

FUNCTION OF HUMAN CAPITAL TO INWARD FOREIGN DIRECT INVESTMENT (FDI) IN ALGERIA

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Abstract

This study investigates the role of Human Capital (HC) to inward Foreign Direct Investment (FDI) in Algeria and the ways to improve it and used annual time series secondary data over the period of 2000-2019. The literature determines the importance of HC, determinants of FDI and the relationship between HC and inward FDI in Algeria. A multiple regression model is employed to estimate the relationship between the role of HC and inward FDI in Algeria. Accordingly, the research considers inward FDI as a dependent variable and HC, corruption and bureaucracy, inflation, political situation, GDP, infrastructure and natural resources as independent variables. The natural resources are used as dummy variable. The regression results indicate that the HC, corruption and bureaucracy, political situation have a positive significant effect on inward FDI in Algeria but HC played an important role than the others to attract FDI in the country.

Keywords: Inward FDI, Human Capital, Algeria, GDP Growth, Inflation, Political Situation.

Introduction

FDI is one of the most essential factors and sources of development in all parts of the world for its effective role in the transmission of technology and modern technologies and subsidize to the accumulation of money and raise the competence of human capital and advance skills and expertise, increase production and the elimination of unemployment. The main objective of this research is to determine the role of human capital to attracting FDI in Algeria and the role of HC in the evaluation, monitoring, selection, management of risks. To identify the key factors that affects the efficiency of the role of human capital. The issue of human capital management is one of the most essential topics that all decision makers, planners and administrators are always interested in, because the human factor is the real factor and the main source of growth and development of institutions.

However, in the era of fierce competition, growing variables and huge technological, developments, normal performance of human capital is not enough to cope with change and increased competition. So, it is attempted to identify the evaluation of human capital and the evolution of FDI in Algeria. The planning strategy of both organizations has main role for assurance of professional integration for that the absence of competent administrative staff and the insufficiency Human Resources will impact negatively the high level performance of workers [1]. [2] research showed human element as an input strategy and an optimal mechanism in the management of human resources. The interest in human resources management has an effective role

in the Chinese economy by treating human resources as regulatory capital [3] the importance and significant impact of human resources as mean to ensure the success of the work and objectives of any economic institution. According to [4] the diagnosis and management of human resources through the identification of a representative sample of Algerian economic institution, has been required to review the methods of human resources management. [5] explained the effect of country risk to inward FDI to Algeria during the period time from 1990 to 2012, where these country risks consist of three elements economic risk, political risk, the financial risk. [6] found determinants of FDI in Africa, which included of accumulation economies, natural resources, and real GDP growth, and international investment agreements. [7] the human capital and self-efficacy could positively influence their performance has incorporated new funding. He has analyzed human capital in two aspects one as the structure of production other as engine of growth, have totally confirmed that economic growth is mostly related with high levels of human capital. According to [8] the factors as infrastructure development and a higher return on capital can attract FDI to non-Sub-Saharan Africa nations. [9] concluded that the factors, economic growth, the openness of the economy, international reserves and natural resource have a direct impact on attracting FDI. According to [10] the bilateral investments treatments (BITs) that provide the best protection for investors attracted FDI compared to an agreement with less stringent standards, bilateral investments treatments could attract FDI in the United States much more than those in Japan, China, and Organization for Economic Cooperation and Development (OECD) countries.

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The research can also help Algerian government to focus more on human capital performance to create a favorable environment to increase inward FDI and to improve local companies' efficiency by adaptation new technical of human capital. The accounting system of personal banking sector is within the primitive stage. They need separate AIS department [13]. Despite its bottlenecks, microfinance has the maximum potential to uplift the poorest sections of society and playing the substantial role in empowering the women in India [14]. The analysis of listed trading companies show that debt ratio is negatively correlated with all financial performance measures Gross Profit (GP); Net Profit (NP); Return on Equity (ROE) and Earnings Per Share (EPS) similarly debt-equity ratio (D/E) is negatively correlated with all financial performance measures except GP and only (D/E) ratio shows significant relationship with NP [15]. Its liquidity and suitability and in contrast with the market's chief and to a comparative customary firm, the overwhelming financial emergency, new organizations can endure and develop and this is an idealistic message towards experts and strategy creators the same [18].

Research Design

In this research is used multiple-regression model for the estimation of a time series data which take period from (1997-2019) because the data is fully available and quite enough for statistical inference. The economic research analyze has been taken both the dependent variable which is Foreign Direct investment and independent variables which are human capital, natural resources, infrastructure, political situation, corruption and bureaucracy, inflation, and GDP. The data is annual time series and collected from internal sources are Algeria Investment Authority, Ministry of Finance, National Center of Informatics and Statistics of Algeria (CNIS), and Bank of Algeria, Algeria National Agency for Promotion of Investment Authority.

Econometric Model

In general, inward FDI takes the models;

$$IFDI = X^n\alpha + \varepsilon \quad \dots (1)$$

Where, inward FDI is a function of n vector of exogenous variables (x) with (β) coefficient and (ε) the regression error term. Both the dependent and independent variables presented in the form of logarithmic transformation except for the variable

considered to be a dummy variable. Accordingly, the economic model is described in the form of;

$$IFDI = \beta_0 HC^{\beta_1} INFRA^{\beta_2} PST^{\beta_3} INFL^{\beta_4} GDP^{\beta_5} NR_t^{\beta_6} CR_t^{\beta_7} \varepsilon \quad \dots\dots (2)$$

Where, HC is the human capital, INFRA is the infrastructure, PTS is the political situation, INFL is the inflation, NR is the natural resource, CR is the corruption and bureaucracy, ε is the regression error term and t is the time in terms of year.

The research is used E-views version (8) software to estimate the model of ordinary least squared (OLS) techniques.

Log FDI = Net inflows in million US dollar, Log HC = Human Capital (Human development index), Log INFRA = Infrastructure, Log INFL = Inflation (Annual growth rate of the GDP), Log PST = perception of the likelihood that the government will be destabilized (measured in index), Log GDP = Gross Domestic Product (measured by million USD), Log CR = Corruption, NR = Natural Resources, B0 = intercept or constant amount. $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = coefficients of the explanatory variables to be estimated, T = time factor and ε = the stochastic error term.

Result and Discussions

Unit root test is done at level and difference on all variables using Augmented Dickey-Fuller (ADF) to ensure the stationary of data and to determine the order of integration. Thus, non- stationary data will result in spurious result.

The null hypothesis is rejected and the alterative hypothesis is accepted for the trace statistic (t-statistic) is greater than the critical value and the probability is less than 5 percent at the difference. Thus, the null hypothesis assumes that there is unit root in the variables and it is rejected.

Following the above result, it is important to indicate or found the presence of long-run relationship between inward FDI (the dependent variable) and the independent variables. Prior to the co-integration test, SBIC-Schwartz Bayesian Information Criterion is applied to identify the model lag length since lag length is essential to run the co-integration test and to determine the long-run association between the dependent and the independent variables, table 1 shows lag length of the model.

**Table1:Lag Length of the Model
VAR Lag Order Selection Criteria**

Lag	Log L	LR	FPE	AIC	SC	HQ
0	94.99102	NA	3.56e-13	-8.799102	-8.450596	-8.731070
1	232.2786	164.745*	7.26e-17*	-17.62786*	-14.83981*	-17.08360*

* indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error, AIC: Akaike information criterion SC: Schwarz information criterion HQ: Hannan-Quinn information criterion.

Once the model lag length is determined, it is possible to run the co-integration test to see the long-run association between the dependent and the independent variables. According to the Johansen test, there are at least four co-integrated

equations. Thus, there is a co-integration between the dependent and independent variables. This meant that there is a long-run association between the dependent and the independent variables.

Table 2: Johansen's Co-Integration Rank Test, Trace

(adjusted): 2000 2019

Included observations: 19 after adjustments

Trend assumption: Linear deterministic trend

Series: INIFDI INHC INCR ININFL INPST INGDP
ININFRAINNR

Lags interval (in first differences): 1 to 1

Unrestricted Co-integration Rank Test (Trace)

Hypothesis	d	Trace	0.05
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No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.983069	189.7250	95.75366	0.0000
At most 1 *	0.921623	112.2317	69.81889	0.0000
At most 2 *	0.767969	63.85345	47.85613	0.0008
At most 3 *	0.707765	36.09667	29.79707	0.0082
At most 4	0.484035	12.72291	15.49471	0.1254
At most 5	0.007879	0.150300	3.841466	0.6982

Trace test indicates 4 co-integrating Eqn (s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (2000) p-values

Residual Diagnostics Test

To avoid unreliable results and error conclusion the variables are tested for the presence of serial correlation or not. Presence of serial correlation opens a door to draw unreliable result from other test. The serial correlation LM test for the model

indicated that the probability is greater than 5 percent (12.98 percent). The null hypothesis assumes that there is no serial correlation in the model. The null hypothesis is accepted and the alternated hypothesis is rejected, (Serial Correlation LM Test shows in table 3).

Table 3: Serial Correlation LM Test

Breusch-Godfrey	Serial	Correlation	LM	Test:
F-statistic	1.448374	Prob. F(2,12)		0.2732
Obs*R-squared	4.083446	Prob. Chi-Square(2)		0.1298
R-squared	0.194450	Mean dependent var		0.000445
Adjusted R-squared	-0.342584	S.D. dependent var		0.177711
S.E. of regression	0.205914	Akaike info criterion		-0.025191
Sum squared resid	0.508806	Schwarz criterion		0.422461
Log likelihood	9.264507	Hannan-Quinn criter.		0.071961
Durbin-Watson stat	2.210828			

The presence of Heteroscedasticity is checked since the presence of Heteroscedasticity in the model invalid at statistical significance. The Heteroscedasticity test indicated that the probability is greater than 5 percent (34.78 percent). This meant that the model had no Heteroscedasticity and it is acceptable. The null

hypothesis assumed that there is no Heteroscedasticity in the variables and it is accepted but the alternative hypothesis is rejected. Therefore, the model is acceptable based on the Heteroscedasticity test and shown in table 4 Heteroscedasticity test.

Table 4: Heteroscedasticity Test

Heteroscedasticity Test: Breach-Pagan-Godfrey

F-statistic	1.104079	Prob. F(7,13)	0.4155
Obs*R-squared	7.829760	Prob. Chi-Square(7)	0.3478
Scaled explained SS	2.542310	Prob. Chi-Square(7)	0.9239
R-squared	0.372846	Mean dependent var.	0.030078
Adjusted R-squared	0.035147	S.D. dependent var.	0.037255
S.E. of regression	0.036594	Akaike info criterion	-3.495512
Sum squared resid	0.017409	Schwarz criterion	-3.097598
Log likelihood	44.70287	Hannan-Quinn criter.	-3.409154
F-statistic	1.104079	Durbin-Watson stat	1.744430
Prob(F-statistic)	0.415507		

Pair-Wise Correlation Analysis

The correlation result of this research revealed that coefficient ranging from negative one to positive one. If the coefficient is near to one, the relationship between the variables is strong. Similarly, if the coefficient is far from one, the relationship between the variables is weak. Accordingly, human capital, inflation,

infrastructure, inward foreign direct investment (IFDI) had strong positive relationship with GDP. In table 5, Pair-Wise Correlation Analysis shown for inflation, political situation, human capital has strong negative relationship with GDP which has also strong support from literature. On the other hand, human capital with inflation, infrastructure with political situation, GDP with inflation,

corruption and bureaucracy with infrastructure, infrastructure with political situation, corruption and bureaucracy with GDP, human capital with

natural resource had negative weak relationship, while corruption, political situation, GDP and natural resource have weak positive relationship.

Table 5: Pair-Wise Correlation Analysis

	Log IFDI	Log HC	Log CRB	Log INFL	Log INFRA	Log PST	Log GDP	NR
Log inward FDI	1							
Log Human Capital	0.68	1						
Log Corruption and Bureaucracy	0.26	-0.12	1					
Log Inflation	0.52	0.95	-0.18	1				
Log Infrastructure	0.39	0.78	-0.12	0.78	1			
Log Political Situation	-0.58	-0.73	0.03	-0.61	-0.28	1		
Log GDP	0.72	0.96	-0.11	0.88	0.70	-0.74	1	
Natural Resource	0.40	-0.12	0.38	-0.36	-0.32	-0.14	0.01	1

Since the research used multiple regression equation it is also essential to conduct normality test to ensure the error term distribution. The error term required to be normally distributed with constant variance and mean zero. The normality test indicated that the probability is greater than 5 percent (76.7 Percent). This meant that the error term is normally distributed and the model is acceptable. Thus, the null hypothesis is acceptable and the alternative hypothesis is rejected since the null hypothesis assumed that the error term is normally distributed. This is also approved by Jarque Bera which had a probability value 52.96 percent that indicated the error term is normally distributed. The Ramsey's regression specification error test (RESET) is carried out for model specification and the test showed that there are no omitted variables i.e. $[F(7, 13) = 0.055, p > 0.05]$.

This meant that the model specification is fitted well. Thus, the null hypothesis assumed that there are no omitted variables and the null hypothesis could not be rejected at 5 percent significant level but the alternative hypothesis is rejected.

Multiple Regression Analysis

The regression results revealed that the statistics i.e. the F-statistics is 6.25. This means that the F-statistics is statistically significant at 1 percent level. This meant that all the variables i.e. the independent variables collectively described 54.4 percent of the total variations of the inward FDI in Algeria. Since the model had a trend of 17.21674, inward FDI in Algeria augmented with a constant factor without all the variables in the model approximately equal to the trend i.e. 17.21674, Regression Results are given in table 6.

Table 6: Regression Results

Dependent Variable: IFDI
Method: Fully Modified Least Squares (FMOLS) Sample (adjusted): 1998 2019
Included observations: 20 after adjustments Co integrating equation deterministic: C
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.21674	4.42	3.88	0.0022

Log human Capital	24.55***	7.91	3.10	0.0092
Log corruption and bureaucracy	0.096**	0.03	2.85	0.0144
Log inflation	-2.42	1.41	-1.70	0.1133
Log infrastructure	-0.045**	0.01	-2.64	0.0213
Log political situation	1.44**	0.59	2.41	0.0324
Log GDP	0.038	0.50	0.07	0.9400
Natural Resourcee	0.63	0.53	1.17	0.2623
R-squared	0.712070	Mean dependent var.	9.067384	
Adjusted R-squared	0.544111	S.D. dependent var.	0.304415	
S.E. of regression	0.205540	Sum squared resid	0.506958	
Durbin-Watson stat	2.176364	Long-run variance	0.011921	

Note: * $p < 0.05$, ** $p < 0.01$, $F(7, 13) = 6.25$, $p = 0.0025$

The log of human capital is statistically significant at 1 percent significant level ($p < 0.01$). The coefficient of log human capital is positive (24.55) and the corresponding probability is 0.0092, is significant. The results show that human capital is essential for inward FDI in Algeria, and human capital and inward FDI has positive relationship. One percentage increase in human capital results in increases inward FDI by 24.55 percent. The level of education and skills are considered by foreign investors to make an investment decision in a specific country. Some important tables and figures are given in appendix for the help of future research and these figures also guide about the present and past information for Algerian government.

Conclusion

This research basically explores the relationship between human capital and inward FDI in Algeria. Human capital is often use for education (knowledge, skills, abilities, ideas etc.), health, and other human capacities that enable to increase productivity. The Johansen's co-integration test revealed that there are at least four co-integration equations and all dependent and independent variables are move together to achieve the long-run equilibrium and there are long-run association between dependent and independent variables. The residual diagnostic test showed that the model is free from serial correlation and Heteroscedasticity. The regression result indicated that human capital, corruption and bureaucracy, political situation have a positive effect on inward FDI but human capital

is played a significant role to attract FDI in the country. The results imply that the presence of well-developed human capital in the Algeria is one of the basic requirements for potential investors to make an investment decision and has a direct impact on the volume of inward FDI.

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