View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by Research Papers in Economics

The Exchange Rate and Inward Foreign Direct Investment in Mexico

Shanta Parajuli, Graduate Student

Department of Agricultural Economics and Agribusiness
Louisiana State University and LSU AgCenter
Phone: (225) 578-2728
Fax: (225) 578-2716

Email: sparaj1@tiger.lsu.edu

P. Lynn Kennedy, Professor
Department of Agricultural Economics and Agribusiness
Louisiana State University and LSU AgCenter
Phone: (225) 578-2726
Fax: (225) 578-2716
Lkennedy@agcenter.lsu.edu

Selected Paper prepared for presentation at the Southern Agricultural Association

Orlando, FL, February 6-9, 2010

Copyright 2010 by Shanta Parajuli and P. Lynn Kennedy. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all copies

The Exchange Rate and Inward Foreign Direct Investment in Mexico

Abstract: *This paper analyzed the exchange rate and inward foreign direct investment (FDI) in Mexico from the 25 developed countries comprising the Organization for Economic Co-operation and Development (OECD). Our empirical result does not support the significant relationship between exchange rate and exchange rate volatility to determine FDI in Mexico. The wages, export, and distance are found to be significant variables to determine FDI in Mexico which is supported by literatures.*

Introduction

An important part of globalization is the increase in trade as well as the foreign direct investment that has occurred around the world. It is reported that from 1979 to 1999 the ratio of world foreign direct investment (FDI) inflows to capital formation rose by 17% UNCTAD (2000). For many developing countries it has become an increasingly important source of external financing (UNCTAD, 2006). It brings recent technology, knowledge, employment as well as economic growth to a country which, without FDI, wouldn't have had it otherwise.

Fluctuation of the exchange rate in developed countries impacts the economy and generates complications in the international market. The effect of the exchange rate and FDI has been discussed in the literature for quite some time but there is still controversy on the direction in which the effect will occur. There are mixed results for the effect of the exchange rate on FDI. With few exceptions (e.g., Tenreyro, 2007), previous studies assume that exchange rate variability is exogenous. The exchange rate may influence FDI if there are capital imperfections

(Froot and Stein, 1999). The appreciation of the host country's currencies against that of the home country increases FDI in the host country (Campa, 1993)

Most of the literature related to FDI inflows and outflows are focused on developed as compared to developing countries. FDI flows into the developing country are limited because of a lack of reliable data on FDI as well as a shortage of capital (Thomas and Grosse, 2001 and Majeed and Ahmad, 2007). FDI inflows in developing countries are mainly due to those countries' relative low cost of production in such things as raw materials and labor. This type of FDI is called vertical FDI (Shatz and Venables, 2000). The limited amount of research conducted on FDI in developing countries motivated us to study inward FDI in Mexico from developed countries (OECD).

In January 1994, the United States (US), Canada, and Mexico implemented the North American Free Trade Agreement (NAFTA). The main objective of NAFTA is to reduce trade barriers faced by Canada and the United States while importing goods from Mexico and attract the inward FDI. Before GATT, Mexico imposed tariffs of up to 100% and 90% for imported goods and also required the importer to have the proper license. By 1994, the Mexican tariff rate had fallen dramatically, averaging 20%. In addition, the requirement for import licensing was largely eliminated (Qasmi and Fausti, 2001). After NAFTA, these countries have comparative advantages. A marked increase in FDI in Mexico was experienced upon conclusion of NAFTA (Waldkirch, 2008). Between 1994 and 2005, FDI inflows into Mexico were mainly in the manufacturing and service sectors and totaled approximately $170 million. Of total FDI into Mexico, 95 % is from OECD countries (Waldkirch, 2008).

This study evaluates the relationship between exchange rate and inward FDI in Mexico. The major contribution of this paper is testing the stated hypotheses of the determinants of inward FDI to Mexico from OECD countries. Annual FDI inflows into Mexico from the 25 OECD countries were used for the analysis. The United States is the largest investor in Mexico, with over $5 billion (U.S.) in 1995 and with investment topping $11 billion (U.S.) in 2002. The second largest investor in Mexico is Germany with over $0.8 billion (U.S.) in 1995. The FDI inflow is found to have dramatically decreased in 1998 for the United States, Germany, Switzerland, and Canada (Appendix1). The results suggest that the exchange rate and exchange rate volatility (measured by the standard deviation) are positive but not significant. The wage, export, and distance variables are significant and help to explain inward FDI flows. This study differs from previous studies in that the data we consider are primarily for the time period after the implementation of NAFTA.

Literature Review:

There is an extensive literature related to FDI inflows and outflows (Cushman, 1988; Pain, 1993; Barrell and Pain, 1996; Blonigen, 1997; Coughlin, *et al.*, 1997; Blecker, 2009). Theory related to the types of FDI suggests that there are two types of FDI: horizontal (market-seeking) and vertical. The international market searching for the lowest cost of production is called vertical FDI. Vertical FDI is mainly export oriented (Shatz and Venables, 2000).Horizontal FDI involves the establishing of homogenous plants in a foreign location as a means of supplying certain goods in the foreign country. This type of FDI replaces exports to the host country from the home country. Gross Domestic Product (GDP) and Gross National Product (GNP) serve as proxies for market size. The larger the size of the home market, the larger the firm will be and the more capable it will be of expanding abroad. In such a situation, GDP of the home country is

positively related to FDI. There is a host of literature that points toward the relationship between FDI and GDP being positive (e.g., Campa, 1993; Culem 1993; Barrel and Pain, 1996; Chakrabarti, 2001). Groose and Trevino (1996) stated that the size of the home country's market (which serves as a proxy for the number of home firms) is positively related to the amount of FDI in the host country. Bevan and Estrin (2004) studied the determinants of FDI in European transition economies using panel data that covers the period from 1994 to 2000. They conclude that there was a positive relationship between GDP and FDI.

In some cases, domestic demand deficiencies are important reasons for a home country to invest in a foreign market. In such situations, the home country's GDP could be negatively related to FDI (Pitelis, 1996). Per capita GDP measures labor productivity and it is expected that high labor productivity encourages FDI. It is also assumed that higher wage rates discourage inward FDI, so the expected sign for the coefficient could either be positive or negative. Thomas and Grosse (2001) reported the negative relationship of GDP and inward FDI to Mexico during the period from 1980-1995 using the Generalized Least Squares (GLS) method. Brozozowski (2006) studied FDI flows from the European Union (EU) into Mexico for the period from 1994 to 1997 Their results suggest that GDP and real per capita GDP are significant variables in explaining FDI flows. The relationship of FDI and growth in per capita GDP is negative. Pan (2003) studied inward FDI in China during 1984 to 1996 and found a significant but negative relationship. The above literature indicates that inward FDI into a developing country does not hold in the same way as it does for a developed country.

The cost of borrowing money is assumed to be financing cost. Financing cost is borne by the home country. The lower cost of borrowing in the home country attracts inward FDI in the host country. The home country has the cost advantage in investing in the host country. There is,

therefore, a negative relationship between the cost of borrowing and inward FDI. Grosse and Trevino (1996) found that the cost of borrowing for the home country affects outward FDI flow into United States. Ramasamy and Yeung (2007) found that the cost of borrowing was both negative and significant for both the manufacturing and service sectors. Grosse and Trevino (1996) also reported a negative relationship between the cost of borrowing and FDI inflows into the United States. There are numerous studies that show a negative relationship between FDI and the cost of borrowing (e.g., Ajami and Braniv, 1984; Liu, et al. 1997; Thomas and Grosse, 2001; Pan, 2003).

Whether trade and FDI can be viewed as complements or substitutes remains questionable. A complementary relationship indicates that both trade and FDI move in the same direction in the foreign market (e.g., Marchant et al 2002; Lipsey and Weiss, 1981). A substitutionary relationship indicates that an increase in FDI decreases exports (e.g., Gopinath et al. 1999; Mundell, 1999). Grosse and Trevino (1996) found trade's ability to determine inward FDI was negative and significant. But the subdivision of trade flows into imports and exports showed a significant and positive relationship with the FDI determinant.

The home country invests in the host country in order to obtain the advantages of the lower manufacturing costs in the home country. Lower relative wage costs will encourage FDI inflows. The lower labor cost reduces the total cost, especially in labor intensive manufacturing industries. Lower the cost of labor in host country, more attractive is the FDI. Thomas and Groose (2001) found a negative effect of wages in the subsample of the efficiency seeking FDI into Mexico. This might not be the case if the inward FDI in the service sectors where wages are higher than they are in other sectors. This is supported by the study of Ramasamy and Yeung

(2007) who found the relationship between labor cost and FDI in service sectors to be positive but found a negative relationship in manufacturing sectors

The geographical distance from the host country to home country may be a significant determinant of FDI. Goldberg and Grosse (1994) found the relationship between distance and FDI to be negative. Greater distance could be considered a negative transaction cost that could potentially hinder the ability of an economic agent in entering a foreign market and would be a factor that would tend to lower the amount of FDI flows into the host country from home countries.

One factor that can adversely impact investor profit is the rate of inflation. Normally, it assumed that the higher the price is for an item the greater the profit will be but a high inflation rate can be viewed as a barrier to FDI. Botric and Skuflic (2006) examined the determinants of FDI in countries in southeast Europe from 1996 to 2002 and found that FDI had a positive but insignificant effect on inflation. In contrast, Trevino et al. 2002 studied FDI flows in Latin America and reported that FDI flows had a negative but insignificant effect on inflation.

The literature related to the interrelationship between the exchange rate and FDI is mixed. There is no clear statement as to how exchange rates affect FDI. With few exceptions (e.g., Tenreyro, 2007), previous studies assume that exchange rate variability is exogenous. Gorg and Wakelin (2002) studied the effect of exchange rate on outward U.S. FDI flows into developed countries and inward FDI flows into the United States from those same developed countries. The results suggest that there is no evidence that variation in the exchange rate has any noticeable effect on US outward as well as inward FDI flows. Amuedo-Dorantes and Pozo (2001) studied foreign exchange rates and inward FDI flows in the United States during the first quarter of 1976 to the

third quarter of 1998 and reported that there is no statistically significant relationship between the exchange rate and inward FDI. Crowley and Lee (2003) studied the exchange rate volatility and foreign investment between the United States and 17 other OECD countries during the period from 1980 to 1998 under flexible exchange rate regimes. This study reports that the effect of volatility in the exchange rate on FDI is weak. This relationship differs across countries due to differing currency valuations. Countries with a stable exchange rate were found to be least affected. They also emphasized that the relationship between exchange rate and FDI is weak if the exchange rate volatility is small and vice versa.

Depreciation in host countries' currencies tended to attract FDI and provide more returns as compared to exports. Previous literature, (e.g., Froot and Stein, 1991; Gorg and Wakelin, 2002) suggests that the attraction for increased inward FDI flows into the United States is due primarily to the depreciation of the U.S. Dollar.

Thus from the above both the literature and economic theory that have been discussed up to this point, we would then expect the following relationships to hold:

1. The larger the home country market, the greater the FDI inflow into Mexico.
2. There will be a negative relationship between distance from the home country to Mexico and FDI inflows to Mexico.
3. If the cost of the labor is more expensive in the home country, there will be a positive relationship between wages and FDI.
4. There will be a positive relationship between the home country's interest rate and FDI in Mexico
5. The greater the amount of existing trade between Mexico and a home country, the greater the FDI will be in Mexico.

6. There will be a positive/negative relationship between inflation and inward FDI in Mexico

Methodology

Data: We select 25 OECD countries from 1995 -2007 to analyze the effect of the exchange rate and the determinants of the FDI into Mexico. The panel data utilized herein represents a good cross section within the time period studied in this paper.

Dependent Variables:

Foreign Direct Investment in Mexico is the dependent variable of interest and is measured by annual inflows of FDI in millions of dollars. This information was obtained from OECD statistics.

Independent Variables:

Size of home country market: Gross domestic product is used as a proxy for the size of home country market. It is measured in millions of US dollars. This data is extracted from the International Monetary Fund's *International Financial Statistics* (CD- ROM version) (2009).

The cost of borrowing: The long term interest rate measured in percent is extracted from OECD Main *Economic Indicators.*

Existing bilateral trade: Consist of the imports to OECD Countries from Mexico and exports from OECD countries to Mexico (host). The data is extracted from the OECD statistics. It is measured in US dollars. For analytical purposes the data extracted was converted into millions of US dollars.

Geographic distance: The distance from the capital of Mexico, Mexico City, to the home country's capital city, measured in kilometers. The data were extracted from a geographic distance locator on the Internet and can be found at http://www.timeanddate.com/worldclock/distance.html.

Wage cost: Represents the cost of labor. The data were extracted from the United States Bureau of Labor Statistics 2007 publication entitled *International Comparisons of Hourly Compensation Costs for Production Workers in Manufacturing*. It is measured in US dollars.

Inflatation: The GDP deflator is obtained from the International Monetary Fund's *International Financial Statistics* (CD- ROM version) (2009).

Model

The advantage of having a panel-data set is that it allows for the modeling or the heterogeneity or differences in behavior across countries. According to Green (2008), the panel model is written as :

$$FDI_{it} = x`_{it}\beta + z`_{i}\,\alpha + \varepsilon_{it} \qquad 1$$

Where $i = 1, 2,\ldots, 25$ are indices that are country specific, x_{it} denotes the FDI determinants at time , ε_{it} are the serially uncorrelated errors with a zero mean and constant variance .

In equation (1), country specific effect is $z`_{i}\,\alpha$ where z_i contains a constant term and a set of individual or group specific variables which may be observed or unobserved. If z_i is observed for all countries, then the model can be estimated using ordinary least squares (OLS) regression. If z_i is unobserved but correlated with regressors x_{it} then the least squares estimator of β is biased and inconsistent. In such a case, a fixed effect model is more appropriate. If the unobserved

individual heterogeneity or country specific effects are uncorrelated with the regressors, then a random effect model is most appropriate. According to Green (2008), the random model is formulated as

$$FDI_{it} = x`_{it}\beta + z`_{i}\,\alpha + u_i + \ \varepsilon_{it} \qquad 2$$

Where u_i is a random variable that is independent of the regressors means that $Cov(x_{it}c_i) = 0$. There is no partial effect of x_{is} on FDI_{it} for $s \neq t$. The assumption implies that explanatory variables in each time period are uncorrelated with the idiosyncratic (individual) error term in each time period.

$$E\left(x`_{is}u_{it}\right) = 0$$

The nature of the country specific effect is unknown in FDI analysis, thus we estimate both a fixed effects model and random effects model and compare the results using a Hausman test. In such a test, under the null hypothesis, both fixed effect and random effect estimators are consistent. That is, there is no correlation between the error terms and regressors and estimates from both regressions converge to a true value in a large sample. The regression model for the variables of interest is written as:

$$FDI_{it} = \propto_i + \beta_1 GDP_{it} + \beta_2 R_{it} + \beta_3 EX_{it} + \beta_4 IMt_{it} + \ \beta_5 INF_{it} + \beta_6 DIS_{it} + \beta_7 ER_{it} + \beta_8 STD_{it} + \varepsilon_{it} \qquad 3$$

FDI = inflows of foreign direct investment into Mexico

GDP= gross domestic product

R= cost of borrowing

Ex= export from the home country to Mexico

IM = import from Mexico to home country

DIS = geographic distance from host country to the home country

INF = inflation

Where i is the partner country with Mexico at time t; u_{it} is the serially uncorrelated errors with zero mean and constant variance.

Descriptive Statistics

Table 1 shows the descriptive statistics for the variables of interest. FDI inflow was found as low as being above 2 billion (negative) for Japan in 2007. Maximum FDI is for the United States in 2007. Figure 1 shows the volatility in countries across time. The volatility of the exchange rate is measured by the standard deviation of the exchange calculated by average of the monthly changes in the exchange rate (country/Mexico) as used by Gorg and Wakelin 2002. For most countries, such as the United States and Canada, the volatility is rather small but for other countries, e.g., Korea and Italy, the volatility is somewhat greater.

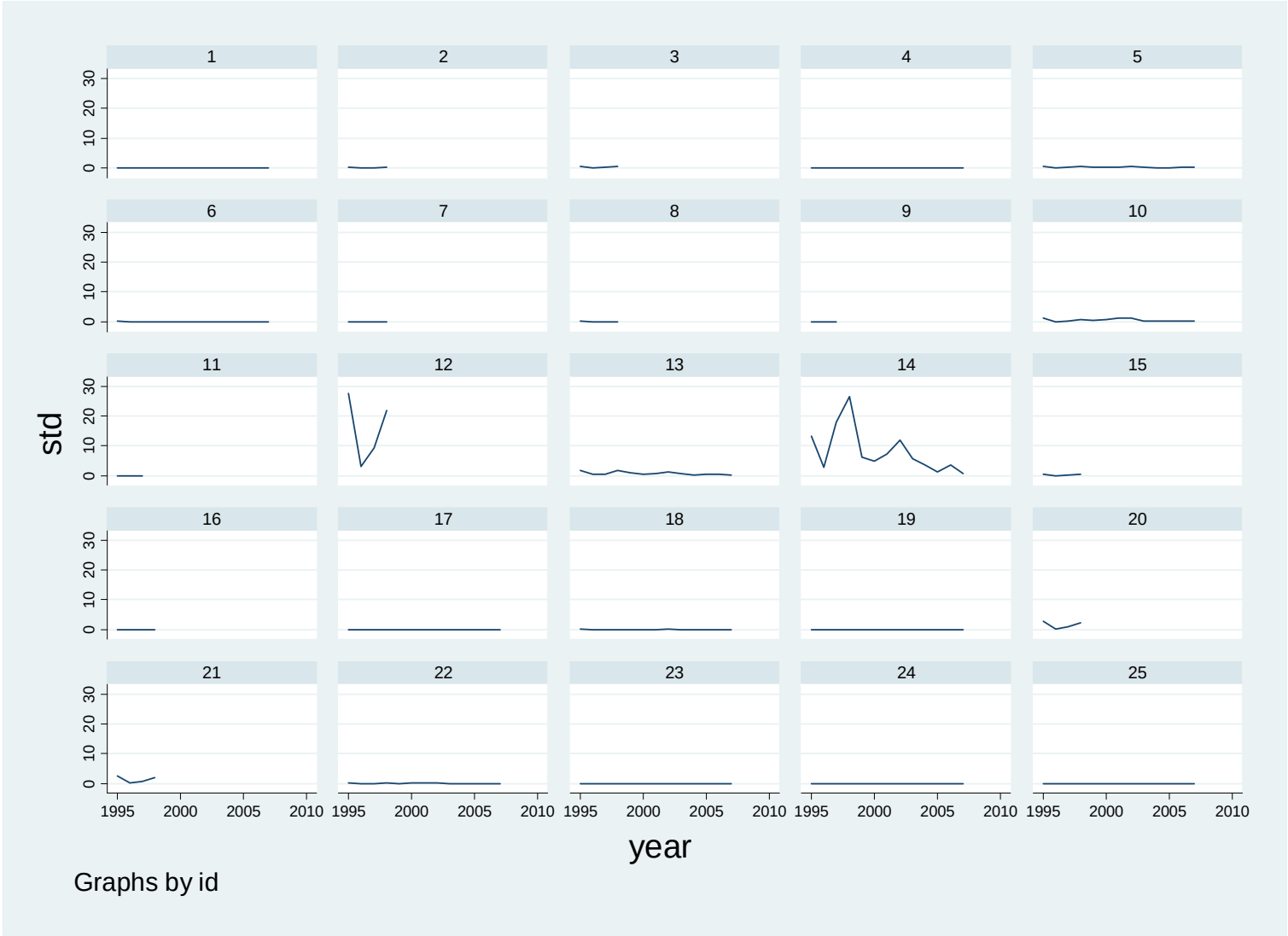
Results

This section discusses the regression results obtained by using equation (3). The analysis uses FDI flows from the OECD countries to Mexico for the period commencing in 1995 through 2007. The selection of OECD countries is a very good representation for examining FDI inflow into a developing country from developed countries. Tests for heteroscedasticity were positive, suggesting its presence. Initially, both a fixed effects and random effects model were run. The null hypothesis for the Hausman test was not rejected, suggesting that the random effects model is the more appropriate model for the data. The results obtained from the random effects model are presented here.

Table 1: Descriptive Statistics for Variables of Interest.

Variable	Obs	Mean	Std.	Min	Max
FDI	316	662.22	2251.23	-2482.9	21092.60
GDP	325	1110.15	2162.69	7.02	13843.83
WAGE	297	20.02	8.65	2.54	48.56
Exchange rate	224	13.05	38.89	0.04	256.67
STD	224	0.92	3.5	0	27.58
Cost of borrowing	307	5.24	1.82	0	12.21
Import to OECD	320	4950.75	19642.10	0.11	137000.00
Export to Mexico	321	6145.63	27557.06	0.14	213000.00
INF	325	100.95	12.88	58.96	151.60
DIS	325	9314.08	2015.67	3596.00	13179.00

Figure1: Exchange Rate Volatility



std = volatility, please see appendix 2 for id information

The empirical results obtained by using a random effects model are listed in Tables (2). Overall the model performs well. The model was able to explain 88 % of variation in FDI inflows into Mexico from OECD countries. Empirical results suggest that the dependent variable, *FDI*, depends significantly upon the *wage*, *export* and *distance* variables.

GDP: The coefficient of the home market size is negative and insignificant which contradicts our hypothesis. Our result suggests that market seeking may not be the primary reason for investing into Mexico from an OECD country's perspective. We may say that FDI inflow into Mexico is mainly vertical. The negative and significant effect for market size was found by Borenztein et al. 1998.

Exchange rate: Exchange rate is found to be a negative and insignificant determinant of FDI in Mexico. This does not support our hypothesis. Depreciation in host currencies decreases inward FDI in Mexico from OECD countries. This evidence is at odds with some of the literature such as Cushman (1985). However, this result is in line with Campa (1993). Therefore we conclude that the exchange rate is not a significant determinant for inward FDI into Mexico. Standard deviation (volatility) is a positive and insignificant variable for determining FDI inflows which is agreement with the findings of Gorg and Wakelin (2002). Small exchange rate volatility for countries such as Canada, New Zealand, the United States, and Sweden makes sense since greater economic stability, as evidenced by lower exchange rate volatility, would enhance the ability of these countries to invest abroad.

Table: 2 Random Effects Model to Determine FDI inflow into Mexico from the OECD

Independent Variables	Excluding dummy	*US dummy*	*NAFTA dummy*
Constant	812.21	195.94	816.17
	(1.87)*	(0.14)	(-2.08)**
GDP	-0.12	-0.11	-0.12
	(-1.29)	(-1.3)	(-1.22)
WAGE	5.06	5.07	5.00
	(2.19)**	(2.19)**	(2.13)**
Exchange rate	-3.13	-3.39	-3.12
	(-1.56)	(-1.49)	(-1.46)
STD	22.66	23.94	22.50
	(1.14)	(1.11)	(1.08)
Cost of borrowing	12.23	18.75	12.10
	(0.66)	(1.17)	(0.66)
Distance	-0.09	-0.09	-0.09
	(-2.11)**	(-1.99)**	(-3.32)***
Import to OECD	0.18	0.20	0.18
	(2.09)	(1.86)*	(2.05)**
Export to Mexico	-0.05	-0.06	-0.05
	(-1)	(-0.99)	(-0.97)
US dummy		657.40	
		(0.42)	
NAFTA dummy			21.16
			(0.07)
Adjusted R^2	0.88	0.88	0.89
Observations	172	172	172

*Significant at the 0.10 level **Significant at the 0.05 level *** Significant at the 0.01 level Values in (parenthesis) are t-values.

Trade: Coefficient of import to the OECD is positive and significant in determining FDI flows into Mexico. This may suggest that FDI inflows into Mexico are largely due to the low cost of production thanks to such factors as low labor cost and/or low raw material cost. Coefficient of export to Mexico variable is negative and insignificant. The negative coefficient may imply a substitutionary relationship between FDI and export to Mexico. This result is supported by those findings in Gopinath *et al*. (1999) and Mundell (1999).

Distance to host country: Distance plays an important role in explaining FDI. The *distance* coefficient is negative and significant which is consistent with the initial hypothesis and with the literature (Grosse and Trevino, 1996; Thomas and Grosse, 2001).

Wages: The *wage* coefficient is positive and significant. When the wage in the home country increases one dollar, FDI inflows into Mexico increase by more than 5 million dollars. The results are consistent with results previously found in the literature (Wheeler and Mody, 1992; Feenstra and Hanson, 1997).

Inflation: The *inflation* coefficient is positive and insignificant. A similar result was found by Botric and Skuflic (2006), and by Busse and Hefeker (2007). The results are at odds with those mentioned in Bengo and Sanchez-Robles (2003).

Cost of borrowing: Borrowing cost in the home country is negatively related to FDI. The coefficient of the cost of borrowing is not statistically significant variable to explain FDI in Mexico. This result is odd with the finding of Thomas and Grosse, 2001.

Since the United States is the largest investor into Mexico, this could possibly be one cause for estimation bias. To account for this we ran the regression with a Dummy for the United States so as to remove any bias. Having done this, the sign of the variables did not change. Furthermore, the significance for the variables did not change except for the *export* variable (Table 2). A similar method was employed in the regression so as to remove any effects potentially stemming from NAFTA by using a dummy for both Canada and the United States. Here, like in the previous case, the variable signs did not change. *Distance* was found to be highly significant and suggests that the greater the distance a potential investor is from Mexico, the less likely that particular investor would be to invest in Mexico.

Conclusion

This paper has analyzed the determinants of foreign direct investment (FDI) in the developing economy of Mexico from OECD countries over the period from 1995 to 2007. Results indicate that *wage*, *exports to OECD countries*, and *distance* are significant explanatory variables that help to determine FDI in Mexico. This study found a substitutionary (though insignificant) relationship between FDI and exports to Mexico from OECD countries. The relationship between the exchange rate and FDI is negative but insignificant and does not support the initial hypothesis. Standard deviation is used herein as the measure of the volatility and was found to be positive but insignificant. This finding is meaningful for the country that has a smaller level of volatility but not quite as meaningful for the country which has a higher level of volatility (i.e., Korea).

References

Ajami, R. A. and R. Barniv. "Utilizing economic indicators in explaining foreign direct investment in the US". *Management International Review* 24(4), 1984: 16-26.

Amuedo-Dorantes, C. and S. Pozo. "Foreign exchange rates and foreign direct investment in the United States." *The International Trade Journal* XV (3), 2001: 251-252.

Barrell, R. and N. Pain. "An Econometric Analysis of US foreign direct investment." *Review of Economics and Statistics* 78, 1996: 200-297.

Bengoa, M. and B. Sanchez-Robles. "Foreign direct investment, economic freedom and growth: New evidence from Latin America." *European Journal of Political Economy* 19, 2003: 529-545.

Bevan, A. A. and S. Estrin. "The determinants of FDI into European transition economies." *Journal of Comparative Economics* 32, 2004: 775-787.

Blecker, R. "External shocks, structural change, and economic growth in Mexico, 1997-2007." *World Development* 37 (7), 2009: 1274-1284.

Blonigen, B.A. Firm-specific assets and the link between exchange rates and foreign direct investment." *American Economic Review* 87(3), 1997: 447-465.

Borensztein, E., J.D. Grengorio, and J.W. Lee. "How does foreign direct investment affect economic growth?" *Journal of International Economies* 45, 1998: 115-135.

Botric, V. and L. Skuflic. "Main determinants of foreign direct investment in the Southeast European Countries." *Transition Studies Review* 13 (2), 2006: 359-377

Brzozowaki, M. "Exchange rate variability and foreign direct investment consequences of EMU enlargement." *Eastern European Economics* 44 (1), 2006: 5-24.

Busse, M. and C. Hefeker. "Political risk, institutions, and foreign direct investment". *European Journal of Political Economy* 23, 2007: 397-415.

Campa, J. M. " Entry by foreign firms in the United States under exchange rate uncertainty." *Review of Economics and Statistics* 75, 1993: 614-622.

Chakrabarti, A. "The determinants of foreign direct investment: sensitivity analyses of cross country regressions." *Kyklos* 54, 2001: 89-113

Counghlin, C. C., J.V. Terza., V. Arromdee. "State characteristics and location of foreign direct investment within United States." *Review of Economics and Statistics* 73 (4), 1991: 675-6783.

Crowley, P. and J. Lee. "Exchange rate volatility and foreign investment: International Evidence." *The International Trade Journal* XVII (3), 2003: 251-252.

Culem, C.G. "The locational determinants of direct investments among industrialized countries." *European Economics and Statistics* 75, 1993:885-904.

Cushman, D.O. “Exchange rate uncertainty and foreign direct investments among industrialized countries.” *Weltwirtschaftliches Archiv* 124, 1988: 322-336.

Cushman, D.O. “Real exchange rate risk, expectations, and the level of direct investment.” *Review of Economics and Statistics* 67, 1985: 297-308.

Feenstra, R.C. and G.H. Hanson. “Foreign direct investment and relative wages: Evidence from Mexico’s Maquiladoras.” *Journal of International Economics* 42, 1997: 371-393.

Froot, A. and J.C. Stein. Exchange rate and foreign direct investment: “An imperfect capital markets approach.” *The Quarterly Journal of Economics* 106 (4), 1991:1191-1217

Goldberg, L.G. and R. Grosse. “Location choice of foreign banks in the United States.” *Journal of Economics and Business* 46, 1994: 367-379.

Gopinath, M., D.Pick, and U.Vasavada. “The economics of foreign direct investment and trade with an application to the U.S food processing industry.” *American Journal of Agricultural Economics* 81 (2), 1999: 442-452.

Gorg, H and K, Wakelin. “The impact of exchange rate volatility on US direct investment.” *The Manchester School* 70 (3), 2002: 380-397.

Green, W.H. Econometric analysis.” Sixth edition, 2008.

Groose, R. and L.J. Trevino. “Foreign direct investment in the United States: An analysis by country of origin.” *Journal of International Business Studies* 27(1), 1996: 139- 155.

International Monetary Fund’s *International Financial Statistics* (CD- ROM version), 2009

Lipsey, .E. and M.Y. Weiss. “Foreign production and exports in manufacturing industries.” Review of Economics and Statistics 63, 1981: 488-494.

Liu, X., H. Song, Y. Wei and P. Romilly. “Country characteristics and foreign direct investment in China: A panel Data analysis.” *Weltwirtschaftliches Archiv* 133(2), 1997: 313-328.

Majeed, M.T and E. Ahmad. “FDI and Exports in developing countries: theory and evidence.” *The Pakistan Development review* 46 (4), 2007: 735-750.

Marchant, M.A., D.N. Cornell, and W, Koo. “International trade and foreign direct investment: Substitutes or Complements”. *Journal of Agricultural and Applied Economics* 34 (2), 2002: 289-302.

Mundell, R.A. “International trade and factor mobility.” *American Economic Review* 47, 1999: 321-35.

Pain, N. “An econometric analysis of foreign direct investment in the United Kingdom.” *Scottish Journal of Political Economy* 40, 1993: 1-23.

Pan, Y. “The inflow of foreign direct investment to China: the impact of country-specific factors.” *Journal of Business Research* 56(10), 2003: 829-833.

Pitelis, C. “Effective demand, outward investment and the (theory of the) transnational corporation: An empirical investigation.” *Scottish Journal of Political Economy* 43 (2), 1996: 1992-206.

Qasmi, B.A. and Fausti, S.W. “NAFTA intra-industry trade in agricultural food products”. *Agribusiness* 17 (2), 2001: 255-271.

Ramasamy, B. and M. Yeung. “The determinants of foreign direct investment (FDI) in services.” http://ssm.com/abstract=100332.

Shatz, H. and A.J Venables. “The geography of international investment.” World Bank Policy Research Working Paper No. 2338.

Tenreyro, S. “On trade impact of nominal exchange rate volatility.” Journal of Development Economics 82 (2), 2007:485-508.

Thomas, D. and R. Grosse. “Country-of-origin determinants of foreign direct investment in an emerging market: the case of Mexico.” *Journal of International Management* 7, 2001: 59-79.

Trevino, L.J., J.D. Daniels., H. Arbelaez, and K.P. Upadhyaya . “Market reform and foreign direct investment in Latin America: Evidence from an error correlation model.” *International Trade Journal* 16 (4), 2002: 367-392.

UNCTAD World Investment Report. United Nations Conferences on Trade and Development, 2000

UNCTAD World Investment Report. United Nations Conferences on Trade and Environmental Review, 2006.

UNCTAD. World Investment Report 2006.

Waldkirch, A. The effects of foreign direct investment in Mexico since NAFTA. Department of Economics, Colby College, USA.

Wheeler, D. and A. Mody. “International investment location decisions: The case of US firms.” *Journal of International Economics* 33, 1992: 57-76.

Appendix 1 Annual inflows of foreign direct investment in Mexico (in million US dollars)

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Australia	-1	4.6	1.3	3.5	7.9	7.4	4.2	-2	0.6	7	24.1	31.9	134.9
Austria	0	0.4	0.6	5.9	1.8	1.8	15.7	0.6	-5.9	1	-0.2	42.2	55.4
Belgium	-	-	-	-	33.6	39.5	71.2	108.5	80.1	45.5	-53.9	178.5	201.2
Canada	392.5	515.5	224.1	181	625.3	699.6	989.4	221	254.8	551.2	424.8	557.3	709.8
Czech	-1.1	4.4	0	0	0	0	0	0	0.2	0	0.1	0.1	4.1
Denmark	15.5	17.6	18.5	47.4	179	203.2	250.9	208.3	54.2	115.5	42.5	196.6	84
Finland	14.2	-0.1	1	1.6	28.1	219	83.6	24.8	120.3	-50.1	18.2	29.2	53.4
France	98.3	119.3	59.6	127.9	168	-2482.9	392.5	349.4	529.5	226.8	363.8	120.7	202.8
Germany	877.3	196.2	480.2	136.6	764.4	347.7	-110.3	595.5	462.5	407.7	341.1	206.7	493.2
Iceland	0	0.3	0.7	1.3	0	0	-0.1	1.3	0	0	-2.4	0	0
Ireland	4	19.6	3.7	-2.3	1	4.8	6.2	114.7	3.2	-1.1	16.9	-11.1	79.8
Italy	17.7	18.3	29	16.4	35.3	36.4	17.6	37.6	9.3	166.4	32.6	16.8	32.9
Japan	-325.7	139.3	350.4	98.9	1232.7	417.2	187.6	166.1	121.6	369.9	123.5	-1459.6	371.8
Korea	113.4	85.8	190.4	49.9	46.1	30.1	48.2	31.5	37.1	47.5	96.2	71.2	40.2
Luxem	-	-	-	-	13.6	20.6	122.6	45.8	21	17.5	156.5	173.7	523.5
Netherlands	396.4	487	307.4	1056.7	1085.8	2682.5	2598	1460	570.5	3340	2437	2701.8	4317
N. Zealand	-	0	0	0.1	0	0	1.6	62.7	6.7	6.2	0.2	0.3	0.2
Norway	0	0	0.1	0.1	0	0.6	3.4	8.1	26.5	7.2	9.4	6.7	25
Poland	0	0	0	0	0	0	0	0	0	0.9	1.5	0	0
Portugal	0	0.1	0.6	3.4	4.1	-0.1	0.2	11.4	2.2	-0.7	0.8	0	6.2
Spain	-6	70.7	312.1	263.7	1042.1	2112.5	739.1	730.4	1775.9	7854	1185.1	1588.2	5199
Sweden	56.2	96.6	7.2	59.7	690.5	-279.4	-139	-47.9	-40.9	188.6	334	23.1	24.5
Switzerland	406.6	77.1	28.6	18.2	125.2	151.5	-176.6	461.6	312.3	1135	312.8	558.6	589.1
U.K.	328.1	78.7	1829.8	184	-187.5	282.6	131.6	1247	1056	273.7	1282.6	1230.1	551.2
U.S.	5311.3	5163.1	7236.8	4997.2	7420	12689.7	21092.6	12708	9555.3	8586	11578	12328.6	11496

Data source is the OECD database International Direct Investment

Appendix 2

id	Country
1	Australia
2	Austria
3	Belgium
4	Canada
5	Czech Republic
6	Denmark
7	Finland
8	France
9	Germany
10	Iceland
11	Ireland
12	Italy
13	Japan
14	Korea
15	Luxembourg
16	Netherlands
17	New Zealand
18	Norway
19	Poland
20	Portugal
21	Spain
22	Sweden
23	Switzerland
24	United Kingdom
25	United States