Determinants of the Sources of FDI into India

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Abstract

Inward FDI flows over 2000-01 from many source countries into India, one of the fastest growing large developing economies in the period, have been explained by an extended gravity model and the an extended allometric models by incorporating other variables such as common language, tax status, interest differential, and distance to arrive at the importance of these variables. Additionally, in representing the "size" in the both models by not GDP but as a constitution of per capita income and population, the difference between countries with the same GDP but at different levels of development are accounted for in the normalization itself so that the influence of the economic variables is more robustly estimated. The allometric model is found to be superior in explaining the overall variance in FDI inflows.

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Introduction

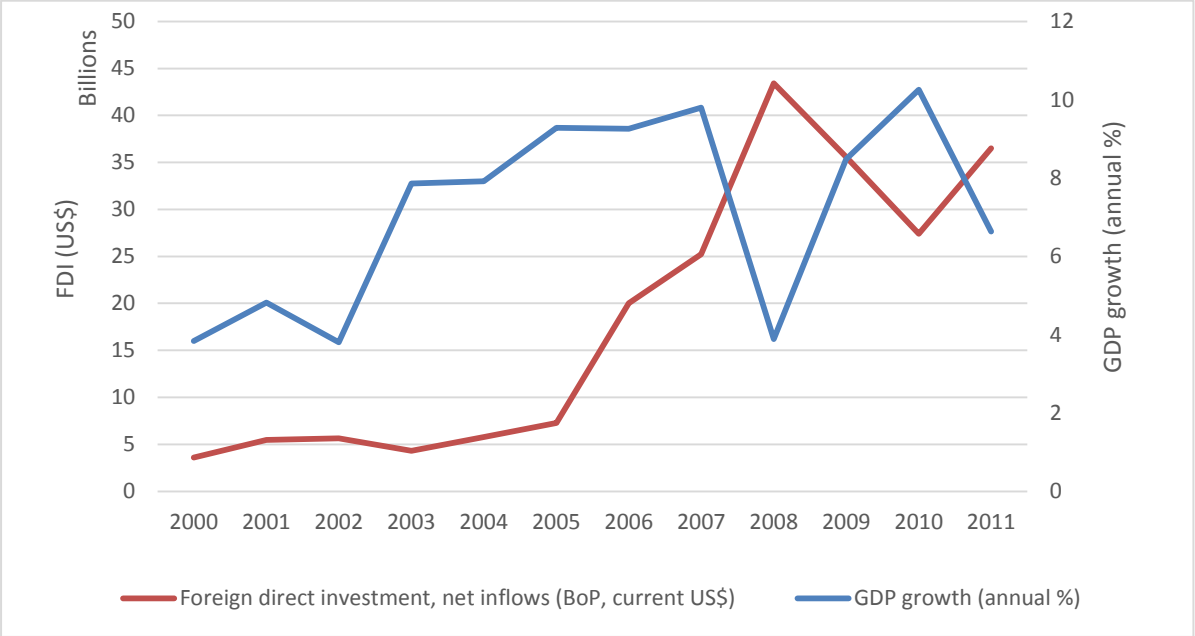
Today, foreign direct investments (FDI) into a large developing economy like India arise from many source countries and the question of country characteristics that drive inward FDI into India is interesting. Much of the theory rightly has focused on the recipient country characteristics, since the potential set of source countries is the same for all recipients and therefore the explanation of FDI into a country (or cross-sectionally across countries) lies with country level variables. Similarly broad trends in the global environment such as world growth, global commodity and payments cycles since they affect all countries would contribute to the explanation of the time wise pattern of investment flows.

Analysis of inward and outward FDI have been carried out on stocks but more typically on flows, usually at the country, and firm or industry levels when such data are readily available. Panel data analyses have been quite ubiquitous since the data when available is also available for reasonably long time periods. The fact that the definition of FDI both inward and outward have varied across countries makes the inter-country analysis, especially of inward flows somewhat circumspect even though the analysis over time is more robust. However for some important countries, following from significant regime shifts typically in the form of deep reforms favoring FDI and the growth process, the time wise analysis is interesting as well, and necessitates the use of time dummies in panel studies.

In this study we carry out an analysis of the inward FDI flows from a number of countries into India over the period from 2001-02 to 2010-11. The period is interesting because it saw the rapid rise of FDI into India once the economy revived from its slow growth over 1997-98 to 2002-03, from 2004-05. The rapid growth in GDP in India over the period was initiated by the fiscal stimulus provided by the vast investments in the road sector and the high rate of around 8.5% was maintained over the period 2003-04 to 2008-09. Other factors that contributed to the high growth were the rapid growth in money supply, and the revival of the world economy from 2003-04 which pushed up exports of both goods and services from India. Slowing down had begun in 2007-08 with

the central banker tightening money in response to a largely supply side inflation which was apparently beginning to raise the inflationary expectations. The global financial crisis brought down growth rates over a couple of quarter as exports declined sharply, but revived to reach 8.5% during 2009-10 and 2010-11 due to the fiscal stimulus provided by the government. (Morris, S., 2012). FDI flows have followed the trend in growth but had begun to decline with the global financial crisis. FDI growth though had slowed down from 2007-08 during which period the central bank had begun to tighten money supply to raise interest rates and which also resulted in currency appreciation. See Fig.1.

Figure 1: Growth Rates of GDP and the Inward FDI in India (2000-01– 2010-11)



Source: World DataBank

Thus the time wise pattern of FDI inflows in the aggregate in India has had a strong correlation with GDP growth of the recipient country as is brought out in the literature.[2] See Appendix table for a tabulation of the main source countries over this period.

[2] Many studies would on causation between GDP and FDI have found mutual causation, and many others have found the link from GDP to FDI to be the stronger. Cf. Chowdhury, A., and Mavrotas, G. (2006); Hansen, H. and Rand, J. (2006); Carkovic, M. and Levine, R. (2002). Others have found the link to be different for different countries. Cf. De Mello, L. R. (1999).

Overview

In this paper, we seek to explain the country wise patterns of inward FDI into India. Since the data is not at the industrial or firm levels, the variables from the advantage concept of Kindleberger (Kindleberger, C. P., 1974) formalized in the Organisation, Location and Internalisation (OLI) framework of Dunning (Dunning, J. H., 1988) are not relevant. These typically are proxies for ownership advantage such as technology generation, R&D, patents, intangibility of assets, scale economies, organizational effects and networks, besides the degree of market power. Similarly, the internalization related variables are also not relevant. However variables reflective of the cost of operating at a distance that are source country dependent –such as common language, or even those reflective of the capabilities of the source country as such – such as "high technology" exports can be expected to have influence conditional on a proper normalization for the source country size.

Finance theories of FDI, the most important of which has been the theory of Aliber (Aliber, R. Z., 1970), would suggest that the fischer-open or the uncovered parity condition essentially the difference in interest rates in a world of fixed exchange rates or a the interest rate differences adjusted for exchange rate differences in flexible exchange rate regimes would also influence FDI, since portfolio investments typically would not fully equalize the uncovered interest rates. This variable would remain important in this study.

In the analysis the first consideration is to find a method to adjust for the size and intensity of the source country in its inward FDI into India. The most obvious one is to develop a gravity model and augment the same.

One of the interesting models that was first used by Tinbergen (1962) to explain trade flows (and later extended to FDI flows) is the gravity model. The gravity model is inspired by the basic gravity equation in Newton's physics, wherein the FDI flows between two countries depend on the size of the two countries and the distance between the two. The popularity of the gravity model comes from literature on economic geography which makes use of the gravity equations.

The gravity model has worked very well in studies of bilateral trade where the trade (typically export or the sum of exports and imports) are explained in terms of the product of the GDPs of the pairs of countries in question. Direction of Trade Statistics which covers such data over nearly all country pairs and across time has shown the empirical reliability of the model. Indeed without an underlying gravity model to "normalize" the trade flows, it would be difficult to test most economic trade theories be they those arising out the pure trade theories, the monetary theory or the neo-factor theories. Cf. Feenstra, R., James R. Markusen, and Andrew K. Rose (2001).

The illustrative equations of the vanilla gravity model for FDI can be described as:

$$FDI_{i,j}=(GDP_i)^x*\left(GDP_j\right)^y/(Distance_{i,j})^z \quad \ldots (1)$$

where, i and j refer to the source and host countries respectively.

Over the years, a few papers have tried to model FDI flows using the gravity model to test the country-level effects of FDI. These include Globerman and Shapiro (2003); Bevan, Estrin, and Mayer (2004); and Cuervo-Cazurra (2008). These studies incorporate several variables in addition to the basic gravity model. These augmented gravity models have a higher explanatory power and have produced clear empirical results. For instance, R.C.J. Zwinkels, S. Beugelsdijk (2010) make use of market size, geographic distance, political stability, cultural distance and common language as explanatory variables for outward FDI flows. J.W. Fedderke, A.T. Romm (2006), on the other hand, use market size, employment, capital stock, corporate tax, capital labor ratio, wage rate, property rights, trade openness etc. as independent variables.

Moreover, these papers use additive terms for the extra factors in the log form of the equation. This would mean that the original augmented gravity equation would be of the form:

$$FDI_{i,j}=\frac{(GDP_i)^x*\left(GDP_j\right)^y}{\left(Distance_{i,j}\right)^z}*\prod_k\left(1+C_k*factor^{\#}_{i,k}\right) \quad \ldots (2)$$

(#factor terms include an intercept/constant term as well)

When linearizing the expression (taking log on both sides), the equation transforms to:

$$\ln(FDI_{i,j}) = \ln(GDP_i)^x + \ln(GDP_j)^y - \ln(Distance_{i,j})^z + \sum_k \ln(1+C_k*factor_{i,k}) \quad \ldots (3)$$

If the factor values are small the ln $(1 + C_k*factor_{i,k})$ can be approximated to $C_k*factor_{i,k}$. The equation reduces to:

$$\ln(FDI_{i,j}) = x*\ln(GDP_i) + y*\ln(GDP_j) - z*\ln(Distance_{i,j}) + \sum_k C_k factor_{i,k} \quad \ldots (4)$$

Historically, FDI had been highly concentrated in a few developed countries. Thus, in the post war period almost half of all outward FDI arose from the US, until nearly the end of the seventies. Germany and the UK together would have accounted for nearly three fourths of the rest. In the eighties though, the sources of FDI began to diversify with Japan taking the lead. (UNCTC, various issues). As many more countries reduced the gap in per capita income and levels of development with the US the overwhelming advantage of the US in FDI began to decline and by the 2000s, FDI sources included very significantly even the emerging economies most notably China, India and the larger Latin American countries.

The OLI framework with an expanded set of sources of advantages – such as specialization in smaller scales of output, appropriate technology, learning by doing, lower managerial costs, lower costs of operating at a distance, idiosyncratic technologies, and such other factors have been used up to explain the increasing set of source countries in FDI. As economies turned liberal over the 90s and 2000s, FDI became much more of a regular aspect of the capital formation of most economies. This is not to say that policy and growth differences across countries have not affected inward and outward FDI. Even more importantly as manufacturing and tradable (and other modern) services base has diversified and the capabilities of firms headquartered in a a range of countries including the newly industrializing, have increased, the degree of market power associated with the source country firms has declined. Thus today when automobile investments take place there are potentially many countries that have the technology and capability, increasing the number of source countries in FDI.

These considerations would suggest that a gravity model which should really be seen as a model that helps to normalize the quantities of FDI flows, and which ex-ante makes no assumptions about the particular capabilities of the countries, ought to work reasonably

well, and should be the first step in checking out the role of other factors suggested by the OLI framework and Finance theories.

Gravity model: The gravity model is inspired by the basic gravity equation in Newton's physics, wherein the FDI flows between two countries depend on the size of the two countries and inversely the distance between the two. The popularity of the gravity model comes from literature on economic geography which makes use of the gravity equations. Cf. Sen, A., and T. Smith (1995).

The usual gravity model when used in studies on trade and investment flows has the problem that it does not distinguish two countries which have the same level of GDP which are differently constituted in terms of per capita income and population. A richer economy is likely to have a higher propensity for FDI being more developed and hence having the probability that there are some efficient and developed firms which have the country as their home. Similar a priori arguments can be made with regard to trade since between two countries one rich and the other poor, the richer country is likely to have a higher import ratio since at high levels of income the variety in the goods and services demanded is large. (Morris, S., 1993)

We therefore argue for a distinctive impact of each of these two factors on FDI. Root and Ahmed (1979) have also argued that absolute GDP is a relatively poor determinant of FDI, especially when it reflects the population size rather than income. The same split for the host country may not be warranted when it remains the same for all flows; and becomes relevant for different source countries.

The altered model with different weights to per capita GDP and population can be depicted as:

$$\log(FDI_{i,j}) = x_1 * \ln(\text{per capita GDP}_i) + x_2 * \ln(\text{population}_i) + y * \ln(GDP_j) - z * \ln(\text{Distance}_{i,j}) + \sum_k C_k \text{factor}_{i,k} \quad \ldots (5)$$

This results in an expression which is a simple augmented gravity model. Most of the additional factors in the model would be source country variables, when the host remains the same as in the analysis.

Allometric (or "biometric") model: One of the lesser-used models to explain FDI flows is what we call, the "allometric model," which assumes that the superscripts of the terms in the gravity model are influenced by the additional factors.[3] That is to say,

$$FDI_{i,j} = \frac{(GDP_i)^{\sum_k x_k * factor_{i,k}} * (GDP_j)^y}{(Distance_{i,j})^z} * \prod_k (1 + C_k * factor_{i,k}) \quad \ldots (6)$$

Here, the superscript from Eq. (2), x or y, is a function of the additional factors that feature in the augmented model. The superscript y is assumed invariant as the factors are predominantly source country effects. From here, the linear model can be deduced by splitting the GDP term as mentioned before and taking the log transformation. It would be as follows:

$$\log(FDI_{i,j}) = \sum_k x_{1,k} * factor_{i,k} * \ln(\text{per capita } GDP_i) + \sum_k x_{2,k} * factor_{i,k} * \ln(population_i) + y * \ln(GDP_j) - z * \ln(Distance_{i,j}) + \sum_k C_k * factor_{i,k} \quad \ldots (7)$$

In contrast to Eq. (5), the model changes to one where there are interactive terms between the source country factors and each of logarithm of source country per capita GDP, and logarithm of source country population.

In analysis to follow, we will seek to provide a model that is relevant to the Indian FDI experience in recent history. Variables that provide the highest explanatory power will be identified and presented in the model. Also, the explanatory power of the simple unconventional augmented gravity model, Eq. (5), and the one (biometrical) with interactive terms, Eq. (7), will be compared.

[3] Allometric models have been widely used by biologists to study sizes of parts of bodies of groups of animals belonging to a set (such as mammals) to the some measure of the overall size of the body, i.e., in scaling laws and in growth.

Description of variables and methodology

Since the host country remains the same throughout the period of study, the FDI inflows will predominantly vary based on the country of origin and the year in question. Therefore, when carrying out the country level analysis of FDI inflows into India over time, we can distinguish the explanatory variables based on the source country effects and the time series effects. In this regard, the basic gravity model[4] has been observed to plain FDI inflows to a reasonable extent. This study will focus on determining additional variables that are significant in explaining FDI inflows into India between 1996 and 2012 over and above the basic gravity model. Using these variables the two models will be compared. The augmented gravity model (Eq. 8) assumes an additive effect of the additional variables to basic model; the biometric model (Eq. 9) used in the study, as discussed before, and considers interaction terms of the additional variables with the GDP per capita and population of the source countries. The empirical model that has been chosen is as follows:

$$\ln(FDIin_{i,j,t}) = x_1 * \ln\left(\text{GDP per capita}_{i,t}\right) + x_2 * \ln\left(pop_{i,t}\right) + x_3 * \ln(GDP_{j,t}) + x_4 * \ln(distance_{i,j}) + [VarSum_{i,t}] \quad \ldots (8)$$

$$\ln(FDIin_{i,j,t}) = x_1 * \ln\left(\text{GDP per capita}_{i,t}\right) + x_2 * \ln\left(pop_{i,t}\right) + x_3 * \ln(GDP_{j,t}) + x_4 * \ln(distance_{i,j}) + x_5 * \ln\left(\text{GDP per capita}_{i,t}\right) * [VarSum_{i,t}] + x_6 * \ln\left(pop_{i,t}\right) * [VarSum_{i,t}] + [VarSum_{i,t}] \quad \ldots (9)$$

where,

x_n is a constant

$VarSum_{i,t}$=Sum of all relevant independent variables with their respective coefficients

i=source country and j=host country

The final model also incorporates a variable that varies across time interacting with GDP:

$$\text{Growth in world FDI outflows}_{t-1} * \ln(\text{GDP per capita}_{i,t-1})$$

[4] Since India's GDP per capita and population are used for each of the time points, the time wise patterns of changes in the economy in so far as they have affected GDP are proxied by these variables. It is possible to improve the fit by using time dummies to characterise the stance of the entral banker or other policy changes. Since the data is taken for a short period this aspect was not considered.

Description of Variables

From literature, several variables that may be relevant to explain FDI inflows were identified. The final model is arrived at by removing the variables that were found to be insignificant.

Lending Rate Differential: This is the difference between the prime lending rates in source country and the host country.

$$\text{Lending Rate Differential} = \text{Prime Lending Rate}_{source,t} - \text{Prime Lending Rate}_{host,t}$$

This variable describes the borrowing cost of money in the source country relative to the borrowing cost of money in the host country.

Tax Haven Dummy: This indicator variable flags a tax haven status of a country. It takes a value of 1 in case the country is a tax haven; and takes 0 otherwise.

Common Language Dummy: This indicator variable flags countries that share common official language with the host country. It takes a value of 1 in case the country has a common language with the host; and takes 0 otherwise.

Hi-Tech Exports %age: This is the percentage of hi-tech exports to the GDP of the source country. The variable captures the level of sophistication of the source country.

$$\text{Hi-Tech Exports \%age} = \frac{\text{Hi-Tech Exports at current prices}}{\text{GDP at current prices}}$$

In the proposed model, the country effects are captured by the lending rate differential, tax haven dummy, common language dummy, and hi-tech exports %age. The time series variation is captured by the growth of world FDI outflows.

Exchange Rate Depreciation: This is the percentage decrease (year-on-year) in the currency rate expressed in units of domestic currency to 1 unit of foreign currency.

$$\text{Exchange Rate Depreciation} = \frac{\text{Exchange Rate}_{\text{INR/Frgn Curr},t} - \text{Exchange Rate}_{\text{INR/Frgn Curr},t-1}}{\text{Exchange Rate}_{\text{INR/Frgn Curr},t-1}}$$

Trade Openness: This is expressed as a fraction of total trade flows to the GDP of an economy.

$$\text{Trade Openness} = \frac{\text{Total exports} + \text{Total imports}}{\text{GDP}}$$

Inflation: Annual price inflation is calculated based on the GDP Deflator.

$$\text{Inflation} = \frac{\text{GDP Deflator}_t - \text{GDP Deflator}_{t-1}}{\text{GDP Deflator}_{t-1}}$$

Growth in World FDI outflows: The FDI inflows into India are tested against growth of aggregate FDI outflows from countries in the world. This is expected to capture the general trends and important worldly episodes over time that may have influenced FDI into countries.

Handling of Zeros: The FDI inflows from many countries have been recorded to be zero. These values become difficult to handle especially during the log transformation of the inflows. To avoid these issues, $ln(FDIin_{i,j,t} + 1)$ is used as the dependent variable in place of $ln(FDIin_{i,j,t})$.

Data Measurement and Description

The data used for the study is a compilation of numbers obtained from multiple sources, spanning a breadth of 125 countries over period of 17 years (1996–2012). For the data on yearly FDI inflows into India, SIA Newsletters, published by the Department of Industrial Policy and Promotion under the Ministry of Commerce and Industry (Govt. of India), were used. Distance values and common language connections were obtained using the CEPII datasets available online. Tax haven status of an economy was determined using OECD's Tax Transparency reports. The growth data in the FDI outflows in the world over the period of study was obtained from the World Investment Reports published by UNCTAD. The rest of the data including GDP, GDP per capita,

GDP deflator, exchange rate, lending rate, and population numbers; and hi-tech products trade percentages were taken from the World Development Indicators database (World Data Bank).

The data collected for each of the variables is transformed into a balanced panel. This panel data is used for OLS regression.

Results and Discussion

The legends for the variables used in the regression are shown in Table 1.

Table 1: Description of Variables

Legend	Description
lnfdi	The logarithm of FDI inflows (with 1 added to handle zeros)
wgr_lngdps	Growth of world FDI outflows (1 year lag) * Logarithm of GDP of source country (1 year lag)
lngdph	Logarithm of GDP of host country
lndist	Logarithm of distance between source and host country capitals
lnpgs	Logarithm of GDP per capita of source country
lnpops	Logarithm of population of source country
ldiff_lnpgs	Lending rate difference (source-host) * Logarithm of GDP per capita of source country
techr_lnpgs	Hi-tech exports %age (source) * Logarithm of GDP per capita of source country
tax_lnpgs	Tax haven indicator * Logarithm of GDP per capita of source country
lang_lnpgs	Common language indicator * Logarithm of GDP per capita of source country
ldiff_lnpops	Lending rate difference (source-host) * Logarithm of population of source country
techr_lnpops	Hi-tech exports %age (source) * Logarithm of population of source country
Ldiff	Lending rates differential
TechR	Hi-Tech exports %age
Tax	Tax haven indicator
Lang	Common language indicator

The results of the OLS regression have been shown below. These results (I & II) are of final models after dropping variables that were found to be insignificant. The biometric model, in comparison to the augmented gravity model, seems to provide a better explanation for FDI inflows into India. The Adjusted R^2 for the proposed model (III in the results table) is 55%. These results have been observed to be the same in a two-stage

model. The basic gravity equation is regressed in stage 1; followed by residuals of stage 1 and the remaining variables in stage 2.

Table 2: Results of OLS Estimation

Variable	**(I)**	**(II)**	**(III)**
Intercept	-46.8992 (<0.0001)***	-41.5716 (<0.0001)***	-42.2150 (<0.0001)***
wgr_lngdps	–	–	-0.2528 (0.0059)**
lngdph	0.5683 (0.3661)	1.3432 (0.0442)**	1.5850 (0.0191)**
lndist	-4.4117 (<0.0001)***	-4.5703 (<0.0001)***	-4.5719 (<0.0001)***
lnpgs	4.0903 (<0.0001)***	4.1724 (<0.0001)***	4.1959 (<0.0001)***
lnpops	2.4657 (<0.0001)***	2.0481 (<0.0001)***	2.0480 (<0.0001)***
ldiff_lnpgs	–	-0.0516 (<0.0001)***	-0.0530 (<0.0001)***
techr_lnpgs	–	0.0334 (0.0035)**	0.0326 (0.0044)**
tax_lnpgs	–	-0.9598 (0.0817)*	-0.9077 (0.0998)*
lang_lnpgs	–	-0.8422 (0.0024)**	-0.8732 (0.0016)**
ldiff_lnpops	–	0.0227 (<0.0001)***	0.0233 (<0.0001)***
techr_lnpops	–	0.0356 (<0.0001)***	0.0357 (<0.0001)***
Ldiff	-0.0200 (0.1359)	–	–
TechR	–	-0.8514 (<0.0001)***	-0.8451 (<0.0001)***
Tax	4.7078 (<0.0001)***	12.8140 (0.0107)**	12.4181 (<0.0001)***
Lang	4.4241 (<0.0001)***	11.0437 (<0.0001)***	11.2293 (<0.0001)***
Adj. R^2	*0.496*	*0.547*	*0.550*
Observations	*1531*	*1354*	*1347*

P-values are in parenthesis
*Significance at the 0.100 level
**Significance at the 0.050 level
***Significance at the 0.001 level

The signs of the coefficients for GDP per capita of source, population of the source, GDP of the host, and the distance between the host and source are found consistent with the gravity model. As hypothesized previously, the coefficients of per capita GDP and population of the source country differ significantly; the former is found to be 4.1959, while the latter is 2.0480. This contrasts with the basic gravity model where both

these variables are raised to the same power. The results clearly indicate a stronger impact of GDP per capita of source vis-à-vis population of source, on the FDI flows.

The coefficient of growth in world FDI outflows is found to be negative (-0.2528). FDI across the world is usually dominated by large investing nations exchanging monies amongst themselves. Hence, the world outflows are predominantly amongst rich nations. A fall in the growth of these flows could imply that more FDI into the developing countries may be expected. The negative coefficient of growth in world FDI outflows is consistent with this explanation. It has also been found that this factor operates with a lag of one year.

The tax haven indicator is found to be extremely significant and positive (12.4181). Countries with an opaque tax infrastructure are found to be great sources of investments into India. This may be attributed to the fact that there is a propensity on the part of countries to route investments through tax havens in order to miminise taxes back at home. The common language indicator also has a positive impact on FDI inflows into India. This can be explained from the fact that countries that share a common language find it easier to do business and therefore, would have a greater inclination to invest in the other.

Conclusion

The study looks into the determinants of sources of FDI inflows into India over the period 1996-2012. Beginning with the basic gravity model, the study incorporates several variables in order to explain the FDI inflows better. In addition to this, an allometric model is also proposed as an alternative. The final analysis shows that the allometric model explains FDI inflows better than the augmented gravity model. FDI inflows into India over the period of study are seen to be positively correlated to GDP per capita of the source country, population of the source country, GDP of the host country, Tax haven indicator, and Common language indicator; while being negatively correlated to "distance" between source and host country capitals, and growth rate of world FDI outflows with a lag of one year. The study also suggest that in studying aspects of

economies, and especially in their interactions, a base level allometric model should be used over which the variables from specific economic theories can be considered.

References

1) Aliber, R. Z. (1970). A theory of direct foreign investment. *The International Corporation*, 17-34. MIT Press, Cambridge Mass.
2) Bevan, A., Estrin, S., & Meyer, K. (2004). Foreign investment location and institutional development in transition economies. International Business Review, 13, 43–64.
3) Carkovic, M. V., & Levine, R. (2002). Does foreign direct investment accelerate economic growth? *U of Minnesota Department of Finance Working Paper*.
4) Chowdhury, A., & Mavrotas, G. (2006). FDI and growth: what causes what?.*The World Economy*, *29*(1), 9-19.
5) Cuervo-Cazurra, A. (2008). The effectiveness of law against bribery abroad. Journal of International Business Studies, 39(4), 634–651.
6) De Mello, L. R. (1999). Foreign direct investment-led growth: evidence from time series and panel data. *Oxford economic papers*, *51*(1), 133-151.
7) Dunning, J. H. (1988). The eclectic paradigm of international production: a restatement and some possible extensions. *Journal of International Business Studies*, pp.1-31.
8) Fedderke, J. W., & Romm, A. T. (2006). Growth impact and determinants of foreign direct investment into South Africa 1956–2003. Economic Modelling, 23, 738–760.
9) Feenstra, Robert C; James R. Markusen and Andrew K. Rose (2001) "Using the gravity equation to differentiate among alternative theories of trade", Canadian Journal of Economics, 34 (2), pp. 430–447, May 2001
10) Globerman, S., & Shapiro, D. (2003). Governance infrastructure and US foreign direct investment. Journal of International Business Studies, 34(1), 19–39.
11) Hansen, H., & Rand, J. (2006). On the causal links between FDI and growth in developing countries. *The World Economy*, *29*(1), 21-41.
12) Kindleberger, C. P. (1974). *American business abroad: six lectures on direct investment*. Harvard Univ Press. Harvard Mass.
13) Morris, S. (1993). Structural Determinants of Openness of Economies: The Conceptual Basis and Cross-Sectional Evidence. No. WP1993-08-01_01206). Indian Institute of Management Ahmedabad, Research and Publication Department.
14) Morris, Sebastian (2012), Economic Growth in Gujarat in Relation to the Nation and Other States in Recent Times - A Statistical Analysis, W.P. No. 2012-11-02, Nov. Indian Institute of Management, Ahmedabad.
15) Root, F. and A. Ahmed (1979). Empirical Determinants of Manufacturing Direct Foreign Investment in Developing Countries, Economic Development and Cultural Change, 27, 4, 751–767.
16) Sen, Ashish and Tony Smith (1995), *Gravity Models of Spatial Interaction Behaviour,* Springer.
17) Tinbergen, J. (1962). Shaping the world economy. New York: Twentieth Century Fund.
18) UNCTC (various issues), World Investment Report, UN Centre for Transnationals, UCTAD.

19) Zwinkels R. C. J., Beugelsdijk S. (2010). Gravity equations: Workhorse or Trojan horse in explaining trade and FDI patterns across time and space? International Business Review, 19, 102–115.

Appendix Table: Share of top investing countries from 2000 – 2011

Inflows in Rs. crore

Rank	Country	FDI cumulative inflows (2000 - 2011)	% of total inflows
1	Mauritius	281,248	41.8%
2	Singapore	71,309	10.6%
3	U.K.	69,147	10.3%
4	U.S.A.	47,096	7.0%
5	Japan	36,969	5.6%
6	Netherlands	30,615	4.6%
7	Cyprus	26,832	3.9%
8	Germany	19,726	2.9%
9	France	12,038	1.8%
10	U.A.E.	9,538	1.4%
-	Others (115)	66,840	10.1%