THE IMPACT OF INVESTMENT CLIMATE INDICATORS ON GROSS CAPITAL FORMATION IN DEVELOPING COUNTRIES

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ABSTRACT

This paper examines the impact of investment climate indicators on gross capital formation in developing countries. Based on data from the World Bank Investment Climate Surveys for a sample of thirty-six developing countries, we find that corruption constraint as measured by the share of senior managers that ranked "corruption" as a major or very severe constraint, courts constraint as measured by the share of senior managers that ranked "courts and dispute resolution systems" as a major or very severe constraint, tax administration constraint, loss as a share of sales for those firms reporting a crime such as theft, vandalism or arson in the previous year, management time dealing with officials with regard to requirements imposed by government regulations (e.g. taxes, customs, labor regulations, licensing and registration etc.) as a percent of management time in a given week, and the share of firms with less than 20 employees that have a loan from a formal financial intermediary, linearly affect the share of gross capital formation in the GDP of a developing country. We also note that the coefficient estimate for corruption, loss as a share of sales, and the share of small firms has the unexpected sign and attribute this finding to the severe multicollinearity that exists among these variables and between them and the other variables.

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INTRODUCTION

Given that in developing countries 53 percent of people live on less than US$2 a day, youth unemployment rate is more than twice the average, and populations are rapidly growing, there is an urgency in expanding employment opportunities for young people. This may be achieved by giving firms of all categories incentives to invest productively, create jobs and expand. Only recently has the role of the investment climate of a country received much attention in the economic development literature. The 2005 *World Development Report* recognizes the importance of this role when it states that "improving the climate for investment in developing countries is essential to provide jobs and opportunities for young people and to build a more inclusive, balanced, and peaceful world." It looks at the role of governments in creating better climates for investment in such countries and suggests that they address the issues of reducing the costs of doing business, of policy-related risks, and of barriers to competition. Furthermore, the Report emphasizes the need for governments to bridge the gaps between policies and their implementation as well as tackling corruption and other rent-seeking activities so as to

"build credibility with firms, to foster public trust and legitimacy, and to ensure their policy interventions are crafted to fit local conditions."

According the World Bank (2005), the share of private investment in the GDP nearly doubled in China and India and more than doubled in Uganda, as a result of improvements in investment climate in the 1980s and 1990s. Property rights security prompts firms to reinvest between 14 and 40 percent more of their profits in their businesses in transition economies such as Poland, Romania, Russia, Slovakia, and Ukraine. There is also wide variation across countries in the level and the composition of the costs of contract enforcement difficulties, inadequate infrastructure, crime, corruption, and regulation, which can be as high as more than 25 percent of sales—or more than three times the typical tax burden borne by firms. Firms in many developing countries do not have confidence in the legal system to uphold their property rights.

In addition, there are severe inadequacies of finance and infrastructure, which raise barriers to opportunities and costs and risks for firms, large and small. Furthermore, when workers in developing countries have inadequate skills, firms find this to be a serious obstacle to their operations. Even within countries there is also wide variation across locations and within a single location firms may be affected differently depending on the nature of the activity in which they are engaged and on their size, with the small and informal firms getting the hardest hits.

The present study empirically examines the impact of investment climate indicators on gross capital formation in developing countries. Statistical results of such empirical examination will assist governments in those countries identify areas that need to be strengthened in order to increase the level of investment, which in turn will foster economic growth and reduce poverty.

This paper is organized as follows. In the next section, a selected review of the literature on investment climate in developing countries is given. This is followed by the formulation of a statistical model to be estimated. Theoretical underpinnings for the inclusion of explanatory variables are included in this section. Statistical results are reported in the subsequent section. A final section gives concluding remarks as well as policy recommendations.

A SELECTED REVIEW OF THE LITERATURE

Taggart (1991) gives a review of the literature which incorporates risk and taxes in the calculation of discount rates to be used in standard net present value models, while Myers and Ruback (1992) derive a simple yet robust rule for discounting risky cash flows in NPV calculations.

Boadway and Shah (1995) survey the effects of tax incentives on the decision to invest in developing countries and conclude that the political climate, the reliability of fiscal commitments, capital markets and the availability of cash, as well as both economic and political uncertainty exert influences on such decision. After reviewing the literature on irreversible investment to calibrate the importance of the link between uncertainty and investment, Serven (1997) shows that there exists a negative relationship between investment outcome and measures of instability, using cross-section and time-series data for Sub-Saharan Africa. Pattillo (1998) uses panel data on Ghanaian manufacturing firms to test predictions from models of irreversible investment under

uncertainty. She finds that firms wait to invest until the marginal revenue product of capital reaches a firm-specific threshold level. In addition, empirical results show that higher uncertainty raises that threshold level, while uncertainty has a negative impact on investment levels that is greater when firms have more irreversible investment projects.

Schneider (1997) contrasts investment crises in Mexico and Brazil and suggests that successful concertation depends on political stability, strong business associations, and shared perceptions of vulnerability. Reinikka and Svensson (1999) use firm-level data to identify and quantify a number of cost factors such as those associated with transport, corruption, and utility services. They also find that factors such as crime, erratic infrastructure services, and arbitrary tax administration—not only increase firms' operating costs but also influence how they perceive the risks of investing in (partly) irreversible capital.

According to Stern (2001) to be able to reap greater benefits from globalization entails an improvement in the investment climate, which includes the provision of sound regulation of industry as well as the promotion of competition, the combat against bureaucratic delay and inefficiency and corruption, and the improvement of the quality of infrastructure. He also stresses the importance of the investment climate for small and medium-size enterprises (SMEs), the informal sector, agricultural productivity, and the creation of nonfarm employment.

Klein and Hadjimichael (2003) discuss the need for an appropriate framework set by government and a commercial culture that enable competition to work effectively. Such a framework includes the establishment of clearly defined property rights and of laws dealing with dispute resolution as well as with consumer and worker protection so as to reduce transaction costs. In other words, they advocate the establishment of an investment climate that is conducive to effective markets.

More recently, Hallward-Driemeier, Wallsten, and Xu (2003) use a survey of 1.500 Chinese firms in five cities to empirically examine the effects of a comprehensive set of components of the investment climate on firm performance. They find that the major factors contributing to such performance include international integration, entry and exit, labor market issues, technology use, and access to external finance. Love and Mylenko (2003) find that the presence of private credit registries lowers financing constraints and raises the share of bank financing, while public credit registries do not seem to have any significant bearing on these perceived financing constraints. In addition, in countries that have private registries, SMEs tend to have larger share of bank financing and these registries tend to be more effective when rule of law is stronger. On the other hand, the existence of a public credit registry tends to be more beneficial for younger firms compared to older ones.

Bastos and Nasir (2004) using data collected in a recent investment climate survey of garment and food processing firms in five countries in Eastern Europe and Central Asia find that pressure from competition is the most important factor in the investment climate, accounting for more variability in firm-level productivity than the provision of infrastructure or issues involving government rent seeking or bureaucratic burden. Thus, they focus more on the impact of investment climate factors on productivity level rather than on gross capital formation itself.

Rather than focusing on the impact of investment climate indicators in a particular developing country or a small set of countries within a particular region, in this

paper we examine the effect of such indicators on gross capital formation using a sample of thirty-six developing countries[1]. We hypothesize that gross capital formation as a percentage of GDP is a function of the following factors: corruption, courts, tax administration constraints, loss as a share of sales for those firms reporting a crime such as theft, vandalism or arson in the previous year, management time dealing with government officials as a percentage of total management time, and the share of firms with less than 20 employees that have a loan from a formal financial intermediary.

THE STATISTICAL MODEL

If we assume that investment climate indicators linearly affect gross capital formation, we can state the following statistical model[2]:

$$GrossI = \beta_0 + \beta_1 Corrupt + \beta_2 Courts + \beta_3 TaxAdmin + \beta_4 LossSales + \beta_5 MgtTime + \beta_6 Small + \varepsilon \quad (1)$$

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where *GrossI* = Share of gross capital formation in GDP, in 2003
Corrupt = Corruption constraint as measured by the share of senior managers that ranked "corruption" as a major or very severe constraint, in 2001 through 2004.
Courts = Courts constraint as measured by the share of senior managers that ranked "courts and dispute resolution systems" as a major or very severe constraint, in 2001 through 2004.
TaxAdmin = Tax administration constraint as measured by the share of senior managers that ranked "tax administration" as a major or very severe constraint, in 2001 through 2004.
LossSales = Loss as a share of sales for those firms reporting a loss to the establishment due to theft, vandalism or arson in the previous year, in 2001-2004.
MgtTime = Management time dealing with officials with regard to requirements imposed by government regulations (e.g. taxes, customs, labor regulations, licensing and registration, etc.) as a percent of total management time in a week, in 2001-2004.
Small = Share of firms with less than 20 employees that have a loan from a formal financial intermediary, in 2001-2004.

Batra, Kaufmann, and Stone (2002) use econometric analysis of responses to the World Business Environment Survey (WBES)[3] to show that there is a strong correlation between corruption, regulatory and tax constraints, and protection of intellectual property rights and firm-level performance, as measured by sales and investment growth and participation in the formal economy. Criminal activity results in losses to a firm and thereby raises its cost of doing business, including that of gross capital formation. To reduce crime entails efforts to prevent and deter crime as well as to improve enforcement.

Corruption and crime also increase the risk of doing business and hence discourage firms from undertaking investment projects, especially those that are of an irreversible nature.

Since in many developing countries there is a lack of confidence on the part of firms in the courts to uphold their property rights, it is important to improve courts in order to facilitate the free flow of reputation information and remove unnecessary obstacles to the use of alternative dispute resolution mechanisms. The investment climate in a developing country is also profoundly shaped by the way its government regulates firms and transactions. When regulatory systems are not appropriately designed or administered, the ability of firms to compete on international markets is vastly reduced. The investment climate is compromised when unnecessary costs such as formal and informal payments or expenditures of staff time and delays are imposed as a result of bureaucratic red tape.

Finally, inadequacies in finance erect barriers to opportunities and increase costs and risks for small firms as well as multinational corporations. In particular, SMEs in developing countries depend less on commercial banks for investment finance than large firms do. Instead, they rely more on internal funds and retained earnings. In addition, they receive less support from the state than do medium and large firms, but they get much more financing from family and friends.

Data on all variables are from the *2005 World Development Report.*

EMPIRICAL RESULTS

Table 1 gives least-squares estimates of regression coefficients in equation *(1)* for a sample of thirty-six countries. The goodness of fit of the model to the data is quite good as indicated by the value of 0.367 of the adjusted coefficient of determination. We observe that the share of senior managers that rank "corruption" as a major or very severe constraint is significant at the 5-percent level of significance. However, the coefficient estimate of this variable does not have the expected negative sign. There may be two possible reasons for this result. First, as table 2 indicates, there exists a severe degree of collinear association between this variable and the following explanatory variables: share of senior managers that rank "courts and dispute resolution systems" as a major or very severe constraint, "tax administration" constraint, share of firms with less than 20 employees that have a loan from a formal financial intermediary, and management time dealing with officials with regard to requirements imposed by government regulations as a percent of management time. Second, as pointed out by Batra, Kaufmann, and Stone (2002), corruption can be a two-way street in the sense that in some regions firms may be able to obtain what they want from corruption and thus their managers do not perceive it as a constraint.

The share of senior managers that rank "courts and dispute resolution systems" as a major or very severe constraint is strongly significant at the 1 percent level of significance and its coefficient estimate does have the expected negative sign. A one-percent increase in this share is expected to lead to a 0.41 percent decrease in the share of gross capital formation in the GDP. Tax administration constraint also exerts a very strong negative impact on gross capital formation as this variable is statistically significant at the 0.5 percent level. All else equal, a one-percent increase in the share of senior managers that

TABLE 1. EMMPIRICAL RESULTS

RHS Variables	Co-efficient Estimates	"t" ratios
Intercept	31.647	7.220
Corrupt	.203	1.990**
Courts	-.408	-2.661**
Tax Admn.	-.229	-3.153*
Loss Sales	.599	1.910***
Mangt.Times	-.570	-1.676
Small	.130	1.720***

Note: * Significant at 0.5 % level; ** Significant at 1.0 % level; *** Significant at 5.0 % level

rank "tax administration" as a major or very severe constraint is expected to result in a 0.23 percent decline in the share of gross capital formation in the GDP. Loss to the firm due to theft, vandalism or arson in the previous year as a share of sales is significant at the 5 percent level, but its coefficient estimate has the wrong sign. This is probably due to its linear association with the share of small firms that have a loan from a formal financial intermediary. On the other hand, management time dealing with officials with regard to requirements imposed by government regulations such as taxes, customs, labor regulations, licensing and registration, etc. as a percent of management time is barely statistically significant even though its coefficient estimate does have the expected negative sign. A one-percent increase in the share of management time dealing with officials is expected to lead to a 0.57 percent decline in the share of gross capital formation in the GDP in a developing country. Finally, the share of small firms that have a loan from a formal financial

TABLE 2. SAMPLE CORRELATION COEFFICIENT MATRIX

	Corrupt	*Courts*	*TaxAdmin*	*LossSales*	*Small*	*MgtTime*
Corrupt	1					
Courts	0.815	1				
	8.218					
TaxAdmin	0.419	0.179	1			
	2.696	1.063				
LossSales	-0.025	-0.137	0.074	1		
	-0.146	-0.808	0.438			
Small	0.438	0.461	0.043	-0.372	1	
	2.842	**3.032**	0.255	**-2.341**		
MgtTime	0.621	0.510	0.238	0.033	0.086	1
	4.630	**3.461**	1.433	0.195	0.503	

Notes**:** Bold t-statistics imply statistical significance at the 10 percent or lower level.

intermediary is significant at the 5 percent level and its coefficient estimate does have the expected positive sign. A large share of firms with less than 20 employees that are able to formally secure a loan implies a low financing constraint in a particular developing country. A one-percent increase in this share is expected to result in a 0.13 percent increase in the share of gross capital formation in the GDP, all else holding constant.

CONCLUSION

In this paper we use a statistical model and data from a sample of thirty-six developing economies to empirically analyze the impact of several investment climate indicators on the share of gross capital formation in the GDP. The results are fairly robust as indicated by the value of the adjusted coefficient of determination. We are able to draw the following conclusions:

1. Since corruption exerts a significant impact on gross investment in developing countries, which may lead to distortions in policies tilting in favor of some groups to the detriment of others, it is important for governments in these countries to become more accountable through greater transparency. This will help to restrain rent-seeking activities.
2. Governments in developing economies need to facilitate the enforcement of contracts. In other words, they need to make the improvement of the court system a high priority. Failure to do so will reinforce the lack of confidence of firms in the courts to uphold their property rights.
3. There is a strong need for the improvement of tax administration. This will help increase tax revenue collection, place a proportionate burden on all firms, and encourage competition.
4. Since criminal activity in the form of theft, vandalism or arson poses a serious constraint for many firms in all regions of the developing world it is necessary for governments to increase their effort to prevent and deter crime, as well as to enforce the law. It has been suggested that communities need to be involved more in policing activities.
5. The removal of unjustified burdens and streamlining of procedures can help reduce unnecessary costs and delays due to too much government regulation. Successful reforms will help decrease regulatory uncertainty and risk by curbing discretion and expanding consultation. In addition, they may eliminate barriers to competition via the reduction of barriers to entry and exit and the assault on anticompetitive behavior by firms.
6. The problems of financial repression and distortions created by state ownership, monopolies, directed or subsidized credit, and other policies attractive to the short-term interests of politicians and favored groups have plagued the smallest firms the most. Such problems have been known to retard financial sector development and undermine firm-level productivity and economic growth. It is thus necessary for governments to step in and encourage competition among providers of financial services.

ENDNOTES

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[1] The sample consists of the following countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Brazil, Bulgaria, Cambodia, Croatia, Czech Republic, Ecuador, Estonia, Georgia, Guatemala, Honduras, Hungary, Indonesia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Nicaragua, Poland, Romania, Russia, Senegal, Slovakia, Slovenia, Tajikistan, Tanzania, Turkey, Ukraine, Uzbekistan, and Zambia.

[2] In an earlier model, we include the following constraint variables: political uncertainty, crime, tax rate, licensing, finance, electricity, skills, and labor regulation; and percent change in GDP deflator (to capture the effect of inflation on gross capital formation). We find that the inclusion of these variables does not add to the explanatory power of the model and thus re-estimate the model without them. This result is available from the author by request.

[3] An initiative led by the World Bank Group in 1999 and 2000, which collects enterprise data from more than 10,000 firms in 80 countries and one territory.

REFERENCES

Bastos, Fabiano and John Nasir, "Productivity and the Investment Climate: What Matters Most?", 2004, Washington, D.C.: World Bank Policy Research Working Paper Series 3325.

Batra, Geeta, Daniel Kaufmann, and Andrew H.W. Stone, *Investment Climate around the World: Voices of the Firms from the World Business Environment Survey, 2002* Washington D.C.: World Bank.

Boadway, Robin and Anwar Shah, "Perspectives on the Role of Investment Incentives in Developing Countries" in Anwar Shah, ed., *Fiscal Incentives for Investment and Innovation, 1995,* New York: Oxford University Press.

Hallward-Driemeier, Mary, L., Colin Xu, and Scott Wallsten,) "The Investment Climate and the Firm: Firm-Level Evidence from China" , 2003, Washington, D.C.: World Bank Policy Research Working Paper Series 3003

Klein, Michael U., and Bita Hadjimichael, *The Private Sector in Development: Entrepreneurship, Regulation and Competitive Disciplines,* 2003, Washington, D.C.: World Bank.

Love, Inessa and Nataliya Mylenko "Credit Reporting and Financing Constraints" Washington, D.C.: World Bank Policy Research Working Paper Series 3003, 2003.

Myers, Stewart C., and Richard S. Ruback, "Discounting Rules for Risky Assets" MIT Center for Energy and Environmental Policy Research Working Paper No. 93-001 WP, November1992.

Schneider, Ben R. "Big Business and the Politics of Economic Reform: Confidence and Concertation in Brazil and Mexico" in Maxfield, Sylvia, and Ben R.

Schneider, eds. *Business and the State in Developing Countries*, 1997, Ithaca, N.Y.: Cornell University Press.

Serven, Luis, "Uncertainty, Instability, and Irreversible Investment: Theory, Evidence, and Lessons for Africa,", 1997, Washington, D.C.: World Bank Policy Research Working Paper Series 1722.

Stern, Nicholas, "Building a Climate for Investment, Growth, and Poverty Reduction in India" in Nicholas Stern, ed., *A Strategy for Development,* 2001, Washington, D.C.: World Bank.

Pattillo, Catherine, "Investment, Uncertainty, and Irreversibility in Ghana," *IMF Staff Papers,* 1998, Vol. 45 (3), pp.522-53.

Taggart, Robert A., "Consistent Valuation and Cost of Capital Expressions with Corporate and Personal Taxes," *Financial Management,* 1991, Vol. 20, pp.8-20.

World Bank, *World Development Report 2005: A Better Investment Climate for Everyone*, 2005, New York: Oxford University Press.