

## THE IMPACT OF INTERNATIONAL CAPITAL FLOWS ON THE ECONOMIC GROWTH IN ALGERIA DURING THE PERIOD 1990-2018

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### ABSTRACT

This study examined the effect of international capital flows on economic growth in Algeria for the period, 1990 to 2018. This study relied on four core channels of international capital flows which includes foreign direct investment (FDI), official development assistance (ODA), personal remittances (REM), and external debt stock (EXTDS) into Algeria. We found that all channels of international capital flows were not statistically significant in the short and long-run except the foreign direct investment.

We result from this study that Algeria needs deep reforms in order to attract more foreign capital, especially creating an appropriate environment In order for these flows to contribute substantially to economic growth.

**KEY WORDS:** International Capital flows, Economic Growth, Foreign Direct Investment, Algeria

**JEL CLASSIFICATION:** F21, O47, C51.

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## L'IMPACT DES FLUX INTERNATIONAUX DE CAPITAUX SUR LA CROISSANCE ECONOMIQUE DE L'ALGERIE AU COURS DE LA PERIODE 1990-2018

### RÉSUMÉ

L'étude a examiné l'effet des entrées de capitaux internationaux sur la croissance économique de l'Algérie pour les périodes 1990 à 2018. L'étude a utilisé quatre principaux canaux d'entrées de capitaux internationaux, qui comprennent l'investissement direct étranger (IDE), l'aide publique au développement (APD), les envois de fonds personnels (REM) et le stock de dette extérieure (EXTDS) en Algérie.

Nous avons constaté que tous les résultats n'étaient pas statistiquement significatifs à court et à long terme, à l'exception de l'investissement étranger direct.

Nous avons appris de cette étude que l'Algérie a besoin de réformes profondes afin d'attirer plus de capitaux étrangers, en particulier en créant un environnement approprié pour que ces flux contribuent de manière substantielle à la croissance économique.

**MOTS CLÉS:** Flux Internationaux De Capitaux, La Croissance Economique, L'investissement Direct Etranger, Algérie.

### أثر التدفقات الرأسمالية الدولية على النمو الاقتصادي في الجزائر خلال الفترة 2018-1990

#### ملخص

تناولت الدراسة الحالية أثر تدفقات رأس المال الدولية على النمو الاقتصادي في الجزائر للفترة الممتدة من 1990 إلى 2018، حيث اعتمدت الدراسة على أربع قنوات أساسية للتدفقات الرأسمالية الدولية تشمل الاستثمار الأجنبي المباشر (FDI)، المساعدة

الاجنبية (AIDS)، التحويلات الشخصية (REM) ومخزون الديون الخارجية (EXTDS) في الجزائر.

أظهرت النتائج أن جميع قنوات تدفقات رأس المال الدولية لم تكن ذات دلالة إحصائية على المدى القصير والطويل باستثناء الاستثمار الأجنبي المباشر.

واستخلصنا من هذه الدراسة إلى حاجة الجزائر لإصلاحات عميقة من أجل استقطاب أكبر لرؤوس الأموال الأجنبية، وخصوصا خلق محيط ملائم من أجل أن تساهم هذه التدفقات بشكل مباشر في النمو الاقتصادي.

كلمات مفتاحية: التدفقات الرأسمالية الدولية، النمو الاقتصادي، الاستثمار الأجنبي المباشر، الجزائر.

## INTRODUCTION

The speed of movement of international capital is one of the most important economic developments in the world in recent times. Although the developed countries are the main destination for them, the developing countries have also known a relatively large increase in this movement. The movement of international capital is a form of financing especially in the event of a deficit in internal financing, in view of the positive effects it creates on the economy from diversification of sources of income, and bringing in modern technology and thus achieving economic growth.

Since the fuel price crisis in 1986 and the sharp decline in financial resources and its certainty by not relying almost entirely on a single source of financing (petroleum), Algeria has been working on developing economic and financial reforms to attract the largest possible volume of international capital. It has provided tax incentives and legal facilities to foreign investors, in addition to developing reforms affecting the financial sector.

In light of the economic transformation that Algeria has known since the 1990s and the liberalization of capital flows to and from

Algeria, this study comes to ascertain the importance of external financing for the Algerian economy by studying the impact of international capital flows such as international aid (donations), foreign direct investment, migrant remittances, and external debts on economic growth in Algeria using data for the period from 1990-2018.

The relationship between economic growth and International Capital has been a subject of large academic research, many policymakers and academics have argued that International Capital can have a positive impact on economic growth. The question to be addressed in this research is: have the international capital real effect on the economic growth of Algeria during the period 1990-2018?

This study considered an important study for the future studies because it reached to useful findings and recommendations that can help the other authors to present new studies which study the same problem. This study showed its novelty by revealing the real impact of International Capital Flows on Economic Growth in Algeria, through four constant variables such as Foreign Direct Investment (FDI), official development assistance (ODA), personal remittances (REM) and external debt stock (EXTDS), and there was a process of data analysis on this basis, The results show that there is no significant impact of the International Capital Flows on Economic Growth in Algeria except the Foreign Direct Investment. based on the findings and recommendations, the Decision-Makers can use these recommendations that have been made for the sake of developing the country's economic sector and making improvements on personal remittances (REM) and external debt stock (EXTDS) and especially Foreign Direct Investment (FDI) which plays the most important role and the main factor in increasing the country's Economic Growth rates, reducing the Unemployment rate in it, improving the population's living situation and increasing the per capita share of (GDP) in the State. the study Work to clarify and study all trends and movements of international capital Flows and composing a clear summary showing the design of an effective theoretical framework for the variables of the current study and Investigating, concluding and presenting some

important and useful recommendations of direct evidence of the results of this study and submitting them to Decision-Makers.

## **1- REVIEW OF LITERATURE**

On the subject of the impact of International Capital on economic growth many studies are taken on consideration both theories and empirical, (Ekwe and Inyiama 2014) This study aims at empirically determining the extent to which foreign capital flows have impacted on the growth performance of the Nigeria economy from 1982–2012. From the results of the analysis, it was discovered that Foreign Capital Inflows had a positive and significant effect on economic growth as proxied by the GDP, which is an indication that foreign capital inflows exerted considerable influence as a key fiscal policy instrument of economic growth over the stated period. Also the Foreign Capital Outflow in the same vein had a positive and significant effect on the GDP, which is another indication that it exerted considerable influence as a key fiscal policy instrument of economic growth over the stated period. Furthermore, the openness of the economy, which was another explanatory variables used to ascertain the growth performance of the economy, had a positive and significant effect on the GDP. On the other hand, the Human Capital Development had a negative and insignificant effect on the GDP. The implication is that it did not exert much influence on economic growth over the stated period. Finally, the inflation rate had a positive sign with GDP. It was however; statistically insignificant which points to the severity of the inflationary pressure brought to bear on the economy over the stated period. The study concludes that policy on foreign capital flows should be vigorously pursued and enhanced to provide a buffer to the nations dwindling internally generated revenue (IGR) amidst an astronomically growing population.

(Makori, Kagiri, and Ombui 2015) study test the degree of Effects of External Capital on Economic Growth in Kenya furthermore Findings revealed that: FDI and GDP do not have a significant relationship; AIDS has a positive significant relationship with GDP;

while migrant remittances and GDP has a positive significant relationship.

(Ndambendia, Nkendah, and Njoupouognigni 2010) examine the relationship between FDI, AIDS and the economic growth of 36 African countries. Using a fixed-effects dynamic panel data model, they assert that there is a strong positive relationship between these external capital flows and economic growth. add to that, the study(Aga 2014)employs time series techniques to analyse the effect of foreign direct investment on economic growth in Turkey. Annual data used during the period 1980-2012. The gross domestic product (GDP) is the dependent variable and foreign direct investment (FDI), domestic investment (DIN) and trade liberalization (TL) are the explanatory variables. The result of Augmented Dickey Fuller (ADF) test hence shows that the series are non-stationary in the level form and stationary in the first difference. The result demonstrates that there is no causality linkage between GDP with both FDI and DIN. At the same time, there is one-way causality between GDP and trade liberalisation (TL) in the context of Turkey. On the other hand, it is found that there is statistically insignificant yet positive short run impact of foreign direct investment on gross domestic product (GDP) . In addition to this, there is a significant as well as positive impact of domestic investment on economic growth; however, there is negative and significant impact of trade liberalization on economic growth.

The study of (Okoro, Nzotta, and Alajekwu 2019) examined the effect of international capital inflows on economic growth of Nigeria for the periods 1986 to 2016, and employed four core channels of international capital inflows which includes foreign direct investment, official development assistance, personal remittances, and external debt stock and GDP growth rate . The result showed that international capital inflows have long run effect on economic growth of Nigeria Specifically that FDI and REM had significant positive effects on economic growth. However, EXTDS and ODA had no significant effects on economic growth. The study further showed that international capital is a powerful tool for boosting economic growth of Nigeria. The recommendations among others include that policy

makers should forthwith discourage the use of external debt and official development assistance in Nigeria.

Study (Sami & Mbah, 2018) about External Debt and Economic Growth: The Case of Emerging Economy, where revealed a negative and significant influence of external debt on economic growth in Oman. Further, gross fixed capital was found to be positively significant in determining growth performance in Oman. The study, therefore, recommends a more productive use of the external debt fund in order to affect positive growth.

The study (Guenouni& Ameer, 2020) aims to study the relationship between international capital movement and economic growth in Algeria during the period 1990-2018. The results found that there is a long-run relationship between FDI, migrant remittances, external debt, subsidies and economic growth with difference impact in short and long-run. We conclude that Algeria needs deep reforms in order to attract more foreign capital, especially to create an appropriate environment in order to contribute to economic growth.

Through our presentation of previous studies, we noticed that most of the studies, if not all of them dealt with one form of international capital flows and its impact on some macroeconomic indicators, the most important of which is economic growth. However, our study differs from previous studies, since we dealt with all forms of international capital movement (except for portfolio investment for the absence of data) and its impact on economic growth in one model.

### **1.1- International capital flows**

Several studies have used various terms to explain international capital inflow: external capital all these terms describes capital flows from abroad into the local economy for productive purposes. Capital inflow is the influx of external resources into the local of capital resources for the purposes of investment, trade and business production On the other hand, investment is the funds committed into economic activity with the hope of making benefits from future returns over a period of time By this assertion, reference (Ibenta 2005)

imply that investment is necessary for growth. The attraction of capital from abroad boosts local capital which is often insufficient in developing economies like Algeria. Thus, the link between capital and growth can be gained by developing countries when they engage in encouraging and sourcing capital abroad. Sources of these capitals can be from foreign direct investment which in this study includes foreign portfolio investment, official development assistance, remittances and even external debt stock, The link between these variables and economic growth is reinvestigated because external capital inflow is necessary and sufficient for economic growth in the less developed countries (Gupta and Islam 1983).

#### 1.1.1.1. Foreign direct investment (FDI)

The terms FDI and FPI involve the process of bringing in investors resources (money, material and man) from foreign countries into the local economy for productive purposes. A combination of FDI and FPI forms foreign private capital flows called foreign private investment. FDI is a foreign investment made so as to acquire a lasting management interest (for instance, 10% of voting stocks) and at least 10% of equity shares in an enterprise operating in another country other than that of investors' country (Danja 2012).

(Danja 2012) FDI is the direct transfer of technological know-how and managerial practices to the host country, unlike the Foreign Portfolio Investment (FPI) which is a mere change of ownership. FPI are further split between debt and equity investments and recently financial derivatives" has been added as part of portfolio investments. In addition, available data suggest that FDI flows tend to be more stable compared to Foreign Portfolio Investment (Lipseay 1999). The reason for this is that FPI has high liquidity and short time horizon because it can be traded in the financial market unlike the FDI that is in real assets. As well, the FDI inflow is hardly affected by the national exchange rate as the FPI.

And the Positive effects of FDI on economic growth can occur directly by increasing the stock of physical capital in the recipient country as foreign capital is accumulated indirectly by encouraging

human capital development and strongly boosting technological upgrading. According to (DeMello 1999), FDI leads to growth through two processes:

it increases total investment by attracting higher levels of domestic investment, through interaction of the more advanced technology with the host's human capital, FDI is more productive than domestic investment (Ewe-Ghee 2001). FDI not only boosts capital formation but also enhances the quality of capital stock (Ajayi and Khan 2000). Furthermore, FDI not only can increase the export capacity of the host country but also induces new job vacancies (Stamatiou and Dritsakis n.d.). FDI creates potential spillover of knowledge to the local labor force while at the same time, the host country's level of human capital determines how much FDI it can attract and whether local firms are able to absorb the potential spillover benefits (Adefabi 2011).

FDI can improve growth through increases in technology, assist in human capital formation, contribute to international trade integration, employment generation and growth, knowledge spillover and supplementing domestic savings among others (Barrell and Pain 1997; Görg and Greenaway 2004; DeMello 1999). All of the above benefits of FDI contribute to higher economic growth, which is an important tool for poverty alleviation.

On the other hand, the risk of capital flight has constituted a negative effect of FDI on the growth of an economy as observed by (Akinlo 2004) on the study of economic growth and FDI in Nigeria. (Kant 1996; Stiglitz 2000) also identified capital flight as detrimental to economic growth. Capital flight implies that investors exploit the host economy and transfers gains to the home economy thereby leading to reduction of capital in the host economy.

Foreign presence may furthermore reduce productivity of domestically owned firms especially in the short-run where there is no technology spillover whereas in the long-run, labor mobility may occur and lead to spillovers (Aitken and Harrison 1999), although if FDI is concentrated in a specific sector, it might not have spillover effects. FDI is therefore expected to complement domestic capital rather than replace it.

### 1.1.1.2. Foreign aid

Foreign aid is one of the foreign capital flows for developing countries. It is an official grant or loan received by a country (mostly developing) for the promotion of economic development, and growth. Foreign aid is a major source of capital (average of 53.8% of government expenditure of 50 aid dependent countries from 1975 to 1995) to the government (Svensson 1999). It mostly goes into an economy through the public sector and it is used for public expenditure in most cases. It is mainly known to be used more for consumption purposes rather than investment. Foreign aid affects the growth of an economy mainly through development projects and investment rather than consumption. Foreign aid is usually used to fill in gaps in the economy, such as the savings gap (S-I)<sup>1</sup>, which is a combination of the foreign exchange gap or external financing gap (X-M)<sup>2</sup> as well as the fiscal gap (G-T)<sup>3</sup>. The “two-gap” model specified in Easterly, as developed by (Chenery and Strout 1996), has been employed to explain the link between foreign aid and economic growth. This is shown as:  $g = (I/Y) / \mu$ ; and  $I/Y = A/Y + S/Y$ , where I = required investment; Y = output; g = targeted GDP growth; A = aid; S = domestic savings and  $\mu$  = Incremental capital-output ratio (ICOR). This model explains how foreign aid increases investment and how investment leads to increase in economic growth.<sup>4</sup>

This has also been used to explain foreign debt flows.(Lensink and Morrissey 2006) identified a number of mechanisms through which aid can contribute to economic growth, namely: “aid increases investment in physical and human capital stock; aid increases the capacity to import capital goods or technology; aid does not have

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<sup>1</sup> The savings gap is expressed as ‘S-I’ and refers to the difference between domestic savings (S) and domestic investment (I).

<sup>2</sup> The external financing gap is expressed as ‘X-M’ and refers to the difference between imports (M) and exports (X). This has to do with the interaction between countries on trade.

<sup>3</sup> The fiscal gap is expressed as ‘G-T’ and refers to the difference between government expenditure and government income (taxation).

<sup>4</sup> Refer to Easterly (2003) for a detailed account of this process.

indirect effects that reduce investment or savings rate; and aid is associated with technology transfer that increases the productivity of capital and promotes endogenous technological change". The general theory behind the aid-growth theory is that physical capital leads to economic growth. (McGillivray et al. 2006) identified four main alternative views on the effectiveness of aid which are:

- (i) Aid has diminishing returns.
- (ii) Aid effectiveness is influenced by external and climatic environments.
- (iii) Aid effectiveness is subjective by political situations.
- (iv) Aid effectiveness is dependent on the quality of institutions.

The transfer of aid might result in increase of national income drive the relative price of non-traded goods and increase the returns to factor in the non-traded sector. The consequence will be a real exchange rate appreciation, and a decrease in the output of the traded goods sector, as factors of production move into the non-traded sector. An appreciation of the real exchange rate will have a negative impact on the competitiveness of an economy.

#### 1.1.3. Remittances

There has been an increase in remittances over the years for developing countries. It is an expanding source of external finance which is a form of private capital that goes to individuals. Remittances are mostly driven by sound macroeconomic environment in recipient countries (Giuliano and Ruiz-Arranz 2009). They are positively correlated with macroeconomic performance (domestic savings, investment, higher real income growth and financial development).

Remittances generally help to develop financial markets, finance entrepreneurial activities, act as insurance against shocks, finance household expenditure and household human capital formation, and bridge savings and external financing gaps. It also has potential to be harnessed into long term bonds as diasporas bonds—the Diaspora Bonds Model (Ratha, Mohapatra, and Silwal 2009). This would lead to an increase in growth. The literature has grouped migrant remittances

into two main components, namely the endogenous migration approach and the portfolio approach (Barajas et al. 2009).

Migrant is concerned for the welfare of other family members therefore the migrant's consumption includes the consumptions of the other members of the household left behind in the home country. The portfolio approach isolates the decision to refrain from the decision to migrate, and as such does not take into consideration issues of family bonds. According to the portfolio approach, the migrant earns income and decides how to allocate savings between host- and home-country assets. Remittances from the portfolio approach therefore stem from the decision to invest in home-country assets. The portfolio view is a theory of remittances that supports the view that remittances behave like other foreign capital flows. The effect of remittances could also be negative on the economy if they lead to an appreciation in the exchange rate (Amuedo-Dorantes and Pozo 2004).

#### 1.1.4. The external debt stock (EXTDS)

The external debt stock (EXTDS) which is what the World Bank refers to as all unpaid portion of external financial resources which are needed for development purposes and balance of payment support which could not be repaid as and when due (Obademi 2013).

(Arnone, Bandiera, and Presbitero 2005). Generally, it is that portion of a country's debt that was borrowed from foreign lenders including commercial banks, governments or international financial institutions (Ajayi and Khan 2000).

### 1.2- Economic Growth

Economic growth can be defined as the increase of per capita gross domestic product (GDP) or other measures of aggregate income typically reported as the annual rate of change in real GDP (Pegkas 2015). Economic growth has generally been measured in terms of Gross Domestic Product (GDP) and Human Development Index (HDI) which is an index that measures national growth based on measures of life expectancy at birth, education attainment, literacy

and adjusted real per capita income (Okoro et al. 2019). The present study adopted GDP as proxy for economic growth.

In general, the literature shows that causality relations vary depending on the period studied, the econometric methods used, and the country. The results possibly will be bidirectional, unidirectional, or no causality relations may be present. Moreover, some studies find that there is an insignificant relation between International Capital and economic growth, and a small number of studies find a negative link between International Capital and economic growth. The greater part of studies, however, concludes that International Capital and trade have a positive significant relation with economic growth. Therefore, from the mentioned above, it is essential to examine the relationship between International Capital and economic growth.

## **2- METHODS**

### **2.1- Sample and data**

Through this part, we will try to answer the problem of this study by a standard study in order to measure the impact of foreign direct investments on the economic growth rates achieved in Algeria since its orientation towards a market economy and opening up to foreign markets in the early nineties, for the period between 1990-2018, considering that the year 1990 was the real beginning of the economic and financial reforms aimed at entering the market economy system, while the year 2018 was The study's stopping point is that it provides us with reasonable data and statistics on foreign direct investment and economic growth in Algeria. Accordingly, the ARDL model was used (and the data of the annual reports and bulletins for Algeria, issued by the Open Bank World), was used.

### **2.2- Model design**

The autoregressive distributed lag (ARDL) approach is a co-integration technique for determining long-run and short-run relationships among variables under study simultaneously and is introduced at first by (Pesaran and Shin 1999) and further extended. ARDL co-integration test is used because this method has a number of

advantages when it is compared to other alternatives such as (Engle and Granger 1987) and (Johansen 1988) procedures. First of all, it has more power and therefore recommended when sample size is small (Acaravci and Ozturk 2012). One other flexibility of the ARDL bounds F testing is its usability when not all variables have the same order of integration. Variables in the analysis may be I(0), I(1) or combination of both. The only basic condition for the integration order of the variables is order's being at most 1 (Acaravci and Ozturk 2012).

Model which specifies that international capital flows is significantly influenced the economic growth (GDP) is formulated as follows;

$$\text{Ln(TGDPt)} = \beta_0 + \beta_1 \text{Ln(FDIIt)} + \beta_2 \text{Ln(EXTDSt)} + \beta_3 \text{Ln(REMt)} + \beta_4 \text{Ln(AIDSt)} + \beta_5 \text{Ln(INFt)} + \epsilon_i$$

**TGDP:** Growth rate of real Gross Domestic Product used as an abbreviation for economic growth and the dependent variable in the model.

**FDI:** Foreign Direct Investment divided by GDP used as an abbreviation for Foreign Direct Investment  
**DEPT:** total external debt stock divided by GDP used as an abbreviation for external debt stock

**EXTDS:** The External Debt Stock

**REM:** Personal remittances divided by GDP used as an abbreviation for remittance.

**AIDS:** Official development assistance divided by GDP used as an abbreviation for Foreign Aid

**INF:** Inflation

$\beta_0$  is the constant while  $\beta_1$ -5 are the coefficients of the explanatory variables. The theoretical expectation of the study is that capital has positive effect on economic growth. The relationship is  $\beta_1 > \beta_2 > \beta_3 > \beta_4 > 0 < \beta_5$ . The econometric tools of data analyses were employed to estimate the model posed to examine the effect of international capital on economic growth of Algeria.

### 3- RESULTS AND DISCUSSION

#### 3.1. Stationarity test « Unite Root Test »

We will use the single root test, the Augmented Dickey-Fuller (ADF) stationarity test, whose application depends on the degree of delay, and the latter was determined with a degree of delay of zero based on the correlation function Partial self.

**Table 1.** The unit root test results for the selected variables in Algeria.

Variables	Levels		First Difference		Decision
	ADFC	PP	ADFC	PP	
TGDP r	-0.56	<b>0.43</b>	-8.90	<b>0.00</b>	i(1)
FDI	-7.36	<b>0.00</b>	-	-	i(0)
AIDS	1.89	<b>0.88</b>	-8.78	<b>0.00</b>	i(1)
REM	-0.83	<b>0.32</b>	-5.74	<b>0.00</b>	i(1)
EXTDS	3.46	<b>0.00</b>	-	-	i(0)
INF	-1.35	<b>0.12</b>	-7.94	<b>0.00</b>	i(1)

Source: Authors computation using Eviews10.

The order of integration of the variables is examined first. The stationarity tests is performed first in levels and then in first difference to establish the presence of unit roots and the order of integration in all the variables.

The results of the Augmented Dickey-Fuller (ADF) stationarity test in the table 1 indicate the FDI and EXTDS series is less than 0.05, and therefore the two series are stable at level I(0), and we also note that the probabilistic value (ADF) for the REM, AIDS and INF series is greater than 0.05, and from it the chains are unstable, while the probabilistic value (ADF) of the series of differences is less than 0.05. Thus, the series is stable at the first difference I(1). Also, the dependent variable TGDP is stable at the first difference. The results obtained from the stability study make it possible to apply the ARDL approach.

#### 3.2- ARDL Bounds Tests

(Narayan 2004) tabulated two sets of critical values, the upper bound critical values refers to the I(0) series, meaning that there is co-integration among the variables and the lower bound critical values to the I(0) series, meaning that there is no co-integration relationship

between variables . For some significance level, if the F-statistics falls outside the critical bound, a conclusive inference can be made without considering the order of integration of the explanatory variables<sup>20</sup>.

The ARDL bound test is based on the Wald test (F-statistic). When the computed F-statistic is greater than the upper bound critical value, we can reject the null hypothesis H<sub>0</sub> meaning that the variables are co-integrated. But If the F-statistic is less than the lower bound critical value, we cannot reject the null hypothesis H<sub>0</sub> meaning that there is no cointegration among the variables. When the computed F-statistics falls between the lower and upper bound.

**Table 2.** ARDL Bounds Test

Test Statistic	Value	k
F-statistic	3.328613	5
Critical Value Bounds		
Significance	<b>i0</b>	<b>i1</b>
10%	2.08	3
5%	2.39	3.38
1%	3.06	4.15

Source: Authors computation using Eviews10.

The results in table (2) suggest F value is above from upper and lower bound test at 10% level of significance so we can say that there is cointegration among variables. Overall, the bounds test results support the presence of cointegration relationship among the variables running from the independent variables to dependent variable which we assume by using bounds test to cointegration, we will go for examining the long-run relationship.

### 3.3. Long-Run Estimates

**Table 3.** Long-run Coefficients

Variables	Value	Prob
FDI	0.423917	0.0434
EXTDS	1.356201	0.2903
REM	-0.369450	0.5774
AIDS	-1.493890	0.1336
INF	0.051201	0.8789
c	-3.782802	0.4355
P( F-Statistique )=0.01		R2 adj= 0,58 DW= 2,05

Source: Authors computation using Eviews10.

From Table (3), we observe that the explanatory power of the model is good, where (as) the independent variables explain the dependent variable with 56%, and the rest is explained by other variables not included in the model, as there is no self-correlation between errors through the value of DW and the model is statistically acceptable because the P (F-Statistique) =0.01 < 0.05.

**Table 4.** Short-run error correction estimates.

Variables	Value	Prob
D(FDI)	0.266301	0.0202
D(EXTDS)	0.716211	0.1865
D(REM)	-0.372160	0.1402
D(AIDS)	-0.241624	0.6044
D(INF)	0.131478	0.4644
c	-0.981532	0.0000
EC = LNTGDP - (0.42LNFDI + 135LNEXTDS -0.36LNREM - 1.49LNAIDS + 0.05LNINF -3.78 )		

Source: Authors computation using Eviews10

As for the calculated Student statistic, it is shown to us that all parameters of the long-and short-term model variables are statistically insignificant except for foreign direct investment. The equilibrium correction coefficient The coefficient of ECM (-1)) is estimated as(-0.98) (0, 0000) for the model which is reasonably large .And imply that deviations from the long-term growth rate in growth economic are corrected by 0.98 percent over the following year (that mean the speed of adjustment is 98%) meaning that 98% of the disequilibrium due to the previous year's shocks is adjusted back to the long-run equilibrium in the current year. This means that the adjustment takes place relatively quickly, i.e. the speed of adjustment is relatively high.

As for the indication of the estimated parameters, we note that there is no difference between the short and long-run, where:

As presented, the long-term coefficients for the model results in table (4) show that in the long-run and the Short-run the foreign direct investment has a significant effect on growth economic and a one percent increase in this variable leads to 0.24% increase in growth economic in the Short-run and 0.48% in the long-run. Alternatively, a one percent increase in EXTDS leads to a 0.69% increase on growth

economic in the Short-run and 1.15% in the long-term. The results also show that a one percent increase in REM leads to a 0.35% decrease on growth economic in the Short-run and 0.36% in the long-run and we note also that a one percent increase in AIDS leads to a 0.22% decrease on growth economic in the short-run and 1.48% in the long-run. Alternatively, a one percent increase in INF leads to a 0.12% increase on growth economic in the Short-run and 0.04% in the long-run.

### 3.4- Model quality

In order to study model quality, we perform the following diagnostic tests:

**Table 5.** The results of diagnostic tests for model.

Heteroskedasticity ARCH Test			
H0: Contrast stability			
F-statistique	0.14	Prob F (1,25)	0.70
Breusch-Godfrey Serial Correlation LM Test			
H0: There is no problem with self-correlation regression equation serial residuum			
F-statistique	1.39	Prob F (2,14)	0.27
Nomality test Bera-Jarque			
H0: the residues are naturally distributed.			
Jarque-Bera	0.83	Prob	0.60
RAMSEY Reset Test			
H0: The MODEL is correctly specific			
F-statistique	0.27	Prob	0.61

*Source: Authors computation using Eviews10.*

Through the table (5), the results of the diagnostic tests of the model confirm the following:

The Heteroskedasticity ARCH Test indicates that the probability of Fisher is 0.7, which is greater than the level of significance, 5%, which causes us to accept the H0 that the remaining variance is constant.

Breusch-Godfrey Serial Correlation LM Test indicates that the Fisher probability of 0.27 is greater than the significance level of 5%, which causes us to accept the H0 that there is no serial self-correlation problem for the regression equation residues.

For a normal distribution of random errors, the probability of Jarque-Bera is 0.60. It is greater than the level of significance by 5%,

which confirms the acceptance of the null hypothesis that the remnants are naturally distributed.

Ramsey's test shows that the model does not have a problem with inadequate functionalities, indicating that the probability value is 0.61 which is greater than the significance level by 5%.

## **CONCLUSION**

This paper has examined the effect of International Capital flows in economic growth in Algeria over the period 1990–2018, using the auto-regressive distributed lag approach to co-integration analysis. Through the applied standard model, we found that all results were not statistically significant in the Short and long-run except for foreign direct investment.

We found that foreign direct investment positively affects on economic growth in the short and long-run, and this result is consistent with economic theory and previous empirical studies like (Ekwe and Inyama 2014) That aims at empirically determining the extent to which foreign capital flows have impacted on the growth performance of the Nigeria economy from 1982–2012. From the results of the analysis, it was discovered that Foreign Capital Inflows had a positive and significant effect on economic growth as proxied by the GDP. For Algeria, most of these foreign investments go to the hydrocarbon sector, which is the primary source of economic growth.

As for the external indebtedness, which we found to have a direct relationship with economic growth in the long and short run, this shows the role that this indebtedness played in economic transformation and structural change, especially in the 1990s.

Due to the significant decrease in fuel prices, although they were not used entirely in the development of the economy.

As for migrants' remittances, they were inversely related to economic growth. Because these financial transfers are mostly through informal channels, in addition to converting them directly to demand for imported goods, which negatively affects economic growth. The lack of sound economic and financial foundations may explain the absence of the effect of migrant remittances on economic

growth (remittances of Algerian migrants do not exceed 2 billion \$ annually, and 60% of which are transferred informally) that different with study of (Makori, Kagiri, and Ombui 2015) test the degree of Effects of External Capital on Economic Growth in Kenya, that found Migrant remittances and GDP has a positive significant relationship.

The inverse relationship between external subsidies and economic growth shows that these subsidies are not directed to economic sectors, but rather are provided by some international organizations to specific groups of the population, and that most of them are not capital, that different with study of (Ndambendia, Nkendah, and Njoupouognigni 2010) examine the relationship between FDI, AIDS and the economic growth of 36 African countries. Using a fixed-effects dynamic panel data model, they assert that there is a strong positive relationship between these external capital flows and economic growth.

For inflation, we found that according to economic theory, there is a positive relationship between it and the economic growth, as rising domestic commodity prices (especially after reducing the amount of imported goods) stimulate investors to increase production, although it is not covering the national market.

In light of our results, it can be said that Algeria still needs to attract more foreign capital, especially after the drop in oil prices in 2020 and in light of the covid-19 pandemic, and this will only be by creating an appropriate environment for these resources and working to direct them to all economic sectors. In addition to not only relying on foreign direct investment, but also working on how to attract all forms of foreign capital movement, such as migrant remittances.

In light of this study, officials should:

- Reconsider the fiscal system in order to motivate more foreign investors.
- Actual and comprehensive reform of the financial system should be the first interface for attracting foreign capital, with the opening of branches of national banks abroad to facilitate the process of transferring immigrant money.
- Repeal rule 51/49 in all sectors and keep it in strategic national sovereign sectors such as hydrocarbons.

- Government should provide adequate and needed infrastructure like roads, Electricity and even tax holidays to technologically advanced economies which are mostly the custodians of FDIs.
- The policymakers must facilitate the process to encourage investors to do their business.
- Strengthen fiscal management and improve the planning and budgeting of public expenditure to curtail abuse and misallocation of resources.
- Developing the national fabric of small and medium enterprises, so that foreign investments find institutions to work with in the framework of subcontracting.
- Develop plans, programs, investment maps and information bases and make them available to the foreign investor to be a tool for the state through which it clarifies its foreign investment objectives.
- Benefiting from the successful experiences of developing countries in attracting foreign investments.

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