

## How to increase FDI flows: a demonstration of the new determinant creation theory for Mexico and Chile

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Foreign direct investment, determinants, public policy, Mexico, Chile.

### Abstract

*In today's world, Mexico and Chile are nations with growing economic development. Both have different and interesting histories leading to that growth and have had to design in recent years, public policies which contribute to the accumulation of capital. One of the principal sources of capital is the attraction of foreign direct investment – which, starting with its normative aspect – and proceeding to the attraction of investment flows, have had to be modified lately. According to the theory of the creation of new determinants, the probability of improving some determinants will contribute to an increase in attracting foreign direct investment flows to the receiving state.*

*This research demonstrates that once the theory mentioned above has been applied to Mexico and Chile, the results shows that both nations attracted more FDI flows. For the case of Mexico, the skilled labor as well as low cost labor, tax incentives and natural resources contributed to get more inflows and for the case of Chile, inflows increased because it offers tax incentives, a better legal framework and an industrial policy focus on FDI to international investors. It is also remarkable that in both cases, they use regularly other determinants to attract FDI such as infrastructure, gross domestic product, geographical location, and the like.*

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### 1. Introduction

In recent years, FDI has grown faster than trade flows and global production for various reasons such as political and economic changes in many developing countries. Those changes are characterized by the shift to democratic political systems as well as changes toward economic and legal systems oriented in the direction of trade liberalization in which Mexico and other countries played an important role since 1986 when signed as a GATT member.

Many developing countries have made economic and structural changes in order to obtain some benefits and attract FDI, in that sense, FDI flows are likely to be attracted to developing economies that pursue an outward-oriented strategy of economic development such as Mexico and Chile.

In Latin America, the relative stability of the region and the adoption of outward-oriented public policies have reassured foreign and local investors based on market reforms (Ramírez, 2001). Because of such liberalization and changes, the FDI increased in developing countries in the 1990's (Erdal and Tatoglu, 2002) and particularly, Latin America has shown a sustainable growth since 2010 (CEPAL, 2013).

In Mexico, President Miguel de la Madrid (1982-1988) and Carlos Salinas (1988-1994) initiated the neoliberal reforms. Since 1993, the FDI became an important source of private capitals outflows and inflows for Mexico as well as for many countries around the world. From that year, Mexico's public policy oriented to FDI flows uptake changed since a new foreign investment law was created. The new law expressed the need to encourage domestic and foreign productive investment within the country. Later on, in 2007 the PROMEXICO federal office was open for the purpose of attracting

investment flows through different strategies like working together with the 32 states to make them attractive to foreign capitals.

As for the case of Chile, it began to liberalize its foreign investment regulations in 1974 when Pinochet promulgated Decree Law 600. In 2002, the Chilean government launched an Investment Platform initiative to attract international corporations by tax-exemption but, there are, however, some regional incentives for isolated geographical zones and to the information technology sector. Institutional offices like CORFO, has implemented the "Chile Invest" plan with an important mission on attracting capitals from abroad.

On the other hand, the attractiveness of a state or a city for foreign direct investment flows depends on the number and kind of determinants they possess.

Deichmann *et al.* (2003) found that some factors determining the spatial decisions of multinational firms in a Middle East country depend on policy implications.

Considering the above, the government agenda should focus on making the country more attractive for FDI, especially in times of crisis when traditional determinants are put to the test and inspire proposals for new opportunities.

Popovici (2012) notes that the idea of entering a new era of determinants of FDI is not new as there are several studies that highlight the key factors for attracting FDI. This emphasizes that the classical theories of FDI probably should be changed and others should be based on the emergence of new local capacities.

This research is divided as follows. In second part, a literature review is offered. Several research papers were analyzed to describe the key factors for attracting FDI considering classical theories in order to compare them with the determinants used by Mexico and Chile during 2000 to 2013. Section three includes the data and variables used to explain the new determinant creation theory; based on the Mexican case where the most relevant determinants used to obtain FDI are infrastructure, skilled labor, low labor cost, security, tax-break, natural resources, gross domestic product, legal system, geographical location and industrial policy. Descriptive statistics are presented in section four as well as a probit model to test the theory in section five. Finally, conclusions are discussed in section six.

## 2. Literature review

Most of the literature related to the attraction of FDI by countries is based on different theories such as localization economies and their determinants, trade and resource endowments. In that sense, the eclectic paradigm of Dunning (1988) argues that the path FDI takes is partly due to the specific advantages which one country has, because of its regional geographic location and / or location in the world. These advantages arise from using resource endowments and / or assets held abroad by some countries in the world which are attractive to a company by combining them with its own resources.

That combination suggests that if a foreign company wants to use the resources of a country, it should establish a subsidiary by initiating a flow of FDI and then establish a start-up operating facility (Hill, 2008) but, the risk is a main determinant that has to be considered. As for the case of some nations in Latin America like Chile and Mexico, the recently inward flows demonstrate that multinational companies consider these two nations as reliable markets to invest in.

Likewise, the theory of international production suggests that the decision of a company to start manufacturing operations in other countries depend on certain attractions that the country of origin of the company has compared to the resources and benefits that it will obtain in locating a manufacturing subsidiary abroad (Morgan and Katsikeas, 1997).

According to the CEPAL (2011), most of investments made in Latin America have a significant impact on the consolidation or diversification of the production profiles, particularly as foreign direct investment has a major impact on host economies, roughly measure the relationship between foreign direct investment and gross domestic product.

In 2012, Chile received flows equivalent to 11.3% of its gross domestic product mostly for mining while in Mexico; natural resources and low labor cost industries were not the main destiny.

The theory of trade and resource endowment explains that FDI is directed toward countries with low wages and abundant natural resources that provide inherent differences of opportunity and initial favorable conditions for businesses.

There is a consensus about the characteristics required for a host country to attract FDI which is that it depends on the motivations that foreign investors have in relation to their investment projects. According to Dunning (1983), the first reason is related to the market, whose main purpose is to serve local and regional markets from the FDI host country if the market grows and generate some return for the investor, the second relates to the investment made by a company in acquiring resources that are not available in the country of origin such as natural resources and low-cost inputs including labor. The latter corresponds to the level of efficiency achieved through the dispersion of value chain activities considering that the geographical proximity to the country of origin will minimize transportation costs.

All this suggests that the direction, in which FDI is aimed, is highly related to the comparative advantages (Kinoshita, 2003) of a given country. Then, one country that has, among other determinants, access to markets as well as cheap labor and abundant natural resources will attract larger inflows of FDI.

Berkoz (2009) argues that countries have traditional factors and environmental variables that are attractive to foreign companies. The traditional factors are market potential, labor costs, economic growth and government policies. The environmental variables correspond to political, economic, legal and infrastructural factors.

Kinoshita (2003) in turn, maintains that the most important determinants a country has to attract FDI are government institutions, natural resources and economies of agglomeration. Government institutions are one factor contributing to decisions by investors as to whether to invest or not in a particular country because these institutions directly affect the operating conditions of enterprises. The investment cost for companies is not only economic but they also have to fight against entrenched practices in countries such as bribery and time lost in engaging in diverse and various negotiations resulting from the arrival of the company to a new market. Therefore, for the operating conditions of a company to appear reliable to the investor, there are two institutional variables to be considered: The legal system and the quality of the bureaucracy. As for the legal system, both its impartiality as well as popular perception of it is good determinants of the reliability of legal institutions in the country.

Likewise, the variable related to the quality of the bureaucracy describes a non-political and professional bureaucracy which in turn facilitates the procedures for staff to be hired. With respect to agglomeration economies, investors seek those markets where there are benefits derived from the concentration of economic units which results in positive externalities (benefits and technological spill, use of skilled labor and concentrated in specific locations and links forward and backward with related industries) but also by investments made by other investors which can be seen as a positive sign of favorable investment conditions reducing uncertainty. As for the natural resources, Rasiah (2000) argues that developing economies with a resource-rich endowment obtains FDI.

Other studies describing the FDI determinants indicate that the infrastructure, good governance, taxes (Rasiah, 2000) and the labor market are conditions that governments must maintain (Bellak, et. al., 2010) but Lim (1983) found a negative relationship between investment incentives and FDI in 27 developing countries.

De los Santos (2014) suggests that the system of incentives offered by one nation cannot significantly fall out of line from the incentives provided by other nations that compete with one another for the worldwide flows of FDI.

Government policy can also enhance the attractiveness of FDI flows by ensuring the adequate provision of economic and social infrastructure in the form of paved roads, ports, airfields, relatively cheap energy supplies and a well-educated work force. Those quasi-public goods are used by the private sector from Mexico and Chile to serve themselves for their operations (Ramirez, 2001).

Groh and Wich (2009) describe the determinants to attract FDI in a country as labor costs, quality and the provision of quality infrastructure and legal systems. On the other hand, some authors consider that the provision of infrastructure should be a precondition for companies to establish subsidiaries in foreign markets as are a major emphasis on the provision of transport infrastructure as well as information and communication technologies (Botric and Skuflic, 2006, Goodspeed, et. al., 2009).

Studies by Wei *et al.* (1999), Mariotti and Piscitello (1995), Broadman and Sun (1997) and He (2002) conclude that there is a positive relationship between infrastructure and FDI because the better the infrastructure is in a location the higher its desirability. Rasiah (2000), states out that FDI in developing countries is concentrated in economies endowed with good infrastructure.

In a recent research conducted by Botello and Davila (2013), concluded that public policy used in some states of Mexico to attract FDI, is based on the attractiveness of some determinants like skilled labor, cheap labor and infrastructure.

As opposed to what Botello and Davila (2013) concluded, Ondrich and Wasylenko (1993) and Rasiah (2000) found that there is no evidence that wages affect the location of new foreign plants, specially cheap labor but that it's not the case for skilled labor. Flexible production forms have given rise to greater dispersal of organizational power as well as process innovation; local accumulation at peripheral sites has stimulated economic progress, albeit only in locations generating the requisite skills (Rasiah, 2000), suggesting that specialized FDI requires skilled labor. In the same way, Mendoza (2011) found that manufacturing companies established with foreign economic resources in Mexico demands skilled labor.

Despite the Chilean government public policy to attract FDI, it is a fact that flows in 80's and 90's were primarily confined to mining and traditional industries where the country has a comparative advantage on low unit cost labor and natural resources while in Mexico the manufacturing sector was the great winner although the maquiladora is a low cost industry. This means that Mexico started a few years ago a well development plan focused on green field investments with a strong multinational participation.

According to the research studies mentioned above, there are similarities in the description of the traditional determinants, which explain the attractiveness of a country with respect to foreign capital which suggests that the design of public policy in some countries like Mexico and Chile, in relation to attracting financial resources from abroad, is very similar. In the case of Mexico, the statistics of attracting FDI for the period covering 2000 to 2013 show that relationship. In fact, the 32 Mexico's states reports for 2000 to 2013 showed that the most common used determinants for attracting FDI are infrastructure, skilled labor, cheap labor, industrial policy, natural resources, gross domestic product, the legal system, geographic location, tax break and security. Berkosz (2009) found almost the same determinants for the case of Turkey and suggests that a location analysis needs to be done in order to develop specific growth strategies to be applied by policy-makers in their plans to attract FDI to certain locations.

Figuroa (2012) assumes that tax facilities, proximity to markets, and cheap labor are insufficient factors to guarantee the cycle of capital, since what stands out is the outgoing transfer of the innovation activity itself, which suggests that the attraction of new FDI flows requires the creation of new determinants or the renewal of the most used. The advance of global knowledge has become itself as an attractive determinant to catch the attention of investors. In recent years, many countries around the world are worried about the way they are going to attract capitals.

Perhaps, their research agenda would change to more focused analyses of the fundamental determinants that drive such flows of FDI (De los Santos, 2014). Should they create new determinants or renew the ones that are already used to?

As for the case of Mexico and Chile, an FDI behavior from 2000 to 2013 is described in section 5.

### **3. Objectives, Variables, Hypotheses and Data**

#### **3.1 Objectives**

The objective of this research is to compare the behavior of inflows in Mexico and Chile from 2000 to 2013 after applying the new determinant creation theory.

#### **3.2 Variables**

The dependent variable used in this research is:

3.2.1 fdi (amount of foreign direct investment). Foreign Direct Investment (FDI) has been selected as a dependent variable relative to the amount of Mexico's and Chile's foreign direct investment inflows from 2000 to 2013.

3.2.2 impde (improvement of determinants). This variable was selected as a dependent variable to use it in the *probit* model in order to explain if the probability of improvement of the determinants used to attract foreign direct investment contributed to increase inflows from 2000 to 2013 by Mexico and Chile.

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

3.2.3 ifra (infrastructure). This variable explains if infrastructure was used as a determinant to attract foreign direct investment from 2000 to 2013 by Mexico and Chile. Infrastructure is considered as paved roads (km) and airports (number).

3.2.4 qualab (qualified labor). This variable explains if skilled labor was used as a determinant to attract foreign direct investment from 2000 to 2013 by Mexico and Chile. This variable was measured by the number of professionals that every State has in the two countries.

3.2.5 wage (minimum wage). This variable explains if low cost labor was used as a determinant to attract foreign direct investment from 2000 to 2013 by Mexico and Chile.

3.2.6 sec (security). This variable explains if security was used as a determinant to attract foreign direct investment from 2000 to 2013 by Mexico and Chile.

3.2.7 taxex (exemption from tax payment). This variable explains if exemption from tax payment was used as a determinant to attract foreign direct investment from 2000 to 2013 by Mexico and Chile. Some Mexican States offer in their annual reports tax payment exemptions for international investors as well as some Chilean provinces.

3.2.8 natures (natural resources). This variable explains if natural resources were used as a determinant to attract foreign direct investment from 2000 to 2013 by Mexico and Chile. Some Mexican States offer in their annual reports natural resources to be used by international firms as well as Chile.

3.2.9 gnp (gross national product). This variable explains if gross national product was used as a determinant to attract foreign direct investment from 2000 to 2013 by Mexico and Chile. A few Mexican states offer as an argument to attract capital from abroad that they have well-developed industries as well as Chile but with different sectors like Mexico.

3.2.10 legal (legal framework). This variable explains if a legal framework was used as a determinant to attract foreign direct investment from 2000 to 2013 by Mexico and Chile



3.2.11 geoloc (geographical location). This variable explains if geographical location was used as a determinant to attract foreign direct investment from 2000 to 2013 by Mexico and Chile.

3.2.12 indpol (industrial policy). This variable explains if a foreign direct investment industrial policy was used as a determinant to attract foreign direct investment from 2000 to 2013 by Mexico and Chile.

### 3.3 Hypotheses

For main model is:

H<sub>1</sub>: The attraction of foreign direct investment in Mexico and Chile depend on infrastructure development, on skilled labor, on low cost labor, on security, on tax exemption, on natural resources, on gross national product, on legal framework, on geographical location and industrial policy from 2000 to 2013.

For Probit model representing the most efficient variables:

H<sub>2</sub>: The probability of improving infrastructure, skilled labor, low cost labor, security, tax exemption, natural resources, gross national product, legal framework, geographical location and industrial policy will attract more foreign direct investment flows.

### 3.4 Data

Four hundred and sixteen yearly state reports were reviewed by the authors to build a database for the case of Mexico in this research. These reports were accumulated by the government of each state of Mexico. The authors found in those reports that the determinants used to attract foreign direct investment by the 32 states during 2000 and 2013 were skilled labor, cheap labor, tax exemption, legal framework, security, natural resources, infrastructure, gross national product by state, industrial policy and geographical location which according to different authors, are the most common used around the world despite that it is not clear if the determinants are new or renewal for countries. The same data was collected for the Chilean case through information provided by the embassy located in Mexico City as well as official web pages. A second database was also built to make the comparison but also a panel data analysis.

## 4. Descriptive statistics

In this section, authors show the most relevant descriptive statistics for this research.

First, we present in Table 4.1 some relevant statistics about the FDI inflows from 2001 until 2012 for the Mexican case.

Table 4.1

Period	Mean	Std. Dev.	Min	Max	Total
2001	950	3,917	-46	22,283	30,053
2002	742	2,892	-17	16,413	24,040
2003	593	2,018	-12	11,442	18,893
2004	790	2,594	-2	14,492	25,140
2005	760	2,355	-532	12,514	24,890
2006	630	1,739	-110	9,717	21,026
2007	937	2,826	-54	15,993	32,409
2008	864	2,401	-25	13,613	28,937
2009	523	1,511	-56	8,426	17,890
2010	702	1,613	-53	7,417	26,369
2011	619	2,067	-17	11,802	23,746
2012	403	586	-1	2,693	20,306
Total	709	2,322	-532	22,283	293,700

As we can see, the most important average of inflows was in 2001 (see table 4.1 and figure 4.1), equally for the maximum amount for the FDI (see figure 4.2), however the biggest amount of inflows was in 2007 (see table 4.1 and figure 4.3). In the following figures we want to show graphically the trend of the FDI flows in Mexico during the same period.

Figure 4.1

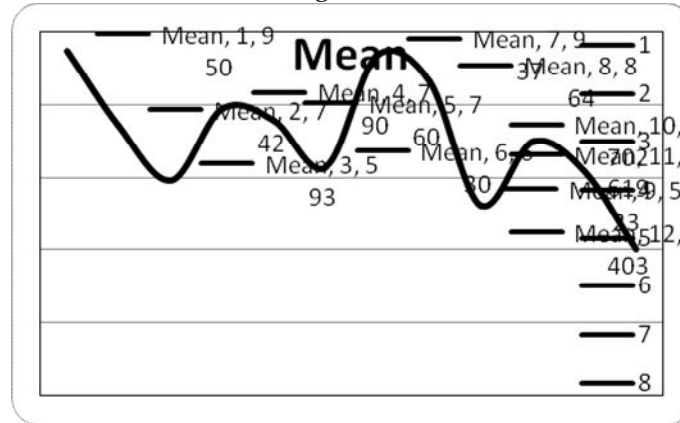


Figure 4.2

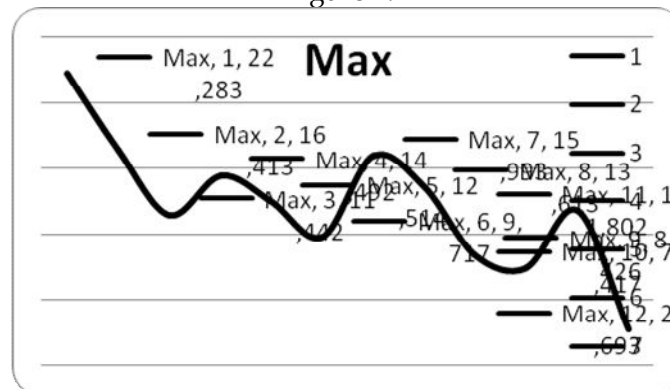
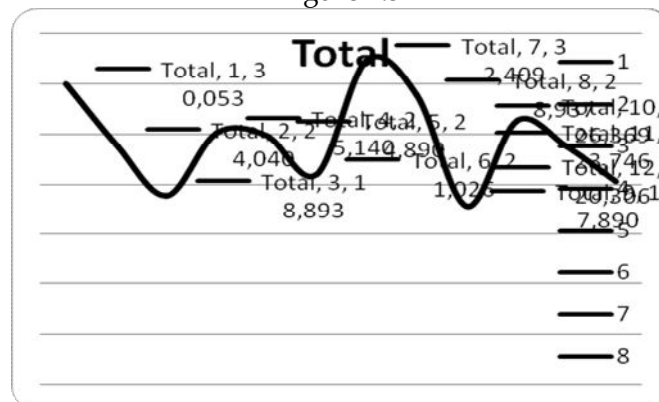


Figure 4.3



As shown above, Mexico's FDI flows were very volatile, there are years in which the FDI grows and there are years in which FDI downs. Besides the trend, it seems going down year by year.

In table 4.2 we also show some relevant statistics for the Chilean case considering the same period of time.

Table 4.2

Period	Mean	Std. Dev.	Min	Max	Total
2001	162,217	369,025	0	1,081,110	6,060
2002	186,573	405,702	0	1,494,584	5,035
2003	49,230	81,425	113	263,447	2,674
2004	66,365	89,219	0	267,072	6,755
2005	81,413	164,008	0	494,674	3,929
2006	103,408	198,222	0	673,170	5,945
2007	42,109	62,501	0	203,229	7,413
2008	218,670	450,359	0	1,518,799	12,157
2009	156,076	269,943	0	965,779	11,154
2010	72,320	205,077	0	800,318	11,764
2011	169,071	436,952	0	1,595,217	13,790
2012	0	0	0	0	30,323
Total	108,954	157,236	0	1,595,217	116,999

As we can see in Table 4.2, the most important average amount of inflows was in 2008 (see table 4.2 and figure 4.4), meanwhile in 2011 Chile reached the maximum amount for the FDI (see table 4.2 and figure 4.5), however the biggest amount of inflows was in 2012 (see figure 4.6). In the following figures we want to show graphically the trend of the FDI flows in Chile.

Figure 4.4

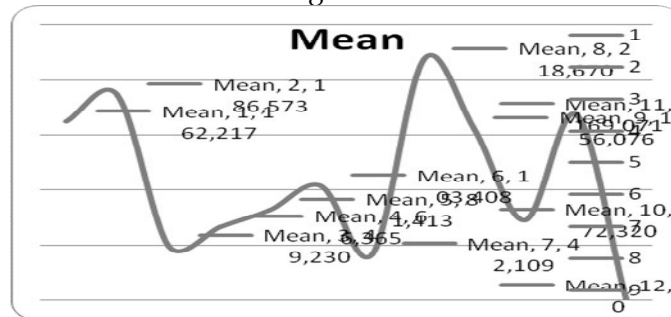


Figure 4.5

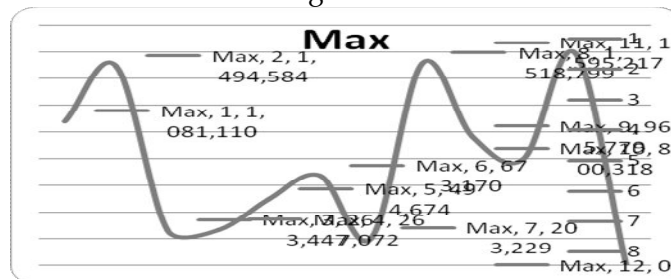
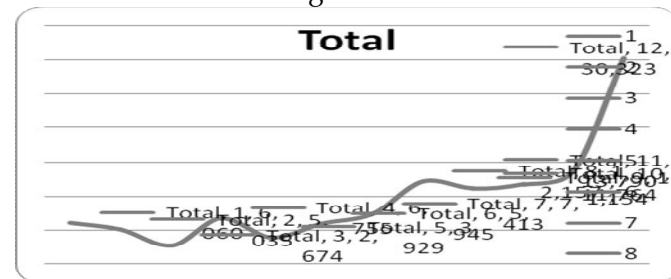


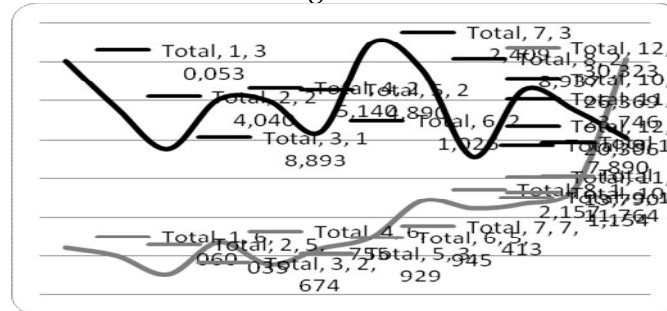
Figure 4.6





If we see this figures, the mean and the maximum are very similar to Mexico, but for the total amount of FDI flows looks like very impressive its upward trend.

Figure 4.7



In Figure 4.7, authors offer a comparison between the total amount of inflows for Mexico and Chile and we see that the amount for Chile is lower than Mexico, however, since 2007 Chile had an impressive increase in the FDI flows, meanwhile in Mexico the trend decreased since 2009 but it is more difficult to have a sustainable trend when capturing important amount of flows.

## 5. Methodology, Models and Results

### 5.1 Methodology

It is important to state out that the same hypotheses were used for Mexico and Chile, however to test them, were carried out several models of time series data, the results for these models indicate the nature of each of the variables used, and the relationship they have with the dependent variable and its statistical significance.

Once we have variables that will be employed in a probit model originally used by Bliss (1934) as well as applied to stochastic models by Steinbrecher and Shaw (2008) it was necessary to check and simulate the dependent variable (*impde*), which was developed as the probability that there is an improvement in the determinants that each one of the Mexican and Chilean states/provinces raised in their public policies and in their development plans, related to foreign direct investment flows. The probit model tested the hypotheses and the main objective of this research.

The probit model was used to propose a new theory of attraction of foreign direct investment based on the creation of new determinants or renewal thereof as part of the public policy of the countries. The database developed for this study contains data on the determinants used by each of the states of Mexico and Chile for a period of thirteen years. During those years, there are states that do not use the ten determinants commonly used to attract foreign direct investment or there are states that decide to improve the determinants and previously used by the states. In any of these circumstances apply to the proposal of the new theory.

### 5.2 Models

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

For Mexico,

Main model is:

$$fdi_t = \beta_0 + \beta_1 ifra_t + \beta_2 qualab_t + \beta_3 wage_t + \beta_4 sec_t + \beta_5 taxex_t + \beta_6 natures_t + \beta_7 gnp_t + \beta_8 legal_t + \beta_9 geoloc_t + \beta_{10} indpol_t + u_t$$

For the main model we have the following equation for efficiency:

$$fdi_t = \beta_0 + \beta_1 qualab_t + \beta_2 wage_t + \beta_3 taxex_t + \beta_4 natures_t + \beta_5 gnp_t + u_t$$

The Probit model for Mexico using the variables for the efficient model is:

$$P(impde_t) = \beta_0 + \beta_1 qualab_t + \beta_2 wage_t + \beta_3 taxex_t + \beta_4 natures_t + u_t$$

For Chile,

Main model is:

$$fdi_t = \beta_0 + \beta_1 ifra_t + \beta_2 qualab_t + \beta_3 wage_t + \beta_4 sec_t + \beta_5 taxex_t + \beta_6 natures_t + \beta_7 gnp_t + \beta_8 legal_t + \beta_9 geoloc_t + \beta_{10} indpol_t + u_t$$

For the main model we have the following equation for efficiency:

$$fdi_t = \beta_0 + \beta_1 ifra_t + \beta_2 qualab_t + \beta_3 wage_t + \beta_4 sec_t + \beta_5 gnp_t + \beta_6 geoloc_t + u_t$$

The Probit model for Chile using the variables for the efficient model is:

$$P(impe_t) = \beta_0 + \beta_1 taxex_t + \beta_2 legal_t + \beta_3 indpol_t + u_t$$

### 5.3 Results

As the models described before were handled through time series, we verified that the variables have a stationary stochastic process. The variables presented a nonstationary process so, 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 in the Table A1 for Mexico and in the Table A6 for Chile show the results for them:

$$fdi_t = \delta_0 + \alpha_1 fdi_{t-1} + \alpha_2 fdi_{t-2} + \alpha_3 fdi_{t-3} + \alpha_4 fdi_{t-4} + \gamma_1 ifra_{t-1} + \gamma_2 ifra_{t-2} + u_t$$

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 stationary variables; besides that, we use the Wald test (Wald, 1940) to prove if the model has an asymptotic chi-square distribution. The model was as follows and in Table A2 for Mexico and in Table A7 for Chile show the results for them:

$$fdi_t = \delta_0 + \alpha_1 fdi_{t-1} + u_t$$

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 determinants for foreign direct investment flows that have been submitted in Mexico by 2001 to 2012.

The interaction of all independent variables in the Main model is shown with respect to the dependent variable in Table A3 for Mexico and Table A8 for Chile. Here, we had to analyze the model separately. First, in the case of Mexico as we can see in Table A3, there are variables with poor significance, so, with the general-to-specific method we dropped the following variables *ifra*, *sec*, *legal*, *geoloc* and *indpol*. It was expected that all the variables were significant but, the independent variables corresponding to infrastructure, security, legal system, geographic localization and for industrial policy, were not. Secondly, for the case of Chile we show the econometrical results in Table A8. The variables we dropped were *taxex*, *natures*, *legal*, and *indpol* corresponding to Tax exemption, natural resources, legal system and for industrial policy, respectively.

Subsequently, we build some more efficient models with a great significance in each of them that we show in Table A4 for Mexico and in Table A9 for Chile.

Once interactions were tested using linear regressions, a simulation using the *probit* model was done. The results showed that the probability of an improvement in the determinants increased flows of foreign direct investment. The presented results correspond to Mexico in Table A5 and for Chile in Table A10, and we only use the most efficient variables to demonstrate the theory. When we tested the probit model for each country, it had a good response for the most efficient variables shown in the model earlier.

## 6. Conclusions

The theories proposed by several authors to explain how countries attract FDI are diverse. Some of them are based on the use of different determinants as part of its public policy. In this sense, during the 2001-2012 period, Mexico used ten determinants in common for each of the 32 states to attract foreign direct investment, however, the main model with efficiency demonstrated that the most important determinants used by Mexico to attract FDI were skilled labor, low cost labor, tax exemption, natural resources and gross national product.

We found out that the other determinants apparently were less important but they do have a great significance. For example, the safety-related determinant was found not to be significant as part of its public policy because it is now known that Mexico is facing serious security problems and cannot use that determinant in attracting foreign direct investment. On the other hand, Mexico is also considered as a three-zone divided nation (Northern, Centre and Southern) that have differences among them. The North and Centre zones are well connected with infrastructure such as paved roads, ports, airports but it is not the case of the south zone.

On the other hand, it is well-known in international markets that Mexico has an enormous free trade agreement network that has been used in the last decades to attract FDI with a combination of industrial policy and geographical location and they have become part of the firm's decisions when going abroad.

There are positive relations between the rest of the determinants and the dependent variable which is coherent with the literature review.

Since the period studied is twelve years, it was observed that some states of Mexico during that period decided to create or renew their determinants in order to attract more and new flows of foreign direct investment. In that sense, the purpose of this article was to test the new determinant creation theory proposed by Botello and Davila (2015) as part of the public policy of the 32 state governments and the probit model demonstrates that relationship.

The case of Chile is very interesting because it shows that is currently using six determinants proposed by the authors to attract FDI. The use of infrastructure, skilled labor, low labor cost, security, gross national product and geographical location are the most relevant of the tenth to attract inflows. Reports from CEPAL (2013) indicate that Chile is the only nation in Latin America that is capturing more inflows related to its gross national product. The mining sector still continues to be one the most relevant sector to attract FDI specially because low cost labor but on the other hand we found out that there are another zones that are focused on attract international firms that need skilled labor. The term security means that Chile is a safe country where investors can trust in.

The comparison that was made between the two countries demonstrated that they are using at least three of the same determinants to attract FDI but with a different focalization strategy in their public policy. For example, Chile uses low cost labor for mining while Mexico uses it for "maquiladora" sector. We can assume that this depend on the use of natural resources for Chile and; proximity and NAFTA for Mexico.

As a last idea, if any government in the world is interested in attracting new or more foreign direct investment must create or renovate the determinants used to attract investment flows. There are probably cities or provinces who want to attract resources for certain types of industry but they must create or renew the related determinants, such that the different types of industry prevailing in a country use different determinants and some of them they shall not be used to attract new resources and should focus on the development of new determinants.

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## Appendix

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

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
fdi					



L1	0.508729	0.052105	9.76	0.000	0.4066052	0.6108529
L2	0.3263268	0.0534649	6.1	0.000	0.2215375	0.4311161
qualab						
L1	30.23529	1652.03	0.02	0.985	-3207.684	3268.154
L2	73.59285	1657.667	0.04	0.965	-3175.375	3322.56
wage						
L1	118.0432	1308.728	0.09	0.928	-2447.016	2683.102
L2	-90.3526	1324.556	-0.07	0.946	-2686.434	2505.729
taxex						
L1	-4.16302	357.4516	-0.01	0.991	-704.7553	696.4293
L2	94.46906	355.3705	0.27	0.790	-602.0444	790.9825
natures						
L1	-89.96946	513.2468	-0.18	0.861	-1095.915	915.9758
L2	-68.92927	526.3356	-0.13	0.896	-1100.528	962.6696
gnp						
L1	39.08159	530.368	0.07	0.941	-1000.421	1078.584
L2	137.0884	535.216	0.26	0.798	-911.9157	1186.092
_cons	34.15935	162.6493	0.21	0.834	-284.6275	352.9462

Table A2. Econometric results to find the Granger causality Wald tests (Mexico).

Equation	Excluded	chi2	df	Prob> chi2
fdi	qualab	0.27296	2	0.872
fdi	wage	0.03027	2	0.985
fdi	taxex	0.31046	2	0.856
fdi	natures	0.87606	2	0.645
fdi	gnp	0.71715	2	0.699
fdi	ALL	2.8653	10	0.984

Table A3. Econometric results to prove the Main model (Mexico).

fdi	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
ifra	-340.6887	471.7757	-0.72	0.471	-1269.61 588.2331
qualab	1398.227	454.5108	3.08	0.002	503.2996 2293.154
wage	1415.295	367.7762	3.85	0.000	691.1473 2139.443
sec	-83.17773	345.2768	-0.24	0.81	-763.0245 596.669
taxex	976.0842	338.4365	2.88	0.004	309.7059 1642.463
natures	-1931.841	317.8878	-6.08	0.000	-2557.759 -1305.923
gnp	888.0013	419.6766	2.12	0.035	61.66194 1714.341
legal	852.9122	396.8614	2.15	0.033	71.49596 1634.328
geoloc	-267.715	497.5836	-0.54	0.591	-1247.452 712.0225
indpol	-736.166	549.2051	-1.34	0.181	-1817.546 345.2135
_cons	347.5979	629.5481	0.55	0.581	-891.9764 1587.172

Table A4. Econometric results for the efficiency for the Main model (Mexico).

fdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
qualab	1202.727	387.9903	3.1	0.002	438.8434	1966.611
wage	1230.081	352.4779	3.49	0.001	536.1149	1924.047
taxex	945.1029	319.7686	2.96	0.003	315.5355	1574.67
natures	-1835.417	306.8978	-5.98	0.000	-2439.645	-1231.19
gnp	1031.067	389.8551	2.64	0.009	263.5119	1798.623
_cons	-125.1932	317.7903	-0.39	0.694	-750.8657	500.4793

Table A5. Econometric results for the probit model (Mexico).

impde	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
qualab	2.221216	0.3491229	6.36	0.000	1.536947	2.905484
wage	1.165196	0.3128022	3.73	0.000	0.5521149	1.778277
taxex	1.243878	0.2587321	4.81	0.000	0.7367728	1.750984
natures	1.947812	0.2923151	6.66	0.000	1.374885	2.520739
_cons	-2.06253	0.3380848	-6.1	0.000	-2.725164	-1.399896

Table A6. Econometric results for the Vector Autorregressive (VAR) models, to prove collineality (Chile).

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
fdi						
L1	0.0452078	0.0909708	0.5	0.619	-0.1330918	0.2235074
L2	0.2116691	0.097692	2.17	0.030	0.0201963	0.4031419
ifra						
L1	-140521.3	285761.6	-0.49	0.623	-700603.8	419561.1
L2	35017.72	307217.7	0.11	0.909	-567117.9	637153.4
qualab						
L1	-57566.71	490302.1	-0.12	0.907	-1018541	903407.8
L2	-173939	489935.2	-0.36	0.723	-1134194	786316.5
wage						
L1	-23703.95	308734.1	-0.08	0.939	-628811.6	581403.7
L2	-27868.51	309538.9	-0.09	0.928	-634553.6	578816.5
sec						
L1	51169.65	139161.1	0.37	0.713	-221581	323920.3
L2	84133.8	138932.4	0.61	0.545	-188168.7	356436.4
gnp						
L1	1509.544	189543.6	0.01	0.994	-369989	373008.1
L2	88217.98	191585.1	0.46	0.645	-287282	463717.9
geoloc						
L1	465049.5	281293.4	1.65	0.098	-86275.45	1016374
L2	-679104.5	279923.9	-2.43	0.015	-1227745	-130463.8
_cons	448189.9	169845.1	2.64	0.008	115299.7	781080.2

Table A7. Econometric results for find the Granger causality Wald tests (Chile).

Equation	Excluded	chi2	df	Prob> chi2
fdi	ifra	0.76602	2	0.682
fdi	qualab	7.1837	2	0.028
fdi	wage	0.55204	2	0.759
fdi	sec	5.713	2	0.057
fdi	gnp	1.3134	2	0.519
fdi	geoloc	12.46	2	0.002
fdi	ALL	2.8653	12	0.984

Table A8. Econometric results to prove the Main model (Chile).

fdi	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
ifra	-275976.2	151734.3	-1.82	0.071	-576208.3 24256.03
qualab	-359871.5	70963.9	-5.07	0.000	-500285.7 -219457.3
wage	-114422.6	76357.41	-1.5	0.136	-265508.8 36663.59
sec	164059.4	53789.13	3.05	0.003	57628.43 270490.4
taxex	14142.65	68411.69	0.21	0.837	-121221.6 149506.9
natures	12764.68	54525.17	0.23	0.815	-95122.68 120652
gnp	122554.2	68417.35	1.79	0.076	-12821.19 257929.6
legal	67997.02	65944.64	1.03	0.304	-62485.72 198479.8
geoloc	-204993.7	81330.97	-2.52	0.013	-365920.9 -44066.48
indpol	31734.49	90332.88	0.35	0.726	-147004.6 210473.5
_cons	640284.6	150905.2	4.24	0.000	341692.9 938876.4

Table A9. Econometric results for the efficiency for the Main model (Chile).

fdi	Coef.	Std. Err.	t	P>  t	[95% Conf. Interval]
ifra	-222450.9	119302.4	-1.86	0.064	-458442.7 13540.93
qualab	-348030	66890.92	-5.2	0.000	-480346.9 -215713.2
wage	-96531.58	56814.62	-1.7	0.092	-208916.5 15853.35
sec	191730.4	46876.39	4.09	0.000	99004.32 284456.6
gnp	147637.1	64151.28	2.3	0.023	20739.55 274534.7
geoloc	-210663	68516.82	-3.07	0.003	-346196 -75129.97
_cons	640827.6	130717.2	4.9	0.000	382256.1 899399.1

Table A10. Econometric results for the probit model (Chile).

impde	Coef.	Std. Err.	z	P>  z	[95% Conf. Interval]
taxex	0.8998633	0.4470276	2.01	0.044	0.0237053 1.776021
legal	2.180706	0.4004419	5.45	0.000	1.395854 2.965558
indpol	1.865219	0.4729674	3.94	0.000	0.9382194 2.792218
_cons	0.1999643	0.0775323	2.58	0.010	0.0680037 0.3519249