

# Creation of Employment in Mexico derived from Foreign Direct Investment from 2005 to 2018

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## Keywords

Active Public Policy, foreign direct investment, employment, productive sectors, Mexico.

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## Abstract

*Globalization and the liberalization of trade throughout the world have brought about various changes, mainly at the economic level, but also at the level of public policies, since they have been adapted to both the needs of the government and those of the companies. Therefore, the changes are intended to offer benefits to the productive sectors to facilitate their development.*

*Thus, one of the main elements for development is national and foreign investment. Regarding foreign direct investment (FDI), each country designs its own public policy to attract investment flows in order to meet different national goals.*

*While there are some countries that decide to make many efforts to attract capital from abroad and fulfill their government plans, others decide to assess the economic impact of foreign capital. That is, the difference in economic development lies on the design of passive public policies or active public policies to attract FDI. The purpose of this research paper is to demonstrate how foreign direct investment policies impacted on the creation of employment in Mexico from 2014 to 2018 in primary, secondary and tertiary sectors*

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## 1 Introduction

One of the major concerns of governments worldwide today is the generation of jobs. These are created by public and private investment. Within the private investment, the foreign direct investment that is generated by the multinational companies that are attracted by the passive public policies of each government stands out.

However, one of the primary objectives of the attraction of FDI by the government is the evaluation of the impact that these capitals have on the national economy. Active public policy is responsible for measuring these impacts.

This research is divided as follows. In second part, a literature review is offered. Several research papers were analyzed to describe the importance of the creation of employment for countries, key factors of FDI and gross national product (GNP). Section three includes the data and variables used to explain the model for creation of employment in Mexico based on FDI flows and GNP. Descriptive statistics is offered in chapter four. Section five explains the methodology applied for this research and in the last section results and conclusions are shown.

## Literature review

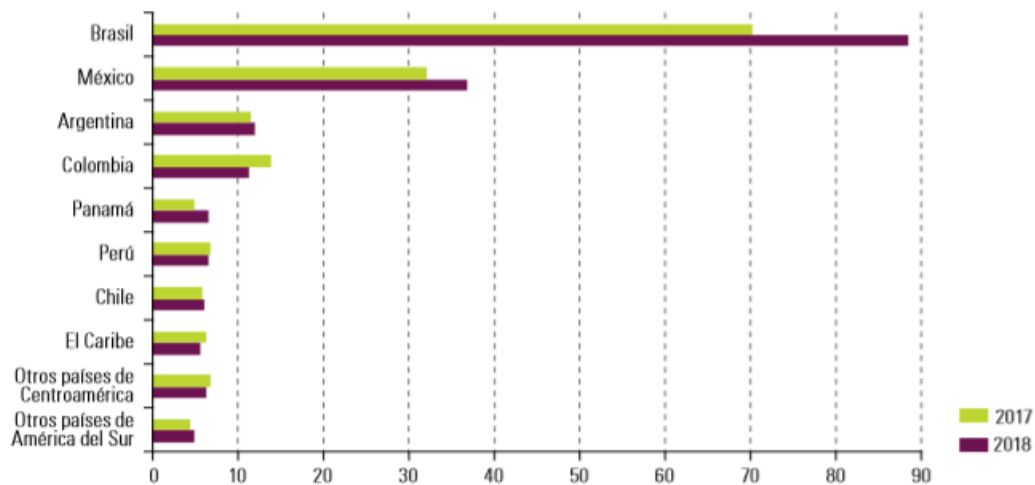
Employment is a subject of current economic policy. From the point of view of workers in developed countries, FDI is often a threat to traditional jobs in the industry that suffer from being relocated abroad. On the other hand, the increase in employment in these countries is seen as a better contribution to poverty reduction and the fulfillment of the millennium goals. However, the impact of FDI on the labor market remains a matter of debate (Jenkins, 2006).

The implementation of new technologies, processes and standards, forms of organization, intra and inter-company links, intra and inter-industry trade, as well as the integration into and of an economic and social network, can lead to impacts that are not necessarily seen from a macroeconomic perspective. The potential effects on the learning process, economies of scale and economies of scope have been highlighted

by multiple authors (Caves, 1971; Fajnzylber, 1983; Graham and Krugman, 1991; Storper, 1997; UNCTAD 1999). It is relevant to note that foreign investment cannot only be considered from the perspective of the receiving economic units. On the contrary, these flows also reflect the strategic interests of transnational enterprises and other companies in search of access to markets and greater competitiveness of their global production and distribution networks, among other reasons (UNCTAD, 1998).

In this context, in 2018 the inflows of foreign direct investment (FDI) in the world were 13% lower than those of 2017 and reached a value of 1.3 billion dollars, similar to that recorded in 2010, the first year of recovery after of the global financial crisis of 2008. This decrease was more pronounced in developed economies (27%), mainly in Europe, as a result of the impact of the tax reform in the United States, which promoted greater flows of repatriation of profits from Europe to that country (which had negative FDI outflows during the year), while there was a slight increase (2%) in developing economies, where stable levels have been maintained in recent years. On the other hand, the expansion of China's investments outside of Asia slowed down, mainly in the case of those directed to the United States and the European Union (ECLAC, 2019). The following chart shows selected countries with the highest inflow of FDI.

Chart 1: Latin America and the Caribbean (selected regions and countries): entry flows of foreign direct investment (FDI), 2017-2018 (US billions of dollars).



Source: ECLAC, 2019.

Figure 2 shows the behavior of foreign direct investment that Mexico had from 1999 to 2018. We highlight that in 2001 and 2013 the greatest investment flows are captured in recent years.

Figure 2: Foreign Direct Investment in Mexico 1999 - 2018



Source: Ministry of Economy, México.

The international context and global perspectives of investment flows show the importance that FDI can acquire as a factor that contributes to building local capacities, fostering sustainable development and modifying the productive structure of Latin America and the Caribbean. As noted in previous reports, high FDI flows do not guarantee by themselves a contribution to the productive diversification of the region and long-term growth (ECLAC, 2019).

There is a divergence of opinions on the effect of FDI on domestic employment. The unions maintain that there is a loss of real or potential jobs when companies invest abroad, as well as when exports fall or imports rise (Chiatchoua, Castillo and Santibáñez, 2016). Most of the analyzes of the effects of this type of investment in the labor market identify both positive and negative aspects.

In the positive ones, when FDI complements national investment, it implies the creation of new companies and the demand for work tends to increase (Chiatchoua, Castillo and Santibáñez, 2016). The percentage of highly qualified employees in companies with FDI is, on average, 17% compared to 9.8% in domestic companies (Fedesarrollo, 2007).

On the other hand, FDI can displace local investment, so the net effect on employment is less than the number of people directly employed by foreign subsidiaries. According to Jenkins (2006), FDI tends to focus on capital-intensive industries, so jobs created per dollar invested are low. In addition, links with local companies can be weak if most of the inputs used by foreign subsidiaries are imported and only constitute an enclave within the local economy. If there are no obstacles to investment and you can easily move to alternative locations, the jobs that are created are likely to be unstable, that is, highly elastic to international competitiveness (Chiatchoua, Castillo and Santibáñez, 2016). Likewise, as the population satisfies basic material needs, it allocates a greater proportion of its income to the demand for services, so the rapid relative deindustrialization is also explained, implying the growth of the tertiary sector (Godbout, 1993).

In an international context of reduction of FDI flows and strong competition for investments, policies should not be aimed at recovering the amount of FDI flows, but should increasingly aim to attract the type of FDI that contributes to form knowledge capital and advance in the shift towards sustainable production, energy and consumption patterns. The growing incorporation of a sustainable development approach in the strategic decisions of the world's main transnationals is an opportunity to design policies that accompany this paradigm shift (CEPAL, 2019).

In recent years, foreign direct investment flows increased more than world production or trade (Romero, 2012). For many developing countries, it has become an important source of external financing. During the years 2000 and 2001, Mexico was one of the countries with the highest reception of FDI in Latin America and one of the four largest in the world, registering entries for 18.3 and 29.9 billion dollars (mmd) in those years. The sale of Bancomer contributed to that figure (UNCTAD, 2006).

FDI has also had a differentiated investment in economic activities in each of the states. In the area of the Federal District (DF), State of Mexico and Puebla, FDI has been directed to manufacturing, financial services, commerce, mass media, among others (Chiatchoua, Castillo and Santibáñez, 2016). For the area composed of the border states, this investment has been concentrated in manufacturing, with significant investments in mining in Sonora and Coahuila; In the cases of Baja California Sur and Quintana Roo, it has been used for construction, real estate services and accommodation services, a situation that reflects the tourist bonanza in these entities (Ramírez, 2013).

FDI is in net increase in Mexico, despite difficult times such as the events of September 11, 2011, the financial crisis in the United States (US) and insecurity in the country. The main investors in Mexico are: United States of America, Holland, Spain, Germany, United Kingdom and Canada. The economic sector that receives the highest FDI is the industrial sector, it participates with 57.4%, the services sector with 42.1% and the agricultural sector with 0.5% (Chiatchoua, Castillo and Santibáñez, 2016).

## **2 Objectives, Variables, Hypotheses and Data**

### **Objectives**

The objective of this research is to find out if the attraction of foreign direct investment in Mexico during the period of 2005 to 2018 has created jobs, but also in which sectors were created.

**Variables**

The dependent variable used in this research is:

emp (number of jobs in Mexico from 2005 to 2018).

The independent variables in their different modalities that will be considered for the theoretical model are:

3.2.3 fdi (foreign direct investment from 2005 to 2018).

3.2.4 gnp (gross national product from 2005 to 2018).

**Hypotheses**

For main model, the hypothesis is the following:

H<sub>1</sub>: The arrival of capital coming from abroad creates jobs in México.

The secondary hypotheses are:

H<sub>2</sub>: The arrival of capital coming from abroad creates job in México in the primary sector.

H<sub>3</sub>: The arrival of capital coming from abroad creates job in México in the secondary sector.

H<sub>4</sub>: The arrival of capital coming from abroad creates job in México in the third sector.

**3 Data**

Three databases were worked for this project. The first one, was about the inflows that Mexico received from 2005 to 2018. The second database was developed under the concept of the kind of jobs that were created through the Foreign Direct Investment during the period of 2005- 2018. Those jobs were classified into primary, secondary and tertiary sector. The third and last one is about the GDP of the primary, secondary and third sector.

**4. Descriptive statistics**

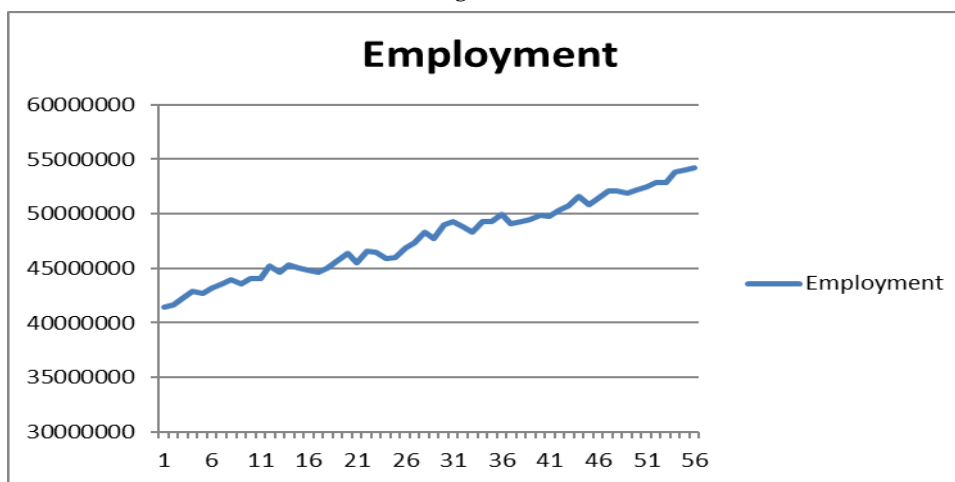
For the case of flows of the Foreign Direct Investment (FDI), the Mexican Gross National Product (GNP) and the Employment (Emp) in México, we show the most relevant descriptive statistics for this research per the period of 2005 until 2018, as follows. First, we show in the Table 4.1 the variables for Mexico in relation with the flows of FDI, GNP and Employment, from 2005 until 2018.

Table 4.1

Variable	Mean	Std. Dev.	Min	Max
emp	47,800,000	3,511,877	41,400,000	54,200,000
fdi	7,329	3,255	2,351	21,015
gnp	763,579	197,378	451,735	1,158,439

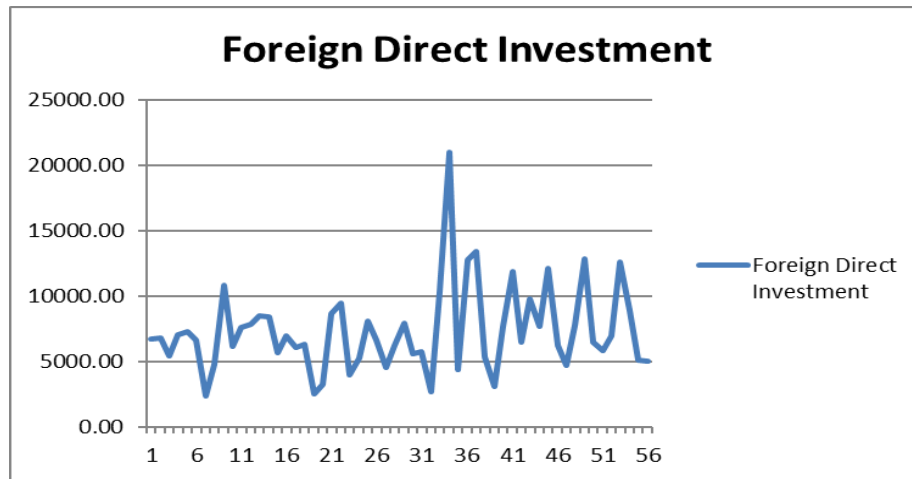
In Figure 4.1 we show the Employment (Emp) quarterly for the period 2005 to 2018.

Figure 4.1



As we can see, the Employment has a slight upward trend, year by year during the whole period of study. In Figure 4.2 we show the flows of Foreign Direct Investment (FDI) quarterly for the period 2005 to 2018.

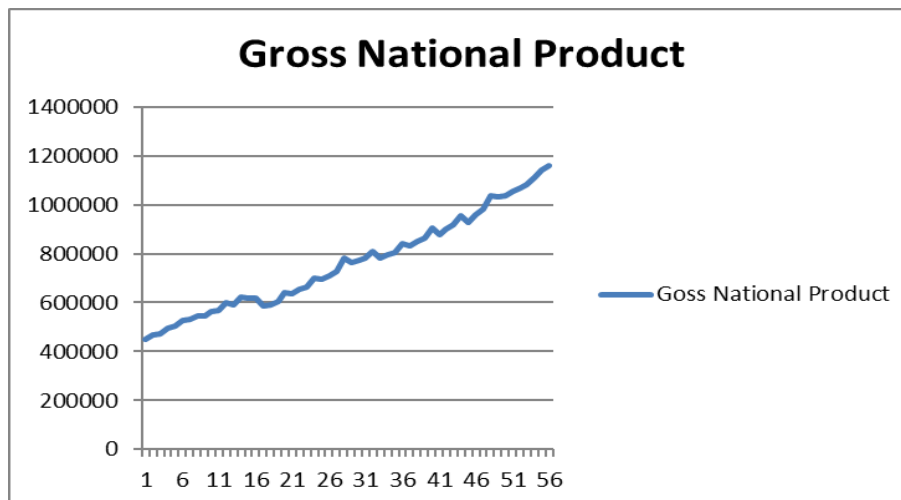
Figure 4.2



As we can see, the flows of Foreign Direct Investment exhibits an erratic behavior during the whole period. The highest value for incoming capitals was in the second quarter of 2013, in the same way the lowest value was in the third quarter of 2006.

In the Figure 4.3 we show the Mexican Gross National Product (GNP) quarterly for the period 2005 to 2018.

Figure 4.3



Similarly with respect to the Employment figure, the Gross National Product, has a slight upward trend, year by year during the whole period of study.

## 5. Methodology, Models and Results

### 5.1 Methodology

It is important to state out that in this research we divided the data base in three different activities in México (employment, FDI and gross national product), however were carried out several models of time series data and the results for these models indicates the nature of each of the variables used, and the relationship they have with the dependent variable and its statistical significance.

## 5.2 Models

The following equations are the proposal models to prove the hypotheses postulated earlier:

Main model is:

$$emp_t = \beta_0 + \beta_1 fdi_t + \beta_2 gnp_t + u_t$$

## 6 Results

Due to the models that we show are handled through time series, we verified that the variables have a stationary stochastic process in the models proposed. As the variables presented a nonstationary process, the models are not useful to find reliable results by the method of ordinary least squares (OLS), in accordance with Engle and Granger (1987) that conducted a cointegration study. Then, we made a linear combination of two series, each of which is integrated of any kind of order, additionally checked and corrected the errors through the Granger causality (Granger, 1969 and Granger and Newbold, 1974) to verify that indeed the time series used are stationary, the following model show this test and the results are in Table A1 for Mexico:

$$emp_t = \beta_0 + \beta_1 emp_{t-1} + \beta_2 emp_{t-2} + \beta_3 fdi_{t-1} + \beta_4 fdi_{t-2} + \beta_5 gnp_{t-1} + \beta_6 gnp_{t-2} + u_t$$

In addition, was revised collinearity of the variables through a model of vector autoregressive (VAR), where it was found that indeed the variables presented a high collinearity and that has to be corrected for the variables are stationary, besides we use the Wald test (Wald, 1940) to prove if the model has an asymptotic chi-square distribution, the model was as follows and the results are in Table A2:

$$emp_t = \delta_0 + \alpha_1 emp_{t-1} + u_t$$

Once we have corrected the errors that could be present in the time series, and we are sure that the variables shown a Stationary Stochastic Process we proceeded to find the corresponding relations with each of the proposed variables.

As can be seen in Table A3, Foreign Direct Investment (FDI) doesn't have an adequate statistical significance, for this reason we proceed to make a correction through a run on the data with regard only with this variable to see if there is a relationship or not with employment. In accordance with the above can be seen in Table A4, that Foreign Direct Investment (FDI) again does not present an adequate statistical significance, however, comes to present a very slight correction to the significance of this variable, even so, we think that there is a correct explanation of this variable toward employment.

Due to the above, it took the initiative to make an econometric prove to the same model but for different economic sectors in Mexico in order to find out if any of the economic sectors created jobs during 2005 - 2018.

Table A5 shows us only data for primary sector, presenting the same problem that in Table A3, in the sense that Foreign Direct Investment (FDI) has no statistical significance. A correction was applied, however in this case, there is no improvement in the statistical significance, as shown in Table A6. It is concluded that there is not a significant relationship between Foreign Direct Investment (FDI) and employment generation at least in the primary sector for the Mexican economy.

For the secondary sector, the data presented the same problem, as shown in Table A7, finding similar results than in the primary sector and in the main model (Foreign Direct Investment has no statistical significance). However, the correction and isolate only the effect of Foreign Direct Investment (FDI) with respect to employment, it is observed that it is corrected in a considerable way. That makes us conclude that the secondary sector has a very good correlation between employment and Foreign Direct Investment (FDI).

Finally, the econometric proves for the tertiary sector were carried out as shown in Table A9. Again, presented the same situation as in previous cases, Foreign Direct Investment (FDI) has no statistical significance. A correction was made for this sector but presented a better condition rather than the primary sector (Table A10).

## 7 Conclusion.

Based on the results presented in the previous section, it can be concluded that apparently Foreign Direct Investment (FDI) does not have any effect on employment in Mexico during the period of study (2005-2018). Although the effect of Gross Domestic Product (GDP) is significant and positive. The exception that can be seen is for the secondary sector in which both Foreign Direct Investment (FDI) and Gross Domestic Product (GDP) contribute significantly to employment generation in Mexico for the period under study (2005-2018).

Although the tertiary sector does not present significant results, it does not mean that there are not interesting results. We find out that, comparing tables A9 and A10, the data reveals that there is an improvement in the creation of jobs in this sector, which means that in Mexico, both the secondary and tertiary sectors are the ones that create more jobs. It is well-known that Mexico is a modern and manufacturing country but in the past years captured FDI flows to tertiary sector. An example of this, is the acquisition of domestic banks by international banks when the Foreign Investment law was modified and improved to get capital from abroad. The energy sector as well as aeronautical and telecommunications are also the most favored ones.

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## Appendix

Table A1. Econometric results for the Vector Autoregressive (VAR) models, to prove collineality.

	Coef.	Std. Err.	z	P>  z	[95% Conf. Interval]	
emp						
emp						
L1	0.721750	0.146182	4.94	0.000	0.435239	1.008261
L2	-0.081789	0.141762	-0.58	0.564	-0.359638	0.196060
fdi						
L1	-6.180372	18.062310	-0.34	0.732	-41.581860	29.221110
L2	14.160940	17.859970	0.79	0.428	-20.843960	49.165840
gnp						
L1	-10.201740	4.021305	-2.54	0.011	-18.083350	-2.320125
L2	16.737800	3.851098	4.35	0.000	9.189784	24.285810
_cons	12600000	4431584	2.84	0.005	3902797	21300000
fdi						
emp						
L1	-0.001091	0.001074	-1.02	0.310	-0.003196	0.001014
L2	0.002061	0.001041	1.98	0.048	0.000021	0.004102
fdi						
L1	0.058407	0.132680	0.44	0.660	-0.201640	0.318454
L2	-0.269247	0.131193	-2.05	0.040	-0.526381	-0.012113
gnp						
L1	0.029281	0.029539	0.99	0.322	-0.028614	0.087177
L2	-0.042364	0.028289	-1.50	0.134	-0.097809	0.013082
_cons	-27542.97	32552.90	-0.85	0.397	-91345.48	36259.54
gnp						
emp						
L1	0.008120	0.005948	1.37	0.172	-0.003539	0.019778
L2	-0.003547	0.005768	-0.61	0.539	-0.014853	0.007759
fdi						
L1	-1.185938	0.734972	-1.61	0.107	-2.626456	0.254580
L2	0.959938	0.726738	1.32	0.187	-0.464443	2.384319
gnp						
L1	0.463769	0.163631	2.83	0.005	0.143059	0.784479
L2	0.476733	0.156705	3.04	0.002	0.169597	0.783868
_cons	-153521.30	180325.10	-0.85	0.40	-506952.10	199909.40

Table A2. Econometric results for find the Granger causality Wald tests.

Equation	Excluded	chi2	df	Prob > chi2
emp	fdi	0.76328	2	0.683
emp	gnp	22.602	2	0.000
emp	ALL	25.059	4	0.000
fdi	emp	3.9615	2	0.138
fdi	gnp	2.4483	2	0.294
fdi	ALL	8.8483	4	0.065
gnp	emp	1.9256	2	0.382
gnp	fdi	4.4847	2	0.106
gnp	ALL	7.1877	4	0.126



Table A3. Econometric results to prove the complete model for whole the data.

emp	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
fdi	5.3852	21.0402	0.26	0.799	-36.8161 47.5866
gnp	17.6021	0.3469	50.74	0.000	16.9062 18.2979
_cons	34300000	288826.3	118.76	0.000	33700000 34900000

Table A4. Econometric results for the efficiency for the complete model for the whole data.

emp	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
fdi	201.2059	144.2669	1.39	0.169	-88.0318 490.4435
_cons	46300000	1155227	40.08	0.000	44000000 48600000

Table A5. Econometric results to prove the model for the primary economic activities.

emp	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
fdi	166.4068	884.2374	0.19	0.851	-1607.1490 1939.9620
gnp	27.7860	3.1706	8.76	0.000	21.4266 34.1454
_cons	5733731	89661.82	63.95	0.000	5553892 5913570

Table A6. Econometric results for the efficiency for the model for the primary economic activities.

emp	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
fdi	803.1824	1366.2850	0.59	0.559	-1936.0540 3542.4190
_cons	6452750	56067.47	115.09	0.000	6340342 6565159

Table A7. Econometric results to prove the model for the secondary economic activities.

emp	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
fdi	-4.3423	25.9565	-0.17	0.868	-56.4044 47.7199
gnp	16.0481	1.3095	12.26	0.000	13.4216 18.6746
_cons	7865737	318923.6	24.66	0.000	7226058 8505417

Table A8. Econometric results for the efficiency for the model for the secondary economic activities.

emp	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
fdi	90.2581	48.0720	1.88	0.066	-6.1205 186.6368
_cons	11400000	259007.2	44.07	0.000	10900000 11900000

Table A9. Econometric results to prove the model for the tertiary economic activities.

emp	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
fdi	-37.3776	52.5501	-0.71	0.480	-142.7797 68.0245
gnp	18.8708	0.7708	24.48	0.000	17.3249 20.4168
_cons	20700000	396701	52.23	0.000	19900000 21500000

Table A10. Econometric results for the efficiency for the model for the tertiary economic activities.

emp	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
fdi	-157.9863	181.8565	-0.87	0.389	-522.5866 206.6141
_cons	29600000	568971.8	51.96	0.000	28400000 30700000