Investment Climate and International Integration[*]

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Abstract: Drawing on recently completed firm-level surveys in Bangladesh, Brazil, China, Honduras, India, Nicaragua, Pakistan, and Peru, this paper investigates the relationship between investment climate and international integration. These standardized surveys of large, random samples of firms in common sectors reveal how firms experience bottlenecks and delays in hard infrastructure such as power and telecom as well as in soft infrastructure such as customs administration. The authors focus primarily on measures of the time or monetary cost of different bottlenecks (e.g., days to clear goods through customs, days to get a telephone line, sales lost to power outages). For many of these costs, the obstacles are lower in China than in the South Asian or Latin American countries. There is also systematic variation across cities within countries. The authors estimate a probit function for the probability that a randomly chosen firm is foreign-invested and a separate probit for the probability that a randomly chosen firm is an exporter. These measures of international integration are higher where investment climate is better. For locations to take advantage of opportunities in the international market, they need good infrastructure and a sound regulatory environment. The interaction of openness and sound investment climate creates a good environment for investment and production. This paper helps explain why China has been so successful over the past decade, both in terms of integration and of rapid growth, while other countries have had varied success.

JEL Classification: F02, Economic Integration and Globalization; F21, Foreign Direct Investment; O19, International linkages to Development; O25, Trade Policy; O4, Economic growth and Aggregate Productivity

Key words: Globalization, Foreign Direct Investment, Economic Development.

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1. Introduction

Developing countries overall have grown faster than rich countries over the past 15 years. However, this good aggregate result masks the fact that some countries in the developing world are growing extremely fast (fastest growth in the world), while others languish or even decline. This study focuses on eight countries – four in Latin America (Brazil, Honduras, Nicaragua, and Peru) and four in Asia (Bangladesh, China, India, and Pakistan) – that demonstrate this diversity. Over the past decade China has grown spectacularly well; Bangladesh, India, and Peru moderately well; Brazil and Pakistan hardly at all; and Honduras and Nicaragua at negative rates (figure 1). Six of the eight were at similar levels of per capita GDP in 1990, while Peru and Brazil were at distinctly higher levels of development.

The eight countries are also typical of developing economies more generally in that the variation in their growth rates is highly correlated with increased trade integration. China had a spectacular increase in the ratio of trade to GDP between the 1980s and 1990s (figure 2). Bangladesh, Brazil, and India all had substantial increases, while Honduras and Pakistan had no increase in trade integration. Nicaragua is the only real anomaly in the group with a 30% increase in trade integration but negative growth in the 1990s. There is certainly a popular perception that the increased trade integration is connected to growth. The recent global attitudes survey by the Pew Research Center for The People and The Press (2003) found very robust popular support for the view that international economic integration is good for the developing world. In particular, the percentages of households that thought that growing international trade and business ties are good for their country ranged from highs of 93% in Honduras and 90% in China, to lows of 73% in Brazil and 69% in India.

This correlation between integration and growth, however, merely begs the question: What has led to China's extraordinary integration with the global economy and why has the trade of Brazil or Bangladesh increased more modestly and that of Honduras or Pakistan not at all? It is likely that the answer lies partly in trade policies. Of these eight countries, Pakistan has been the least aggressive trade liberalizer, while China's average tariff rate declined from around 40% in the mid-1980s to 17% by the end of the 1990s (figure 3). However, it seems unlikely to us that formal trade policy is the whole story. Pakistan, it can be seen, had a fairly significant decline in average tariff rates, and no change in trade to GDP at all. Brazil and Peru were, if anything, slightly more aggressive trade liberalizers than China, but saw much smaller trade responses. We do not have the comparable tariff data for Honduras in the 1980s, but by the end of the 1990s it had the lowest tariff rates among these countries – yet its trade to GDP ratio actually declined in the 1990s.

The idea that we explore in this paper is that these moves to liberalize trade need to be complemented by a sound investment climate if developing countries are to get the desired outcomes in terms of greater foreign trade and investment and higher growth. What we mean by investment climate is the institutional, policy, and regulatory environment in which firms operate – factors that influence the link from sowing to reaping. If the local government is highly bureaucratic and corrupt; if government's own provision or regulation of infrastructure and financial services is inefficient so that firms cannot get reliable services – then returns on potential investments will be low and uncertain. It will be difficult to get foreign investors to locate in such a country or to get domestic entrepreneurs to make investments in response to potential export opportunities, if the investment climate is poor.

This concept of investment climate is closely related to what some authors in the macro literature have called high-quality institutions (Knack and Keefer 1995, Acemoglu; Johnson, and Robinson 2001) or "social infrastructure" (Hall and Jones, 1999). The latter authors, for example, write:

> Our hypothesis is that differences in capital accumulation, productivity, and therefore output per worker are fundamentally related to differences in *social infrastructure* across countries. By social infrastructure we mean the institutions and government policies that determine the economic environment within which individuals accumulate skills, and firms accumulate capital and produce output. A social infrastructure favorable to high levels of output per worker provides an environment that supports productive activities and encourages capital accumulation, skill acquisition, invention, and technology transfer….Social institutions to protect the output of individual productive units from diversion are an essential component of a social infrastructure favorable to high levels of output per worker... Regulations and laws may protect against diversion, but they all too often constitute the chief vehicle of diversion in an economy.

The idea that social infrastructure influences growth has been investigated in the cross-country studies noted above using proxies for strength of property rights and government efficiency. This literature is suggestive, but suffers from three problems: (1) there are not that many countries in the world on which there are good enough data on social infrastructure to derive robust statistical results;[1] (2) the proxies used as explanatory variables do not provide much specific guidance about what countries need to do to improve their investment climates; and (3) using national-level data assumes that the investment climate is the same across locations within a country, when in fact there may be interesting variation based on local governance.

Aside from cross-country growth studies, there are also cross-country studies of flows of direct foreign investment. A number of studies have found that where institutions and/or infrastructure is better, direct foreign investment is more likely. However, the cross-country

[1] See Levine and Renelt (1992); Rodriguez and Rodrik (2000); Dollar and Kraay (2003).

studies do not always agree and, like the growth studies, suffer from the three problems noted in the previous paragraph.[2]

Our contribution is to go down to the firm level to collect data on how institutional and policy weaknesses actually affect firms. We have collaborated with in-country partners on large, random surveys of establishments in Bangladesh (1,001), Brazil (1,642), China (1,500), Honduras (215), India (1,900), Nicaragua (394), Pakistan (965), and Peru (576). In large countries such as Brazil, China, and India, we cover a significant number of cities. These surveys include data on ownership (foreign or domestic), sales (export or domestic), inputs, and outputs, as well as objective aspects of the investment climate. We describe these in more detail below, but in general we are interested in aspects of the environment such as how long it takes to get goods through customs, how long it takes to get a phone line, or how frequent and disruptive are power outages. We developed the questionnaire through pilot testing and with input from firms about the key bottlenecks that they face. Note that the countries are all major exporters of garments and other labor-intensive manufactures, so that they face similar international market conditions. It is natural then to inquire why their performances have been so diverse.

[2] The role of developing countries' institutions and policies in the competition for foreign direct investment has received attention in a number of recent studies. Although some authors (Wheeler and Mody 1992, Hausmann and Fernández-Arias 2000) find that host countries' institutions do not induce greater inflows of FDI, numerous other empirical studies reach the opposite conclusion. Shang-Jin Wei (1997, 2000) shows that both the average level of corruption in host countries and the uncertainty caused by the variability of the bribe rate have a significant negative correlation with inward bilateral FDI. Using a variety of institutional indicators and employing different estimation techniques, Stein and Daude (2001) confirm that the quality of developing countries' institutions has a positive effect in attracting FDI. Working with investor firm-level data, Smarzynska and Wei (2000) provide further support for the negative relationship between corruption in the host country and foreign investors' decision to invest there, while also exploring the differential mode of entry (wholly owned enterprise versus joint venture) based on the level of corruption in the host country and the level of technical sophistication of the investor firm. While suggesting that domestic socio-political considerations are irrelevant for investor decisions, Wheeler and Mody (1992) demonstrate the prominent role played by host countries' quality of infrastructure in determining foreign investor expenditure there. Démurger et al. (2002) use differential growth rates in Chinese provinces to disentangle the effects of geography and policy on growth; akin to Wheeler and Mody, they assert that local improvements in infrastructure matter for integration into the world economy, and subsequently, for growth.

The analytical framework for this study is straightforward. We argue that several of the investment climate bottlenecks that we cover act as an informal kind of trade barrier, making it easy or difficult to connect to international markets. This is easiest to see with our measures of customs efficiency; difficulty in moving goods in and out of the country will encourage firms to focus on the local market rather than on the international one. Difficulties in getting phones lines or reliable financial services similarly make it difficult to connect with a larger market.

We are going to use country dummies in our empirical analysis, so we are controlling for national level trade and other policies. The model we have in mind is that Brazil has potential comparative advantage in a range of industries. However, poor local governance can undermine that potential. While customs administration in principle is a national level institution, in practice clearance times vary quite a lot from one location to another within countries. So, if a city has problems with customs clearance, getting phone lines, or wire transfers cleared, then its locally owned firms are less likely to take advantage of international markets. The location will also be less attractive to international firms that are looking for production platforms as part of integrated global production. Thus, our hypothesis is that a random draw of firms of a given sector, within a country, will find more exporting firms and more foreign-invested firms where these bottlenecks are low, and more domestically oriented firms where bottlenecks are high. This argument also suggests that in cities with poor investment climate it is difficult for firms to connect with other parts of the national market, but we do not have the data to test that complementary proposition.

It is important to have in mind alternative theories or models that might explain the empirical patterns that we observe. A competing but not mutually exclusive hypothesis about why different locations in the developing world have such different experiences concerns the

role of geography.[3] It is possible that distance from markets and/or agglomeration economies can explain the dynamism of some locations and the stagnation in others. We control for these factors in the analysis. It is also possible that there is something else about China (political stability, culture, size) that can account for its success. In our analysis we include country dummies to capture these effects. A strength of our approach is that we can identify the importance of investment climate based solely on variation across cities *within countries.*

The paper proceeds as follows: In the next section we describe the firm surveys in more detail and present the main investment climate indicators that we use in the empirical analysis. The surveys are based on stratified random samples of establishments in particular sectors that vary somewhat across the countries. Garments are covered in all of the countries, as well as some other labor-intensive sectors. In this section we establish that there are statistically significant differences across cities in the extent of foreign investment and the extent to which firms export. There are also systematic differences in many of the indicators that we collect. We can say with a high degree of confidence that customs clearance is faster in China than in Bangladesh, and faster in Bangladesh than in Pakistan. If our prior is that time delays and service breakdowns are bad things, then we can say that China looks the best of the four countries on many of the measures (fast customs clearance, fast access to new phone lines, few power outages). However, one of the interesting things that emerges is that each location tends to have its relative strengths and weaknesses. In China, for example, the state-owned banking

[3] Krugman and Venables (1999) argue that in many lines of production there are advantages to producers locating close together and that these agglomeration economies could explain the concentration of production in certain locations. Limão and Venables (2001) provide cross-country empirical support for this notion. Gallup and Sachs (1999) focus on a different aspect of geography: the debilitating effect of malaria and other diseases and their impact on productivity. In our work we will introduce variables that attempt to capture the importance of being close to markets and major concentrations of population, as highlighted by the Krugman-Venables work. We are not well placed at the moment to look at the geographic factors emphasized in Sachs's recent work, because few of the locations that we cover in this study have major malaria or disease problems. As the investment climate surveys are extended to more locations (surveys for example are underway in Tanzania and Uganda), it will be possible to examine the effect of malaria or AIDS on foreign investment and linkages to the international market.

system is providing poor services to the firms (largely privately owned) in our sample. We also show that there are important differences across cities within a country. Our analysis covers about 60 cities in these four Asian countries.

In section 3 we estimate probit models for the probability that a firm exports and for the probability that it is foreign-invested. There is a clear relationship between investment climate indicators and international integration: exporting and foreign investment are much more common in locations in which hassles and delays are low. We control for a number of geographic factors such as distance from major markets, distance from ports, and population of the city. We also show that the results are robust to including country dummies, so that identification comes only from the variation across locations within a country. The coefficients are economically meaningful. For example, they suggest that if Calcutta could attain Shanghai's level of investment climate, the share of firms in these sectors exporting would increase by about 50% from the current 24% to 34%, comparable to what is found in coastal Chinese cities. Similarly, the share of foreign-invested firms would rise dramatically from the current 3% of firms to 19%.

Clearly there is some truth as well to the stories that emphasize natural geography and agglomeration economies, and our estimates confirm this. We do not find manufacturing plants randomly distributed around rural locations. That said, most of the locations we cover are large cities, and many of them are ports, with potential access to the international market. Locations such as Calcutta (India), Karachi (Pakistan), Chittagong (Bangladesh), SaoPaulo (Brazil), and Tianjin (China) are not performing as well as Guangzhou and Shanghai in China. So, while being a big port city is an advantage, the advantage can easily be undone by poor local governance. The fact that the investment climate indicators are highly significant even after

controlling for geography, population, and even country dummies is consistent with the view that local governance is very important.

Thus, we conclude in the final section that a number of major cities in China have created quite good investment climates, compared with other locations at similar levels of development ten years ago and with similar good potential for access to the international market. The result of this better investment climate is that there is a strong connection between sowing and reaping. As a result, these locations receive a large amount of foreign investment and have large numbers of firms that are selling internationally. We have shown in a companion paper (Dollar, Hallward-Driemeier, and Mengistae 2003) that good investment climate is related to high productivity, wages, and profitability at the plant level. These new results suggest that this high productivity is at least partly related to the greater international integration that comes with a sound investment climate. The foreign-invested firms tend to have higher productivity (probably owing to superior technology or management) and exporting firms tend to be the higher productivity ones as well. It is not clear from this work if exporting itself causes higher productivity; it may simply be that exporting provides an opportunity for the high-productivity firms to expand to a scale that they would not otherwise be able to achieve. Either way, it would contribute to aggregate productivity growth. Given the large differences in investment climate that we find in our surveys, it is not surprising that the extent of international integration varies so much across these locations. Returning to the puzzle that we started with: the evidence supports the view that the interaction of open trade and investment policies with a sound investment climate has created especially dynamic growth in a number of Chinese cities.

2. Measuring Investment Climate with Firm-Level Data

The empirical growth literature has used a number of proxy variables that get at different aspects of the investment climate: subjective measures of the strength of the rule of law, expropriation risk, and government effectiveness in providing public services. This approach has the advantage that it can cover a lot of countries and establish a general link from investment climate to growth. The disadvantage of these indicators is that they are subjective and do not provide much specific guidance about how the investment climate affects firms and about which aspects of the investment climate are especially important. It is for these reasons that we turned to firm-level data to get better measures of the investment climate and a clearer understanding of how it relates to firm performance, international integration, and growth. At the end of the day, all growth occurs at the firm level (defining firms broadly to include farms and productive households). So, it is necessary to investigate firm dynamics if we are to understand the growth patterns in the global economy.

The investment climate measures that we are going to present are based on large, random samples of firms in specific sectors in four countries: Bangladesh, China, India, and Pakistan from Asia, and Brazil, Peru, Nicaragua and Honduras from Latin America This investment climate survey project has evolved over time and has a number of precursors within the World Bank. Based on this practical experience, we have developed a common set of objective questions that will be included in all future surveys sponsored by the Bank. . Each survey also uses a similar sample design, a stratified random sample of establishments being drawn in each country. The sample is stratified first on sub-sector: we want to collect production and investment data from firms producing broadly the same product. The garment sector was covered in each of these countries and is the best example of a relatively homogeneous industry

in which we have observations from all four countries. The other sectors covered are textiles, leather products, electronic and electrical goods, chemicals and food products in Bangladesh; business services, IT, electronic equipment and components, consumer appliances, apparel and leather products, and auto parts in China; textiles, leather goods, food products, drugs and pharmaceuticals, electronic consumer goods, metal products, plastics and machine tools in India; and textiles, leather goods, food processing, sporting goods, electronics, electrical goods, chemicals, and IT in Pakistan.

The samples are also stratified based on location. The locations covered are Dhaka and Chittagong in Bangladesh; Beijing, Chengdu, Guangzhou, Shanghai, and Tianjin in China; 38 cities in India; 12 cities in Pakistan; 13 in Brazil; 8 in Peru; and 9 cities in Nicaragua and Honduras combined

In each country we worked with a local partner to draw these samples and to train enumerators to visit the establishments. The typical observation is based on a three-hour visit to the factory. Because of the interest and support from the business community in each country, we have been able to attain high levels of cooperation from firms.

Table 1 presents some quantitative measures of the investment climate collected by these surveys. For simplicity we focus the presentation of data here on sixteen large cities in each of which we have at least 74 observations. In the survey instrument there are sometimes multiple questions that cover a similar theme. For example, as a measure of access to finance, there is information on use of overdraft facilities as well as the share of firms that have a bank loan or on how long it takes to clear checks. Within the same theme, the correlation of the indicators is high. Thus, in the empirical analysis in the next section, we have decided to focus on five

indicators presented in Table 1. The five were selected because the questions have high response rates in all countries and because they capture different dimensions of the investment climate.

A question that relates both to bureaucracy in general and to bureaucratic control of access to international markets in particular, is how long it took importing or exporting firms to get their last shipment of goods through customs. Some of the Chinese cities look the best here, especially on the export side. Exporters got their goods through customs in an average of 3.9 days in Guangzhou and 4.4 days in Shanghai (though Tianjin, at 6 days, is not as efficient). In Karachi, at the other extreme, the average delay in export customs was 15.8 days. In India, Chennai is not far from Chinese standards, whereas Calcutta has an average of 8.1 days, which is about the average for Sao Paolo and Rio de Janeiro in Brazil. For garment producers there is basically a 60-day production cycle, so that losing a week or more on the import of fabric and another week or more on the export of finished garments, is a serious bottleneck. The advantage of basing these means on large samples is that the standard errors are fairly small and hence the difference between Guangzhou and Shanghai, on the one hand, and Calcutta and Karachi, on the other, is highly significant statistically.

Our experience with this survey work over several years has taught us that reliability of the public power grid is a big concern for firms, especially in South Asia. We ask firms to estimate the loss in sales owing to power outages. With less than 1.5% of sales in Shanghai and around 2% in Guangzhou and Tianjin, China is here on about a par with Brazil, but significantly better than Dhaka (3.4%), which in turn is much better than either Indian cities such as Chennai and Calcutta or Karachi, Pakistan – all of which have firms losing about 6% of sales to unreliable power. Given the losses stemming from power failures, many firms respond by running their own generator. While it not uncommon for large firms in any location to have their own power

generators, for small and medium enterprises (SMEs) the cost of maintaining a power generator is quite high and burdensome. Thus, another gauge of the reliability of the power supply is the proportion of firms that have their own generators. The results (not presented in the table) are similar; the share of firms with their own generator is 42% in the Pakistan sample and only 16% in the China sample. The numbers for firms with their own wells are also nearly identical (44% in Pakistan compared to 16% in China).

Another question that relates to both infrastructure and government bureaucracy is how many days it took to secure a phone line, for firms that have secured one in the past two years. Again, China looks relatively good (16 days for the sample as a whole), compared to 18 days in Karachi, 28.7 in Rio de Janeiro, 126 in Bangalore, 143 in San Pedro and a whopping 168 in Dhaka. These are all countries in which the public sector plays a role in allocating fixed phone lines. Overall, the infrastructure questions provide a fairly consistent picture in which China looks better than the other countries, especially those of South Asia.

The survey questionnaire has a series of questions on financial services. Again, in all of these countries the government stake in the banking sector is dominant. On the question of whether firms have overdraft facilities, the responses range from a low of 16% in Chengdu and Tianjin, to 37% in Shanghai, 66% in Dhaka, and about 75% in Chennai and Sao Paolo. None of these countries has particularly good financial services; this is one area in which parts of China seem to be lagging the other countries. Average clearance times for checks (not presented in the table), for example, ranges from 2 days in Pakistan to nearly 5 days in China. In our China sample, there are a lot of private medium-sized firms, and the data reveal that in general they are not receiving good services from the largely state-owned financial system.

In summary, across these countries and within these countries there is significant variation in many of the investment climate measures, so that the potential is there to explain differences in international integration and firm performance based on variation in the investment climate across locations. In the next section we relate these investment climate indicators to two measures of international integration: the share of firms that export and the share that are foreign-invested. Table 2 reports these data for the sixteen cities that we have highlighted. It can be seen that foreign investment is much more common in Guangzhou and Shanghai than in the other cities: from randomly chosen samples, 41% of the Shanghai firms have foreign participation and 28% of the Guangzhou firms. At the other extreme, less than 1% of the Karachi sample is foreign-invested.. The share of firms exporting is very high in those two Chinese cities as well. Dhaka also has a high share (45% of the sample). Again, Karachi is much less integrated with only 15% of the sample exporting.

These variations can arise from a number of different sources. The sectoral composition of the samples is not identical in each city, so that the high share of exporters in the Dhaka sample partly reflects the high weight of garments in the sample there. In the next section we will control for sector, country, and geographic factors, and explore the extent to which differences in investment climate can explain the remaining variation in patterns of international integration.

In our empirical analysis, we are going to treat the investment climate as exogenous to firms. We have tried to develop questions that objectively measure the investment climate. Nevertheless, there may be endogeneity problems resulting from firm performance affecting these measures. For example, it is possible that an especially efficient firm can work within the exogenously given environment to reduce inspections, or power losses, or days for customs

clearance or phone lines. That same efficiency may make it more likely that a firm is an exporter. To address this potential, we average the indicators across firms in a particular city. So, for example, we take an average of these indicators for firms in Dhaka, and that location-specific mean enters the empirical analysis. This approach has a further important advantage for us: only 140 firms in Bangladesh report getting a phone line in the past two years and hence answer how long it took. If we took each investment climate indicator at the firm level, we would end up with a relatively small sample of observations in which all the investment climate indicators are available. By creating the location averages, we are taking the view that the average experience of Dhaka firms in getting phones in the past two years, tells us something about the investment climate that is relevant to all firms in Dhaka.

3. Investment Climate and International Integration

To isolate and test for the importance of the investment climate for international integration, we begin by estimating a probit function across 7,302 firms for which we have the necessary data. The dependent variable is a zero-one indicator of whether or not a firm has foreign equity participation. We want to estimate the probability that a randomly chosen firm in a particular city has foreign participation. It is likely that this varies by sector. Our hypothesis is that it depends as well on the investment climate indicators discussed in the previous section. Foreign investors have a large number of potential production locations to choose from, and our hypothesis is that their choice is influenced by the regulatory and infrastructure environment. Other factors may be relevant as well, and we will control for a number of these. But we start with a simple specification in which we have sector dummies and the five investment climate indicators discussed above.

There is a clear relationship between investment climate and the likelihood of foreign investment (table 3, column 1). All of the investment climate indicators have the intuitive sign and two of them are individually significant. Foreign investment is more common where customs clearance is quick, power losses are low, time to get a fixed phone line is low, and availability of overdraft facilities is high. There is a fair amount of correlation across locations in the various indicators, and this tends to mute the individual significance of the variables. The joint test on the five variables is highly significant (at well below the .01 level). We are going to emphasize this joint test and whether or not the predicted effect (discussed below) is economically meaningful. In these estimates we have addressed geographic clustering of errors.

The basic specification is augmented in column 2 to include several geographic variables that have been hypothesized in the literature as potential determinants of the location of production: distance from major markets, distance from the nearest port, and population size.[4] Not surprisingly, geography does matter for foreign investment: it is less likely in locations far from major markets and with small populations. Still, the investment climate variables that were important in the first specification remain so here. One can easily think of a whole host of other factors that might influence the choice of foreign investors, such as political or macro stability of the country, the quality of its legal system, or availability of high-quality labor. We are going to argue that country dummies will adequately control for most of these factors. Labor is relatively mobile within the countries on which we are focusing, so if good human resources are important, the country dummy should pick this up.

[4] The distance to major markets variable is the smallest of, distance from the location to Brussels, Washington, or Tokyo – the capitals of the three largest markets. The distance to port variable captures the fact that some locations in our sample are interior locations (Chengdu, Lahore, Bangalore) while other are themselves port cities (Chittagong, Karachi, Calcutta, Guangzhou, Shanghai, Tianjin). The third geography variable that we use is population of the city, which indicates whether there is a large market in the immediate vicinity of the firm.

Column 3 reports the full specification with geography and country dummies. The importance of investment climate is somewhat muted, but nevertheless comes through clearly. The joint test of the five investment climate indicators is highly significant (p-value below .01). The coefficient on the China indicator variable is positive and significant, so that there are things about China other than our investment climate indicators that make it more attractive to investors than the benchmark country, Pakistan. Still, identifying only off within country variation, there is a clear relationship between investment climate and foreign investment. It remains the case that foreign investment is positively related to efficient customs, reliable power, telephone connectivity, and availability of financial services.

While we have been careful to make these samples random draws from the available lists of firms, we are somewhat concerned that the registration of formal sector firms is not always up-to-date and comprehensive in developing countries. It turns out that the average size of firms in the China and Bangladesh samples is significantly larger than the average size in the India and Pakistan samples. This variation may be an endogenous response to the differences in investment climate; but it is also possible that there was some bias in the underlying lists from which we sampled. If large firms have easier times with customs or with getting a phone line, then potentially the errors introduced are not random, but rather correlated with our variables of interest. So, as a robustness check we include in column 4 employment size as an additional right-hand-side variable. Size is highly correlated with foreign investment, but its inclusion does not fundamentally change the relationship between investment climate and foreign participation.

Finally, in column 5 we turn the column 3 estimates into marginal effects so that we can conduct some counterfactual experiments to get a sense of the magnitude of these estimated effects. Recall that these are the estimates that include both geography and country dummies.

We consider what would be the impact on the probability of foreign investment if lagging cities such as Calcutta, Dhaka, Karachi, and Rio de Janeiro had the vector of investment climate characteristics that we find in Shanghai. The results are plausible and economically important. In Karachi, for example, the share of foreign-invested firms in these sectors would go from the current 1% to about 20% (figure 4). Shanghai is significantly better than most other cities in the sample in terms of power losses, customs clearance, and days to get a phone line (though not so great on financial services). Shanghai's advantages make it more attractive to foreign investors. In Calcutta and Dhaka as well there would be significant increases in the share of foreign investment, if they could attain Shanghai's level in these investment climate areas. Note that, after controlling for these investment climate indicators and the geographic variables, China's advantage over the other Asian countries is quite large: the marginal effect of being in China is estimated to be 0.497; that is, there is almost 50 percentage points difference between the share of foreign firms in the China sample compared to the other samples, after controlling for the other variables in the analysis.

Having established the link from investment climate to foreign investment, we turn next to the link between investment climate and exporting. Our hypothesis is that the international firms attracted to a good investment climate have a global sales orientation. In addition, domestic firms are more likely to achieve the quality and scale required for exporting if they are operating in an environment of efficient customs and reliable infrastructure. Table 4 repeats the same specifications as table 3, but now the dependent variable is a zero-one indicator of whether or not a firm has export sales.

Again there is a clear relationship between the investment climate indicators and the probability of exporting, though the coefficient on days to get a phone line has a counterintuitive

but statistically significant sign. The results are quite similar with the geography variables added (column 2). As with foreign investment, geography seems to matter: being far from markets and having a small population make it less likely that a city has large numbers of exporters. Once again a country dummy for China is positive (column 3). Note, however, that neither geography variables nor country dummies are statistically significant. On the other hand, the investment climate indicators are jointly highly significant (p-value below .01). Even with country dummies included, customs delays, power reliability, and financial services are all important determinants of export status, with signs in the intuitive directions. Column 4 shows once again that controlling for size of the firm does not materially affect the results.

With the marginal effects in column 5 we can conduct an analogous thought experiment: how would the probability that a firm exports change, if Calcutta, Dhaka, or Karachi had the vector of investment climate characteristics that we observe in Shanghai. In Karachi the share of exporting firms would rise from 15% to 31%. In Calcutta the gain would be 10 percentage points.

4. Conclusions

We have shown in a companion paper that investment climate matters for the level of productivity, wages, and profit rates at the firm level (Dollar, Hallward-Driemeier, and Mengistae, 2003). That is, where hassles and bottlenecks are higher , productivity and profitability are lower. The new results here complement that earlier work. We find that a sound investment climate – as reflected in low customs clearance times, reliable infrastructure, and good financial services – attracts foreign investment. These foreign firms generally bring superior technology and management and hence raise the average productivity of a randomly

chosen sample of firms. The same investment climate factors make it more likely that domestic firms will export, enabling the more productive firms to expand their scale and scope.

Clearly other factors, including geography and national level policies, matter as well. But the point that we emphasize here is that, among large port cities in Asia and Latin America there are large differences in the volume of inward foreign investment and in the extent to which the cities' firms successfully sell in international markets. There are also large differences in the investment climate indicators that we have collected. In Karachi it is difficult to move goods through customs and difficult to get reliable power or telecom services. Similar problems, though not as extreme, hamper firms in the port cities of Calcutta and Chittagong in South Asia, and Rio de Janeiro and Sao Paolo in Brazil. It is no surprise then that the cities with poor infrastructure have relatively little foreign investment and export activity.

These results as consistent with the larger literature on the importance of institutions and policies for economic growth. Our contribution is to collect data from a large number of firms to see how weak institutions actually affect the environment in which firms operate and to investigate the importance of local governance. Most of the existing work on the relationship between institutions and growth assumes that the important institutions are constant within a country. The empirical link that we establish between investment climate indicators and firm performance is robust to the inclusion of country dummies, which reveals that there is significant variation in the investment climate across locations within countries. So, local governance is important.

In our presentation we have stressed the joint significance of the investment climate indicators as factors in differences in economic performance across locations. As more surveys are completed and the sample size grows, it will be possible to gain more confidence about the

importance of specific aspects of the investment climate. Based on current data, we find that customs clearance times, power reliability, and availability of financial services are key determinants of foreign investment and export status. This suggests that the government's role in providing a good regulatory framework for infrastructure, access to the international market, and finance is particularly important. Looking to the future, there are a number of directions for further work, all of which will be easier as more of these investment climate surveys are completed. First, as more data are collected it will be possible to get a better understanding on exactly which aspects of the investment climate are important. Second, we plan to sponsor repeat surveys (rolling panels) on about a three-year cycle. Many of the institutional features that we are capturing are likely to be quite persistent. On the other hand, there are communities around the world that are deliberately trying to create a better environment for entrepreneurship and productivity, so gradually we should be able to find time-series variation in the investment climate and to investigate the question of whether, within a location, improvements in the investment climate lead to greater foreign investment and more domestic firms exporting. We hope that these surveys will be a useful tool for communities that are trying to improve their investment climates, helping them to benchmark themselves against other locations and to measure their progress over time.

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Table 1. Investment Climate Indicators for Cities

City	*Days to Clear Customs*		*Loss Due to Power Outage (% of total sales)*	*Days to Get a Telephone Connection*	*Share of Firms with Overdraft Facility*
	Imports	*Exports*			
Bangalore	8.22	6.71	2.12	126.44	0.46
Calcutta	10.09	8.07	5.98	22.56	0.57
Chengdu	13.46	9.93	2.84	13.61	0.16
Chennai	6.65	4.54	6.44	24.03	0.75
Chittagong	12.8	8.56	3.05	53.38	0.66
Dhaka	11.46	8.88	3.35	168.47	0.66
Guangzhou	5.43	3.90	2.01	23.60	0.25
Karachi	10.55	15.78	6.14	18.43	0.33
Shanghai	6.67	4.40	1.45	13.18	0.37
Tianjin	7.63	6.03	1.56	6.96	0.16
Sao Paolo	12.87	7.7	1.18	13.42	0.74
Rio de Janeiro	14.78	8.78	3.77	28.7	0.72
Minas Gerais	12.25	9.13	1.46	15.55	0.79
Bahia	13.22	9.25	1.9	15.03	0.61
Managua	5.04	2.03	5.99	98.93	0.33
San Pedro	7.18	1.44	7.02	143.74	0.56

Table 2. Indicators of International Integration for Cities

City	*Share of Firms Foreign Invested*	*Share of Firms Exporting*
Bangalore	0.05	0.30
Calcutta	0.03	0.24
Chengdu	0.11	0.21
Chennai	0.08	0.36
Chittagong	0.02	0.31
Dhaka	0.03	0.45
Guangzhou	0.28	0.42
Karachi	0.01	0.15
Shanghai	0.41	0.38
Tianjin	0.23	0.27
Sao Paolo	0.1	0.35
Rio de Janeiro	0.04	0.16
Minas Gerais	0.04	0.20
Bahia	0.06	0.18
Managua	0.14	0.19
San Pedro	0.2	0.49

Table 3. Maximum Likelihood Estimates of the Probit of Being Foreign Invested (clustered by city)

	Probit Specifications				Marginal Effects
	(1)	(2)	(3)	(4)	for (3)
Investment Climate Indicators					
Days to clear customs, import (log)	-0.148	-0.048	-0.043	-0.060	-0.019
	(4.34)**	(0.88)	(0.67)	(0.99)	(4.34)**
Days to clear customs, export (log)	-0.390	-0.431	-0.080	-0.099	-0.051
	(9.38)**	(8.63)**	(1.06)	(1.28)	(9.38)**
Loss due to power outage, % of total	-0.586	-0.365	-0.126	-0.082	-0.076
sales (log)	(15.42)**	(8.11)**	(1.74)	(1.09)	(15.42)**
Days to get a telephone connection (log)	-0.142	-0.271	0.025	-0.016	-0.018
	(4.19)**	(7.40)**	(0.37)	(0.23)	(4.19)**
Share of firms with overdraft facility (log)	-0.172	0.059	0.383	0.256	-0.022
	(4.61)**	(1.05)	(3.81)**	(2.44)*	(4.61)**
Sectors					
Textiles	-0.026	0.024	0.035	-0.085	-0.003
	(0.32)	(0.28)	(0.36)	(0.85)	(0.32)
Garments_and_leathergoods	-0.252	-0.135	-0.223	-0.307	-0.030
	(3.96)**	(2.03)*	(2.89)**	(3.85)**	(3.96)**
Food	-0.232	-0.106	-0.088	-0.136	-0.026
	(2.38)*	(1.05)	(0.76)	(1.13)	(2.38)*
Electrical_electronic	-0.147	0.132	0.372	0.414	-0.017
	(1.25)	(1.07)	(2.84)**	(3.08)**	(1.25)
autocomponents	0.155	0.167	0.285	0.159	0.022
	(2.05)*	(2.16)*	(3.58)**	(1.93)	(2.05)*
chemical_pharma	0.215	0.295	0.314	0.246	0.032
	(2.61)**	(3.45)**	(3.17)**	(2.38)*	(2.61)**
Geographic Variables					
Distance of city from major markets (log)		-0.504	-0.236	-0.401	
		(6.36)**	(1.29)	(2.14)*	
Distance of city from port (log)		0.011	-0.007	-0.011	
		(2.37)*	(1.27)	(1.97)*	
Population of city (log)		-1.562	-0.447	-0.442	
		(4.07)**	(0.89)	(0.85)	
Population of city, squared (log)		0.059	0.020	0.019	
		(4.37)**	(1.13)	(1.02)	
Country Dummies					
Brazil			-0.036	0.038	
			(0.19)	(0.19)	
Honduras			1.173	1.022	
			(2.63)**	(2.18)*	
Nicaragua			0.823	0.767	
			(3.80)**	(3.46)**	
Peru			4.375	4.699	
			(10.10)**	(10.88)**	
India			-0.210	-0.171	
			(1.24)	(0.96)	
Bangladesh			-0.353	-0.459	
			(2.02)*	(2.54)*	
China			0.993	0.497	
			(4.90)**	(2.37)*	

Table 3. Maximum Likelihood Estimates of the Probit of Being Foreign Invested (clustered by city) (continued)

	Probit Specifications				Marginal Effects
	(1)	(2)	(3)	(4)	for (3)
Employment size (log)				0.217	
				(12.56)**	
Constant	0.581	15.081	3.146	3.971	
	(3.81)**	(5.43)**	(0.87)	(1.06)	
Observations	7302	7302	7302	7302	7302
Chi-sq test	433.03	236.88	28.04	13.61	
Prob > Chi - sq	0.0000	0.0000	0.0000	0.0000	

Absolute value of z-statistics in parentheses

* significant at 5%; ** significant at 1%

Chi-sq test tests joint significance of the 5 investment climate indicators

Table 4. Maximum Likelihood Estimates of Exporting Probit (clustered by city)

	Probit Specifications				Marginal Effects
	(1)	(2)	(3)	(4)	for (3)
Investment Climate Indicators					
Days to clear customs, import (log)	-0.105	-0.089	-0.066	-0.071	-0.035
	(3.96)**	(3.24)**	(2.31)*	(2.40)*	(3.96)**
Days to clear customs, export (log)	-0.070	-0.066	-0.070	-0.109	-0.023
	(2.35)*	(2.08)*	(1.91)	(2.82)**	(2.35)*
Loss due to power outage, % of total	-0.282	-0.255	-0.420	-0.378	-0.095
sales (log)	(11.61)**	(9.23)**	(10.10)**	(8.62)**	(11.61)**
Days to get a telephone connection (log)	0.216	0.222	0.185	0.157	0.073
	(10.11)**	(9.07)**	(4.65)**	(3.72)**	(10.11)**
Share of firms with overdraft facility (log)	0.173	0.157	0.346	0.122	0.058
	(6.25)**	(4.27)**	(6.31)**	(2.08)*	(6.25)**
Sectors					
Textiles	-0.085	-0.088	-0.117	-0.383	-0.028
	(1.49)	(1.51)	(1.94)	(5.96)**	(1.49)
Garments_and_leathergoods	0.380	0.384	0.426	0.327	0.134
	(8.52)**	(8.38)**	(8.92)**	(6.48)**	(8.52)**
Food	-0.283	-0.280	-0.283	-0.416	-0.089
	(4.45)**	(4.34)**	(4.27)**	(5.81)**	(4.45)**
Electrical_electronic	-0.256	-0.257	-0.204	-0.118	-0.080
	(2.90)**	(2.83)**	(2.18)*	(1.21)	(2.90)**
autocomponents	0.031	0.036	0.035	-0.175	0.011
	(0.49)	(0.56)	(0.54)	(2.55)*	(0.49)
chemical_pharma	-0.094	-0.088	-0.154	-0.324	-0.031
	(1.51)	(1.40)	(2.36)*	(4.67)**	(1.51)
Geographic Variables					
Distance of city from major markets (log)		0.008	0.903	0.748	
		(0.14)	(6.45)**	(5.09)**	
Distance of city from port (log)		-0.009	-0.011	-0.018	
		(2.73)**	(3.24)**	(4.84)**	
Population of city (log)		-0.372	-0.728	-1.042	
		(1.34)	(2.23)*	(3.02)**	
Population of city, squared (log)		0.013	0.024	0.034	
		(1.32)	(2.15)*	(2.79)**	
Country Dummies					
Brazil			-0.847	-0.770	
			(7.58)**	(6.54)**	
Honduras			0.156	-0.171	
			(0.46)	(0.46)	
Nicaragua			0.291	0.246	
			(2.02)*	(1.61)	
Peru			-0.192	0.206	
			(1.28)	(1.28)	
India			-0.142	0.071	
			(1.59)	(0.75)	

Table 4. Maximum Likelihood Estimates of Exporting Probit (clustered by city) (continued)

	Probit Specifications				Marginal Effects
	(1)	(2)	(3)	(4)	for (3)
Bangladesh			-0.082	-0.374	
			(0.77)	(3.31)**	
China			0.606	-0.299	
			(4.36)**	(2.01)*	
Employment size (log)				0.418	
				(30.27)**	
Constant	-0.477	2.035	-2.339	0.032	
	(4.51)**	(1.01)	(0.94)	(0.01)	
Observations	7302	7302	7302	7302	7302
Chi-sq test	251.9	206.26	190.91	116.29	
Prob > Chi - sq	0.0000	0.0000	0.0000	0.0000	

Absolute value of z-statistics in parentheses

* significant at 5%; ** significant at 1%

Chi-sq test tests joint significance of the 5 investment climate indicators

Table 4. Maximum Likelihood Estimates of Exporting Probit (clustered by city) (continued)

	Probit Specifics				Marginal Effects
	(1)	(2)	(3)	(4)	for (3)
Employment size (log)				0.418	
				(30.27)**	
Constant	-0.477	2.035	-2.339	0.032	
	(4.51)**	(1.01)	(0.94)	(0.01)	
Observations	7302	7302	7302	7302	7302
Chi-sq test	251.90	206.26	190.91	116.29	
Prob > Chi - sq	0.0000	0.0000	0.0000	0.0000	

Absolute value of z-statistics in parentheses

* significant at 5%; ** significant at 1%

Chi-sq test tests joint significance of the 5 investment climate indicators

Figure 1. Per capita GDP growth rate 1990–99 and per capita GDP in 1990

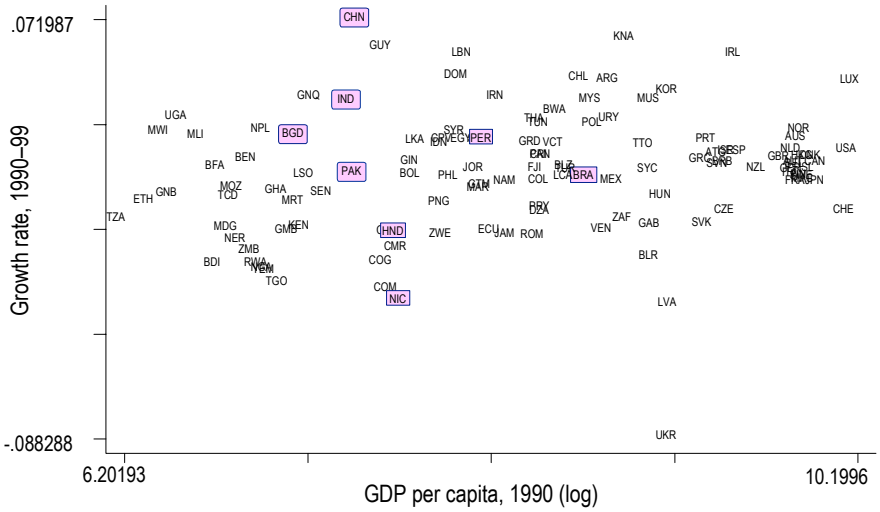


Figure 2. Change in trade to GDP between the 1980s and 1990s

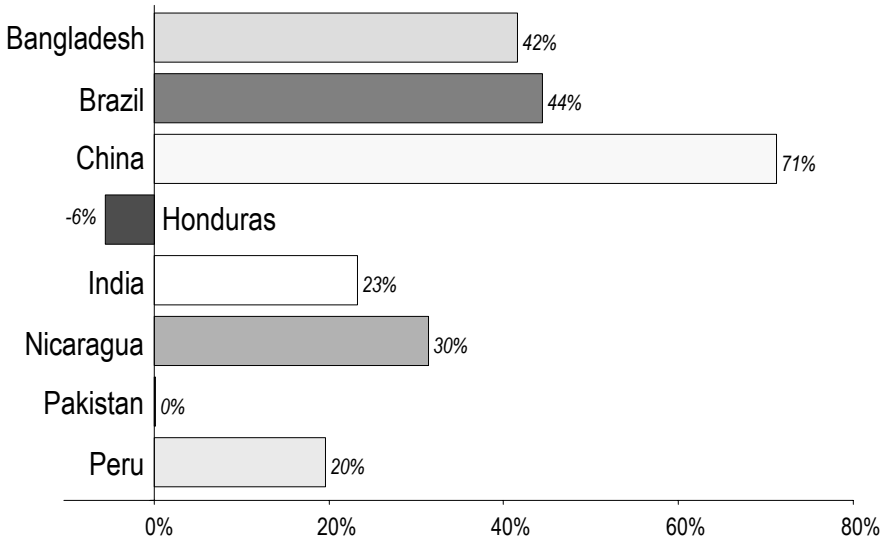


Figure 3. Trends in average tariff rates

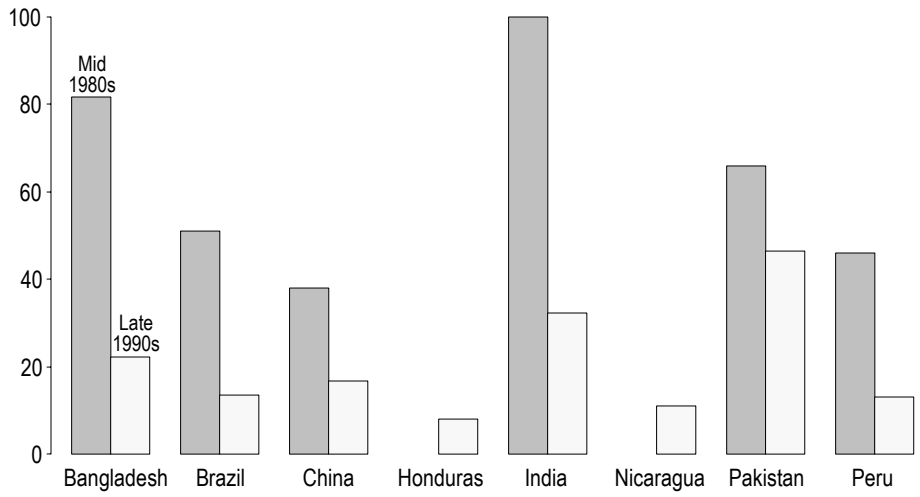


Figure 4. Actual versus potential share of firms that are foreign invested

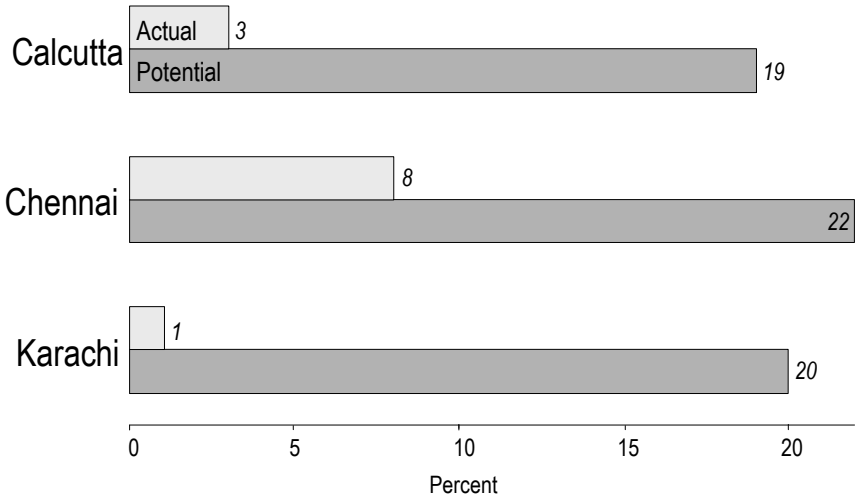
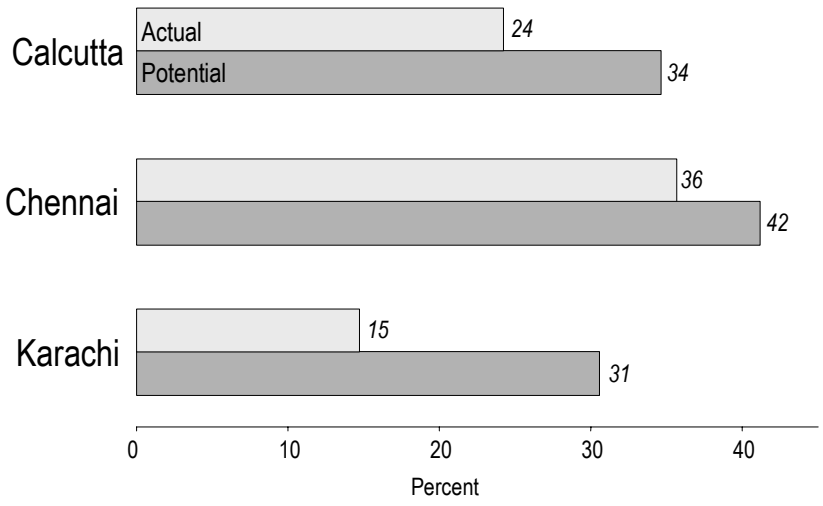


Figure 5. Actual versus potential share of firms exporting



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