

Pattern of Foreign Direct Investment in Developing Economies: A Comparative Analysis of China and India

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Abstract

Qualitative information and data show significant differences in the magnitude and type of foreign direct investment inflows among developing economies. Explanation of the differences requires analysis of market institutional factors as well as the supply and demand side conditions. This paper adopts the approach that different configurations of supply, demand and market institutional factors explain the type of investment flows into developing economies. The argument is illustrated through a comparative study of China and India.

Key Words: Developing Economies; Foreign Direct Investment; China, and India

JEL Classification: F23, P52

I. Introduction

Foreign direct investment (FDI) is increasingly recognized as a source of growth for developing economies (Lall, 2000). FDI is generally observed to engender technological progress in developing economies by generating externalities and competitive dynamics (Kokko, 1994; Patibandla, 2002). The literature on multinational firms (MNCs) observes that their ownership of such assets as technology, marketing, management, and networks benefit developing economies through a process of spill-over (Caves, 1996, Aitken and Harrison, 1999). Externalities (spill-overs) tend to be high in high-tech industries and are realized effectively when MNCs build backward and forward linkages with local firms and institutions (UNCTAD 2001; Patibandla and Petersen, 2002). There is wide disparity in the magnitude and pattern (type) of foreign direct investment among developing economies (Noorbaksh, Paloni and Youseff, 2001; UNCTAD 2001, Table 1). In this context, an interesting research issue arises - why do a select few developing and transition economies attract higher portion of foreign direct investment than others ? Secondly, why do some of these attract FDI into relatively high-tech and capital intensive industries and others into low-tech unskilled or semi-skilled intensive industries? Thirdly, what are the policy implications for developing economies for deriving maximum growth benefits from FDI?

At a broader level, the driving forces for the recent growth of FDI inflows into developing economies (UNCTAD, 2001) include the opening up of these economies to FDI, the supply side factor of low manpower costs and the demand side growth in incomes. At a more complex level, explanation of differences in magnitude and pattern of FDI inflows into these economies requires a comparative analysis of an array of supply, demand and market institutional factors (Globerman and Shapiro, 2002) as these countries differ not only from developed countries but also from each other in several ways.¹ They differ in the level of economic development and in endowments of market, political, and

¹ The theoretical stream of FDI that is envisaged to explain FDI flows among developed economies simplifies FDI as a substitute for intra-industry trade (Markusen and Venables, 1998 & 2000; Markusen, 1995). As in intra-industry trade models, similarity in income levels and factor endowments are the underlying explanations for FDI flows among developed economies. In this context, the decision to engage in multinational production is a trade-off between added fixed costs

legal institutions (Dixit, 1999). For example, in several countries in Asia, Africa, and Latin America informational imperfections arise in contractual formulations and enforcement because of poor administration and in service enforcement because of low levels of education, technology and communication infrastructure. In the case of the transition economies of the former USSR, education levels and physical infrastructure endowments are high the capitalist institutions such as property rights are highly underdeveloped. Furthermore, as these countries implement policy reforms from a high level of state intervention and a socialistic mode of production to free-market mechanisms, government policy changes frequently, due to both political compulsions and in the learning process. These changes, in turn, signal high risk in the form of non-credible policy commitments, a risk that differs for different industries depending on the extent of sunk costs, and intangible assets.

The new institutional economics (Williamson, 1985; North, 1990) show that the efficiency of economic activity depends on such market institutional factors as transaction costs and property rights, implying that the importance of institutional conditions is essential in an economy for attracting FDI (Henisz and Williamson, 1999; Henisz and Zelner, 1999; Levy and Spiller 1996). For example, a country that has very attractive supply and demand side factors such as endowment of low cost skilled labor and a large home market but very inefficient institutions of poor property rights and high transaction costs would not attract much FDI. The example could be the Russian economy (Pomfret, 1997; Heinz, 1998).

The pattern of FDI inflow refers to inflow of FDI into different industries in a country. At a broader level, one can look at it in terms of vertical and horizontal investments. At a more detailed level, the pattern of foreign direct investment has to separate industries on the basis of: knowledge and skill intensity of production, importance of intellectual property rights (IPRs), degree of fixed and sunk (economies of scale) and the trade costs of serving the foreign market by exporting (Markusen and Venables, 1998). These theories can afford to ignore or give a marginal treatment to market institutional and political factors as OECD countries share similar institutions in terms of private property rights, protection of intellectual property, and such democratic institutions as independent judiciary.

costs in investment, and labor and capital intensity of production. This paper takes the approach that differences in the endowment and different configurations of supply side factors such as un-skilled and skilled labor, and industry clusters; demand side factors such as incomes and market size; institutional conditions such as property rights, transaction costs, and credible commitment of policies, determine the pattern of FDI. In this light, this paper seeks to explain interesting and significant qualitative empirics regarding differences in the level and pattern of FDI into two large and fast growing developing economies, i.e., China and India (UNCTAD, 2001, Huang, 2002, Pomfret, 1997, Sachs, Varshney and Bajpai, 1999, Patibandla and Petersen, 2002).

The following section brings out the supply and demand side and institutional factors that govern determinants of pattern of FDI by embarking on a brief review of different streams of literature. In section 3, a conceptual framework is presented to explain the pattern of FDI inflows into developing economies by the differences in the configuration of demand and supply side and market institutional factors. In the section 4, a comparative analysis of China and India is undertaken with a few select industry case studies. Concluding comments are given in section 5.

2. Determinants of Pattern of FDI

Conceptually, foreign direct investment takes place when a foreign firm decides to invest in a production unit in the host country, with control over its assets. In other words, the decision by a firm to invest in a foreign country is essentially a decision to control some proprietary asset within the firm rather than transact it via the market (Hymer, 1976). We discuss some of the pertinent factors that govern FDI in developing economies in the following.

2.a. The Supply and Demand Side Determinants of FDI

FDI can be seen as an extension of and substitute for international trade. The comparative advantage hypothesis of FDI (Bhagwati and Srinivasan, 1983; Grossman and Helpman, 1991) explains production relocation, not to serve the host market but to export from the host country. The MNC's decision on where to locate production is determined by differences in relative production costs of

different locations converted to a common currency (Caves, 1996). In this case, FDI expands international trade. This would imply that, for some reason, local firms in developing economies are not able to take advantage of their comparative advantage in low labor costs and MNCs are able to make use of it, instead. In the case of FDI among developed economies with similar relative factor endowments, FDI can be treated as a substitute for intra-industry trade in differentiated goods by incorporating transportation costs and multi-plant operations (Markusen 1995). The intangible asset theory of FDI shows that innovation provides a firm specific advantage (Hymer 1976, Dunning 1988, Caves, 1996). Similarity in per capita income levels among developed economies provides immediate markets for new (income elastic) differentiated goods. In this case, FDI is a substitute for international trade in differentiated goods, which implies that the pattern of FDI is horizontal.

Horizontal investment in developing economies can be motivated to take advantage of low labor costs and for catering to local market, which apply to prosperous large developing countries such as China, and Latin American economies such as Brazil and Mexico (Markusen and Venables, 1998). Production of new differentiated goods and services in developing countries through FDI requires the availability of skilled labor, managerial talent, certain technological institutions, and intellectual property protection. Labor intensive industries, such as the electronic industries, can take advantage of low labor costs for global market and also for catering to growing local market of larger and prosperous developing economies. In other words, in developing economies with growing local markets, and low cost skilled and semi skilled labor, the advantage of low cost labor applies to both horizontal and vertical FDI. If the local market is too small, FDI in capital-intensive manufacture goods does not take place, as serving the market through exports is more efficient than duplicating plants. Existence of a large local market for capital-intensive goods in a developing economy could be a strong pull factor for FDI for both catering to local market and for undertaking exports. This is because a large local market allows realization of static and dynamic economies of scale, which, when combined with low cost of skilled and unskilled labor, can provide a strong advantage to undertake exports.² One important condition is that the

² The size of the market for differentiated goods in developing economies is determined by income distribution characteristics. Large developing economies such as India, Mexico, Brazil and China are characterized by skewed income distribution with large numbers of low income and a small number of high-income consumers. In these countries, the high-income consumers could be a large market for

cost advantage arising out of low labor costs and the scale advantage should not be offset by high costs of infrastructure bottlenecks.

Another important determinant of the FDI pattern is presence of technologically dynamic industry clusters. Recent literature on geography and trade shows that externalities (agglomeration economies) of industrial clusters are important factors in the location decision of firms belonging to a specific industry (Porter, 1990; Krugman, 1991). External economies of cluster activity implies that for given inputs, the output of an individual firm is larger the larger is the aggregate output of other firms producing the same good in a cluster or a region. The presence of technologically dynamic clusters in a country or a region can therefore attract multinational investment (UNCTAD, 2001). Our focus in this paper is not to explain how clusters take root. However, if technologically dynamic clusters exist in a developing economy, it could be a strong pull factor for FDI as external economies of cluster activity in a developing economy can magnify the comparative advantage arising out of endowment of low-cost skilled labor (Patibandla and Petersen, 2002, Puga and Venables, 1999).³

2.b. The Institutional Determinants of FDI

We concentrate on three main elements of market institutions in explaining pattern of FDI in developing economies: property rights, transaction costs and credible commitments of government policies. There is a large body of theoretical and empirical literature on FDI with respect to the issue of

differentiated goods. A developing economy with a small local market but low wage costs will attract investment mainly for comparative advantage reasons. A good example could be garment production in Bangladesh.

³ Another important geographic factor in determining FDI in developing economies is geographic proximity to developed economies. For example, Latin American countries such as Mexico and Brazil benefit significantly from their close proximity to the United States of America. This aspect is captured by the gravity models (Deardorf, 1995), which are not taken into account in this paper.

internalization, which takes into account of institutional elements of property rights and transaction costs (see Caves, 1996; Dunning, 1988, Buckley and Casson, 1976 for the insights of this literature).⁴

Protection of intellectual property rights has implications on FDI on two levels 1) whether FDI takes place at all in a particular country in a specific industry, and 2) ownership modes relating to joint ventures. When the value of assets protected by patents and trademarks cannot be fully realized by owners, the incentive to invest in these technological and marketing based assets is reduced. Under a weak property rights regime, higher ownership modes are more efficient because of reduced cost of unwanted dissemination. Where property rights protection is greater, ownership mode is less important, as the risk of asset appropriation is less (Tecece, 1977; Kumar, 1996).

In Dunning's (1977) OLI framework, the concept of internalization is an extension of Coase's (1937) theory of the firm based on transaction costs logic. The institutional aspects determining investment decisions in developing economies are more complex than is generally formulated in the internalization literature. The new institutional economics makes a distinction between institutional environment (North, 1990) and the institutions of governance (Williamson, 1985, 1998). The institutional environment is defined jointly by the rules of the game (the formal constraints: constitutions, laws, and property rights) and the conditions of embeddedness (the informal constraints: sanctions, taboos, customs, traditions, and codes of conduct). The institutions of governance are market, quasi-market, and hierarchical modes of contracting- more generally of managing transactions and seeing economic activity through to completion (Williamson, 1998). Institutional conditions for efficient market functioning are far less developed in developing and transition economies than in advanced capitalist economies. Rules of the game may not be in place and if they are, there is not necessarily effective enforcement. For example, there could be administrative discretion on the part of governments and government agents owing to informational imperfections and weak legal systems. This administrative discretion not only places those who have

⁴ Similarity in the institutions of property rights in protecting intellectual property among developed countries is one of the reasons for FDI in modern industries being maximum among these countries.

already invested at a great hazard, but also causes those who are contemplating investment to think again (Williamson, 1998; Henisz and Williamson, 1999)⁵.

Following from the above, the risk of appropriation for MNCs stems from both governments and private agents. The former case is characterized as two kinds: predation by governments and predation by government agents. Government can appropriate property rights by changing policies for political reasons. This can also arise out of absence of regulatory predictability and procedural transparency.⁶ If the rules are unclear and non-transparent and also judicial enforcement costs are high, government agents can predate on private agents for extracting bribes.

The credibility and effectiveness of a regulatory framework and, hence, its ability to facilitate private investment, varies with a country's political and social institutions (Levy and Spiller, 1996). Under totalitarian systems with no independent legislature, and judiciary units, predation by government agents is easier than in a democracy. However, the risk of appropriation through changes in the rules and taxes can also arise in democracy. In a democracy, if there is room for discretion owing to non-transparency of the rules and there is high transaction cost to the legal process, or if

⁵ For example, the largest foreign investor in Russia, General Electric withdrew despite \$600 million in sunk costs citing arbitrary and capricious taxation and an uncertain regulatory environment. In China, Matsushita had to face an increase in tax from 5% to 17% with only a few weeks notice in 1994 (Henisz, 1998).

⁶ On the other hand, there can be instances where the government enters into strategic alliances with MNCs for production. In this case, government can have a stake in seeing through its success. One example is the collaboration between the Indian government and the Japanese firm Suzuki to produce small cars in India in the early 1980s. The Indian government gave highly preferential status to the undertaking by giving monopoly status in small car production for a long period. As a result, Maruti-Suzuki became the largest car producer in India. Another example is the aircraft production in Brazil, a result of collaboration between the Brazilian government and MNCs (Goldstein, 2000). However, MNC collaboration with host governments can still pose contractual hazards if the governments behave opportunistically. Examples can be the several failures of TNC and the public sector collaborations in China.

elections, which change power among political parties, determine the status of the property rights, political risk escalates to the same level as under a dictatorship. The degree of this risk differs across different industries depending on the extent of sunken investment costs- exit from a country involves writing off a large investment.

In Williamson's (1985) theory of vertical integration, internalization takes place when contractual hazards associated with transactions are high given the behavioral assumptions of bounded rationality and opportunism. A major part of the transaction costs of joint ventures and arm's length contracts are costs of appropriation of the ownership advantages through opportunistic behavior in contracts. These costs will be high in countries where with weak contract laws, weak legal systems and intellectual property rights protection. In other words, transaction costs are high when the costs of understanding and foreseeing contingencies and formulating contracts in a clear manner are high. Furthermore, an effective judiciary must exist to enforce contracts (Williamson, 1985). In the case of large infrastructure projects, which are natural monopolies, MNCs enter into contracts with governments, which provides scope for opportunism on the part of local government as the MNC invests large sunk costs and is locked-in locally. If the prevailing institutions in a specific country cause high transaction costs of contracts, FDI in these industries will be discouraged. Contracts might be more incomplete in high-tech industries than traditional industries because of the complexity of technological change, such as the case in the interface among telecommunication, software, and cable TV industries at present. The telecommunication and cable TV industries have natural monopoly properties where the government has a role in issuing licenses to investors. FDI in these industries in developing economies faces high risk if the institutional mechanism provides greater scope for discretionary powers and government opportunism.

3. The Framework

The pattern of FDI in terms of investment flows into different industries in developing economies is determined by different configurations of supply, demand and institutional factors. This argument is illustrated by taking a few examples. This approach can be applied to several other industries taking their basic characteristics in terms of sunk cost intensity, technology intensity, and skilled and unskilled labor

intensity, etc., in relation to the endowment of the specific countries' factors as discussed in the previous section. For example, a country that has all the necessary institutional conditions of property rights, and credible policy commitment, but lacks a skilled work force, would not support FDI into high-tech industries and would attract FDI into low-tech industries. If such a country has a sufficiently large domestic market for differentiated goods, serving the market with exports is more viable than FDI unless MNCs invest substantially in training and educating of local manpower. In such a case, MNCs have to measure the trade-off between the costs of training and the benefits of locating production closer to the market. The benefits of location are again a trade-off among costs of transportation, tariff barriers and costs of multi-plant operations (economies of scale).

On the other hand, if a country is endowed with skilled labor but lacks effective intellectual property rights, FDI does not come into high-tech industries. If FDI comes into the high-tech industries it will be mainly for utilizing low cost manpower for serving home and other markets through exports rather than serving the host country market. If a developing economy has a reasonably effective intellectual property regime, low cost skilled manpower and a growing local market, then FDI in high-tech industries becomes highly attractive.⁷ This is because a TNC can take advantage of low cost skilled labor for both the international market and also the local market.

Among developing economies, China, Mexico, Brazil, Argentina, Indonesia, Thailand, India and Vietnam attract a major share of FDI flows (see Table 1). China, Mexico, Brazil, Argentina, Russia and

⁷ Another interesting case exists when a developing country has the intellectual property rights on paper and legal infrastructure, but local enforcement is weak. In such a case, a MNC has to invest in enforcement, if the local market is highly attractive. An interesting example is the Indian movie industry. India has a well-defined copyright act and legal infrastructure but the enforcement had been very weak. It has a large market for both locally made movies and the Hollywood movies. As a result, pirating of movies within the video-parlor industry was widespread. In recent years, the Hollywood studios that opened offices in India started to invest significant resources in enforcement of the copyright act by cooperating with local enforcement agencies. Another similar case is India's software industry, which is discussed later.

India possess the necessary supply and demand side factors to attract both horizontal and vertical investments. They have large and growing domestic markets for differentiated goods and services and a large pool of low cost semi-skilled and skilled labor. Most African nations attract a very little investment and most of it is for extracting natural resources.⁸ The former Soviet Union countries have a large pool of skilled labor and an infrastructure base, but lack efficient market institutions of property rights and credible government policies, factors which appear to discourage investment in high-tech industries and those industries with large sunk costs (Henisz, 1998). Among the ex-communist countries, Poland, the Czech Republic, and Hungary attract a major part of FDI (Table 1; UNCTAD, 2001).⁹ The market institutional conditions- institutional environment and institutions of governance- are quite divergent in these countries with different historical and political backgrounds. As mentioned in the introduction, this study is restricted to a comparative analysis of China and India with selective industry case studies in the following. We compare China and India on the macro level, before analyzing the cases of two high-tech industries and an infrastructure industry on the micro level. These industries are the software, pharmaceutical and electricity generation industries.

4. China and India: A Comparison

China and India are the two most populous countries in the world and, at the same time, the fastest growing, large developing economies. During the last 10 years China's economy averaged a growth rate of 8 percent (Pomfret, 1997; Huang, 2001) and India around 6 percent (Ahluwalia, 1999). China opened its economy to FDI in specific regional zones in 1978 (Pomfret, 1997) and India started to undertake market reforms in the early 1990's. Both economies have a large pool of skilled and semi-skilled labor and a large and growing domestic market for differentiated goods, composed of a sizeable section of rich and middle class consumers. The political and economic institutions of these economies are quite divergent. A review of the economies and the reform process can be seen in several other studies (Sachs, Varshney and Bajpai, 1999; Sachs and Woo, 1997; Branstetter and Feenstra, 1999; Pomfret, 1997; Li, Li and Zhang, 2000; Cheng and Wu, 2001, Huang, 2001, David D.Li, 1996). We briefly compare these

⁸ The reasons could be that most of these countries do not have an endowment of skilled labour to produce differentiated goods.

⁹ Poland started to develop market institutions much earlier than the other ex-communist countries.

economies in terms of FDI flows and patterns at the macro level and then at the micro level of industry case studies.

China ranks number one among developing economies for the magnitude of FDI inflows (Table 1). It accounts for about 40 percent of total FDI flows into developing economies in the recent years. It is also estimated that about 80 per cent of it comes from overseas Chinese mostly from Taiwan and Hong Kong (Huang, 2001). On the other hand, India attracts much smaller amount- about US \$ 3.6 billion in 1997 and \$ 2.3 billion in 2000 (Table 1). There are several reasons for this disparity. China opened up to FDI much earlier than India and has built a good infrastructure base in the coastal regions. Consequently, the Chinese economy, which has been growing at a rapid pace, presents a larger market than India. The second explanation is drawn from the pattern of investment. About 70 percent of FDI in China has been in export driven manufacturing. Huang (2002) shows that a large part of FDI in China is into the lower end of manufacturing by small firms from Taiwan and Hong Kong (see Table 2). Huang argues that the Chinese government has, historically, systematically discriminated against domestic private investment (firms) favouring foreign firms and their collaborations with State Owned Enterprises. He observes that because of the distorted incentives given to FDI, a portion of FDI in China is 'round-trip', whereby a firm exports money, registers a company in Hong Kong or Singapore, and then brings the money back as FDI to make use of the incentives given to FDI.¹⁰ Furthermore, while the foreign firms had been given legal protection of the property rights in 1979, the local private entrepreneurs were not covered until 1999. Consequently, as Huang (2002) observes, small firms from Taiwan and Hong Kong have established a sizeable presence, even in the Chinese arts and handicraft industry that produces ivory and jade sculptures, carpets, personal ornaments, silk handicrafts, porcelain, and cloisonné, - a centuries old indigenous industry.¹¹ However, the World

¹⁰ In India's case, a fair amount of FDI is routed through Mauritius because of the tax haven treaty, which guarantees complete tax exemption from Indian taxes.

¹¹ Vietnam presents a similar case to the Chinese experience at present. Vietnam opened its doors to FDI as it undertook transformation from communism to free market economy. FDI from neighbouring the East Asian countries flows in to make use of low cost labour in the low-end manufacturing industries. A part of the explanation can be drawn from the absence of competitive

Investment Report of UNCTAD (2001, p.26) observes that the old image of the so-called “flying-geese formation” is giving way to that of technology-intensive activities of MNCs in the recent years. Major MNCs in the fields of computers, pharmaceuticals, petrochemicals, and power-generating equipment have extended their production networks to China. Most investment is directed to cater to the large growing local market.

[Table. 2 about here]

India has a large base of matured, private, large scale and small-scale (unorganized) sector, which took care of most of the lower-end manufacturing, assembly line and commercial service sector (Lall, 1999). The major part of FDI in India had been in infrastructure sector, including such areas as telecommunications, transportation, and power and fuels, and service sectors such as software, rather than in manufacturing (see Tables 3 A and 3 B; Athreye and Kapur, 2001).¹² The presence of a well-developed private sector facilitates FDI through mergers and acquisitions. From 1997 to 1999, about 40 per cent of FDI in India came through mergers and acquisitions. In 1999-2000, M&A deals were worth Rs 36,9630 million. Within the M&A segment, acquisitions or takeovers dominate in India, as they do in most developed countries, with mergers accounting for about one-fourth of M&A deals in the country. The sectors that attracted FDI through this route, were banking and financial services advertising and other business services and travel services. Other sectors witnessing a sharp rise included chemicals, textiles, electrical and electronic industry, hotels, and pharmaceuticals. Business restructuring through takeovers, acquisitions, mergers, and sale of assets was most pronounced in the financial sector in 1999-2000. Part of the explanation could be that that the Indian economy is transforming rather prematurely into a service economy. At present, 52 per cent of India’s GDP is accounted by the service sector while this is 30 percent for China. Consequently, a significant amount of FDI is flowing into the service sector- areas such as call centers, insurance, database management, medical transcript processing and financial services such as credit cards. As shown in Table 3.B,

local private firms. In the year 2000, Vietnam attracted about \$ 2 billion of FDI inflow, which was similar to a much larger country, India (see Table.1, UNCTAD, 2001).

¹² It is generally observed that many, MNCs that win the Indian government approval to invest never actually proceed. In recent years, about \$ 10 billion a year in approvals has been granted, but the actual investment rate is about \$ 2.5 billion.

about 37 percent of FDI approvals for the period of 1991-2002 are in the service sector. One of the reasons attributed for this is the endowment of large pool of educated and English-speaking workforce (Kapur and Ramamurti, 2001).

[Tables 3.A and 3.B are about here]

The above differences in the pattern of FDI between China and India are a result of differences in the market institutional conditions and prevailing industrial endowments. For example, as mentioned before, nonexistence of property rights for local agents and the political pecking order that discriminated against private entrepreneurs in favor of public sector firms in China restrained emergence of a competitive local industry, resulting in small MNCs entering China in low-end manufacturing through joint collaborations with inefficient public sector units (Huang, 2002). On the other hand, property rights for local agents under India's democratic institutions enabled local entrepreneurs to establish themselves in both the small and large-scale sectors. Politically, China has been a communist state: a monolithic dictatorship of one party with a single individual wielding vast power. India has been a federal democracy with an independent judiciary with widely diffused powers.¹³ Given the common feature of large and growing domestic markets and endowments of skilled labor, the differences in the institutional conditions determine the pattern of FDI in these countries at present. Some of these arguments are illustrated through the micro level industry case studies in the following.

4. a. The Software Industry

China has a large domestic market for the Information Technology (IT) industry- the software and hardware segments. While only about 4.3 million people own PCs, and fewer than 1.4 million people

¹³ The absence of an independent judiciary makes property rights highly weak even if they exist on paper. Ahlstrom, Bruton, and Lui (2000) show that in China, firms can be given permission to operate in a certain market, and a year or two later that permission can be withdrawn arbitrarily. Corporate assets can be seized while disputes are resolved. If a court judgment is given in favor of a private firm but local officials do not agree with the ruling, they can refuse to comply.

are Internet subscribers in India (www.nasscom.org), in China, about 6 million PCs were sold and about 16 million subscribed to the Internet in the year 2000. China attracts a large amount of FDI (about \$ 6 billion) in the hardware segment with IBM, INTEL, NEC, and Hewlett and Packard having set up large subsidiaries. One reason is Chinese law, which stipulates that MNCs can sell their computers in the country only if they have a manufacturing base in China (www.english.peopledaily.com; www.chinadaily.com).

In the case of information goods such as software, production in the host economy is not necessary for serving local market because marginal costs of reproduction and transportation costs are close to zero (Shapiro and Varian, 1998). The negligible marginal costs of information goods make pirating very easy. On the other hand, in the case of hardware, pirating is more difficult because of positive marginal costs and the technological complexity of producing semi-conductors.

China is considered to be the biggest source of counterfeited software products owing to its weak intellectual property rights regime and poor enforcement (Harvard Asia Business Conference, February 2001, www.fas.harvard.edu). About 90 percent of software in use is counterfeited. The Chinese government is even observed to be one of the worst offenders (News Day, February 7, 1995). However, software companies such as Microsoft have a presence in China to cater to the Chinese market.¹⁴ Why has Microsoft invested and continue to stay in China? One explanation is that Microsoft operating systems have lock-in characteristics- once a user is trained to use the operating system, s/he has to invest significant costs to switch to a different operating system. A first mover firm that is able to lock-in users will always have an advantage. Microsoft's strategy could be that by the time China joins WTO, it will have locked-in a large number of users on whom it can leverage in the future. However, as argued in the previous section, the enforcement of the rules depends on larger institutional issues of interaction between the institutional environment and the institutions of governance.¹⁵ Enforcement of the rules

¹⁴ Microsoft-China's CEO, Jack Gao observes "We have a lot of users, but we do not have a lot of customers." (Business Week On Line Dec 11, 2000).

¹⁵ Recently, Microsoft announced investments worth of US \$ 750 million in China with a tie-up to China's powerful State Development Planning Commission (Economic Times, June 28, 2002). This

becomes viable when local agents develop economic interests in the enforcement, which is illustrated in the following case of India's software industry.

In contrast to China, India has attracted larger investments into the software industry- both for programming and for R&D. Almost all of the large American and West European IT firms have set up R&D centers in India and have plans for expansion. Most MNC operations in India are for taking advantage of low cost skilled labor for supporting the parent operations and very few of them have a local market focus (Patibandla and Petersen, 2002). Local software companies, such as TCS, Infosys, and Wipro in India started to grow since the early eighties mainly by exports to the US with little domestic market focus (Arora, Arunachalam., Jai Asundi, & Fernandes, 2001, Ghemawat and Patibandla, 1999). Texas Instruments' entry in 1985 and successful operation in making use of low cost skilled labor for exports induced the entry of several other MNCs from the US and Western Europe into India. The market reforms of 1991, which opened up the economy to trade and investment, gave a further boost industry's exports. By the mid 90's, quite a few local firms had become major wealth generators.

India's copyright protection had been weak until recently. In the early 90s, India's software industry association (NASSCOM) lobbied with the government to amend the Indian copyright act. The act was amended in 1995 to make it up to par with the most modern law in the field. In recent years, NASSCOM has undertaken the enforcement of the act in cooperation with the government agencies (Ghemawat, Patibandla and Couglin 2000). This internal dynamics of institutional change generate the necessary institutional conditions for MNCs to invest and expand their operations in India for software development, and to undertake R&D for the global market, and to serve the growing local market (Patibandla and Petersen, 2002).

Furthermore, as discussed in Section 2, the software industry cluster in Bangalore has become a technologically dynamic, providing strong agglomeration economies. The low cost skilled labor, combined with the agglomeration benefits of the cluster, provides a strong comparative advantage for

could be a part of the strategy to co-opt the Chinese government to implement the copyright and curb the widespread piracy of software.

MNCs to use it as a location for producing for the international markets. Southern India has large pool of software engineers and programmers and their productivity appears to have been enhanced by the organization of the industry into a technologically dynamic cluster in Bangalore. A large number of MNCs have set up R&D and software development centers in Bangalore for supporting the technological activity of the parent units with about 140 MNCs subsidiaries in Bangalore alone (Balasubramanyam, & Balasubramnyam, 1999, Patibandla and Petersen, 2002).¹⁶ On the other hand, China does not seem to have developed any significant high-tech industry clusters. The industry and technology zones promoted by the Chinese government led to concentration of a wide range of industries in specific locations but not to a specific high-tech industry cluster (Cheng and Wu, 2001; Zhang, 1994).

4. b. The Pharmaceutical Industry

The pharmaceutical industry is also a knowledge intensive industry in which IPRs play a critical role for foreign direct investment. At the global level, the pharmaceutical industry can be divided into two kinds of firms: innovative firms and producers of generic drugs. The innovating firms are located mostly in developed economies. The research-oriented pharmaceutical companies are among the most multinationally oriented in the world. Protection of IPRs (patents) is crucial requirement for

¹⁶ One other cluster that is taking shape is the automobile industry in the coastal state, Tamil Nadu in the southern part of India. The interesting aspect of this cluster is that it arises out of the entry of quite a few MNCs into the Indian automobile industry in the recent years. Several MNCs such as Hyundai, Ford Motors, General Motors, and Mitsubishi have set up plants in this location. Unlike in the case of the software industry cluster, the primary motive for the MNC entry is to cater to large growing local market. The location decision of MNCs within India is based on an economic efficiency consideration of advantages of the coastline, locally available skilled labor and relatively efficient infrastructure. As the local market grows it provides significant economies of scale, and as the cluster becomes dynamic, it provides significant external economies. Combining these factors with the low cost of skilled labor will give strong comparative advantage to the MNCs to use the location for serving the other Asian economies.

firms to invest in R&D owing to the associated high costs and uncertainty of investment.¹⁷ The effective patent period for a successful drug ranges from 14 to 20 years, for which an innovative firm will have monopoly status. In countries, with comprehensive patent protection, generic drugs come into production when the patent expires. When a drug becomes generic, its price declines steeply because of competition among large number of firms. In countries, where patent protection is non-existent or weak, all drugs are generic. Firms in these countries undertake reverse engineering of new pharmaceutical drugs developed in developed countries and sell them at low prices to local users (Tanser and Josyula, 1999).

To assess the market size for pharmaceutical products in developing economies, one has to make a distinction between two types of diseases: those that are primarily present in poor countries such as malaria and those that afflict all. Protection of intellectual property rights for drugs restricts the market size in developing economies as most people in these countries can not afford the prices charged by the global pharmaceutical companies (Kremer, 2002; Bhagwati, 2002). In the more advanced developing countries such as India and Brazil, local firms are able to supply the pharmaceutical products at low prices under generic production.¹⁸

The large amount of fixed and sunk R&D costs in developing new drugs causes both high risk and economies of scale in R&D and negligible marginal costs for reproducing successful pharmaceutical products, which, in turn, is a strong motivating factor for MNC to expand market size through exports. Negligible transportation costs imply that MNCs do not have to produce locally to cater to markets of developing economies. In the case of generic drugs, low cost skilled labor could be a motivation to locate production in developing economies. MNCs can locate R&D activity in a developing economy if it is endowed with large pool of low cost skilled labor supported by the necessary technological institutions.

¹⁷ Companies that belong to the Pharmaceutical Research and Manufacturers of America spent about \$ 19 billion on R&D in 1997.

¹⁸ Imposition of IPRs in developing economies through WTO benefits the global MNCs by blocking firms in India from exporting to other developing economies at low prices.

China and India can be termed as countries with large and growing markets for generic drugs. However, two factors constrain markets for global players in this industry: high prices of patented drugs and poor protection of product patents in these countries. Even if a sizeable market is present for new pharmaceutical products among the prosperous section of the populations, global players can serve these markets through imports rather than foreign direct investment in these countries. A comparative analysis of the industry in China and India sheds light on interesting insights into the effectiveness of institutional change in terms of IPRs imposed by external agencies such as the WTO.

Patent protection of pharmaceutical products in India was based on Great Britain's laws until 1970. Consequently, the prices of essential drugs were among the highest in the world and the market was dominated by MNCs until the 1970s (Huang and Hogan, 2001). The patent act was modified in 1970 such that it recognized only process patents and not product patents. Apart from this, the government also enacted price controls on certain pharmaceutical products. These measures were implemented to make certain essential drugs affordable to low-income groups.

The patent act of 1970 allowed firms in India to reverse engineer new drugs developed in developed economies and sell them in India at low prices. Through this practice, the Indian pharmaceutical industry grew very rapidly, averaging a 35 percent annual growth rate over the last 12 years. At present, the industry is valued at about \$ 5 billion. There were about 24, 000 firms in the industry in 1997, including several small and a few large Indian and multinational firms. Multinational firms cater to about 38 percent of total industry sales. MNCs have been active in formulations (branded products) as compared to Indian firms, which concentrate more on bulk drugs and generic pharmaceutical products. Indian companies manufactured drugs in virtually every therapeutic category and marketed them under their own brand names. Because of the generic nature of the market, drug prices are among the lowest in the world. Furthermore, some of the major Indian firms have become major exporters of generic drugs on the world market (Lalitha, 2002; Tanzer, 2001, McNeil, 2000). However, the patent regime and the price controls discouraged MNCs from introducing new drugs in the Indian market. In the Indian market, MNCs sell the pharmaceutical

products that have reached maturity but not new discoveries. Consequently, many of the latest discoveries are not available in India because of the lack of product patents.

In 1994, the Indian government signed the WTO (World Trade Organization) agreement, which mandated a higher level of protection of trade-related intellectual property rights (TRIPS). As a result, India has to implement a patent regime protecting drug products by January 2005. During this transition period, India has to provide five years of exclusive marketing rights to any entity that files a patent application in any WTO member country after January 2005. Furthermore, the government implemented a reduction of the price controls in 2002. Recently, several large Indian firms which reached large sales volumes and technological maturity started to refocus their strategies of investing in R&D and formed joint collaborations with MNCs for R&D efforts in discovering molecules (Smith, 2000).¹⁹ Furthermore, the recent scientific discoveries on the human genome have had a significant effect on the nascent biotechnology industry in India. Strong synergies among the pharmaceutical, information technology and biotechnology fields confer comparative advantages for undertaking R&D in India. In the other words, the modification of the patent regime, the endowment of large pool of scientific manpower, the endowment of complimentary industries, and the vast biodiversity in India provide incentives for MNCs to set up R&D units.

Similarly, China presents a large and growing market for generic and imitation drugs in absolute terms. In the year 2001, there were about 6,300 pharmaceutical firms with a capacity to produce 1,350 chemical drugs and about 8,000 traditional Chinese medicines with a sales value of RMB 209

¹⁹ For example, an Indian company, the Reddys Laboratories Ltd, which became a major player through reverse engineering practices, invested in R&D in collaboration with the Danish pharmaceutical company, Novo Nordisk and the Swedish company, Novartis. This led to the discovery of three molecules that have been licensed for diabetes drugs. Recently, this company lobbied the Indian government to adopt product patents (Huang and Hogan, 2001). Another Indian large firm, Ranbaxy has entered into a licensing agreement with the German multinational Schwarz Pharma AG, under which the MNC will launch Ranbaxys chemical discovery (NCE) for treating benign prostatic hyperplasia. Under the licensing agreement, Ranbaxy would receive \$ 50 million in licensing fees and a percentage of royalties (The Economic Times, June 19, 2002).

billion. During the period from 1978 to 2000, the industry had an annual average growth rate of around 16 percent. Around 97 percent of the chemical drugs are observed to be imitated drugs (Balaji, 2001). Most of the firms are government-owned, public sector companies and a major part of the multinational presence has been joint ventures with public sector firms. By the end of 1999, there were about 1,800 joint ventures representing a total investment of US. \$ 1.5 billion (Cai, 2002).

Unlike India, China adopted product patent protection of pharmaceutical products much earlier in 1992 legally. However, the implementation of the patent law had been highly lackadaisical due to government rules and restrictions on the industry. Strict import regulations and complex licensing procedures restricted imports of pharmaceutical products. Production by foreign companies was allowed only when domestic production was considered to be impossible. The government rules included a provision that allowed local firms to undertake clinical drug trials for selling it even if another company held the patent. Secondly, China's 12 to 15 months' approval process for new drugs allowed information to leak to local companies. The government rules refused to accept the results of clinical trials conducted in other countries, which was counter to international practice and allowed local companies to copy the drugs. These aspects provide support to our argument that legal provisions on paper does not necessarily equal their implementation unless the local government finds them suitable to their interests.

China joined the WTO in December 2001 and agreed to implement the Trade-related Intellectual Property Rights of the Uruguay Round this accession. Foreign companies will be able to lodge compensation claims for the violation of patents ranging from US \$ 400 million to as high as US \$ 1 billion. This is expected to result in the domination of China's pharmaceutical industry by MNCs (Zhang, 2002). Twenty of the 25 pharmaceutical giants listed among the worlds top 500 companies have already invested in China. However, it will be interesting to observe how effectively the Chinese government will implement the TRIPS agreement in the future, especially if it does not suit the interests of the local companies.

4. c. Infrastructure Projects

Both China and India offer large markets for infrastructure projects in electricity generation and distribution, telecommunications, ports, etc., with potentially high returns on investment (World Markets in 2000, World Markets Research Centre, www.wmrc.com). As mentioned earlier, infrastructure investment is subject to high risks owing to large sunk costs and long gestation periods. The natural monopoly nature of these investments makes government intervention pervasive from granting licenses and contracts (bidding) to regulation. The regulatory aspect of investment is important due to public good properties and politicized pricing of public utilities such as electricity and telecommunications. The institutional aspect of credible policy commitments by governments is crucial because of sunk costs and long gestation periods.

China attracted larger investments in infrastructure than India (UNCTAD, 2001). Apart from the market size issues, the differences in the institutional aspects provide a significant explanation on two levels: one is the process of government clearances and the other is the government regulatory mechanism. In the case of India's federal democracy, clearance of large projects is much more complex involving the Federal government at the center and the state government and several other regulatory agencies such as the environmental regulators. The regulatory decisions governing issues such as zoning, land-use, and environment varies from one state to the other.²⁰ FDI approval in India is made at the central level, while implementation is left to state governments. There is a significant difference between approvals and actual inflows as there is no mechanism for either proper delegation or monitoring the implementation.

The regulatory system also allows for bureaucratic discretion. Apart from this, if corrupt practices are suspected, government clearances of projects can be politicized by the strong and independent press, which can delay projects. Furthermore, the independent judiciary can also be a source of high transaction costs. For example, Enron Corporation had to fight about 27 court cases filed by private parties in public

²⁰ Foster's brewing company had to endure the process of obtaining government investment and brewing licenses for 11 years in India. Once the investment took place, the company has grown very rapidly owing to increasing domestic demand for beer.

interest litigation and environmental grounds.²¹ On the other hand, the centralized nature of the decision making of clearance of large project FDI proposals in communist China, provides a clearer signal for the target of negotiation for investors. Secondly, government contracts are not subject to litigation by private parties.²² However, the centralized decision-making increases the contractual hazards of cancellation, as the judiciary and different layers of government do not provide safeguards to contracts. This is illustrated by the following cases.

The Case of Daphol Power Corporation (Enron) in India

The case of Enron in India shows high market transaction costs of contractual hazards, and high costs of safeguards for FDI in large infrastructure projects in a developing economy with inefficient market institutions. It also illustrates market transaction costs of political processes when specific market institutions are missing in the context of a democracy. For example, if the market institutions of competitive bidding with transparent processes are missing, political controversies result. This, in turn, causes high transaction costs of project delays.

The new power policy announced by the Government of India (GOI) in 1991 allowed private investment in the power sector. In 1993, a subsidiary of the Enron Corporation, the Dabhol Power Company (DPC), entered the Indian market in the state of Maharashtra for generation of 695 Mega Watts of electricity with a proposed investment of \$ 2.8 billion. The contract was formulated and signed by three parties- the Central Electricity Authority (CPA), the Maharashtra State Electricity Board (MSEB), and DPC. The electricity was to be purchased by MSEB at a negotiated price. The contract was formulated in the absence of competitive bidding and under non-transparent procedures, which caused a series of controversies, cancellations, and renegotiations (Parikh, 2001).

²¹ According to press reports in the year 2001, four MNCs have pulled out of power projects in India citing bureaucratic and legal delays and costs.

²² One possible reason many western companies invest in the manufacturing industries is that they are not subject to any legal litigation on the grounds of consumer interests both within China and in the other countries served by Chinese exports.

In 1995, the elections changed the parties in power in the state of Maharashtra. The new government re-examined the terms and conditions of the contract. After a detailed examination by a special cabinet committee, the Government of Maharashtra (GoM) concluded that the contract was not in the public interest and cancelled it. In order to legally substantiate the cancellation, the Government of Maharashtra filed a suit in the Bombay High Court. The GoM presented several government documents to substantiate the various allegations. Interestingly, within three months, the government backtracked on its decision without providing any reasons. It renegotiated the contract without any changes in the old contract. In August 1996, DPC and MSEB entered into the agreement that DPC would supply about 2000 MW of electricity in the form of available capacity and gas for a period of twenty years.²³ Numerous safeguards were incorporated into the contract for protecting the investment and ensuring the future payments by MSEB to DPS for the purchase of electricity. These safeguards included the Power Purchase Agreement, the Guarantee by the state of Maharashtra, the State Support Agreement, the Counter Guarantee by the Union of India, and the tripartite agreement between the GoM, the GoI, and the Reserve Bank of India. The Power Purchase Agreement specifies that MSEB had to buy all the power produced by DPC whether there was demand for it or not and even if cheaper power was available from other sources (MNC Masala, www.corpwatch.org). The state government had put a lien on all its assets: past, present and future in this respect. The Republic of India counter-guaranteed the payments due to DPC. In the case that the Government of Maharashtra defaulted in its guarantee, the government of India would be liable for some of the payments due. The GoI would deduct these payments directly from the constitutionally sanctioned share of revenues due to the state of Maharashtra in case of the GoI having to make any payments. Arbitration in the event of a dispute over the counter guarantee would be under English law in England in exclusion to Indian law.

In the year 2000, the MSEB refused to pay to DPC owing to its financial bankruptcy, a deficit of Rs 790 million for November and Rs 1520 million for December by stating that DPC had been charging higher price than its unit costs. Consequently, DPC decided to invoke the central government's counter

²³ The payments due on the renegotiated contract constitute the largest contract in India's. Annual payments to DPC amount to about US \$ 1.4 billion. Total payments amount to about US \$ 35,000 million over the life of the contract (Bidwai,1997).

guarantee on February 6, 2001. On February 12, 2001 the minister of power at the Federal government announced that it would pay all the amounts due DPC by the Maharashtra State Electricity Board.²⁴

The above case shows that the investor's rights were protected by contract through a costly and difficult process but with high transaction costs resulting from inefficient institutions. Part of the transaction costs arose because of missing institutions at the time of contract formulation such as the competitive and transparent bidding process. These transaction costs would be much higher in a democratic polity than in a totalitarian system due to the political power of various interests groups and litigation by private parties. Apart from this, in the context of high uncertainty owing to incomplete nature of contracts, the costs of safeguards are higher. As a result, there is an incentive for a TNC to recover the investment in shorter period by inflating the project costs. These costs result in higher product prices to consumers, which in turn could be highly politicized.²⁵ Interestingly, in the case of DPC in India there are no costs associated with the regulation as the purchaser and distributor of electricity is the state government agency (MSEB). However, owing to the high costs of the electricity sold by DPC to the state government, the State Electricity Board went bankrupt and could not pay the dues to the DPC. This, in turn, led to the fall of the Enron Corporation in India. On the other hand, in China the clearance of the project could be easier but operation could be subject to high transaction costs because of the discretionary powers of government agents, both at the central and local levels. Nevertheless, China attracts larger investment in infrastructure projects than India possibly China's larger market offsets the transaction costs.²⁶

²⁴ The minister announced that GoI would not default on its contractual obligations with DPC by saying, "We will pay DPC all unpaid electricity bills of MSEB which contractually fall on us. The Government of India has never failed in fulfilling any of its obligations. We will never default on our contractual commitments to anyone." (Economic Times, February 12, 2001).

²⁵ For example, DPC charges unit prices ranging between Rs. 3.01 to Rs.4.25 per kwh of electricity while a local firm, the Tata Electric Company offers it at Rs.1.40.

²⁶ In comparing the prospects of FDI in China with other Asian countries, Thornhill (2001) observes "The investor's rationale appears to be: why bother trying to understand the intricacies of small and fiddly markets when you can deal with one pragmatic if sometimes brutal, giant?"

Infrastructure Investment in China

China offers a huge market for infrastructure investment. Its Ninth Five-year Plan unveiled infrastructure investments worth over \$300 billion, 20 per cent of which is expected to be met by FDI. China, like India, also presents a case of high market transaction costs for FDI. There are about 150 laws and regulations covering FDI in China (Jo Winter, *Cracking China*, Corporate Location, Sept 1999). Inconsistent enforcement and weak judicial protection cause non-credible commitments and high transaction costs. China and India differ in transaction costs at the clearance and operation levels. Power centralization in regard to clearing of large projects makes this process subject to lower transaction costs in China than in India. At the operation level, China poses higher transaction costs owing to predation by local government agents as the local governments hold significant regulatory powers and enforcement. As the rules are not transparent, the regulation is subject to high discretion by the local agents. At the operational level, firms have to invest significantly in transaction costs to cultivate local government officials. The varying power structures and idiosyncratic, personal, and local nature of laws and regulation in China cause these transaction costs vary between different regions (Ahlstrom, Bruton and Lui, 2000)²⁷. Contractual hazards are high in China, as independent judiciary does not safeguard contracts. Unlike in India, the projects do not face transaction costs associated with private litigation on public interest and environmental grounds.

We illustrate the above observation with the case of the Laibin B Power plant in Guangxi province (Gailey, 1997). This was the first power project entirely financed by the foreign capital (\$ 616 million). It was cleared by the Chinese authorities within 14 months. The Chinese government at the center wanted to provide a strong boost to infrastructure investment and give a signal to the international investment community that FDI is highly encouraged in this sector. Even in the absence of a legal framework of BOT (build-own-transfer), the Chinese government minimized the transaction costs of clearing the

²⁷ Ahlstrom et al (2000) observe that these transaction costs take the form of practicing different forms of *guanxi* which include coopting strategies in terms of offering shares to local officials, hiring people within government, entertaining the government officials, etc. The traditional Chinese patterns of social relations are called *guanxi*.

project, thereby speeding up the process. This was made possible by the central government despite the involvement of several ministries in making the clearance because the power was vested in the center. This project clearance is considered to be a major success owing to the low transaction costs and short timeframe. This, in turn, provides incentives for other MNCs to undertake infrastructure investments in China. As mentioned before, this type of clearance is not feasible in the federal democracy of India because of different layers of decision-making, and the importance of political vested interest groups and the independent judiciary (private litigation).

5. Conclusion

The qualitative information and data show a wide disparity in the magnitude and pattern of FDI among developing and transition economies. The mainstream FDI literature focuses on the supply and demand side factors such as endowment of unskilled and semi-skilled labor, market size and issues relating to macro-economic stability. However, apart from these factors, market institutional conditions play a critical role in determining the pattern of investment, especially in developing and transition economies as these countries differ significantly in the development of market institutions. In this paper, we have argued that different configurations of supply, demand and market institutional factors govern the pattern of FDI in developing economies. We have illustrated this argument by undertaking a comparative analysis of China and India at both the macro level and at the micro level of select industry case studies.

By taking the view that FDI in high-tech industries confers larger growth benefits than low-tech and resource extracting industries, our framework implies that policies in developing economies have to be comprehensive rather than piecemeal-meal to attract FDI into these industries. Developing countries not only have to invest in the generation of a skilled workforce, technology institutions and infrastructure but also build effective institutional conditions, such as the protection of (intellectual) property rights, a legal infrastructure for efficient enforcement of contracts, low transaction costs for doing business and credible policy commitments. However, generation of necessary market institutional conditions is subject to complex dynamics. The analysis of India's software and pharmaceutical industries suggests that the enactment and enforcement of IPRs are viable only when

local firms become major wealth generators and develop strong economic interest in the protection of IPRs. However, using the example of China, one could argue the other way round that the knowledge intensive industry such as the software industry was not able to develop in China because of weak copyright enforcement. And the Indian software industry took an indirect root of becoming a wealth generator through exports first and subsequently the Copyright act was enacted and is enforced to generate the local market. Furthermore, there was no clash of interests between MNCs and local firms in India's software industry as they did not compete for the local market as they specialized in different segments of the industry and have been mostly export oriented. In the case of the pharmaceutical industry, the story is simpler- Indian firms became major wealth generators because of the weak patent regime, which not only allowed local firms to undertake reverse engineering practices but also shielded them from competition and entry barriers from the globally established MNCs. This helped local firms become major wealth generators over time. The imposition of IPRs through the WTO agreement is viable at present, as several large Indian firms have reached a critical level of technological maturity and have been developing an economic interest in the protection of product patents. In essence, institutional change in developing economies is possible only when local firms and agents become major wealth generators and develop strong economic interest in the change.

The comparative analysis of FDI in infrastructure projects in China and India suggest that transaction costs would be at different levels under democratic and totalitarian systems. The totalitarian system can facilitate lower transaction costs than democracy at the project clearance level because decision-making and implementation are more concentrated under totalitarian systems. However, a totalitarian system could result in more insecure property rights and predation by government agents than in a democratic system with an effective and independent judiciary. Infrastructure projects such as electricity generation are basically public goods. Inefficient market institutions of governance could result in inflated costs of such projects and prices of the services for the public, which in turn, result in political controversies under democratic systems. This then creates a subsequent increase in transaction costs and makes the projects nonviable. In other words, FDI in infrastructure projects with large sunk costs is viable only when there are critical institutions of governance in developing economies.

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Table 1. FDI in Developing Economies. US \$ Million

Country	1989-94 (annual average)	1995	1998	1999	2000
All developing economies	59 578	113 338	188 371	222 010	240 167
China	13 951	35 849	43 751	40 319	40 772
India	394	2 144	2 614	2 154	2 315
Argentina	2 694	5 609	7 281	24 147	11 152
Mexico	6 571	9 526	11 612	11 915	13 162
Brazil	1 498	5 475	28 480	31 362	33 547
Chile	1 220	2 956	4 638	9 221	3 674
Malaysia	3 964	5 816	2 700	3 532	5 542
Indonesia	1 524	4 346	-356	-2 745	4 550
Thailand	1 927	2 004	5 143	3 562	2 448
Vietnam	651	2 336	2 254	1 991	2 081
Hungary	1 152	4 453	2 036	1 944	1 957
Poland	788	3 659	6 365	7 270	10 000
Czech Republic	563	2 562	3 718	6 324	4 595
Russian Federation	850	2 016	2 761	3 309	2 704
Sub-Saharan Africa	2 419	3 485	5 415	6 442	5 582
Middle-East and North Africa	1 533	1 209	2 299	2 530	2 616

Source: World Investment Report, 2001, UNCTAD

Table 2. Pattern of FDI in China 1979-99 US \$ 100 million

Industries	Number of projects	%	Value	%
Total	341,538	100	6,1317	100
Farming, forestation, husbandry, fishing	9,534	2.79	108.27	1.76
Manufacturing	249,352	73.01	3,655.47	59.5
Building	8,826	2.58	188.6	3.07
Transportation, traffic, post and telecommunications	3,721	1.09	149.69	2.44
Wholesales and retailing, catering	17,558	5.14	219.6	3.58
Real Estate and Public Services	33,877	9.9	1,499.77	24.4
Hygiene, sports social welfare	999	0.29	46.17	0.75
Education, culture, arts broadcast, movies and TV	1,317	0.39	20.4	0.33
Scientific research and technological services	2,410	0.7	18.7	0.3
Others	13,944	4.08	230.45	3.75

Source: Economic Intelligence Agency (www.fas.org/irp)

Table. 3A. FDI (actual) Inflows into Select Industries: India
Rs. Million

Industry	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	1995-2001
Electronics and Electrical Equip.	130 (9.16)	154 (7.48)	645 (21.8)	228 (11.4)	172 (10.87)	213 (11.15)	1602.747 (13.44)
Engineering	252 (17.7)	730 (35.47)	580 (19.62)	428 (21.4)	326 (20.61)	273 (14.29)	2703.878 (22.67)
Services	100 (7.0)	15 (0.72)	321 (10.85)	368 (18.4)	116 (7.33)	226 (11.83)	1190.375 (9.98)
Chemicals & Allied Products	127 (8.95)	304 (14.77)	257 (8.69)	376 (18.8)	120 (7.59)	137 (7.17)	1379.809 (11.57)
Finance	270 (19)	217 (10.54)	148 (5.0)	185 (9.25)	20 (1.26)	40 (2.09)	925.1002 (7.75)
Computers	52 (3.66)	59 (2.86)	139 (4.7)	106 (5.3)	99 (6.26)	306 (16.02)	783.7969 (6.57)
Food and Dairy Products	85 (5.99)	238 (11.56)	112 (3.78)	19 (0.9)	121 (7.65)	75 (3.92)	679.9492 (5.7)
Pharmaceuticals	55 (3.8)	48 (2.33)	34 (1.15)	28 (1.4)	54 (3.41)	62 (3.24)	293.1755 (2.45)
Others	347 (24.46)	278 (13.50)	660 (22.32)	262 (13.1)	553 (34.97)	578 (30.26)	2786.376 (23.36)
Total	1418.5	2058	2956	2000	1581	1910	11923.5

Note: Figures in the brackets are percentage shares in the totals.

Source: Center for Monitoring Indian Economy

Table. 3B. Industry wise Break-up of Foreign Collaboration Approvals in India
(August 1991 to March 2002)
Rs. 10 million

Industry	Number of Approvals		Amount of FDI
	Technical	Financial	
Basic Goods	1517	1942	107576 (38.8)
Power	21	246	38018 (13.7)
Oil Refinery	111	144	25399 (9.1)
Capital Goods	3237	3301	25117 (9)
Electrical Equipment	893	768	5963 (2.1)
Electronics	158	327	3228 (1.2)
Transportation	562	610	9456 (3.5)
Intermediate Goods	251	560	4993 (1.8)
Consumer Non-durable goods	1387	2976	27623 (10.1)
Pharmaceuticals	236	247	2884 (1)
Textiles	151	576	3407 (1.2)
Food Products	134	613	9202 (3.3)
Consumer Durable Goods	37	122	9357 (3.4)
Passenger Cars	6	65	8197 (2.9)
Services	571	5601	102928 (37.1)
Computer Software	86	2267	17616 (6.4)
Telecommunications	126	675	55281 (19.9)
Financial Services	8	406	11760 (4.2)
Total	7000	14502	277597 (100)

Notes: Figures in the brackets are percentage shares in the total
Source: Economic and Political Weekly, August 31, 2002.