

Factors of FDI and their Impact on the Moroccan Economy: An Empirical Investigation Using the ARDL Approach

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Abstract

Foreign direct investment (FDI) has gained importance in recent years as an essential component of economic growth. This work has a dual focus: on the one hand, it aims to identify the main determinants of FDI in Morocco, and on the other, it attempts to measure the effect of FDI on the Moroccan economy over the period 1990-2020. We have adopted an approach using the Autoregressive Staggered Lag (ARDL) model, as proposed by Pesaran et al. (2001). The main findings of this study indicate that high economic performance, well-trained human capital, economic stability, market size, and trade openness are the main determinants of FDI. FDI has a positive and significant effect on the Moroccan economy in both the short and long term.

Keywords: foreign direct investment, economic growth, Morocco, cointegration, ARDL approach

1. Introduction

With the increasing globalization of markets, companies have developed various strategies for doing business internationally, giving rise to a number of activities, including foreign direct investment (FDI).

Foreign direct investment (FDI) has grown since the early 1990s, thanks to globalization and the contribution of multinational companies (Mucchielli & Puech, 2003). The end of international détente has created an opportune geopolitical environment that has contributed to this trend. Foreign direct investment (FDI) is increasingly seen as a preferred method of financing development, as it brings in funds, reduces the need for borrowing, generates jobs, transfers technology, and provides direct management and organizational skills. It also helps to increase tax revenues and improve the quality of the workforce (Husain & Wang, 1996; Samata & Dzaka-Kikouta, 2013). Foreign direct investment (FDI) plays a key role in the growth of developing country economies, particularly emerging economies such as Morocco, and has grown significantly as a source of finance. Therefore, it is of crucial importance for policymakers and economic actors to understand the determinants influencing FDI and assess its impact on the Moroccan economy.

FDI is defined by the OECD as an activity in which an investor from one country obtains an interest in and influence over the management of an entity resident in another country (Dihissou, 2017); we mean foreign direct investment. In order to qualify as foreign direct investment (FDI), a company must be created from scratch or undergo mergers and acquisitions to change ownership. The IMF defines a “direct investor” as a person making a cross-border investment to acquire a long-term interest in a foreign company, with the objective of forming a strategic partnership and influencing its management, known as a “continuing interest”. If the investor holds more than 10% of the voting rights, this proves the existence of such an interest.

The results of empirical research that has attempted to confirm the influence of FDI on the economies of host countries. The contribution of spillovers and the transfer of know-how, as well as the positive correlation between FDI and economic performance, have been supported by many authors (Djankov & Hoekman, 2000; Osei & Kim, 2020; Rakhmatillo et al., 2021; Saidi et al., 2020; Wang & Wang, 2022). On the other hand, other studies have highlighted a negative and weak causality, due to the more advanced technologies made available by foreign capital (Bakari & Bouchoucha, 2021; Gouloungou-Mpira, 2022; Shittu et al., 2020; Vukmirović et al., 2021).

Empirical research on foreign direct investment (FDI) suggests the existence of numerous variables explaining the attractiveness of FDI, but in the end, no clear consensus has emerged. These variables can be linked to

industrial factors such as transport costs, location costs, labour costs, technological advantages, clusters of activities, etc. They can also be linked to commercial factors, such as the cost of doing business in a country. They can also be linked to commercial factors such as market size, proximity to demand, barriers to trade, and membership in an integration zone. Lastly, institutional factors such as fiscal or trade policy, legislation on capital repatriation or capital movements, country risk, and the business climate also play a role (Alaya et al., 2010).

Foreign direct investment (FDI) flows have increased significantly, rising from around \$202 billion in 1990 to \$331 billion in 1995 and reaching \$1,430 billion in 2017. However, the geographical distribution of these investments remains unbalanced, amounting to \$2.8 billion in 1990, \$9.6 billion in 2000, and \$42 billion in 2017, with a considerable increase in Africa. The percentage of FDI going to developing countries has increased spectacularly over the last few decades. It represented a fifth of all investment flows in the 1990s (Zumbu & Sumata, 2020), but if middle-income countries are included, these resources now account for almost 50% of global FDI flows. This good growth is due to their wealth in natural resources and the gradual establishment of socio-economic stability (Asiedu, 2006). Since the 1980s, Morocco has been committed to boosting its economy and strengthening its integration into the international economy by adopting incentive measures and reforms aimed at improving the incentives for foreign direct investment (FDI). Morocco has implemented a number of reforms as part of its structural adjustment program to improve the business environment and attract more foreign investment. This has been achieved by putting in place the necessary conditions to increase their attractiveness, adopting specific urgent measures, and implementing policies to liberalize economic activities and open them up to the outside world. In this study, we have opted for an analytical approach based on Model-Based Regression Analysis (MBRA) to examine the variables that affect foreign direct investment (FDI) and how it affects the Moroccan economy. ARDL is a powerful econometric method that allows both short-run and long-run relationships between variables to be considered, providing a more comprehensive and robust analysis.

Our main objective is to identify the main factors influencing foreign direct investment (FDI) flows in Morocco. Using recent and reliable economic data, we will assess the impact of these factors on FDI inflows into the country. In addition, we will seek to quantify the impact of FDI on the Moroccan economy. A thorough understanding of these effects will help guide economic policies aimed at promoting FDI and maximizing its benefits for the Moroccan economy.

This paper is organized as follows: We will first assess a theoretical and empirical overview in Section 1. Then, in Section 2, we will describe the model and approach used as well as the data used. The results of our econometric estimations will be presented and discussed in Section 3, and we will conclude this study in Section 4.

2. Literature Review

2.1 Review of Theoretical Literature

Since the 1980s, economists have developed theories to understand the relationship between foreign direct investment (FDI) and economic growth. Hymer's vertical integration theory, for example, explains that companies engage in FDI by focusing on their internal advantages rather than on local factors. This allows them to manage the costs and risks associated with expanding abroad, while benefiting from the advantages offered by the host country. This theory is often used to explain FDI in the context of the globalization of value chains (Paul & Feliciano-Cestero, 2021). Dunning's OLI paradigm represents an analytical framework that explains how companies mobilize their resources to invest abroad, based on three key dimensions: ownership, location, and internal competitive advantages. However, some studies question its applicability for companies in emerging economies and for virtual FDI models such as Google, Uber, Airbnb and bitcoin. Although the OLI paradigm is widely used in FDI research, it needs to be revised to take into account the specific situations of multinationals operating in emerging economies and new generation FDI models (Paul & Feliciano-Cestero, 2021). According to Vernon's Product Life Cycle (PLC) theory, companies begin by exporting their products before embarking on direct investment abroad. Complex innovations are first developed for the domestic market, and then gradually introduced in developed and developing countries. This theory is frequently used in studies of foreign direct investment (Paul & Feliciano-Cestero, 2021). According to this theory, investment in research and development (R&D) and the recruitment of qualified personnel are necessary for the production of a product. Technology and consumer demand have an impact on the three stages of production: introduction, development, and decline. Advanced companies seek foreign direct investment to protect themselves from their competitors. During the decline phase, production becomes less profitable, and companies seek to establish themselves in countries

where labour is cheaper in order to remain competitive (Chebh & Noureddine, 2022). This theory was the first to provide a dynamic explanation of the link between world trade and foreign direct investment (Amel, 2020). Vernon's theory states that a company can gain an economic advantage by locating in a country where it possesses technology superior to that of local companies (Gouloungou-Mpira, 2022). Institutional theory has been widely used to understand organizational structures and behaviour. Researchers have emphasized the importance of choosing appropriate organizational forms, taking account of the environment (Child, 1997; Eisenhardt, 1988). Several studies have applied institutional theory to explain the strategic choices of emerging companies in developing countries (EMNE) (Meyer, 2004). These imbalances in the distribution of foreign direct investment are influenced by environmental and socio-cultural factors. Improved capabilities can be achieved through government changes, market reforms, educational improvements, and socio-cultural changes. A country with a population open to different business cultures may be more attractive to foreign investors (Paul & Feliciano-Cestero, 2021). The theory of resources and capabilities (RBV) examines how internationalization can provide companies with a competitive advantage, focusing on internal resources, in particular intangible assets such as intellectual property and reputation, to create a sustainable competitive advantage, especially in developing countries (Paul & Feliciano-Cestero, 2021). Furthermore, the theory of comparative advantage explains that each country has its own advantages, such as specific resources or a favourable geographical location, which can be used to attract foreign investment (Chebh & Noureddine, 2022). Finally, André Gunder Frank's 1966 theory of dependence argues that FDI can worsen the economic dependence of developing countries by encouraging the import of technology and finished products from advanced economies, which limits their ability to produce and export higher value-added goods. In addition, FDI can lead to a concentration of wealth within multinationals, which reduces the opportunities for local companies and workers to improve productivity. This theory challenges the liberal idea that FDI is beneficial for all, while the neo-Marxist school argues that transnational corporations and developed nations exploit developing countries (Soussane & Mansouri, 2019).

2.2 Review of Empirical Literature

The relationship between Foreign Direct Investment (FDI) and economic growth sparks debates within the business world. Recent empirical studies covering various countries and regions have sought to evaluate the impact of FDI on growth.

For instance, Yeboua (2021) analyzed the relationship between FDI and growth in 27 African countries from 1990 to 2017. The findings suggest that FDI stimulates economic growth only in countries that have reached a specific institutional level. Vukmirović et al. (2021) studied forecasts regarding FDI, GDP, unemployment and global competitiveness in Serbia, highlighting the importance of FDI. According to (Ngakoli, 2020), FDI needs to reach at least 10% of Congo's GDP to drive growth. Shittu et al. (2020) suggest that FDI has a positive impact on growth in West Africa. Works by (Rakhmatillo et al., 2021; Saidi et al., 2020) indicate a bidirectional relationship between FDI and economic growth. Oseiand Kim (2020) demonstrate that FDI promotes growth, but this effect diminishes when the private credit/GDP ratio exceeds 95.6%. Empirical evidence shows that FDI contributes to growth in Tunisia (Hassen & Anis, 2012). Odhiambo (2022) observes a unidirectional link between growth and FDI in Kenya, attributable to economic growth and prudent policies. Nguyen (2020) asserts that FDI positively impacts growth in Vietnam in parallel with international trade. A study on ECOWAS reveals that human capital and FDI influence growth (Dankyi et al., 2022). However, Bakari and Bouchoucha (2021) note a negative short and long-term effect of FDI on growth in Tunisia. The links between FDI and growth are strong and positive in the Maghreb (Amel, 2020).

Emerging countries consider FDI to stimulate their growth, but the impact varies. Zumbu and Sumata (2020) identify key determinants of FDI: domestic investment, economic openness, and macroeconomic stability. Yeboua (2021) affirms that FDI encourages growth in institutionally developed countries. Wogbe (2014) shows that FDI significantly contributes to growth in the Philippines when human capital grows. Solomon (2011) notes the influence of economic development, human capital, and political context on the FDI-growth relationship. Li and Liu (2005) highlight the interaction between FDI and human capital in the development of LDCs. Lo (2020) demonstrates that financial development strengthens the impact of FDI in Sub-Saharan Africa. Asiamah et al. (2019) identify the main determinants of FDI in Ghana as GDP and electricity generation, while the inflation rate has no effect on FDI.

In Africa, good infrastructure, low inflation, and a favorable investment environment favor FDI (Asiedu, 2006). Abdel-Gadir (2010) noted that large markets attract FDI to MENA. The policy of attracting FDI in Africa involves major determinants like capital formation, trade openness, and education (empirical study on 53 African economies, 1984-2018), nevertheless, factors such as inflation, GDP per capita, capital openness, and private

sector credit stand as the primary obstacles to attracting Foreign Direct Investment (FDI) in the region (Ajide & Lanre, 2022). Rogmans and Ebbbers (2013) identify GDP per capita and trade openness as influencing factors of FDI in MENA.

In Morocco, FDI related to high economic performance and significant exports are observed, but imports have a negative effect (Belhaj, 2021). In the same context, Azeroual and Cherkaoui (2015) demonstrate that the main determinants of long-term FDI in Morocco are factors such as human capital, infrastructure, and gross fixed capital formation (FBCF). However, trade openness, institutional quality, and private sector credit have unexpected negative impacts, while the real GDP variable is not significant in measuring FDI. In Algeria, the degree of economic openness, GDP per capita, and enrollment rates impact long-term FDI (Farida & Lila, 2022). For the DRC, GDP and inflation are not determinants of FDI (Jean, 2022).

3. Data and Methodology

3.1 Data

The data for this study were mainly collected from institutions like the World Bank's World Development Indicators, the International Monetary Fund (IMF), the Moroccan Office of Foreign Exchange, the United Nations Conference on Trade and Development (UNCTAD), the Moroccan Ministry of Economy and Finance, and the Moroccan Office of Statistics (HCP). These data, which are annual, cover the time span from 1990 to 2020 for Morocco. In our model, we're using the Gross Domestic Product (GDP) in current US dollars for the year 2015 as the measure of the country's economic activity.

Net Foreign Direct Investment (FDI) flows are presented as a percentage of GDP and serve as an indicator for net foreign investments. Our basic model also integrates the following control variables, which have been proven empirically to impact economic growth and represent important factors for drawing foreign investments: Infrastructure, assessed by electricity consumption per capita in kilowatt-hours, serves as an indicator of infrastructure availability. According to economic literature, this variable correlates positively with economic success and plays a role in attracting foreign businesses (Asiamah et al., 2019; Asiedu, 2006; Kariuki, 2015; Saidi et al., 2020). Level of financial development, measured by private credit extended by banks as a percentage of GDP, is a significant gauge for evaluating the host country's financial system and is an important factor for foreign businesses. Several empirical studies highlight the importance of this financial development level as a determinant of foreign flows (LO, 2020; Osei & Kim, 2020). Market size, quantified by real GDP per capita, reflects the significance of the studied economy and plays a pivotal role in attracting FDI (Abdel-Gadir, 2010; Asiedu, 2006; Farida & Lila, 2022; Haile & Assefa, 2006; Rogmans & Ebbbers, 2013). Human capital is evaluated based on government spending allocated to education, expressed in millions of Moroccan dirhams. This variable holds particular importance for host countries, given the crucial role of human resources in rapid growth and attracting new investors. Empirical literature supports human capital as a major factor in attracting foreign investments (Li & Liu, 2005; Solomon, 2011; Wogbe, 2014). Trade openness, evaluated by the sum of goods and services exports and imports as a percentage of GDP, is included as a control variable due to its symbiotic relationship with Foreign Direct Investment (FDI). Trade openness makes market access easier, enhances the country's global reputation, and triggers diversification and network effects, thereby lowering transaction costs for foreign investors. This variable is a significant gauge for FDI attractiveness (Ajide & Lanre Ibrahim, 2022; Asiamah et al., 2019; Asiedu, 2002; Farida & Lila, 2022; Kariuki, 2015; Rogmans & Ebbbers, 2013; Zumbu & Sumata, 2020). Inflation rate, based on the Consumer Price Index (CPI), is included due to its crucial role in measuring economic stability. Every investor seeks a stable economic environment devoid of uncertainties. Therefore, this indicator holds particular relevance for attracting foreign investments (Asiedu, 2006; Haile & Assefa, 2006). Table 1 offers a look at the variables used in the study, along with their main descriptions.

Table 1. Description and measurements of variables

Variables	Descriptions	Measures
GDP	Gross domestic product	\$ current from (2015)
FDI	Net inflow of foreign direct investment	Net investment flows as % of GDP
INFR	Infrastructure	Electricity consumption per capita (in kWh)
LFD	Level of financial development	Private credit by banks divided by GDP
Market	Market size	Real GDP per capita (current \$)
HC	Human capital	State expenditure on education
Trade	Commercial opening	Exports + imports as % of GDP
CPI	Inflation	Consumer price index

Source: prepared by the author.

3.2 Methodology

3.2.1 Model Specification

The main objective of this study is twofold. On the one hand, we seek to identify the main factors determining foreign direct investment (FDI). Secondly, we want to determine the impact of FDI on the Moroccan economy. For our model, which we estimate in the form of equation (1) and summarise as follows, we refer to the specifications presented by (Okada, 2013; Wilhelms & Witter, 1998):

$$FDIt = \alpha_0 + \alpha_1 GDP_t + \alpha_2 INFR_t + \alpha_3 Market_t + \alpha_4 LFD_t + \alpha_5 HC_t + \alpha_6 Trade_t + \alpha_7 CPI_t + \varepsilon_t \quad (1)$$

$$GDPt = \alpha_0 + \alpha_1 FDI_t + \alpha_2 INFR_t + \alpha_3 Market_t + \alpha_4 LFD_t + \alpha_5 HC_t + \alpha_6 Trade_t + \alpha_7 CPI_t + \varepsilon_t \quad (2)$$

We use the logarithmic transformation of variables and write equation (1) with a time series specification, as follows:

$$LnFDIt = \alpha_0 + \alpha_1 \ln GDP_t + \alpha_2 \ln INFR_t + \alpha_3 \ln Market_t + \alpha_4 \ln LFD_t + \alpha_5 \ln HC_t + \alpha_6 \ln Trade_t + \alpha_7 \ln CPI_t + \varepsilon_t \quad (3)$$

$$\ln GDP_t = \alpha_0 + \alpha_1 \ln FDI_t + \alpha_2 \ln INFR_t + \alpha_3 \ln Market_t + \alpha_4 \ln LFD_t + \alpha_5 \ln HC_t + \alpha_6 \ln Trade_t + \alpha_7 \ln CPI_t + \varepsilon_t \quad (4)$$

Where $\ln FDI_t$ represents the natural logarithm of FDI inflows. $\ln GDP_t$ is the natural logarithm of GDP. $\ln INFR_t$ represents the natural logarithm of infrastructure measured by electricity consumption, while $\ln Market$ represents the natural logarithm of market size. $\ln LFD_t$ represents the natural logarithm of the level of financial development, while $\ln HC_t$ represents the natural logarithm of government spending on education, $\ln Trade_t$ represents the natural logarithm of foreign trade as a percentage of GDP and $\ln CPI_t$ represents the natural logarithm of the consumer price index. In equations 3 and 4, we also have α_N represents the estimated coefficients of all independent variables where $N = 1, \dots, 7$. The subscript (t) denotes the time period. Finally, the equation contains α_0 and ε_t which denote the constant and the classical error term, respectively.

3.2.2 The ARDL Model

We use the ARDL model in our econometric analysis of time series. This model is adapted to study the short-term dynamics of variables, taking into account the time dimension, to improve forecasting and policy effectiveness. It combines the features of autoregressive (AR) and distributed lag (DL) models. In the ARDL model, we include the lagged dependent variable (Y_{t-p}) as well as the past values of the independent variable (X_{t-q}) among the explanatory variables (X_t). These variables have a specific general form:

$$Y_t = (Y_{t-p} X_{t-q}) \quad (5)$$

$$Y_t = \lambda + \beta_1 Y_{t-1} + \dots + \beta_p Y_{t-p} + \alpha_0 X_t + \dots + \alpha_q X_{t-q} + \mu_t \quad (6)$$

$$Y_t = \alpha_0 + \sum_{i=1}^p \beta_i Y_{t-i} + \sum_{j=1}^q \alpha_j X_{t-j} + \mu_t \quad (7)$$

Thus, the error $\mu_t \sim iid(0, \delta)$ in the ARDL model. The coefficient “ α_0 ” quantifies the immediate impact of the variable X_t on Y_t . To determine the optimal lag (p^* or q^*) which corresponds to the number of lags of the dependent and independent variable to be included in the model, we will use information criteria such as AIC, SIC and HQ. The optimal lag is chosen to minimise the value of one of these criteria. One of the dynamic models, the ARDL model, is capable of estimating the short- and long-term dynamics of cointegrated or integrated series at different levels. The boundary testing strategy proposed by (Pesaran et al., 2001; Pesaran & Shin, 1999) can also be used for this purpose. In the scope of our research, we aim to examine the effects of FDI on the domestic economy. We model the effect of FDI as a variable of interest on GDP, which is our dependent variable. We also take into account other important independent variables that strengthen the results. These variables include infrastructure, market size, human capital, trade openness, inflation and private credit provided by banks that measure the level of financial development. In addition, we examine the main determinants of FDI in Morocco. We therefore propose to estimate an ARDL model for the following function, which is expressed in linear functional form:

$$FDI = f(FDI, INFR, Market, LFD, HC, TRADE, CPI) \quad (8)$$

$$GDP = f(FDI, INFRA, Market, LFD, HC, TRADE, CPI) \quad (9)$$

If we wish to take into account both the short-term and long-term effects of the explanatory variables mentioned, the ARDL representation of functions (8 and 9) will be as follows:

$$\Delta \ln FDI_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta \ln FDI_{t-i} + \sum_{i=1}^p \beta_{2i} \Delta \ln GDP_{t-i} + \sum_{i=1}^p \beta_{3i} \Delta \ln INFR_{t-i} + \sum_{i=1}^p \beta_{4i} \Delta \ln Market_{t-i} + \sum_{i=1}^p \beta_{5i} \Delta \ln LFD_{t-i} + \sum_{i=1}^p \beta_{6i} \Delta \ln HC_{t-i} + \sum_{i=1}^p \beta_{7i} \Delta \ln TRADE_{t-i} + \sum_{i=1}^p \beta_{8i} \Delta \ln CPI_{t-i} + \mu_t \dots \quad (10)$$

$$\Delta \ln GDP_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta \ln GDP_{t-i} + \sum_{i=1}^p \beta_{2i} \Delta \ln FDI_{t-i} + \sum_{i=1}^p \beta_{3i} \Delta \ln INFR_{t-i} + \sum_{i=1}^p \beta_{4i} \Delta \ln Market_{t-i} + \sum_{i=1}^p \beta_{5i} \Delta \ln LFD_{t-i} + \sum_{i=1}^p \beta_{6i} \Delta \ln HC_{t-i} + \sum_{i=1}^p \beta_{7i} \Delta \ln TRADE_{t-i} + \sum_{i=1}^p \beta_{8i} \Delta \ln CPI_{t-i} + \mu_t \dots \quad (11)$$

In the ARDL model, we will apply information criteria such as Akaike-AIC, Schwarz-SIC and Hannan-Quin to identify (p, q) mismatches. As we saw earlier (relations 10 and 11), writing an ARDL model presupposes the existence of a cointegrating relationship between the variables, which even affects the way in which the short- and long-term coefficients of these variables are estimated. We can use the cointegration test developed by (Pesaran et al.), also known as the “bounds test to cointegration” when we have several integrated variables of different orders (I(0), I(1)). To check the existence of a cointegrating relationship between the variables in an ARDL model, there are two steps to follow: Determine the optimal lag using criteria such as AIC, SIC and HQ, and then perform the Fisher test to test the null hypothesis of no cointegration ($H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6 = \mu_7 = \mu_8$) against the alternative hypothesis ($H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6 \neq \mu_7 \neq \mu_8$). The test method consists of comparing the Fisher values with the critical values (upper and lower bounds) simulated by (Pesaran et al.) for different instances and thresholds. Relationships 10 and 11 will be estimated, but before doing so, we will carry out the following steps: First, we will determine the degree of integration of the variables using the ADF test to assess their stationarity. Next, we will test the possible existence of a cointegrating relationship between the variables by applying the (Pesaran et al., 2001) cointegration test, also known as the bounds cointegration test. Finally, we perform diagnostic tests on the models to assess their adequacy.

4. Results and Discussion

Table 2 presents the statistical characteristics of all the variables studied for the empirical study. These data show that the distribution of all the variables is quasi-normal, since the means and medians are close to each other, indicating symmetry in the distribution. However, some variables have slightly different mean and median values, which may indicate a slight asymmetry in the distribution. The Jarque-Bera and probability values do not seem to indicate any serious violations of the normality assumption for these variables. They also confirm that the variables are almost normally distributed. The correlation matrix (Table 3) confirms the existence of a positive relationship between the variables. Economic growth and FDI are both positively and significantly correlated. In addition, they are all positively related to other exogenous variables (market size, trade openness, and infrastructure, level of financial development and level of human capital). However, we find that inflation is negatively correlated with all other variables.

Table 2. Descriptive statistics

	Mean	Median	Minimum	Maximum	Jarque-Bera	Probability
LnGDP	24.89	24.84	24.31	25.54	2.40	0.30
LnFDI	0.62	0.68	-0.60	1.96	0.27	0.87
LnINFR	6.60	6.45	5.89	7.73	4.48	0.10
LnHC	10.26	10.47	9.47	11.12	3.01	0.22
LnCPI	0.55	0.49	-1.19	2.07	0.83	0.65
LnMarket	7.63	7.61	7.10	8.16	3.74	0.15
LnLFD	3.75	3.83	2.61	4.27	4.94	0.08
LnTrade	4.15	4.20	3.85	4.45	2.33	0.31

Source. Authors' calculations.

Table 3. Correlation matrix

	LnGDP	LnFDI	LnINFR	LnHC	LnCPI	LnMarket	LnLFD	LnTrade
LnGDP	1.00							
LnFDI	0.40 (0.02)	1.00						
LnINFR	0.94 (0.00)	0.28 (0.12)	1.00					
LnHC	0.94 (0.00)	0.48 (0.00)	0.83 (0.00)	1.00				
LnCPI	-0.65 (0.00)	-0.46 (0.00)	-0.55 (0.00)	-0.65 (0.00)	1.00			
LnMarket	0.96 (0.00)	0.38 (0.03)	0.86 (0.00)	0.94 (0.00)	-0.57 (0.00)	1.00		
LnLFD	0.82 (0.00)	0.54 (0.00)	0.68 (0.00)	0.87 (0.00)	-0.73 (0.00)	0.82 (0.00)	1.00	
LnTrade	0.82 (0.00)	0.50 (0.00)	0.67 (0.00)	0.89 (0.00)	-0.49 (0.00)	0.87 (0.00)	0.83 (0.00)	1.00

Note. () indicates probability values. Source. Authors' calculations.

It is essential to check the stationarity of the variables before starting any empirical study. We therefore performed ADF unit root tests to check the stationarity of the variables. The results of these tests, presented in Table 4, show that the null hypothesis of non-stationarity can be rejected at the chosen level of significance. On the other hand, at first difference, the ADF tests accepted the alternative hypothesis and confirmed the stationarity of the variables. These results indicate that the variables are integrated at level I(1) except for the variables (foreign direct investment and the inflation indicator), which are stationary in level, otherwise, they have an order of integration I(0). This is an important step in ensuring the validity of future empirical analyses.

Table 4. Unit root test results (ADF)

	Level Variable Logarithm		First Difference		Integration order
	T-statistic	Specification	T-statistic	Specification	
LnGDP	-2.68(0.2504)	Trend+Constant	-6.86(0.0000)***	Trend+Constant	I(1)
LnFDI	-5.77(0.0003)***	Trend+Constant	-	-	I(0)
LnINFR	-2.01(0.5684)	Trend+Constant	-5.48(0.0006)***	Trend+Constant	I(1)
LnMarket	-1.68(0.7332)	Trend+Constant	-3.93(0.0003)***	None	I(1)
LnLFD	-1.81(0.3655)	Constant	-1.98(0.0470)**	None	I(1)
LnHC	-2.19(0.4727)	Trend+Constant	-6.17(0.0001)***	Trend+Constant	I(1)
LnTrade	-2.02(0.5629)	Trend+Constant	-6.87(0.0000)***	Trend+Constant	I(1)
LnCPI	-5.36(0.0008)***	Trend+Constant	-	-	I(0)

Note. P values in brackets, ***, ** significant at 1% and 5% levels respectively.

Source. Authors' calculations.

Given that the series have different orders of integration, classical cointegration tests such as Engle and Granger (for multivariate cases) and Johansen are not appropriate. In this context, the Bounds Test (Pesaran et al., 2001) is more appropriate. The results of the Bounds Test are presented in Table 5. Previously, using the AIC information criterion, the optimal models were ARDL (1, 2, 1, 0, 0, 2, 1, 1) and ARDL (3, 1, 2, 2, 2, 1, 1, 1).

Table 5. Borne Cointegration Test

Model	F-Statistics	Critical Values (Lower bound)	Critical Values (Upper bound)	K*
Model 1	16.13	2.17	3.21	7
Model 2	10.50	2.17	3.21	7

* Number of regressors. Source: Authors' calculations.

The results suggest that there may be a long-term relationship between the variables, since the test statistics are above the upper bounds of the intervals. We are able to achieve our objective and estimate equations (10) and (11) using an ARDL model. The results of the short- and long-term estimations of the model are presented in Tables 6 and 7 respectively.

Table 6. Short-term estimation results

	Model (1)	Model (2)
	ARDL (1,2,1,0,0,2,1,1)	ARDL (3,1,2,2,2,1,1,1)
D(LnGDP)	9.601145(0.0000)***	
D (LnGDP (-1))	7.761824(0.0000)***	0.791985 (0.0001)***
D (LnGDP (-2))		0.996388 (0.0000)***
D(LnFDI)		0.081098 (0.0000) ***
D(LnINFR)	0.047618 (0.9011)	0.023378 (0.4015)
D (LnINFR (-1))		-0.200482 (0.0001) ***
D(LnHC)	1.038757 (0.0083) ***	-0.152279 (0.0003) ***
D (LnHC (-1))	-2.050461 (0.0002) ***	
D(LnTRADE)	1.885821 (0.0033) ***	-0.180123 (0.0009) ***
D(LnCPI)	0.313380 (0.0006) ***	-0.071654 (0.0000) ***
D(LnMARKET)		0.750777 (0.0000) ***
D (LnMARKET (-1))		-0.357921 (0.0001) ***
D(LnLFD)		-0.209970 (0.0003) ***
D (LnLFD (-1))		-0.293029 (0.0001) ***
CointEq (-1)	-1.636699 (0.0000) ***	-1.338941 (0.0000) ***
R²	0.95	0.96
Adjusted R²	0.93	0.94

Note. ***: Significant at 1%. Source: Authors' calculations.

The empirical data presented in Table 6 show that both models are globally significant and that the adjustment coefficients are negative and significant at the 5% level. For the first model, where FDI is the dependent variable, the results suggest that several variables have a significant influence on FDI. A one-unit increase in the logarithmic variation of GDP is associated with a 9.60-unit increase in FDI. This suggests that a country's economic growth has a positive impact on FDI. An increase of one unit in the logarithmic variation of education expenditure is associated with an increase of 1.04 units in FDI. This suggests that investment in education can stimulate FDI. Similarly, education expenditure, which lagged by one period, is associated with a 2.05 unit decrease in FDI. This may indicate some instability in the relationship between education spending and FDI. For the infrastructure investment variable, the results suggest that price stability has no significant influence on FDI. On the other hand, price stability in the economy can favour FDI, since a one-unit increase in the logarithmic variation of the CPI is associated with a 0.31-unit increase in FDI. Furthermore, a one-unit increase in the logarithmic variation of international trade is associated with a 1.89-unit increase in FDI. This suggests that trade openness and participation in the global economy can attract FDI. In conclusion, the main determinants of FDI identified in this analysis are economic growth, past economic performance, education expenditure, price stability, and international trade. These results suggest that in order to attract FDI, it is important for a country to maintain solid economic growth, foster price stability, invest in education and promote international trade. For the model with GDP as the dependent variable, the regression results indicate that the independent variables explain around 96.88% of the variation in GDP. This suggests that a significant part of the observed volatility of GDP can be explained by the regression model, and that the adjustment coefficient presents a negative and significant correlation with a significance level of 5%. Indeed, the majority of the explanatory variables, such as (FDI, market size, level of financial development, human capital, and inflation) have significant coefficients ($p\text{-value} < 0.05$), which implies that they have a statistically significant impact on GDP. However, the infrastructure variable has an insignificant coefficient, suggesting that it has no effect on short-term growth.

However, Table 7 shows the long-term estimation results for the first model. The results indicate that the determinants of FDI include education spending, which is considered an important factor in attracting FDI, market size, and trade openness. On the other hand, real GDP, which measures market size, infrastructure spending, and the level of financial development, is not statistically significant. Thus, in the long term, economic stability plays a role in attracting FDI: a one-unit increase in the CPI is associated with an increase of around 0.38 in FDI. With regard to model (2), the regression results indicate that several variables have significant effects on growth. Infrastructure investment, market size, and FDI have a significant positive effect on the Moroccan economy. In other words, a one-unit increase in FDI, infrastructure, and market size is associated with an increase in GDP of 0.10, 0.26, and 0.67, respectively. On the other hand, the level of financial development and human capital has negative effects on long-term growth. In addition, the trade openness variable is not statistically significant, indicating that its effect on growth is unreliable.

Table 7. Long-term estimation results

	Model (1)	Model (2)
	ARDL (1,2,1,0,0,2,1,1)	ARDL (3,1,2,2,2,1,1,1)
LnGDP	-0.379127 (0.8174)	
LnFDI		0.104556 (0.0050) ***
LnINFR	0.687602 (0.2729)	0.267327 (0.0000) ***
LnMARKET	-3.089081 (0.0003) ***	0.675598 (0.0001) ***
LnLFD	0.172537 (0.5908)	-0.069552 (0.1696)
LnHC	1.676801 (0.0037) ***	-0.166625 (0.0176) **
LnTRADE	2.193538 (0.0229) **	0.038241 (0.7589)
LnCPI	0.373026 (0.0608) *	-0.113994 (0.0008) ***
Constant	1.718684 (0.9563)	19.76252 (0.0000) ***

Note. () indicates probability, ***, **, * at significance level 1%, 5% and 10% respectively.

Source: Authors' calculations.

In order to verify the various hypotheses on the residuals, we carried out diagnostic tests on the two models used. Table 8 shows the analysis of the tests.

Table 8. Results of diagnostic tests

	Model (1)	Model (2)
	ARDL (1,2,1,0,0,2,1,1)	ARDL (3,1,2,2,2,1,1,1)
Breusch-Godfrey LM	2.09(0.21)	1.08(0.40)
Jarque-Bera	2.28(0.31)	0.04(0.97)
Breusch-Pagan-Godfrey	0.50(0.89)	0.79(0.67)
Ramsey Reset	0.41(0.68)	0.29(0.77)

Note. () indicates probability.

Source: Authors' calculations.

The results of the test indicate that, for both models, the Jarque-Bera statistical value is above the 5% significance level, which means that we cannot reject the null hypothesis. This suggests that the residuals are normally distributed. Similarly, the Breusch-Pagan-Godfrey test indicates the absence of heteroscedasticity, implying that the variance of the residuals is constant over time. In addition, the Breusch-Godfrey LM test indicates the absence of autocorrelation in the residuals. Finally, the Ramsey Reset test shows a high p-value for the two models of 0.69 and 0.78, respectively, indicating that the model coefficients are statistically acceptable. Consequently, the regression models are sufficiently well specified to explain the variations observed.

5. Conclusion

In summary, this article set out two main objectives: firstly, to identify the key determinants of Foreign Direct Investment (FDI), and secondly, to examine the link between FDI and economic growth in Morocco by analyzing the impact of FDI on its economy. To address these objectives, we adopted the methodology proposed by Pesaran et al., using the ARDL model for the period 1990-2020. The significant results from our estimations warrant an in-depth analysis.

In the short term, our analysis reveals that the main determinants of FDI in Morocco are robust economic performance, human capital, economic stability, and trade openness. This finding is in line with several previous empirical studies that emphasize the importance of these factors in attracting FDI. These findings align with the conclusions of various studies, particularly those focused on emerging markets, where sustained growth and a strong foundation in human capital have proven crucial in attracting significant FDI flows (Abdel-Gadir, 2010; Asiamah et al., 2019; Belhaj, 2021; Kariuki, 2015; Li & Liu, 2005; Solomon, 2011; Yeboua, 2021; Zumbu & Sumata, 2020). However, for the case of Morocco, our results are consistent with the study conducted by Azeroual (2015), except for the human capital variable, which constitutes a relevant factor in FDI attractiveness, while for trade openness, the result is controversial. Furthermore, the positive and statistically significant link between FDI and short-term economic growth clearly indicates that FDI exerts a stimulating impact on the Moroccan economy.

By extending our analysis to the long term, we provide insightful perspectives on the factors that continue to shape FDI dynamics. It is interesting to note that, contrary to some studies, we observe that investments in infrastructure, although often considered potential catalysts do not demonstrate significant influence on FDI attractiveness in the long term. On the contrary, elements such as market size, investment in human capital, trade openness, and economic stability remain influencing factors for FDI attractiveness in Morocco. However, it is also relevant to note that certain factors, such as financial development, do not exhibit a significant relationship with FDI. This complex conclusion aligns with studies that have reported mixed effects of financial structure on foreign inflows, highlighting the need for a nuanced approach to economic policy. Additionally, our results also confirm the positive impact of FDI on economic growth, thus affirming its role for the Moroccan economy. This positive correlation is consistent with the trend observed in global empirical literature. These findings underscore the vital role of FDI in the Moroccan economy, facilitating the transfer of new technologies, introducing contributions to the industry, creating jobs, and promoting competitiveness among domestic companies. However, to maintain the positive impact of FDI, it is crucial for the government to implement favorable and appropriate policies. This involves facilitating the entry of foreign investments, improving the financial system, developing infrastructure, and enhancing the quality of human resources, an essential factor in attracting both short-term and long-term FDI.

In conclusion, this research further illuminates the relationship between FDI and growth within a specific Moroccan context. Our results engage in a constructive dialogue with the existing literature, highlighting both points of convergence and distinctive nuances. For a country like Morocco, aiming to boost its economic growth and attract foreign investments, the implications of this study reaffirm the necessity of sustained growth,

economic stability policies, and the promotion of international trade. However, the complex role of human capital and financial development calls for a pragmatic and well-calibrated approach. Ultimately, this research aspires to fuel an ongoing dialogue on economic development strategies and to provide guidance to decision-makers on measures conducive to creating an environment favorable to FDI attraction and promoting sustainable growth. Concurrently with the insights drawn from empirical literature review, our study reinforces the notion that FDI remains a catalyst for economic growth in Morocco. However, it's important to note that the international environment and national conditions are constantly evolving. Hence, it is paramount to remain adaptive and flexible in formulating policies that support and encourage FDI flows. The results of this study offer clear insights into the determinants of FDI and its impact on economic growth in Morocco. To take full advantage of these findings, policymakers should commit to promoting an FDI-friendly environment by continuing to strengthen economic stability, investing in human capital, encouraging openness to international trade and developing infrastructure. By adopting a strategic and proactive approach, Morocco can enhance its attractiveness to foreign investors and consolidate its path towards sustainable and prosperous economic growth.

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