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Investment Climate and Regional Development in the Philippines

by

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Abstract

This paper examines the Philippines' investment climate in its many dimensions, relating these to the performance of the economy at the national, regional, and provincial levels. The central thesis is that the economy's slow growth over the past two decades or more can be attributed in large measure to its poor investment climate that constricted capital formation and hampered the productivity improvements and competitiveness of firms; by extension, the differential development of regional and provincial economies can be explained by, among other factors, differences in their investment climates. From a cross-country comparative perspective, the Philippines appears to rate quite poorly in terms of a number of investment climate dimensions, including entry and exit of firms, regulatory burden and corruption, and infrastructure. These macro-level observations are largely corroborated by the results of more rigorous analysis of micro (firm-level) and provincial and regional data. The paper concludes that addressing the deficiencies of the investment climate, complemented by other relevant policy reforms, at the national and local levels, would significantly contribute to enhancing the economy's productivity and long-run growth, as well as raise the performance of the lagging regions towards the level of the leading regions.

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INVESTMENT CLIMATE AND REGIONAL DEVELOPMENT IN THE PHILIPPINES

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Introduction

Private sector development is key to a country's long-run economic growth and poverty reduction. Steady increases in investment and productivity underpin the evolution of the private sector. Investment and productivity growth critically hinge on the quality of the investment climate. Fostering a sound investment climate is one of the fundamental responsibilities of the government for the country to achieve rapid and sustained growth and poverty reduction.

The investment climate can be broadly defined as the "policy, institutional, and behavioral environment, both present and expected, that influences the returns and risks associated with investment" (Stern 2002). Three broad sets of factors make up the overall investment environment: macro fundamentals, institutions and governance, and infrastructure. Macro fundamentals include social and political stability, macroeconomic stability (e.g., sustainable fiscal and external balances, realistic exchange rate, low inflation and interest rates), and competitive markets. Institutions and governance refer to transparency and efficiency in regulation, taxation, and legal system; strong and well-functioning financial sector; labor market flexibility and skilled labor force. Infrastructure concerns the availability and quality of physical infrastructure, such as transportation (roads and ports), telecommunications, power and water supply.

In this paper we examine the Philippines' investment climate in its many dimensions, relating these to the performance of the economy at the national, regional, and provincial levels. Our main thesis is as follows: the Philippine economy's slow growth over the past two decades or more can be attributed in large measure to its poor investment climate that constricted capital formation and hampered the productivity improvements and competitiveness of firms. By extension, the differential development of its regions can be explained by, among other factors, differences in their investment climates. Thus, addressing the deficiencies of the investment climate, complemented by other relevant policy reforms, at the national level and in the regions, would significantly contribute to enhancing the economy's productivity and long-run growth, as well as raise the performance of the lagging regions towards the level of the leading regions.

In the next section, we briefly describe the data and approach used in the analysis. Then we look at the Philippines' overall investment and productivity climate in a cross-

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national perspective to see how the country compares with other Asian developing countries. We next analyze how investment climate indicators influence the economic performance of business establishments in the major industrial centers. We subsequently examine the investment climate and productivity differences across the regions and provinces. We conclude with a summary of the main findings and implications for policy.

Data and Method

A main source of data is the Investment Climate and Productivity Survey (ICS) conducted in June-November 2003 by the National Statistics Office (NSO) for the Asian Development Bank (ADB). The ICS involved a random sample of over 700 business establishments in the country's principal industrial centers (Metro Manila, CALABARZON, Metro Cebu, Davao-General Santos, Clark-Subic), stratified by industry (food and food processing, textiles, garments, and electronics) and firm size (small, medium, and large). The four industries selected are the main contributors to the economy's manufacturing output. The data include investment climate indicators and measures of firm productivity and performance.

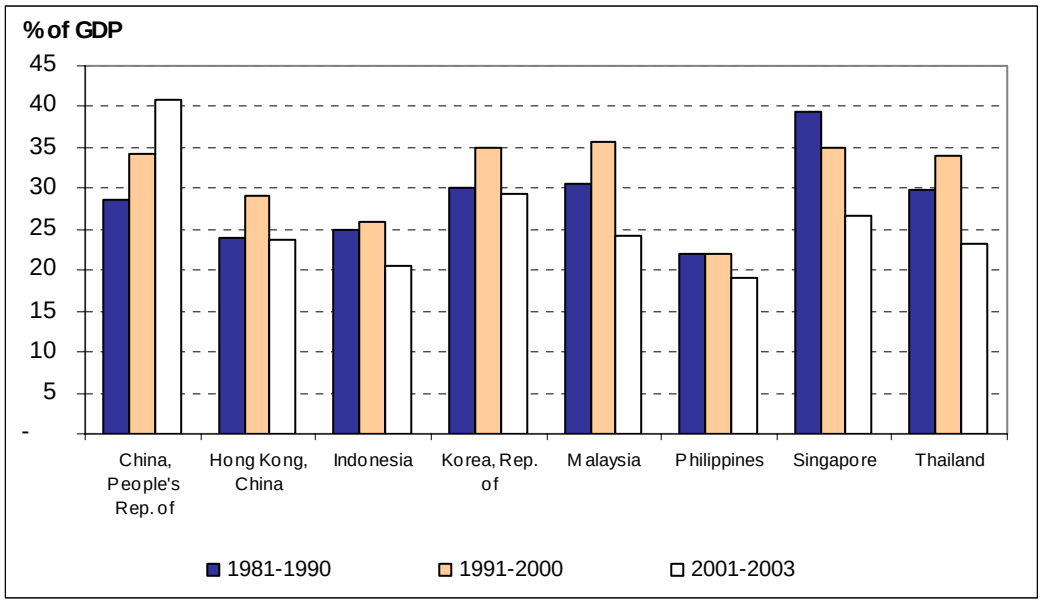
Data on the regions and provinces are drawn from the NSO's surveys on family income and expenditure (FIES) and on the labor force (LFS), and the National Statistical Coordination Board's (NSCB's) regional income accounts. Additional data are taken from the population censuses of 1990 and 2000 and the Commission on Elections' published election reports. Other data are from the Department of Education, Department of Transportation and Communications, and the Philippine National Police as shown in the Philippine Institute for Development Studies' website. Cross-country comparative data are taken from the ADB Statistical Database System, the World Economic Forum's *Global Competitiveness Report, 2004/2004*, and the World Bank's (WB's) *World Development Indicators 2003* and *World Business Environment Survey 2000*, as presented in ADB (2004).

Our analytical approach is to examine how the investment climate affects the performance of business establishments in the country's major industrial centers, as well as how regional and provincial productivity differences can be explained by differences in investment climate indicators. We use standard OLS regression techniques to relate economic performance measures to investment climate indicators and other factors.

Investment, Economic Growth, and Poverty Reduction

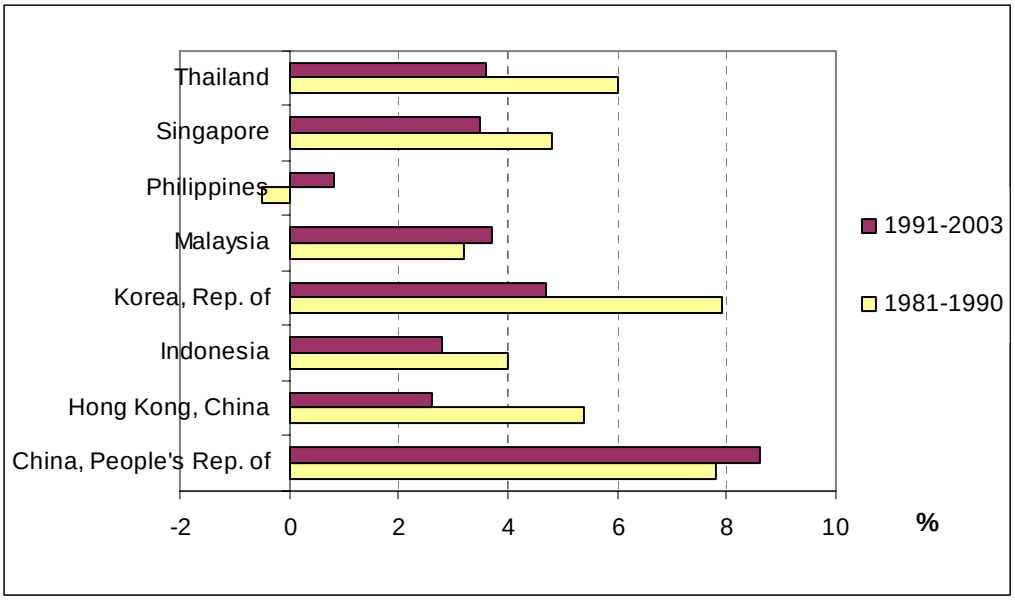
Capital accumulation (investment growth) depends critically on the investment climate, as can be noted from the experience of East and Southeast Asian economies. Countries with better investment climate tended to have higher rates of capital accumulation (Figure 1). Higher rates of capital formation, in turn, fueled productivity and economic growth (Figure 2). The Philippines pales on these scores when compared with the dynamic economies of the region. Figure 3 shows that overall average labor productivity (output per worker) fell from about PhP38,000 in 1981 to around PhP32,000 in 1985 virtually stagnating at that level till 1995, and rising modestly to PhP34,000 in 2003.

Figure 1
Gross Capital Formation in Selected Asian Countries, 1981-2003



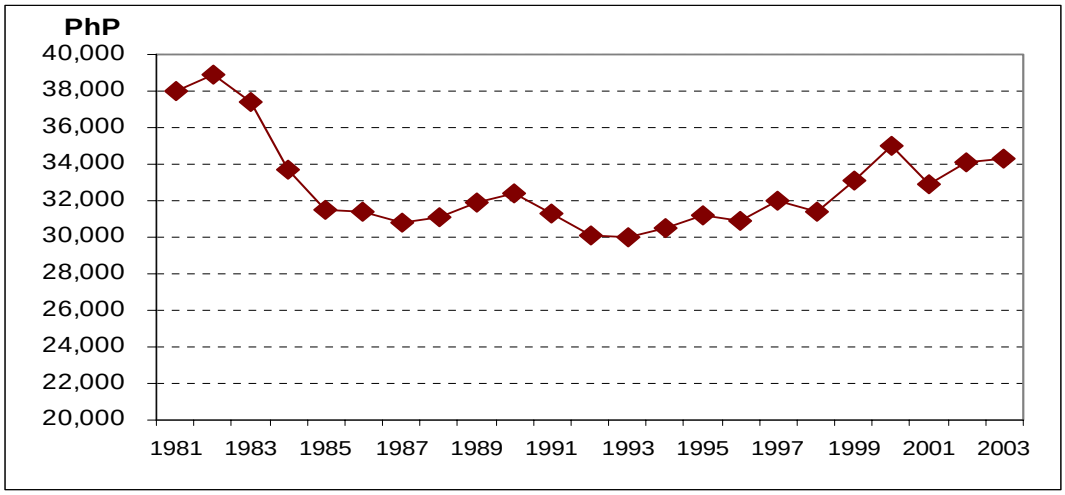
Source: ADB Statistical Database System.

Figure 2
GDP per Capita Growth Rates in Selected Asian Countries, 1981-2003



Source: ADB Statistical Database System.

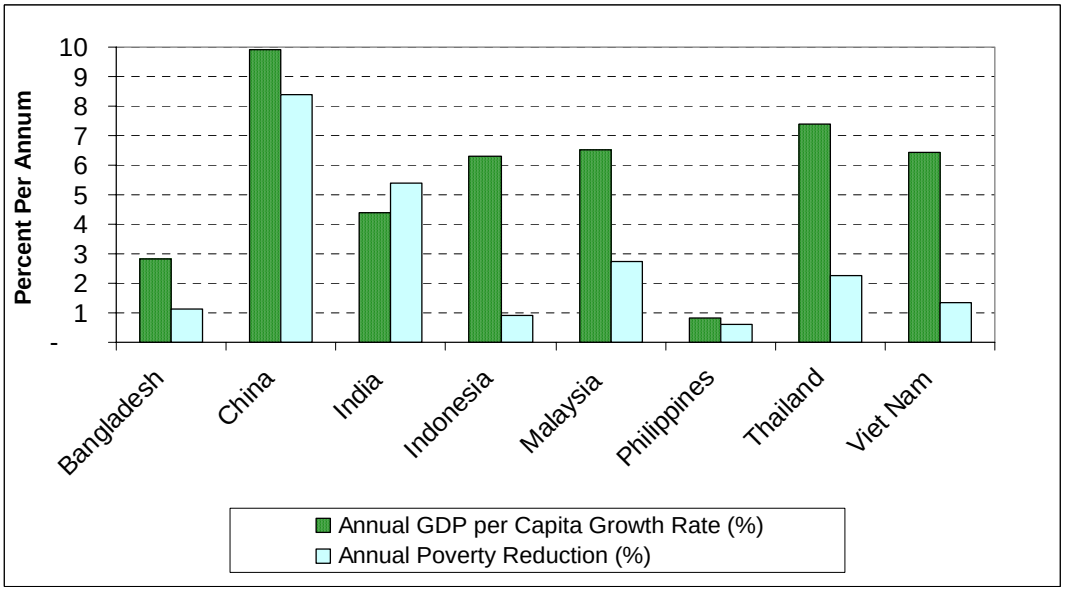
Figure 3
Labor Productivity in the Philippines, 1981-2003



Labor productivity is computed as GDP at constant 1985 prices divided by employed labor.
Source*:* NSCB, *Philippine Statistical Yearbook*, various years.

Increases in investment and productivity lead to rapid and sustained growth, resulting in substantial poverty reduction. The Philippines' failure to achieve significant poverty reduction is attributable to its unsteady and weak economic growth (Balisacan 2003). During the 1990s, the country's per capita GDP growth averaged a mere 0.63%, the lowest in East and Southeast Asia and even markedly lower than the rates for Bangladesh, India, and Sri Lanka. Hence, during that period, the country's poverty reduction rate was also the slowest, as shown in Figure 4 that juxtaposes poverty reduction with GDP per capita growth.

Figure 4
GDP per Capita Growth Rate and Poverty Reduction, Early to Late 1990s



Sources: ADB Statistical Database System and WB, *World Development Indicators 2003.*

In the Philippines, poverty incidence (or the proportion of households below the poverty line) fell from about 40% in 1991 to 32% in 1997 when the economy was relatively buoyant. But as the economy slowed sharply in the aftermath of the Asian financial crisis, poverty incidence rose again to 34% in 2000, remaining at this level in 2003 (FIES 2003). About 5.6 million households were considered poor in 2003. The majority of the poor are the in rural areas where infrastructure is inadequate, productivity is low, and non-farm employment opportunities are scarce. Neither can a lethargic industrial sector offer gainful employment to rural-urban migrants. An improvement in the investment climate in both urban and rural areas is called for to spur investment and productivity increases toward strengthening the private sector that would drive the economy's long-run growth (ADB 2004).

Investment Climate at the National Level

Economic liberalization and investment policy reforms from the late 1980s through the mid-1990s seemed instrumental in attracting foreign direct investment (FDI) into the Philippines, reaching a peak of $2.3 billion (3.5% of GDP) in 1998 (ADB 2004). However, this was disrupted by the Asian financial crisis resulting in a sharp drop in FDI flows to $1.3 billion (1.8% of GDP) in 2000. In 2002 FDI fell again to 1.4% of GDP, which was just within the median for most Asian developing countries. China's and Vietnam's net FDI flows were the highest at around 4% of GDP in 2002.

The system of investment incentives by itself, however, appears to have done little in making up for the deficiencies in the Philippines' investment climate. Fiscal incentives are in fact costly, estimated in terms of foregone revenues at about PhP13 billion, representing 30% of collected revenues from corporate income taxes in 2000 (Medalla 2002). Recent moves to "rationalize" these investment incentives represent an attempt to reverse these revenue losses to help alleviate the fiscal deficits.

Apart from macroeconomic stability and economic openness,[1] the investment climate is shaped by the direct and indirect costs of doing business. These can be classified under three categories: (i) entry and exit procedures for firms; (ii) regulatory burden and extent of corruption; and (iii) infrastructure services (World Bank 2002). A perspective on the performance of the Philippines along these dimensions vis-à-vis other Asian developing countries provides an instructive overview.

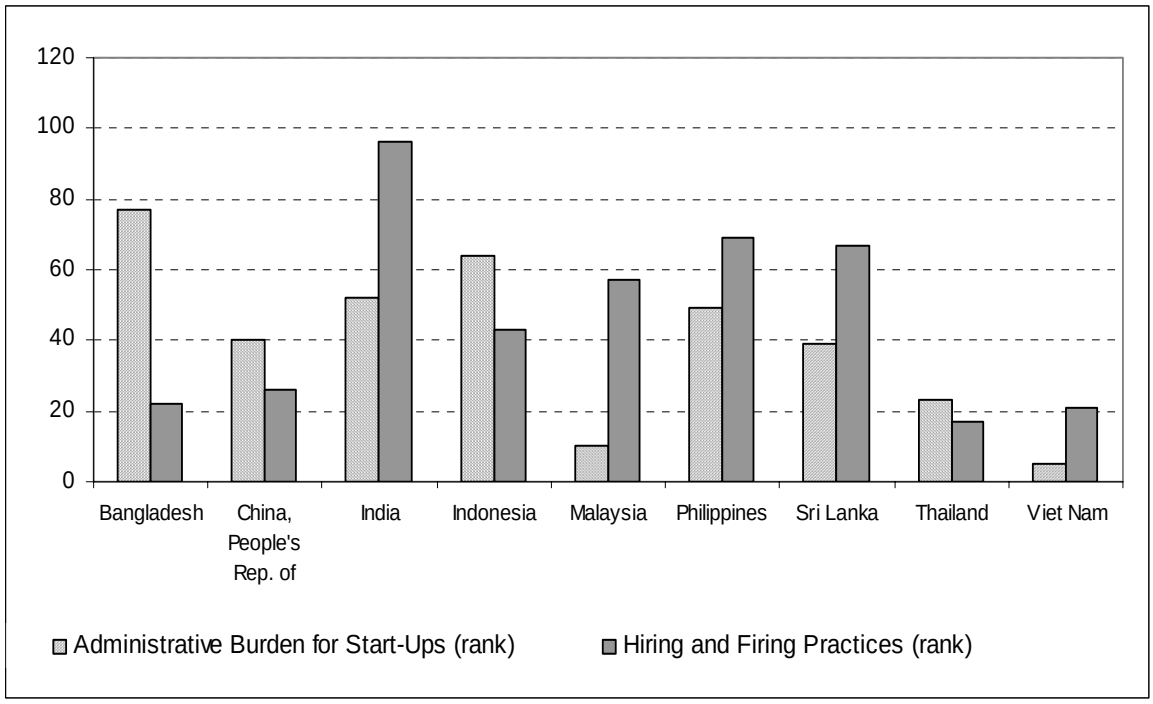
Entry and exit procedures. Policies or regulations that favor smooth entry and exit procedures enhance competition and productivity. Ponderous regulations and procedures, as well as bottlenecks in factor markets (labor, land, and finance), can deter a firm's entry or expansion. Likewise, complex regulations make it difficult for inefficient or unprofitable firms to exit the market. In general, the regulatory framework should make it easy for businesses to start, expand, or close down as dictated by the market.

The *Global Competitiveness Report (GCR) 2003/04* offers cross-country comparisons on the relative ease of entry and exit of firms in 102 countries. Figure 5 shows how the Philippines compares with other Asian developing countries. The

[1] The effect of economic openness on regional development is examined in Pernia and Quising (2003).

Philippines is just within the median in regard to general administrative burden for start-ups, better only compared with Bangladesh and Indonesia and about the same as India.

Figure 5
Ease of Entry and Exit Indicators, 2003
(Ranking out of 102 Countries)



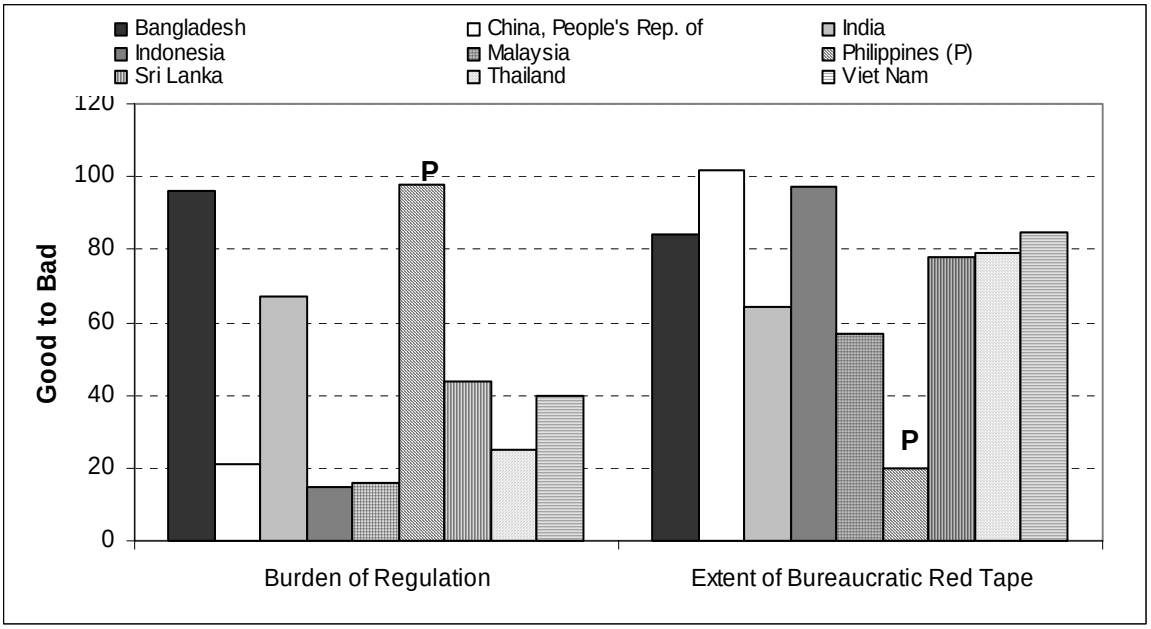
Note: The lower the rank order, the better.
Source: World Economic Forum, *Global Competitiveness Report 2003/04*.

In labor hiring and firing practices, the Philippines appears better than India but worse than all the other countries shown in Figure 5. In hiring workers, firms in the Philippines are mandated to offer at least the minimum wage set by the National Productivity and Wages Board. On the other hand, laying-off workers requires following public guidelines, including the amount of separation pay given to laid-off workers. Labor rules and regulations are covered under Presidential Decree 442 or the Labor Code of the Philippines, as amended by Republic Act No. 6715. Work conditions are also influenced by collective bargaining agreements forged between employers' and workers' unions. There are other policy provisions affecting employment conditions that cover rules on contracting and subcontracting arrangements, wage rationalization, labor relations, and workers' benefits.

Regulatory burden and corruption. Cumbersome regulations can appreciably raise business transaction costs. Such costs include, among others, time spent dealing with red tape and overcoming bureaucratic hurdles, delays in processing of government requirements for business, and direct costs of irregular or informal payments and gifts.

Complaints from businessmen are often raised regarding bureaucratic rigidities and complex rules that encourage rent-seeking. Burdensome regulations induce firms into corrupt practices to shorten bureaucratic red tape. The Philippines is ranked 98 out of 102 countries in terms of regulatory burden (*GCR 2003/2004*). Regulatory burden appears more severe in the Philippines compared with other Asian developing countries (Figure 6). However, bureaucratic red tape in the Philippines seems much less tortuous than in other the Asian developing countries shown in Figure 6.[2]

Figure 6
Regulatory Burden and Extent of Bureaucratic Red Tape, 2003
(Ranking out of 102 Countries)

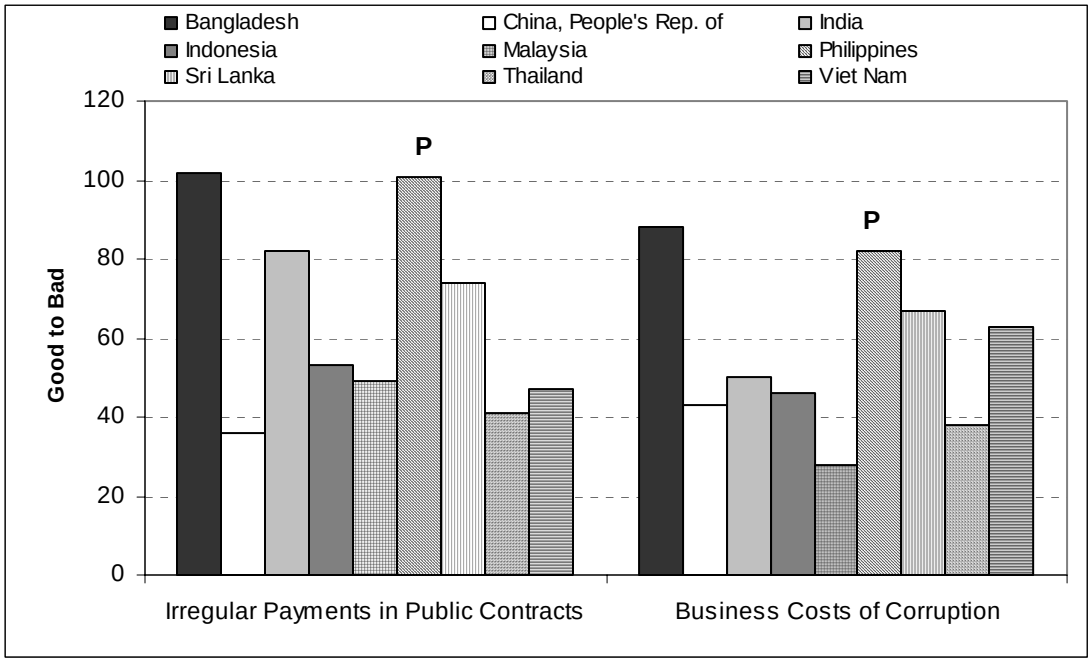


Note: The lower the rank order, the better.
Source: World Economic Forum, *Global Competitiveness Report 2003/04.*

Bribery (informal payments and gifts) eases the access of businessmen to public contracts. The Philippines is ranked second to the worst out of 102 countries in irregular payments in public contracts (*GCR 2003/2004*). Payment of bribes exacts a heavy toll on the economy since it precludes the small, start-up but efficient firms from obtaining public contracts. In addition, it imposes an additional direct cost to business which is often passed on to consumers. In terms of the business costs of corruption, the Philippines ranks 82, better only than Bangladesh among selected Asian developing countries (Figure 7).

[2] This could imply that where the burden of regulation is tortuous, bribery can effectively shorten the red tape.

Figure 7
Irregular Payments in Public Contracts and Business Costs of Corruption, 2003 (Ranking out of 102 Countries)

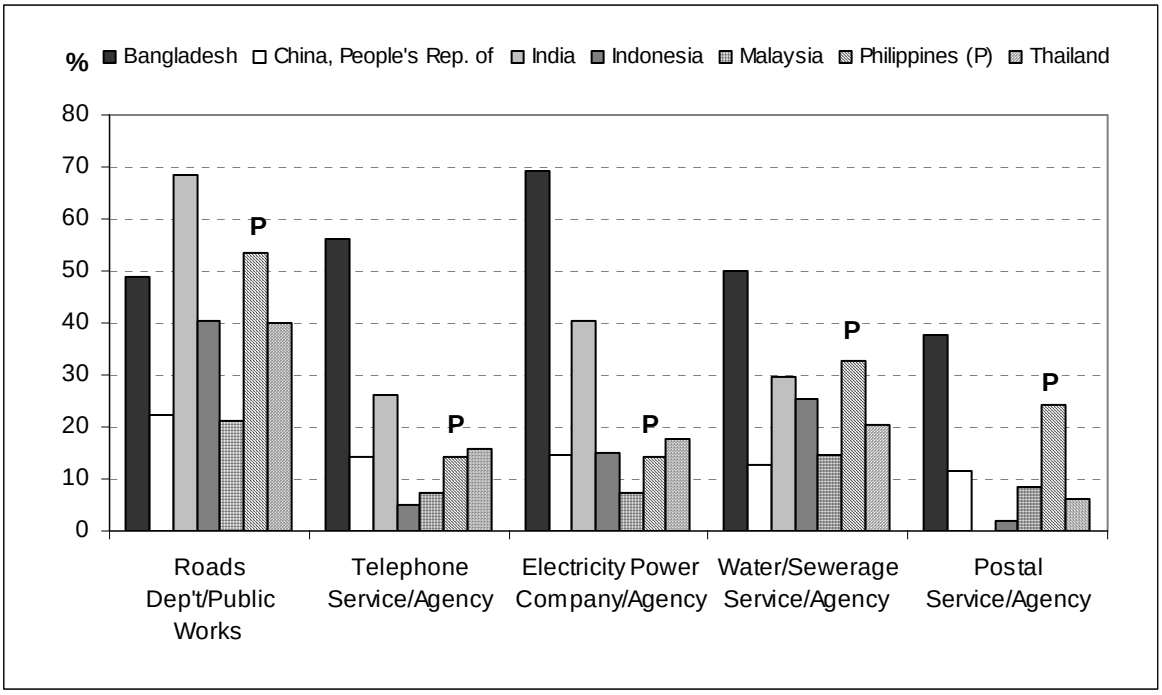


Note: The lower the rank order, the better.
Source: World Economic Forum, *Global Competitiveness Report 2003/04.*

Infrastructure. Good infrastructure facilitates access to factor and product markets, thereby raising productivity. Accordingly, both domestic and foreign businesses are attracted to areas with adequate roads, ports, telecommunications facilities, and power and water supply, as shown by earlier research (e.g., Herrin and Pernia 1987). Quality infrastructure services significantly affect a firm's profitability via reduction in production costs and ability to reach wider markets.

Dissatisfaction with public works (roads) seems to be common in most countries, particularly in India (69%), Philippines (54%), and Bangladesh (49%). By contrast, in China and Malaysia, only around 20% viewed public works as a problem (Figure 8). Within the Philippines, among the various infrastructure services, public works also appear to be the most unsatisfactory. The relatively poor state of roads in the Philippines is further shown by data from the World Development Indicators (WDI 2003) on the proportion of roads that is paved. Only 20% of the roads in the Philippines are reportedly paved versus Thailand's 98%, Sri Lanka's 95%, Malaysia's 76%, and Indonesia's 45%. Only Bangladesh has a smaller proportion (10%) of paved roads. Clearly, poor roads and ports are a serious stumbling block to doing business, making it difficult to access inputs, transport goods and reach markets in a timely manner (ADB 2004).

Figure 8
Percent of Firms Reporting Poor Infrastructure Services, 2000



Note: Data presented here refer to percent of firms reporting quality of public services of each agency/company as slightly bad, bad, or very bad.
Source: World Bank, *World Business Environment Survey 2000.*

Investment Climate at the Sub-national Level

Manufacturing firms in industrial centers

The cross-country perspective presented in the preceding section offers broad indications on how the Philippines has fared relative to its Asian neighbors and which aspects of its investment climate require more urgent reform than others. However, these indications are based on information gathered largely from head offices of businesses located in capital cities in several countries around the world. These are hypotheses that need to be probed with more detailed data on firms of different sizes, pertaining to varied industries, and located in different places across the country. Using the ADB's ICS data on business establishments in the Philippines gathered in 2003, we examine in this section how aspects of the investment climate affect the performance of firms.

We employ regression analysis to examine the relationship between indicators of firm performance and of the investment climate. The dependent variables used are total factor productivity (TFP), labor productivity, investment rate, employment growth, and sales growth. The independent variables include relations with government (bureaucratic regulations and informal payments), infrastructure (power, water, and ICT), access to finance, labor market flexibility, export orientation, workforce quality, capacity utilization, and research and development (R&D) spending. We use dummy variables to

control for industry, location, and employment size. The list of variables with their definitions is given in Appendix 2.

Productivity. Firms with longer export experience have significantly higher TFP, underscoring the benefits of exposure to wider markets and competition (Table 1)[3]. Employment of temporary workers also exerts a positive and significant impact on TFP, suggesting the benefits of labor market flexibility and cost savings from labor contracting. Access to bank finance (particularly foreign commercial banks) has a positive effect, while informal credit sources, which typically charge higher interest rates, affect productivity negatively.[4] Excess capacity is negatively related to productivity, implying the importance of higher capacity utilization. Firms that have to use water from costly private sources appear to have lower productivity, suggesting the importance of efficient public water supply systems.

Table 1
Factors affecting firm-level total factor productivity

Variable	Coefficient	Std. Error	Impact of one SD improvement
excesscap	-0.008	(0.003) ***	0.167
workertemp	0.165	(0.047) ***	0.137
waterx	-0.002	(0.001)	
leverage	-0.222	(0.119) *	0.113
inv_nformal	-0.019	(0.006) ***	0.055
wcap_bankf	0.010	(0.004) **	0.067
wcap_creditc	-0.029	(0.011) ***	0.107
yearsexport	0.022	(0.007) ***	
Textile	-0.743	(0.254) ***	
Garments	0.003	(0.154)	
Electronics	1.806	(0.204) ***	
CALABARZON	-0.138	(0.139)	
Cebu	-0.017	(0.276)	
Davao	0.188	(0.282)	
Medium	0.119	(0.203)	
Small	0.038	(0.183)	
Constant	2.149	(0.234) ***	
Observations	408	Total impact	0.647
R-squared	0.291	Fitted DV	1.970

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The fitted dependent variable (DV) refers to a large-sized firm involved in food and food processing and located in the NCR.

[3] In the tables that follow, the list of regressors is divided into two. The first part contains the main factors affecting investment climate, while the second consists of initial conditions and control (dummy) variables.
[4] We did not correct for possible selection bias in that banks may prefer to lend to productive firms.

Table 2a
Factors affecting firm-level labor productivity

Variable	Coefficient	Std. Error	Impact of one SD improvement
workertemp	0.111	(0.040) ***	0.098
researchsh	0.130	(0.029) ***	0.095
educ3	0.019	(0.010) *	0.072
email	0.268	(0.102) ***	0.268
inlabprod	0.801	(0.040) ***	
Textile	-0.037	(0.179)	
Garments	0.025	(0.092)	
Electronics	0.340	(0.174) *	
CALABARZON	-0.015	(0.084)	
Cebu	-0.065	(0.149)	
Davao	0.142	(0.153)	
Medium	0.073	(0.143)	
Small	0.122	(0.120)	
Constant	0.370	(0.217) *	
Observations	328	Total impact	0.533
R-squared	0.761	Fitted DV	3.860

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The fitted dependent variable (DV) refers to a large-sized firm involved in food and food processing and located in the NCR.

Table 2b
Factors affecting firm-level labor productivity growth

Variable	Coefficient	Std. Error	Impact of one SD improvement
waterx	0.127	(0.06) **	6.104
staffq3	8.577	(3.60) **	13.250
share4	-32.351	(18.92) *	8.388
wcap_bankf	0.962	(0.34) ***	7.869
leverage	-9.904	(4.00) **	5.475
giftcontract	-0.495	(0.23) **	3.357
inlabprod	-2.852	(2.53)	
Textile	7.935	(11.59)	
Garments	4.668	(6.53)	
Electronics	3.358	(8.68)	
CALABARZON	-2.958	(5.13)	
Cebu	2.044	(11.80)	
Davao	10.317	(12.73)	
Medium	-9.904	(8.66)	
Small	-4.119	(7.33)	
Constant	4.401	(14.16)	
Observations	288	Total impact	44.442
R-squared	0.101	Fitted DV	2.090

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The fitted dependent variable (DV) refers to a large-sized firm involved in food and food processing and located in the NCR.

Given the known pitfalls of TFP, labor productivity is often used as an alternative, or even the more favored measure. Labor productivity is positively and significantly influenced by R&D spending, extent of email use (computerization), share of temporary workers in a firm's workforce, and education level of skilled production workers (Table 2a). In a similar vein, labor productivity growth is favorably affected by the quality of production workers, access to bank financing especially foreign banks, and adequate water supply even from private sources (Table 2b). It is negatively affected by high leverage (debt-to-equity) ratio and corruption (business establishments having to give informal payments to secure government contracts).

Investment rate. As in the case of productivity, the investment rate is positively and significantly influenced by export orientation, education level of workforce, ICT utilization, access to foreign commercial banks, and labor market flexibility (Table 3). On the other hand, investment rate is adversely affected by excess capacity (underutilization), needless bureaucratic regulations, and informal payments.

Table 3
Factors affecting firm-level investment rate

Variable	Coefficient	Std. Error	Impact of one SD improvement
excesscap	-0.110	(0.046) **	2.194
giftshr	-0.345	(0.154) **	1.761
exportsales	0.064	(0.035) *	2.846
avgeduc	1.091	(0.366) ***	2.846
wcap_nformal	-0.123	(0.055) **	1.021
inv_bankf	0.260	(0.041) ***	1.399
ict	4.111	(1.158) ***	5.728
workertemp	2.393	(1.359) *	2.025
mgmttime	-0.099	(0.058) *	1.362
incap	-1.179	(0.552) **	
Textile	-8.237	(2.655) ***	
Garments	-6.270	(2.547) **	
Electronics	-4.478	(3.181)	
CALABARZON	-0.316	(2.098)	
Cebu	-4.350	(3.923)	
Davao	-2.811	(3.624)	
Medium	6.140	(3.288) *	
Small	5.604	(3.634)	
Constant	2.063	(6.589)	
Observations	363	Total impact	21.181
R-squared	0.184	Fitted DV	8.550

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The fitted dependent variable (DV) refers to a large-sized firm involved in food and food processing and located in the NCR.

Employment growth. Quality of management and technical staff has a positive and significant effect on employment growth as it fosters expansion of business (Table 4). Employment growth is also promoted by export orientation and ready access to credit from foreign banks, credit cards and state investment funds. It is negatively affected by inadequate water supply, unreliable power supply,[5] and unsafe business environment that results in theft or robbery, vandalism, and arson. Not unexpectedly, R&D spending is negatively associated with jobs growth, suggesting a trade-off between labor and technology at least in the short run.

Table 4
Factors affecting firm-level employment growth

Variable	Coefficient	Std. Error	Impact of one SD improvement
staffq2	3.101	(0.959) ***	4.090
days_water	-0.052	(0.022) **	2.586
days_power	-0.098	(0.062)	
theftshr	-0.601	(0.358) *	1.967
researchsh	-2.074	(0.749) ***	1.438
exportsales	0.071	(0.040) *	3.199
inv_bankf	0.694	(0.066) ***	3.678
wcap_creditc	0.228	(0.135) *	0.833
wcap_devfund	0.204	(0.113) *	0.657
inlabor	-8.097	(1.848) ***	
Textile	-0.809	(3.258)	
Garments	-2.073	(2.337)	
Electronics	2.511	(4.200)	
CALABARZON	3.505	(2.528)	
Cebu	-12.756	(4.333) ***	
Davao	-18.120	(7.086) **	
Medium	-12.409	(5.758) **	
Small	-25.447	(7.489) ***	
Constant	45.400	(12.047) ***	
Observations	373	Total impact	18.446
R-squared	0.222	Fitted DV	0.630

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The fitted dependent variable (DV) refers to a large-sized firm involved in food and food processing and located in the NCR.

[5] Power supply does not seem to be a major issue in the industrial centers where the surveyed firms are mostly located, while water supply still appears to be a problem. This matter will be addressed again in the provincial regressions below.

Sales growth. Again, as expected, ICT has a positive and significant effect on sales growth, as it ensures prompt and timely transactions with clients and suppliers (Table 5). On the other hand, sales growth is adversely affected by bureaucratic red tape, informal payments, excess capacity, and a high share of the workforce needing additional training.

Table 5
Factors affecting firm-level sales growth

Variable	Coefficient	Std. Error	Impact of one SD improvement
excesscap	-0.151	(0.072) **	3.089
ict	4.163	(1.576) ***	5.634
mgmttime	-0.249	(0.135) *	3.135
trainingsh	-0.094	(0.045) **	3.023
giftcontract	-0.518	(0.188) ***	3.575
inv_nformal	-0.996	(0.206) ***	2.993
insales	-0.253	(0.872)	
Textile	-2.374	(5.178)	
Garments	-2.958	(3.384)	
Electronics	-1.672	(5.413)	
CALABARZON	9.150	(3.670) **	
Cebu	17.167	(8.770) *	
Davao	8.080	(10.956)	
Medium	9.561	(4.765) **	
Small	11.867	(4.164) ***	
Constant	0.392	(9.790)	
Observations	390	Total impact	21.448
R-squared	0.118	Fitted DV	5.310

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The fitted dependent variable (DV) refers to a large-sized firm involved in food and food processing and located in the NCR.

Summing-up. The results of analysis at the micro (firm) level largely corroborate the observations at the macro level discussed in the previous section. Investment climate – as indicated by bureaucratic red tape and corruption (informal payments), infrastructure (water, power, and ICT), access to finance, labor market flexibility, and export orientation – is critical to business performance in terms of productivity, investment rate, employment growth, and sales growth. Business establishment characteristics that matter to performance, as expected, include workforce quality, capacity utilization, and R&D spending.

Simulations. To better appreciate the effect of improvements in the investment climate on the different measures of firm performance, we introduce one standard-deviation favorable changes in the explanatory variables[6] and sum up their total impact. We do this only on variables that are significant at the 10% level or better. The one standard-deviation changes represent realistic improvements that the government can bring about, and/or that an average firm can effect, in the short to medium term.

It is instructive to compare the resulting overall improvement in the dependent variable with the estimated performance of the average firm in the sample. Food and food processing establishments located in the National Capital Region (NCR) with a large workforce are treated as the base in the simulations. But note that firm performance may vary significantly according to industry category, employment size, and location. Also, the magnitude of the simulated contribution of an improvement in the independent variable would depend on the distribution (variance) of the particular characteristic in the relevant sample and the degree of its marginal effect. This means that those variables that contribute the most to the change in the dependent variable should all explanatory variables improve would either have a strong marginal effect or a very dispersed sample or both. The simulation results are shown in the rightmost columns of the tables above.

Higher capacity utilization contributes the most to an increase in TFP, followed by greater labor flexibility. Firms in the textile industry have lower TFP than food and food processing firms, which in turn have comparable TFP as those in garments industry. Electronics and electrical machinery firms have significantly higher TFP than food establishments. As to labor productivity, email use makes the biggest contribution, followed by labor flexibility.

An improvement in ICT contributes the most to an increase in investment rate. It is followed by export orientation, educational level of the workforce, labor flexibility, and reduced informal payments. As regards employment growth, an improvement in the quality of management and administrative staff makes the greatest contribution, followed by better access to foreign commercial banks, export orientation, and more adequate water supply. Finally, an improvement in ICT contributes the most to sales growth, but a reduction in informal payments as a share of the value of government contracts and less cumbersome bureaucratic regulations make sizable impacts as well.

Regional and provincial investment climate

While the analysis of survey data on firms gives us a good sense of the characteristics of firms and how these reflect the investment climate, regional and provincial data perhaps offer a better clue to the location-specific quality of the business environment. The limitation of these data, however, is that we are limited to only one measure of firm performance, i.e., labor productivity.

[6] There is one instance where the relevant variable is a dummy (email); we assume an initial value of zero for this variable and thus a discrete change to one for its improvement.

We compiled panel data on infrastructure, economic, social and demographic indicators in three-year intervals from 1988 to 2000. We also constructed political variables denoting the saturation of clan members in local elective posts and whether or not incumbent officials are politically affiliated with the sitting national president.

Using a random-effects GLS regression, we find from the provincial regressions that labor productivity is positively and strongly influenced by road density[7], electrification, and potable water supply coverage (Table 6). At the same time, dependency ratio has a negative and significant impact on labor productivity, indicating the expected adverse saving and capital-shallowing effects in high-fertility provinces. Investment in educational facilities is also strongly and positively related to labor productivity, and so is party affiliation of local officials with the sitting president. Clan membership of elective officials (political dynasty that facilitates corruption), as defined by Gutierrez (1994, is negatively associated with labor productivity. However, these two political variables lose their significance when initial conditions (1988 GDP per capita and typhoons[8]) are included in the regression and are significant.

Table 6
Factors affecting provincial labor productivity

	Variant 1		Variant 2	
Variable	Coefficient	Std. Error	Coefficient	Std. Error
roadd_qa	3.069	(0.468) ***	1.289	(0.271) ***
water	0.052	(0.024) **	0.037	(0.017) **
elect	0.138	(0.029) ***	0.071	(0.023) ***
dep_ratio	-0.071	(0.036) **	-0.068	(0.030) **
ieduc	2.629	(0.608) ***	0.975	(0.523) *
pparty	1.446	(0.793) *	0.816	(0.736)
clan	-4.386	(1.805) **	-1.946	(1.359)
pcgdp88			1.870	(0.137) ***
typhoon			-1.940	(0.904) **
Constant	14.066	(4.100) ***	5.444	(3.401)
Observations	365		361	
R-sq: within	0.067		0.062	
between	0.633		0.903	
overall	0.564		0.811	

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

[7] Quality-adjusted road density as used in Balisacan and Pernia (2003).
[8] Provinces prone to typhoons as used also in Balisacan and Pernia (2003).

We also carried out a similar exercise with regional data. Since we have a smaller number of observations, and most variations in the provincial variables cancel out at the regional level, we only include the most significant independent variables from the provincial regressions, namely, per capita GDP in 1988 and quality-adjusted road density. In addition, elementary and high school participation rates, average monthly crime rate, and telephone density are significant and with the expected signs (Table 7).

Table 7a
Factors affecting regional labor productivity

	hspr		elempr	
Variable	Coefficient	Std. Error	Coefficient	Std. Error
pcgdp88	2.501	(0.285) ***	2.530	(0.262) ***
roadd_qa	0.563	(0.353)	0.727	(0.324) **
additional var.	0.179	(0.031) ***	0.188	(0.055) ***
Constant	-9.043	(3.178) ***	-15.879	(5.539) ***
Observations	56		56	
R-sq: within	0.486		0.222	
between	0.970		0.978	
overall	0.959		0.961	

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 7b
Factors affecting regional labor productivity

	teld		crime	
Variable	Coefficient	Std. Error	Coefficient	Std. Error
pcgdp88	2.510	(0.229) ***	2.601	(0.274) ***
roadd_qa	0.709	(0.298) **	0.849	(0.334) **
additional var.	0.177	(0.089) **	-0.239	(0.086) ***
Constant	0.650	(2.105)	2.972	(2.559)
Observations	70		56	
R-sq: within	0.069		0.177	
between	0.985		0.976	
overall	0.964		0.958	

Note: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Finally, we carried out simulations on how provinces would fare if they had the same investment environment as the five locations that had the highest labor productivity in 2000, namely, Metro Manila, Rizal, Cavite, Laguna, and Benguet (note that except for Benguet, all are included in the ICS sampling areas). For this purpose, we adopt the second variant of the provincial regressions and present below the provinces whose predicted productivity values are within 10% difference from the actual. Simulation results of this sample of provinces, listed from highest to lowest actual labor productivity, are presented in Table 8; the results for all provinces by region are shown in Appendix 1.

Table 8
Simulation results of provincial labor productivity regression

Region[a]	Province	Actual labor productivity[b]	Rank	Percentage change if IC variables correspond to: Metro Manila	Rizal	Benguet	Cavite	Laguna
3	Pampanga	35,194	10	62.06	4.54	-0.79	4.44	3.05
11	Davao Oriental	33,137	14	69.50	8.40	2.74	8.30	6.82
3	Zambales	30,289	17	75.94	9.10	2.91	8.99	7.37
11	Davao (del Norte)	30,152	18	83.79	16.65	10.42	16.53	14.91
12	Lanao del Norte	28,995	20	83.36	13.53	7.06	13.41	11.72
14	Kalinga-(Apayao)	28,322	21	95.35	23.87	17.25	23.75	22.02
10	Camiguin	26,992	25	82.23	7.22	0.28	7.10	5.28
3	Nueva Ecija	26,767	26	89.57	13.93	6.92	13.80	11.97
4	Quezon	25,900	30	93.39	15.22	7.98	15.09	13.19
12	Sultan Kudarat	25,577	31	103.99	24.84	17.50	24.70	22.78
6	Negros Occidental	24,653	33	101.45	19.32	11.71	19.18	17.19
6	Capiz	23,052	37	114.59	26.76	18.63	26.61	24.49
4	Palawan	22,816	39	114.05	25.31	17.09	25.16	23.01
2	Nueva Vizcaya	21,651	40	122.49	28.98	20.32	28.82	26.56
1	La Union	19,851	43	125.12	23.13	13.68	22.96	20.49
1	Pangasinan	19,664	44	124.14	21.18	11.64	21.00	18.51
2	Isabela	19,284	47	131.92	26.93	17.21	26.75	24.21
7	Siquijor	18,607	48	139.59	30.78	20.70	30.59	27.96
1	Ilocos Sur	16,817	55	148.12	27.73	16.57	27.52	24.61
5	Albay	16,044	59	149.26	23.06	11.37	22.85	19.80
9	Sulu	15,321	62	191.15	59.00	46.76	58.78	55.58
4	Romblon	13,942	64	193.48	48.26	34.81	48.02	44.50
5	Catanduanes	13,056	66	196.51	41.44	27.08	41.18	37.42

[a] Based on the regional classification in 1988. [b] In pesos, 1994 prices.

The investment climate variables that we allow the various provinces to acquire from the five base locations are road density, electricity and water supply coverage, and index of investment in educational facilities. The increases in productivity range from 62% to 197% if the provinces were to have the investment climate of Metro Manila. These improvements are huge relative to those that could be achieved if the provinces were to acquire the infrastructure set of any of the four other base provinces, where the highest productivity increases are only between 56% and 59%.

The findings underscore the well-known primacy of Metro Manila and highlight the importance of better road network, which largely drives the result for the Metro Manila simulation. Nonetheless, even modest infrastructure improvements to the standards of Rizal, Cavite, or Laguna could lead to measurable productivity increases in the other provinces.

Conclusion and Policy Implications

From a cross-country comparative perspective, the Philippines appears to rate poorly in terms of a number of investment climate dimensions. As to administrative burden for business start-ups, it rates better than Bangladesh and Indonesia, and similar to India, but worse than several other Asian developing countries. In labor hiring and firing practices, the Philippines comes out better than India but worse than most other Asian countries.

The Philippines' regulatory system is also comparatively cumbersome, though bureaucratic red tape seems less tortuous than in the other countries. Nevertheless, the Philippines rates pretty badly on irregular payments in public contracts and on business costs of corruption, implying that bribery can shorten red tape. As regards infrastructure, the Philippines ranks relatively low on roads and water service, while telephone service is on the high side.

The above macro-level observations are largely substantiated by results of more rigorous analysis of firm-level data. Investment climate – as indicated by bureaucratic red tape and corruption (informal payments), infrastructure (particularly water and ICT), access to finance, labor market flexibility, and export orientation – is critical to business performance, as reflected in productivity, investment rate, employment growth, and sales growth. Business establishment characteristics that matter to performance, as expected, include workforce quality, capacity utilization, and R&D spending.

Analysis of provincial and regional data provides a better clue on the spatial attributes of the business environment. Thus, labor productivity is positively and strongly influenced by provincial road density, electrification, and potable water supply coverage. Dependency ratio has a negative and significant impact on labor productivity, suggesting the expected adverse saving and capital-shallowing effects of high fertility. Investment in educational facilities is also strongly and positively related to labor productivity, and so is party affiliation of local officials with the sitting president. Clan membership of elective officials (political dynasty that tends to conduce to corruption) is negatively associated with labor productivity. Meanwhile, regional data show that road density, primary and secondary school participation rates, crime rate, and telephone density are important components of the investment climate.

What if poorly performing provinces were able to upgrade their investment environment to the level of, say, the better performing provinces (Rizal, Cavite, and Laguna) or Metro Manila which arguably has the best investment climate attributes? Labor productivity increases would range from 62% to 197% if the provinces were to have the investment environment of Metro Manila. By comparison, productivity improvements would be at the most between 56% and 59% if provinces were to be at par with the investment climate of the better performing provinces. Thus, while catching up with Metro Manila is a long shot, even more modest improvements in infrastructure could result in significantly better performance of the provincial economies.

The above findings suggest what policy and institutional reforms are called for at the national and sub-national levels both to make the country internationally competitive and to redress regional and provincial inequalities. While the government under the past and the current administration has made strides in improving the investment climate, a lot more needs to be done in the context of international and sub-national benchmarks. To the extent that a better investment climate is good for the flourishing of business establishments, it is in the self-interest of the private-sector businessmen to cooperate fully in the policy reform effort, such as reducing corruption and improving infrastructure through public-private partnerships. In the final analysis, making positive changes on all aspects of the investment climate to hasten and sustain national and regional development is really the collaborative effort of all sectors of society – the public and private sectors and the wider citizenry.

References

Asian Development Bank. 2004. Improving the Investment Climate in the Philippines (November). Processed.

Balisacan, Arsenio M. 2003. Poverty and Inequality. In *The Philippine Economy: Development, Policies, and Challenges,* edited by A.M. Balisacan and H. Hill. New York: Oxford University Press, pp. 311-341.

Balisacan, Arsenio M., and Ernesto M. Pernia. 2003. Poverty, Inequality, and Growth in the Philippines. In *Poverty, Growth, and Institutions in Developing Asia*, edited by E. M. Pernia and A. B. Deolalikar. London and New York: Palgrave Macmillan, pp. 219-246.

Gutierrez, Eric. U. 1994. *The Ties That Bind: A Guide to Family, Business, and Other Interests in the Ninth House of Representatives*. Pasig City: Philippine Center for Investigative Journalism/Institute for Popular Democracy.

Herrin, Alejandro N., and Ernesto M. Pernia. 1987. Factors Influencing the Choice of Location: Local and Foreign Firms in the Philippines. *Regional Studies* 21(6): 531-541.

Medalla, Erlinda M. 2002. Fiscal Incentives Revisited. *Philippine Institute for Development Studies Policy Notes* (December).

Pernia, Ernesto M. and Pilipinas F. Quising. 2003. Trade Openness and Regional Development in a Developing Country. *Annals of Regional Science*, Vol. 37(3): 391-406.

Stern, Nicholas. 2002. *A Strategy for Development*. Washington, D.C.: World Bank.

World Bank. 2002. Improving the Investment Climate in India. Private Sector Development Team, South Asia Region and the Investment Climate Unit, Washington, DC.

Appendix 1

Simulation results of provincial labor productivity regression

Region[a]	Province	Actual labor productivity[b]	Rank	Percentage change if IC variables correspond to: Metro Manila	Rizal	Benguet	Cavite	Laguna
1	Ilocos Norte	17,395	54	135.29	18.89	8.11	18.70	15.88
1	Ilocos Sur	16,817	55	148.12	27.73	16.57	27.52	24.61
1	La Union	19,851	43	125.12	23.13	13.68	22.96	20.49
1	Pangasinan	19,664	44	124.14	21.18	11.64	21.00	18.51
2	Batanes	19,514	45	99.95	-3.80	-13.41	-3.98	-6.49
2	Cagayan	15,876	60	166.93	39.40	27.59	39.18	36.10
2	Isabela	19,284	47	131.92	26.93	17.21	26.75	24.21
2	Nueva Vizcaya	21,651	40	122.49	28.98	20.32	28.82	26.56
2	Quirino	18,354	50	148.98	38.67	28.45	38.48	35.81
3	Bataan	42,302	6	51.73	3.87	-0.56	3.79	2.63
3	Bulacan	33,743	12	61.88	1.87	-3.68	1.77	0.32
3	Nueva Ecija	26,767	26	89.57	13.93	6.92	13.80	11.97
3	Pampanga	35,194	10	62.06	4.54	-0.79	4.44	3.05
3	Tarlac	28,275	22	86.23	14.62	7.99	14.50	12.77
3	Zambales	30,289	17	75.94	9.10	2.91	8.99	7.37
4	Aurora	23,011	38	111.35	23.36	15.21	23.21	21.08
4	Batangas	33,339	13	62.58	1.85	-3.78	1.75	0.28
4	Cavite	55,349	4	36.64	0.06	-3.33	0.00	-0.89
4	Laguna	46,298	5	44.86	1.13	-2.92	1.06	0.00
4	Marinduque	15,870	61	158.94	31.36	19.55	31.15	28.06
4	Mindoro Occidental	20,568	41	131.55	33.11	24.00	32.95	30.57
4	Mindoro Oriental	17,867	52	151.34	38.02	27.52	37.83	35.08
4	Palawan	22,816	39	114.05	25.31	17.09	25.16	23.01
4	Quezon	25,900	30	93.39	15.22	7.98	15.09	13.19
4	Rizal	72,728	2	27.84	0.00	-2.58	-0.05	-0.72
4	Romblon	13,942	64	193.48	48.26	34.81	48.02	44.50
5	Albay	16,044	59	149.26	23.06	11.37	22.85	19.80
5	Camarines Norte	14,284	63	176.88	35.14	22.01	34.90	31.47
5	Camarines Sur	11,927	70	210.89	41.14	25.42	40.85	36.74
5	Catanduanes	13,056	66	196.51	41.44	27.08	41.18	37.42
5	Masbate	18,550	49	155.36	46.21	36.10	46.03	43.38
5	Sorsogon	11,843	71	207.08	36.12	20.29	35.83	31.70
13	Metropolitan Manila	82,087	1	0.00	-24.66	-26.95	-24.71	-25.30
14	Abra	30,691	16	79.51	13.54	7.43	13.43	11.83
14	Benguet	71,478	3	30.95	2.62	0.00	2.58	1.89
14	Ifugao	27,369	23	98.96	24.99	18.13	24.86	23.07
14	Kalinga-(Apayao)	28,322	21	95.35	23.87	17.25	23.75	22.02
14	Mt. Province	26,656	27	88.74	12.78	5.75	12.65	10.82

[a] Based on the regional classification in 1988. [b] In pesos, 1994 prices.

Appendix 1 (cont'd)
Simulation results of provincial labor productivity regression

Region[a]	Province	Actual labor productivity[b]	Rank	Percentage change if IC variables correspond to: Metro Manila	Rizal	Benguet	Cavite	Laguna
6	Aklan	30,107	19	81.96	14.71	8.48	14.60	12.97
6	Antique	25,019	32	108.61	27.69	20.19	27.55	25.59
6	Capiz	23,052	37	114.59	26.76	18.63	26.61	24.49
6	Iloilo	34,969	11	73.78	15.88	10.52	15.79	14.39
6	Negros Occidental	24,653	33	101.45	19.32	11.71	19.18	17.19
7	Bohol	26,078	29	99.34	21.71	14.51	21.57	19.70
7	Cebu	39,276	8	59.67	8.12	3.34	8.03	6.78
7	Negros Oriental	24,596	34	110.10	27.79	20.16	27.65	25.66
7	Siquijor	18,607	48	139.59	30.78	20.70	30.59	27.96
8	Eastern Samar	11,232	72	249.30	69.04	52.35	68.74	64.37
8	Leyte (Northern)	18,138	51	136.58	24.96	14.62	24.77	22.07
8	Northern Samar	12,776	67	218.59	60.12	45.44	59.85	56.01
8	Samar (Western)	16,307	56	159.05	34.89	23.39	34.68	31.67
8	Southern Leyte	12,442	68	197.95	35.22	20.15	34.95	31.01
9	Basilan	23,311	36	118.83	31.98	23.93	31.83	29.73
9	Sulu	15,321	62	191.15	59.00	46.76	58.78	55.58
9	Tawi-Tawi	11,139	73	250.27	68.51	51.67	68.20	63.80
9	Zamboanga del Nor	19,374	46	139.38	34.88	25.20	34.70	32.17
9	Zamboanga del Sur	27,003	24	94.77	19.79	12.85	19.66	17.85
10	Agusan del Norte	20,011	42	120.25	19.07	9.70	18.90	16.45
10	Agusan del Sur	16,244	57	163.49	38.85	27.30	38.64	35.62
10	Bukidnon	26,180	28	97.16	19.83	12.66	19.69	17.82
10	Camiguin	26,992	25	82.23	7.22	0.28	7.10	5.28
10	Misamis Occidental	23,611	35	98.60	12.85	4.91	12.70	10.63
10	Misamis Oriental	38,902	9	56.85	4.80	-0.02	4.71	3.46
10	Surigao del Norte	13,730	65	174.68	27.22	13.56	26.97	23.40
11	Davao (del Norte)	30,152	18	83.79	16.65	10.42	16.53	14.91
11	Davao del Sur	17,790	53	146.89	33.09	22.54	32.89	30.14
11	Davao Oriental	33,137	14	69.50	8.40	2.74	8.30	6.82
11	South Cotabato	39,509	7	63.46	12.21	7.47	12.13	10.89
11	Surigao del Sur	16,235	58	155.40	30.69	19.14	30.48	27.46
12	Cotabato (North)	31,853	15	79.83	16.27	10.38	16.16	14.62
12	Lanao del Norte	28,995	20	83.36	13.53	7.06	13.41	11.72
12	Lanao del Sur	11,931	69	246.39	76.69	60.97	76.40	72.30
12	Maguindanao	10,364	74	270.97	75.62	57.52	75.29	70.56
12	Sultan Kudarat	25,577	31	103.99	24.84	17.50	24.70	22.78

[a] Based on the regional classification in 1988. [b] In pesos, 1994 prices.

Appendix 2
List of variables with their definitions

Firm-level regressions
(all variables refer to 2002 values unless otherwise stated)

REGRESSAND
(growth refers to percentage change from 2001 to 2002)

tfp	total factor productivity (residual estimated from the usual regression of value added on capital assets and labor size, with industry-specific coefficients)
labprod	labor productivity, computed as value added per worker (excluded outlier observations with values above the 95th percentile)
labprodgr	growth in labor productivity
invrate	100 x investment rate, computed as the value of investments in new machinery and equipment, second hand machinery and equipment, land, buildings and improvement in leasehold, and vehicles divided by the present value (net book value) of current stock of the same (excluded outlier observations with values above the 95th percentile)
employgr	growth in employment including temporary workers, weighted by duration of employment in months with permanent workers assumed to have worked full-time for the whole year (excluded outlier observations with values above the 99th percentile)
salesgr	growth in sales (excluded outlier observations with values above the 99th percentile)

REGRESSORS

Firm characteristics

exportsales	percentage of total sales exported (directly or through a distributor)
excesscap	percentage of available production capacity not used in current operations
workertemp	proportion of temporary workers in total workforce, weighted by duration of employment

Governance-related

mgmttime	proportion of senior management's time in a typical week spent in dealing with requirements imposed by government regulations
giftshr	average amount given to government officials in informal payments as a proportion of total sales
giftcontract	percentage of contract value typically expected in gifts or informal payments to secure a government contract
theftshr	amount of losses due to theft, robbery, vandalism, or arson as a proportion of total sales

Access to finance

leverage	ratio of total liabilities to total assets
inv_bankf	percentage of new investment spending financed from loans with foreign-owned commercial banks
inv_nformal	percentage of new investment spending financed from informal sources, e.g. money lender
wcap_devfund	percentage of working capital financed from investment funds/special development financing/or other state services
wcap_bankf	percentage of working capital financed from loans with foreign-owned commercial banks
wcap_creditc	percentage of working capital financed from credit cards
wcap_nformal	percentage of working capital financed from informal sources, e.g. money lender

Human resources

educ*i*	average number of years of education of *i*
avgeduc	average number of years of education of permanent workforce
share*i*	share of *i* in permanent workforce
staffq1	principal components index of staff quality using *i* = 1, 2, 3, 5, constructed as -0.04641*share1 + 0.26121*share2 - 0.27277*share3 + 0.36726*share5 + 0.45816*educ1 + 0.45751*educ2 + 0.30448*educ3 + 0.45651*educ5 + 3.75
staffq2	principal components index of staff quality using *i* = 1, 2, and 5, constructed as 0.00776*share1 + 0.43165*share2 + 0.19498*share5 + 0.54419*educ1 + 0.61278*educ2 + 0.32243*educ5 + 2.75
staffq3	principal components index of staff quality using *i* = 3 and 4, constructed as -0.56048*share3 + 0.59468*share4 - 0.27746*educ3 + 0.50521*educ4 + 2.0
trainingshr	proportion of permanent workers needing training

where *i* refers to (mutually exclusive and exhaustive):

1	permanent management staff
2	permanent professional staff (trained and certified specialists outside of management)
3	permanent skilled production workers
4	permanent unskilled production workers
5	permanent non-production workers (involved in sales, support, and administrative work not included in management or among professionals)

Infrastructure

waterx	proportion of water supply sourced from private vendors and own or shared well
days_power	number of days power outages or surges from the public grid were experienced
days_water	number of days insufficient water supply was experienced

R&D and ICT

researchsh	spending on design or research and development as a percentage of total sales
email	whether firm regularly uses e-mail in its interactions with clients and suppliers, =1 if yes and =0 if no
ict	principal components index of ICT utilization, constructed as 0.50349*computer + 0.60769*web + 0.61417*email + 1.5, where computer is the percentage of the workforce regularly using computers and web is a variable indicating whether the firm regularly uses a website in its interactions with clients and suppliers

Dummy variables

Food	Food and food processing
Textile	Textile
Garments	Garments
Electronics	Electronics and electrical machinery
NCR	National Capital Region and Subic/Olongapo City
CALABARZON	Cavite, Laguna, Batangas, Rizal, and Quezon
Cebu	Metro Cebu (Cebu City, Mandaue City, Consolacion, Liloan, Compostela, Talisay City, Minglanilla, Naga, Lapu-lapu City, and Cordova)
Davao	Metro Davao and General Santos City (Davao City, Panabo City, Island Garden City of Samal, and Sta. Cruz)
Small	With employment size greater than or equal to 10 but less than 100 (includes number of temporary workers, weighted by duration of employment in months)
Medium	With employment size greater than or equal to 100 but less than 500 (includes number of temporary workers, weighted by duration of employment in months)
Large	With employment size greater than or equal to 500 (includes number of temporary workers, weighted by duration of employment in months)

Initial conditions

yearsexport	number of years since the firm started to export
inlabprod	log of labor productivity in 2000
insales	log of sales in 2000
incap	log of capital stock in 2000
inlabor	log of employment in 2000

Regional and provincial regressions
(1988 regional classification consistently used)

		Source
lprod	labor productivity in pesos per person, in constant 1994 prices, computed as the quotient of real GDP and average employment over the year (FIES income share used as proxy for regional GDP share)	FIES, LFS, Regional Income Accounts
pcgdp88	per capita GDP in 1988, in constant 1994 prices	FIES
typhoon	average annual number of typhoons from 1948 to 1998	PAGASA
roadd_qa	road density, adjusted by quality of material	DPWH and NSO
water	proportion of the household population with potable water, obtained from own-use or shared faucet connected to the community water system	FIES
elect	proportion of the household population with electricity	FIES
dep_ratio	ratio of the household population less than 15 years old to those 15 years and above	FIES
ieduc	weighted average of barangay indicator variables for the presence of an elementary school (1/8), an high school (1/4), a college (3/8), and a library (1/4)	NSO 1990 and 2000 Census
pparty	average of dummy variables for political affiliation of elected local officials (governor, vice-governor, and representatives), =1 if in the same party as the President, =0 otherwise	Comelec
clan	average of indicator variables for membership of elected local officials in political clan(s), as listed by Gutierrez (1994) in author's Appendix A	Gutierrez (1994)
hspr	high school participation rate	DECS
elempr	elementary participation rate	DECS
crime	average monthly crime rate, in number of incidents per 100,000 population	PNP
teld	telephone density, in number of installed lines per 100 persons	DOTC