them, FDI, PR and ODA are the most important sources of FCIs in most host (or recipient) countries.

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FDI is an investment in a business by an investor from another country for which the foreign investor has control over the company purchased. OECD<sup>1</sup> defines “control” as owing 10% or more of the business. Businesses that make foreign direct investment are called Multinational Corporations (MNCs) or Multinational Enterprises. FDI can be a tremendous source of external capital for a developing country, which leads to economic development. FDI may also provide some great advantages for MNCs such as access to the foreign markets, access to natural resources and cost reductions for the factors of production (Faruk, 2013).

Personal Remittances are mainly in the form sent by non-resident to their household (resident) in the home country. In other words, personal remittances are defined as transfers of a sum of money that follow unidirectional paths from a migrant sending to his or her relations and or friends, community, and country (Majumder & Danghui, 2016). Personal remittances (PR) are one of the biggest source of external funding for developing countries and it is three times the size of ODA while supplementing the domestic incomes of millions of poor families across the world.

ODA refers to foreign aids, in other words, the flow of financial resources from the central or local government of donor countries and multilateral agencies to developing countries. ODA is intended to promote the economic development and improve the quality of life in developing countries (Sabra, 2016).

Nowadays, Iran faces the low level of domestic and foreign investment. Some other economic problems of Iran are: severe unemployment of the Youth, high stagflation and stringent sanctions. These problems are lowering Iran’s exchange revenues, and increasing the risk of domestic and foreign investment. There are also some economic and social barriers such as inefficient official bureaucratic procedures, inappropriate environment for attracting foreign capital inflows as a supplementary source of domestic investment (Mafrouzlu et al., 2015). The government also faces difficulties in generating enough funds domestically to finance public expenditure needed in the infrastructures to increase domestic demand, create employment, and boost economic growth. To enhance the insufficient domestic savings, foreign capital inflows (FCIs) seem to be the only alternative source of savings to increase exchange revenues and boost the economic growth in Iran.

FCIs are expected to not only improve economic growth but also raise the welfare of people and reduce poverty to an acceptable level in Iran. In this

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research, the impact of FDI, PR, and ODA on Iran's economic growth are studied.

Iran has received very few FCIs over the last three decades. It has received about 0.22 percent of FDI, 0.27 percent of PR and 0.08 percent of ODA among the developing countries over the recent years (www.worldbank.org, 2016). Figure 1 shows the FDI, PR, and ODA inflows in Iran over the period of 1992-2016.

According to the World Bank, FDI and PR are the biggest sources of external financial inflows in Iran which reached 3372 and 1371 million US Dollar (in real terms, 2015=100) in 2016 respectively. Of course, the PR inflows was more than FDI from 1992 to 2001, then FDI has exceeded PR. The disbursement of ODA was the least of all and it had a fixed trend during the last three decades and is amounted to 77.04 million US Dollar in 2016.

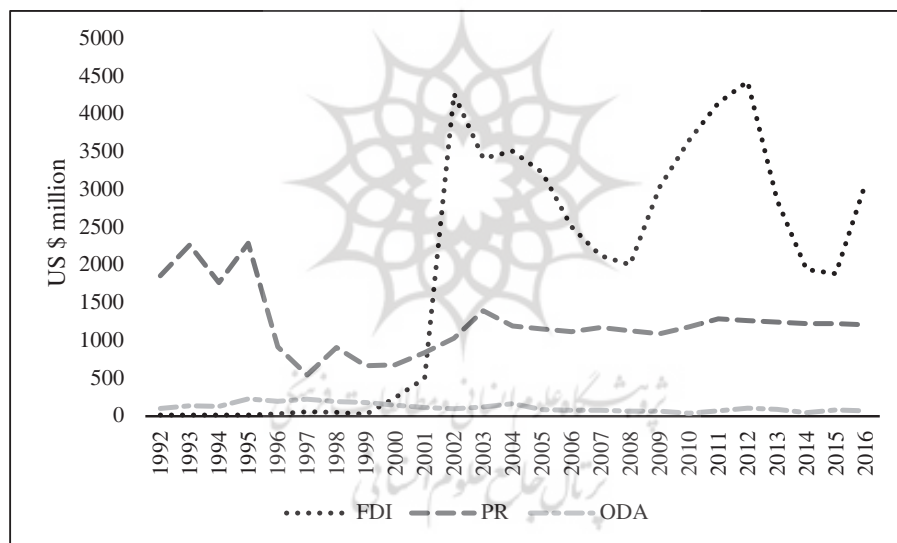


Figure 1. FDI, PR and ODA in Iran

Source: WorldBank.org, and OECD.org (2016).

The hypothesis is that FDI, PR, and ODA have a significant and positive effect on economic growth of Iran. In other words, the question of this research is, "Do FDI, PR, and ODA have a positive impact on economic growth of Iran?" The result shows the effects of various forms of FCIs on economic growth of Iran over the recent three decades. It also shows which of them is

more effective on economic growth of Iran. Foreign capital provides part of investment even if the economic environment improves using appropriate fiscal and monetary policies to absorb different forms of FCIs.

The paper is organized as follows: after introduction, the next section reviews the relevant literature, section three is the methodology and data. Section four presents the empirical results and section five concludes the study with policy recommendations.

## **2 Literature Review**

### **2.1 Theoretical Background**

The neoclassical economists believe the inflow of advanced technologies from developed to developing countries in the form of FDI affects management practices that lead to creating competition in the host country. Technology maximizes the productivity spillover in the economy by changing inferior and low domestic production process into modern technological process. Innovation in production process requires firms to reallocate their resources and facilitate employment to achieve equal income distribution that will reduce the gap between savings and investment. Meanwhile, some economists believe FCIs may have a negative effect on the economic development of a country if the domestic investment gets in the hands of foreign firms rather than local firms due to the insurgence of foreign firms. Under this condition, the productivity of domestic firms reduces because of competition effects of foreign firms (Khaliq & Noy, 2007; Jawaid & Saleem, 2017).

Endogenous growth models suggest three principal channels through which FDI affects growth. First, FDI increases capital accumulation in recipient countries by introducing new inputs and new technologies (Borensztein et al., 1998). Second, FDI increases the levels of knowledge and skills in host countries by training workers and managers on the job (De Mello, 1999; Ali & Mingque, 2018). Third, FDI boosts the competition among the industries of host countries by overcoming barriers to entry and by reducing the market power of existing firms (Fambon, 2013).

The positive or negative impact of FDI inflow depends on the degree of trade openness, the relatively low price production factors (such as low labor cost and the availability of raw materials) and the political stability of the host country. Under an appropriate economic and political conditions, the foreign-invested enterprises can expand their output in internationally competitive and export-oriented product lines, and have the potential to reap economies of

scale and finally increase their goods supply into the international markets (Mah, 2010; Faruk, 2013, Orji et al., 2014 and Habibi & Karimi, 2017).

Remittances also consider important inflow to sustain economic growth and increase the standard of living in the recipient country. Its structure depends on migrants, where they belong and how much they spend in the host country and how much they save and send to the home country (Abida & Sghaier, 2014).

Nowadays, personal remittances (PR) are recognized as one of the most imported sources of global development finance. Remittances increase the rate of accumulation of both physical and human capital in the recipient country (Katushi et al. 2012). Adams (2006) and Iqbal and Satter (2008) confirm a positive relationship between economic growth and remittances. They believe that remittances contribute to poverty reduction and also help in reducing the current account deficit as well as external debt of the recipients' country. Leon-Ledesma and Piracha (2004), Adusah-Poku (2016) and Chami et al. (2003) argue that remittances tend to degrade long-run growth by creating labor substitution and "Dutch disease" impacts, increasing inflation, appreciating the real exchange rate and reducing the labor market participation rates. Remittances may affect total factor productivity by increasing the effectiveness of investment. Remittances also increase the quantity of funds flowing through the banking system. This flow leads to financial expansion and therefore makes higher economic growth possible (Mallick, 2012; Barajas et al., 2009).

Foreign aid or Official Development Assistance (ODA) plays a fundamental role in stimulating economic growth as an additional source of domestic finance which includes savings and domestic investment as well as foreign borrowing. Therefore, it increases the recipient country's available investment fund and the capital stock. In other words, since most of developing countries do not have enough fiscal reserves for investment, free foreign aids are one way of providing fiscal reserve. The effective impacts of ODA on economic growth of the country will depend on how it influences fiscal policy and how much ODA is allocated to government infrastructure investment or current expenditures. Kara et al. (2016) believe ODA is suitable when spends for economic development investments in areas of social infrastructure (such as: health, sanitation, education, housing) and economic infrastructure (such as irrigation, transport, power communication). Remmer (2004), Duta et al. (2010) and Bakhtiari et al. (2013) confirm a positive relationship between ODA and economic growth in different developing countries. They show that foreign aid (ODA) has positive effects if the

economies of developing countries have good fiscal, monetary and trade policies, otherwise, it has negative effects on economic growth.

## 2.2 Empirical Evidence

In the following, some empirical studies about the relationship between FDI, PR, and ODA with economic growth are stated:

Adusah-Poku (2016) examines the impact of foreign capital inflows (which include FDI, personal remittances and foreign aids) on economic growth in Sub-Saharan countries over the period of 1910-2010 and using PMG estimator for dynamic heterogeneous panels. The results confirm that all the three forms of foreign capital inflows have positive and significant impacts on economic growth in the long-run. However, personal remittances was the only short-run driver of growth in Sub-Saharan countries.

Tiwari (2011) examines the determinants of foreign aid flow in 20 Asian countries in a panel framework. Estimation analysis is carried by using pooled annual time series data from 2002 to 2008 in the framework of fixed and random effect model and GMM method. They find that the positive impact of ODA on economic growth in some Asian counties.

Yasin (2013) investigates the relationship between FDI and economic growth in Pakistan over the period of 1976-2010. ADRL method has been used to find long-run and short-run relationships. Results confirm that no long-run relationship exists between FDI and economic growth, whereas the model is good for a short-run relationship.

Kosztowniak (2013) investigates the impact of FDI on economic growth in Poland, using CLS method over the period of 1995-2012. The result shows a low effectiveness of FDI on the Polish market, lack of reinvestment and transfer of income from abroad. The reasons are unfulfilled conditions of the positive FDI impact on the economy of Poland.

Nwaogu & Ryan (2015) investigate the impact of FDI, remittances and foreign aid on 53 African and 34 Latin American and Caribbean countries, using a panel data consisting of eight 5-year periods (from 1970 to 2009), and a dynamic spatial model. It is concluded that separate estimation shows foreign aid and FDI affect economic growth in Africa, but when all three variables are used, only FDI affects African economic growth. For Latin American and the Caribbean, foreign aid and remittances affect economic growth when estimated separately, while remittances affect economic growth when they are estimated simultaneously.

Ibrahim & Dahie (2016) examine the effect of FDI, ODA and domestic investment on economic growth in Somalia, taking annual data from 1970 to

4014. Results confirm that FDI has a significant positive impact on economic growth in Somalia.

Majumder and Donghui (2016) examine the long-run impact of remittances on economic growth in Bangladesh, using ARDL model over the period of 2006-2014. They find a statistically significant long-run positive relationship between remittance and economic growth in Bangladesh.

Habibi, and Karimi, (2017) investigate the impact of FDI economic growth of Iran and Gulf Cooperation Council (GCC) over the period of 1980-2014, using ADRL approach. The empirical results show that FDI is one of the major drivers of economic growth in Iran and GCC. The bounds testing also indicates that there is a long-run steady-state relationship between FDI and GDP in Iran and for each country of GCC.

Jawaid & Saleem (2017) examine the relationship of foreign capital inflows (i.e.: FDI, workers' remittances and external debt) with economic growth of Pakistan over the period of 1976-2015. Co-integration results indicate that FCI and economic growth have a significant relationship in the long-run. They also find the impacts of remittances and external debts on economic growth are more than FDI in Pakistan.

Adedokun (2017) examines the relationship among foreign aid, governance and economic growth in Sab-Saharan Africa (SSA) over the period of 1996-2012, using System GMM method. The results show that foreign aid has an insignificant negative relationship with economic growth. They also show that the general policy of countries in SSA is not good enough for aid effectiveness.

According to the above theoretical and empirical studies, foreign capital inflows can accelerate the speed of economic growth through the transfer of advanced technology. The endogenous growth models are suggested by which FCIs effects on productivity in the host countries, of course under an appropriate and stable economic and political conditions, are studied. Nevertheless, most previous studies have examined the impact of three different forms of FCI inflows (namely FDI, PR or ODA) on economic growth in different countries and regions separately using various models and econometric techniques. There is not also any significant study on the impact of FCIs on economic growth in Iran. Of course, there are a few studies about the effect of FDI and foreign aids on economic growth in Farsi language. This focus of the paper is on the impacts of FDI, PR, and ODA on economic growth of Iran separately and simultaneously in the short- run and the long-run, which have not been studied until now.

### 3 Methodology

#### 3.1 Basic Model of Economic Growth

In order to analyze the connection between the inflow of FCIs and economic growth of the host country, the neoclassical growth model with employing the Cobb-Douglas production function is used. This model adopts a simplified version of the endogenous growth theory which emphasizes the impact of FCIs on long-run growth, and can be explored through the production function. According to empirical studies, FCIs can enter directly into economic growth models (Mah, 2010) or through the spillover impacts (Kotrajaras et al. 2011; Kosztowniak, 2013). In this study, it is assumed that FCIs affect economic growth through the spillover impacts. The econometric model is a Cobb-Douglas given as follows:

$$Y_{it} = A_{it} L_{it}^{\alpha} K_{it}^{\beta} e^{\varepsilon_{it}} \quad (1)$$

Where  $Y_{it}$  denotes real GDP,  $A_{it}$  is total factor productivity (TFP) as the proxy for the technology. The variable  $A_{it}$  has to be endogenized as a function of FDI, PR, and ODA. In other words, in this study the endogenous growth model is formulated by FDI, PR, and ODA which affect the output growth through enhancing the TFP (Fomban, 2013). Thus, it is assumed that  $A_{it}$  is a function of FDI, PR and ODA:

$$A_{it} = F(FDI_{it}, PR_{it}, ODA_{it}) = FDI_{it}^{\beta} PR_{it}^{\phi} ODA_{it}^{\theta} \quad (2)$$

The augmented model of economic growth is obtained by combining equation (1) and (2):

$$Y_{it} = L_{it}^{\alpha} K_{it}^{\beta} FDI_{it}^{\delta} PR_{it}^{\phi} ODA_{it}^{\theta} e^{\varepsilon_{it}} \quad (3)$$

Taking natural logs of equation (3) gives:

$$\ln Y_{it} = \alpha \ln L_{it} + \beta \ln K_{it} + \delta \ln FDI_{it} + \phi \ln PR_{it} + \theta \ln ODA_{it} + \varepsilon_{it} \quad (4)$$

Where  $\alpha$ ,  $\beta$ ,  $\delta$ ,  $\phi$  and  $\theta$  are the constant elasticity coefficients of output relative to  $L, K, FDI, PR$  and  $ODA$ . For estimation purposes, equation (4) is written as:



$$\text{Ln}Y_{it} = \varphi + \alpha \text{Ln}L_{it} + \beta \text{Ln}K_{it} + \delta \text{Ln}FDI_{it} + \emptyset \text{Ln}PR_{it} + \theta \text{Ln}ODA_{it} + \varepsilon_{it} \quad (5)$$

Where all the variables are defined previously;  $\emptyset$  is the constant term and  $\varepsilon_{it}$  is the disturbance term assumed to be independently and normally distributed with zero mean and constant variance.

The variables of the model are as follows:

$Y_{it}$ : real GDP (US \$ million);  $L_{it}$ : total labor force (of the country, million);  $K_{it}$ : the capital stock<sup>1</sup> ( US \$ million);  $FDI_{it}$ : foreign direct investment (net inflows, US \$ million);  $PR_{it}$ : the net personal remittance received by residents ( US \$ million) and  $ODA_{it}$ : the net official development received by governments (US \$ million) and  $\varepsilon_{it}$  is the disturbance term. Subscript  $i$  and  $t$  stand for country and period respectively. In this paper, the annual time series data for Iran over the period of 1992-2016 are used. The data of GDP, L, K, FDI, and PR are obtained from the World Development Indicators by World Bank and ODA data is obtained from OECD's Creditor Reporting System (CRS). All data are in real terms (constant 2010 US Dollar). Regarding the prior expectations, the literature predicts a positive relationship among  $L_{it}$ ,  $K_{it}$ , and real GDP; but the impact of  $FDI_{it}$ ,  $PR_{it}$  and  $ODA_{it}$  on GDP may be positive or negative.

The selected model of this research and the variables are justified by some empirical studies such as Kim and Bang (2008), Mah (2010), Fambon (2013), Kosztowniak (2013), Iqbal et al. (2013) and Adusah-Poku (2016).

### 3.2 Estimation Technique

In order to estimate the short-run and long-run relationship between the dependent and independent variables of the model, Auto-Regressive Distributed Lag (ARDL) approach is used. The main advantage of using ARDL models is that the long-run relationship and the short-run parameters are estimated jointly. They also allow dealing with variables that have different order of integration, namely I(0) and I(1) and not merely I(1). This property is extremely useful given the low power of panel unit root tests in small samples.

The reduced form of ARDL dynamic panel model is as follow:

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<sup>1</sup> K is the proxy of domestic Capital stock and is calculated according to the following formula:  $K_t = K_0 + \sum_{i=1}^t (I - D)_i$  (See Mowlaei & Shahab, 2016 and Hojaber Kiani & Naguib, 2014).

$$Y_{it} = \sum_{j=1}^m \lambda_{it} Y_{it-1} + \sum_{j=0}^n \delta_{it} X_{it} + \mu_i + \varepsilon_{it} \quad (6)$$

Where  $Y_{it}$  is the real GDP;  $X_{it}$  is a vector of explanatory variables;  $\lambda_{it}$  is a scalar; and  $\mu_i$  represents the country-specific effect and  $\varepsilon_{it}$  is the disturbance term.

An Error Correction Model (ECM) of an ARDL (p, q, q...q) specification is shown in the equation below:

$$\Delta Y_{it} = \varphi(Y_{i,t-1}) + \alpha(X_{i,t-1}) + \sum_{i=1}^{\rho-1} \lambda_{i,j} \Delta(Y_{i,t-j}) + \sum_{i=1}^{q-1} \delta_{ij} \Delta(X_{i,t-j}) + \mu_{it} + \varepsilon_{it} \quad (7)$$

Where  $X$  is a vector of explanatory variables;  $\alpha$  contains the long-run dynamics;  $\varphi$  is the error correction term and  $\delta_{ij}$  contains the short-run dynamics.

The ARDL approach is first carried out by estimating Unrestricted Error Correction Model (UECM) in equation (7) using the OLS.

$$\begin{aligned} \Delta \ln(Y_{it}) = & \theta_0 + \sum_{j=0}^a \lambda_{1j} \Delta \ln(Y_{t-j}) + \sum_{j=0}^b \lambda_{2j} \Delta \ln K_{t-j} + \\ & \sum_{j=0}^c \lambda_{3j} \Delta \ln L_{t-j} + \sum_{j=0}^d \lambda_{4j} \Delta \ln(FDI_{t-j}) + \sum_{j=0}^e \lambda_{5j} \Delta \ln(PR_{t-j}) + \\ & \sum_{j=0}^f \lambda_{6j} \Delta \ln(ODA_{it}) + \delta_1 \ln Y_{t-1} + \delta_2 \ln K_{t-1} + \delta_3 \ln L_{t-1} + \\ & \delta_4 \ln FDI_{t-1} + \delta_5 \ln PR_{t-1} + \delta_6 \ln ODA_{t-1} + \varepsilon_{it} \end{aligned} \quad (8)$$

where  $\Delta$  is a different operator,  $a, b, c, d, f$  represent the lag length on the regression variables, and  $\varepsilon_{it}$  is the error term assumed to be white noise. The parameters,  $\lambda_{nj}$  for  $n = 1, 2, \dots, 6$  represent the short-run dynamics of the ECM model whereas the parameters for the long-run relationships are given by the  $\delta_s$  for  $s = 1, \dots, 6$ . The study employs the Schwartz Bayesian Criterion (SBC) to determine the optimal lag length.

## 4 Empirical Results

### 4.1 Panel Unit Root Tests

Table 1 presents the results of the panel unit root tests. There are two types of panel unit root processes. When the persistence parameters are common across-section, then the processes is called a common unit root process. Levin-Lin Chu's (LLC), Breitung & Hardi employ this assumption. When the persistence parameters freely move across cross-section, the unit root process

is called an individual unit root process. Im-Pesaran & Shin (IPS) and ADF-Fisher test are based on this form.

The test results from Table 1 show that except Y, L, K, and FDI, the other variables (PR, ODA) are not stationary. Stationary tests are carried out at the difference for variables that are not stationary at levels. The results are shown in Table 2.

Table 1  
*Result of Panel Unit Root Tests*

Testing assuming a common unit root			Testing assuming individual unit root		
Series Name	LLC t-stat:	Breitung t-stat	Hardi z-stat	IPS w-t-bar stat:	ADF-Fisher X <sup>2</sup>
Ln Y	3.1286 (0.0004)	2.7321 (0.0000)	5.1964 (0.0000)	4.2054 (0.0001)	153.254 (0.0000)
Ln L	-3.3286 (0.0000)	2.2976 (0.0000)	3.3021 (0.0000)	2.2398 (0.0000)	193.573 (0.0000)
Ln K	-6.7534 (0.0000)	3.8421 (0.0000)	9.7531 (0.0000)	3.3218 (0.0000)	218.642 (0.0000)
Ln FDI	2.4327 (0.0000)	-3.4387 (0.0000)	5.9845 (0.0000)	-4.6596 (0.0000)	110.432 (0.0000)
Ln PR	-1.6428 (0.2165)	2.4275 (0.5398)	9.2165 (0.2398)	7.1365 (0.1765)	3.2497 (0.3287)
Ln ODA	0.1853 (0.4175)	0.2863 (0.3876)	13.3222 (0.3574)	5.3421 (0.1843)	45.1906 (0.2634)

Source: Research Findings.

Table 2  
*Result of Panel Unit Root Tests (At First Different)*

Assuming a Common Unit Root			Assuming Individual Unit Root		
Series Name	LLC t-stat:	Breitung t-stat	Hardi z-stat	IPS w-t-bar stat:	ADF-Fisher X <sup>2</sup>
Ln PR	5.1854 (0.0000)	-3.3215 (0.0000)	8.1234 (0.0000)	-3.2543 (0.0000)	162.235 (0.0000)
Ln ODA	6.1247 (0.0000)	-7.1265 (0.0000)	9.1254 (0.0000)	10.1643 (0.0000)	143.2641 (0.0000)

Source: Research Findings.

## 4.2 Panel Cointegration Results

Table 3 presents the results of the Pedroni's co-integration test with null hypothesis of no cointegration. The results show the rejection of the null hypothesis at 1% level significance of within (common auto-regression

coefficients) and between (individual auto-regression coefficients) dimensions. The Kao's test confirms the Pedroni's test with existence of co-integration using the assumption of between-dimensions. The result of Pedroni's and Kao's tests indicate that there are co-integration among the variables and a long-run relationship among them.

Table 3

*Results of Panel Co-Integration Test*

<b>Pedroni's co-integration test</b>				
<b>Common AR coefficients (within dimension)</b>				
	Statistic	Prob.	Weighted Statistic	Prob.
Panel v	1.167543	0.0005	-0.815797	0.0000
panel rho	0.351276	0.0000	0.341461	0.0001
Panel pp	-3.109854	0.0000	-3.508653	0.0000
Panel ADF	-3.246021	0.0000	-4.390754	0.0000
<b>Individual AR coefficient (between dimension)</b>				
Group rho	0.642156	0.0000		
Group pp	-3.264289***	0.0000		
Group ADF	-3.136841***	0.0000		
<sup>b</sup> Kao residual co-integration test				
Test statistic= -4.385411 (0.0021)				

Source: Research Findings. \*\*\* indicates significant at 1% level of significance.

### 4.3 The Results of Long-Run and Short-Run Estimations

Table 4 shows the short-run and long-run estimates based on ARDL. Four alternative models are presented by Table 4. In models 1-3, the study includes only one of the FCIs at a time in addition to the control variables. All three FCIs are included in the model 4.

#### 4.3.1 The Long-Run Results

In this study, all coefficients are interpreted as elasticity. All the three FCIs are found to be long-run drivers of economic growth in all four models. Moreover, all coefficients of FCI variables are consistent regarding the signs and statistically significance.

FDI is the most important foreign capital inflows to Iran. It was reached about 13.20 and 3063.58 million US Dollar in 1992 and 2016 respectively, indicating a 231.08 percent increase (in real terms). One percent increase in FDI increases growth by 6.21 percent and 7.82 percent in models 1 and 4 respectively.

Personal remittances to Iran have been decreased in recent years and they reached about 1858.61 and 1208.35 million US Dollar in 1992 and 2016

respectively, indicating a -34.98 percent decrease (in real terms). One percent increase in personal remittance increases growth by 4.82 percent and 6.72 percent in model 2 and 4 respectively.

The share of foreign aid (ODA) in GDP of Iran is decreased over the past years and it has reached about 99.30 and 68.83 million US Dollar in 1992 and 2016 respectively, indicating a 30.68 percent decrease (in real terms). One percent increase in ODA increases growth by 3.17 percent and 5.86 percent – all other variables constant- in models 3 and 4 respectively.

### 4.3.2 The Short-Run Estimation Results

Table 4 also shows the short-run impacts of FCIs on economic growth that are positive and statistically significant. The result indicates that all the three FCIs are found to be short-run drivers of economic growth in all four models. Of course, the impacts of FDI and PR on economic growth are less than ODA in the short- run in Iran.

The result of model 4 also shows that when three foreign capital inflows are used simultaneously, their effects on economic growth are more than using them separately.

The error correction terms (ECTs) are negative and significant in all four models and confirm the conclusion of co-integration among the variables. The ECTs of -0.0432, -0.0623, -0.0562 and -0.0825 suggest that when economic growth in Iran is above or below its equilibrium level, it is adjusted by almost 4.32, 6.23, 5.62 and 8.25 percent in models 1, 2, 3, and 4 respectively

The results are consistence with other studies such as Iqbal and Satter (2008), Tiwari (2011), Raza et al. (2011), Mallick (2012), Nkwoma (2013), Fambon (2013), Kara et al. (2016), Duta et al. (2010), Majumder et al. (2016), Sabra (2016), Ali and Mingque (2018).

Table 4  
The ARDL Estimation Results

	Model 1	Model 2	Model 3	Model 4
Convergence coefficients	-0.0432*** (0.0122)	-0.0623*** (0.0147)	-0.0562*** (0.0262)	-0.0825*** (0.0158)
<b>Long-run</b>				
Ln L	0.0521** (0.0182)	0.0375*** (0.0082)	0.0298** (0.0126)	0.0432*** (0.0101)
Ln K	0.0623*** (0.0126)	0.0262*** (0.0070)	0.0529*** (0.0122)	0.0821*** (0.0157)
Ln FDI	0.0621*** (0.0013)			0.0782*** (0.0160)
Ln PR		0.0482*** (0.0011)		0.0672** (0.0249)
Ln ODA			0.0317*** (0.0063)	0.0586*** (0.0012)
<b>Short-run</b>				
$\Delta$ Ln L	0.03621*** (0.0075)	0.0682*** (0.0012)	0.0513*** (0.0421)	0.07321*** (0.0018)
$\Delta$ Ln K	0.0721*** (0.0175)	0.0782*** (0.0125)	0.0582*** (0.0141)	0.0881*** (0.0184)
$\Delta$ Ln FDI	0.0491*** (0.0107)			0.0537*** (0.0010)
$\Delta$ Ln PR		0.0662** (0.024)		0.0731*** (0.0169)
$\Delta$ Ln ODA			0.0732*** (0.0115)	0.0851 *** (0.0196)
No. of Obs.	25	25	25	25

Source: Research Findings. \*, \*\*, \*\*\* indicates significance at 10%, 5% and 1% level of significance. Values in () are standard errors. All variables are in their natural logarithmic forms.

## 5. Conclusion

This study attempts to examine empirically the impacts of FDI, PR, and ODA on economic growth of Iran over the period of 1992-2016 by ARDL estimator. All the three forms of foreign capital inflows used in this study affect economic growth positively and are statistically significant in the short-run and long-run. However, the results of estimated model show that FDI and PR have more impacts than ODA on economic growth over the study period. During two recent decades, FDI is the most important source of external capital in Iran and in the 2016, it was 3063.58 million US Dollar, as compared to the PR which stood at 1208.35 million US Dollar and ODA was 68.83 million US Dollar, in real terms. FDI is an enormous source of external capital for Iran which leads to economic development. FDI inflows can help to

transfer the advanced technologies from abroad, and increase the export values and foreign exchange earnings of Iran. Personal remittances can greatly contribute to the welfare and productivity of people and households. The most important objective of donors of ODA is to reduce the poverty in the less developed countries. ODA is also suitable to spend for economic development in infrastructure. If the ODA is allocated for the infrastructure investment, it improves economic growth in the countries. Of course, the impact of FCIs on economic growth is contingent on the appropriate fiscal and monetary policies of recipient countries.

The results of this study show that FDI and PR are the biggest sources of external finance inflows in Iran. Therefore, the government of Iran should endeavor to accelerate the attraction of FDI through offering incentives, for instance, tax breaks to foreign investors who bring their capital into the country even under the economic sanctions. The government can reduce the transaction cost to welcome personal remittances into the country and make policies to encourage Iranian immigrants to bring their savings to Iran. Meanwhile, the government should provide initial conditions for the FCI inflows such as suitable fiscal and monetary policy, good governance and elimination of barriers to entry. Promoting domestic investment, focusing on the internal factors (especially human capital and domestic savings) and trying to remove the economic sanctions result in increased economic growth in Iran.

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