



British Journal of Economics, Management & Trade
3(3): 224-241, 2013

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Business Infrastructure and the Ease of Doing Business

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Authors' contributions

This work was carried out in collaboration between all authors. Author SKP designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author JDS managed the analyses of the study. Author PVP managed the literature review. All authors read and approved the final manuscript.

Research Article

Received 11th March 2013
Accepted 4th June 2013
Published 15th June 2013

ABSTRACT

Aims: Businesses are increasingly affected by the economic, social, legal, technological and political factors. In this paper, we term this the business infrastructure of a country. We analyze how the business infrastructure predicts how easy it will be to do business in a country.

Study Design: Our measure of ease of doing business is taken from the World Bank's index and renowned project "Ease of Doing Business". Their index is calculated on specific features of the micro level decisions facing a business such as ease of getting credit, getting a business license, opening and closing a business, hiring/firing workings, etc. In this paper we test how well the business infrastructure can be used as a predictor of the ease of doing business.

Methodology: This test provides an alternative calculation of how to measure the ease of doing business. We also examine how well the level of business infrastructure correlates with and predicts the Doing Business ease of doing business measure. We utilize ordinal logit to estimate our models. These techniques are specifically designed to preserve the ordinal nature of the dependent variable, the ease of doing business.

Results: Our results indicate that business infrastructure correctly identified 47% of the countries in our sample and were within 1 category for another 46%. Outliers only represented about 7% of all cases.

Conclusion: Our findings indicate that: 1) business infrastructure data may be just as good as complicated surveying techniques; 2) policies to foster corruption control,

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increase freedoms, improve education and health, reduce the size of government, increased globalization, and focus on the rural population will improve a country's ease of doing business and; 3) business infrastructure tells us a lot about how easy it is to business in a country.

Keywords: Business environment; corruption; regulation; human capital.

1. INTRODUCTION

Businesses are increasingly affected by the economic, social, legal, technological and political factors of what is call business environment. In a broader sense, business environment is the total of all external forces, which affect the organization and operations of businesses. Thus, business environment may be defined as all those conditions and forces, which are external to the business and are beyond the individual business unit, but it operates within it. Forces such as customer, creditors, competitors, government, socio-cultural organizations, political parties, national and international organizations, affect businesses directly or indirectly.

A decade ago, there were no globally available indicator sets for monitoring and analyzing such microeconomic factors and their relevance. Some preliminary efforts are dated in 1980s, which was basically the collection of data on perceptions from experts or business surveys. Nevertheless, the unsure reliance and their incomplete coverage mainly for poor countries constrain their usefulness for analysis. In this need, the Doing Business project was initiated nine years ago being the first Doing Business report, published in 2003, covering five indicator sets and one-hundred and thirty three economies. As of today, report covers eleven indicator sets and one-hundred and eighty three economies. Nine topics are included in the aggregate ranking on the Ease of Doing Business report.

Doing Business provides quantitative measures of regulations for starting a business, dealing with construction permits, accessing electricity, registering property, obtaining credit, protecting investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency. It also looks at regulations on employing workers. A fundamental premise of Doing Business is that economic activity requires good rules.¹ However, it has also some limitations. Indeed, the Doing Business has a limited scope since it only focuses on eleven areas of regulation; first, aspects such as, security, corruption, market size, and macroeconomic stability, among others, are not measured; second, it also assumes the business has full information on what is required focusing solely on formal sector; and third, part of data refers to the largest business city only, in a world where small and medium-size enterprises are drivers of job creation, competition, and economic growth. By the same token, we can see that the more the barriers imposed to business creation, the less the probability to foster economic growth.

¹The Doing Business Index methodology comprises the application of inexpensive and easily replicable questionnaires, so data can be collected and analyzed for a large sample of economies. Since the data are collected in a standardized way, comparisons and benchmarks are valid across the surveyed economies. Questionnaires are administered through more than 9,028 local experts including lawyers, business consultants, accountants, freight forwarders, government officials and other professionals routinely administering or advising on legal and regulatory requirements [1]. These experts interact with members of the Doing Business team on regular basis to assure accuracy of the information collected.

In this sense the probability of how easy is to do business in a specific country correlates positively with the same factors that may foster economic growth. In this sense, factors such as macroeconomic infrastructure, political environment, monetary policy, environmental policy, human development, health and education policies, among others, are the main variables that make up the business environment's infrastructure in a country.

The purpose of this paper is to explore and analyze this probability. Our main question is: Can the business infrastructure adequately predict how easy it is to do business in country? An affirmative answer suggests that micro-level knowledge of running a business may be helpful, but not required, to figure out where it is easy to do business.

We do so by first discussing the variables we believe are important in constructing the business infrastructure for a country in the rest of Section 1. Data and methodology are set forth in Section 2 with empirical results noted in Section 3. We conclude our study with main findings and policy implications in Section 4.

1.1 The Business Infrastructure

Up until recently, most of the work on economic, social, and political variables and their impact on the business environment has largely been an academic exercise. However, with advent of the internet, sites such as Wikipedia, Investopedia, and search engines such as Google have brought this work into the popular press and the realm into the decision making that is done by business. While academic work continues in this area, one need to merely pursue the aforementioned websites to discover key variables and relationships that influence the ease of doing business. That being stated, we present some recent academic studies that under lay what can be found in more practitioners' oriented material.

1.2 Macroeconomic Stability

Stable macroeconomic conditions and strong institutional framework are seen as necessary though not sufficient conditions for a favorable business environment [2,3]. In particular, a stable macroeconomic environment in terms of a targeted low inflation, coherent fiscal policy, responsible budget deficits and appropriate tax policies may favor business development through reduction of uncertainty, whereas macroeconomic instability may have a negative impact through the perception of higher risks and its detrimental effects on productivity and investment. However, there is not broad consensus within the scientific community, as well as politicians, with regard to which specific policies are more conducive to business creation.

1.3 Demographic Trends

Demographic trends have been recognized as relevant drivers fostering poles of development in large geographic areas (e.g., China and India), that perhaps few people could imagine just twenty years ago. In particular, population growth, population density, migration from rural to urban areas and age distribution, seem to play a major role in economic development and in the creation business infrastructure that may attract investments keeping the virtue cycle on [4,5].

By the same token, population growth may favor the proportion of working-age population with a positive effect on growth, mainly in developing countries. The composition of the

population also has important implications. Indeed, the availability of a working population not only has implications as a production factor, but also affects salary and tax policies, which may at the end create positive or negative incentives to business creation. Other related factors such as population density, may be positively linked with business infrastructure as a result of increased specialization, knowledge diffusion and spillovers.

1.4 Openness to Trade

Related to demographic distance, globalization, and the lessening of trade barriers, another determinant of economic performance receiving attention is openness to trade. Openness not only facilitates commercial and financial integration, but also the transfer of technology and the diffusion of knowledge from industrialized countries to developing ones. There is a growing empirical literature that has explored this relationship in practice though with inconclusive findings. In fact, there are many researchers who have found that economies, which are open to both trade and capital flows, exhibit higher GDP per capita and faster growth rates, two variables that have also an interplay with a doing business performance [6,7,8].

1.5 Political Interests

Economic and political interests interact in shaping economic development, though the mechanism is still unknown. Although it has been established that property rights institutions, the rule of law, and constraints on the executive are important for growth, the exact ways in which they affect income per capita are not well understood. Prezeworski, et.al. [9] argued, for example, that democratic regimes do not grow at different rates than autocratic regimes, while Mulligan, et.al. [10] argued that there are no systematic economic and social policy differences between democratic and nondemocratic regimes. Asiedu explores impact of political stability and political factors on foreign direct investment and economic growth in Africa [11].

Olson advanced a hypothesis that directly links the formation of political factions and the effects of interest groups on entrepreneurial freedom and pro-growth policies. He stated that significant excess burden emerges in societies with such organized groups that slow down the social process of decision making, erect entry barriers, produce complex legal and regulatory frameworks, and complicate the size and role of government and governmental agencies [12]. As a result, they damage a society's capacity to adopt new technologies and to reorganize in response to technological change, factors that also affect the institutional infrastructure and the creation of businesses.

Starting with the seminal works of Baumol [13] and Murphy, Schleifer and Vishny [14], there is a growing literature on the role of institutions influencing agents' choice between starting a productive business and undertaking alternative activities such as rent-seeking. Baumol's theory underlines how the rules of the game are influencing the allocation of talent between productive activities that are wealth creative, such as starting a business, unproductive activities that are redistributive, such as rent-seeking and destructive activities such as criminality.

1.6 Corruption

In developing and emerging countries, corruption and business-level bribing is a pervasive constraint. Firms are forced into bribing if they want to start and continue their business there. Corruption is negative for the macroeconomic performance and detrimental to growth and to entrepreneurship [15]. The rationale behind this fact is that bribing can benefit some firms by avoiding excessive red tape, such as long and unnecessary administrative procedures and delays. The “grease-the-wheel” assumption admits that the relation is more complex as the red tape is often a product of the corruption system, with corrupt bureaucrats raising the red tape in order to racket firms [16]. Recent developments about this topic are the one provided by Campbell [17] and Campbell [18]. Freytag and Thurig [19] and Desai and Acs [20], which provide a more detailed review of this literature.

1.7 Rural/Urban Population

Demographic factors and trends and its impact on economic growth is another relationship that has been attracted interest. In particular, population growth, population density, migration and age distribution, seem to play the major role in economic growth and business development [5].

High population growth could have a negative impact on economic growth, investment, saving behavior, and business development by affecting quality of human capital formation. On the other hand, population growth may favor the proportion of working-age population favoring business growth, mainly in developing countries. Other related factors such as population density, may be positively linked with economic growth as a result of increased specialization, knowledge diffusion and spillovers impacting entrepreneurial activities positively [21].

In addition, migration has played an important role in changing business environment in which firms operate. Indeed, the capitalism system with its free-market system has change the nature of the society moving workers from rural to urban places during most of the last century and more in a global spectrum nowadays. This migration has also created externalities that hinders the current business environment mainly in big urban cities; for instance, higher criminal rates in industrial and urban centers, as well as higher rates of drug and alcohol consumption and increasing violence have had detrimental effects on business development and entrepreneurial activities [22].

1.8 Human Capital

On human capital and its linkage to productivity, after the pioneering work of Becker [23] the main contributions are coming from Lucas [24] and Romer [25]. Both authors agree that technical change is related to a large extent to the acquisition of knowledge and learning. Romer emphasizes the importance of having a labor force that has substantial schooling and is dedicated to research and development as well. On the other hand, Lucas emphasized that education is not just characterized by formal learning, but also by learning on-the-job and that skills can be acquired in both settings. Both authors emphasize the crucial role of human capital on innovation, technical change, business growth, and therefore, economic growth. A more educated work force produces positive externalities and spillover effects from the development of a high value-added knowledge economy, which is able to stimulate

and maintain a competitive advantage to growing businesses and industries in the global economy.

Although related topic but usually overlooked, health is also an important component of what we know as human capital. A healthy workforce is crucial for increasing country's productivity [26]. For instance, Easterly and Levine [27] estimate that about 60% of the cross-country variation in growth rates of per-capita GDP is attributable to differences in productivity growth, while Klenow and Rodríguez-Clare [28] estimate that in their sample about 90% of the variation is attributable to differences in productivity growth. Then, a workforce with poor health is detrimental to business growth.

1.9 Government

Government activities may have a great impact on business environment. Entrepreneurs are often exposed to factors and uncertainties out of their control, such as excess of reforms and regulatory framework, economic and political disruption and instability discouraging venture activities is operating in and it always try to mitigate those risks by diversifying the portfolio of ventures to meet cash-flow requirements [29]. Excessive government spending and taxation reduce incentives to business creation hampering economic growth. In this sense, government spending, intervention and taxation are bad for growth and business development [4].

1.10 Monetary Policy and Inflation

Last but not least, monetary policy and inflation are also important factors in shaping the macroeconomic environment. Low inflation is an important ingredient in a doing business framework. Indeed, the recognition that expansionary monetary policy can only raise output and employment in the short run and the realization that inflation is costly and detrimental to businesses environment and economic growth, had gather broader consensus [4], [30]. In fact, inflation have many negative effects on business; inflation distorts prices between different time periods, rises interest rates, causes uncertainty which increases risk, re-distributes wealth and income, rises input prices (raw materials, wages and supplies) and the likelihood of wages negotiation, as well as distorts the asset-price relation.

However and contrary to the view that zero inflation is desirable, it seems there is an optimal range, perhaps between 2-4%, where business can growth and develop free of distortions [31]. By the same token, during the last decade inflation targeting has suppressed monetary targeting because of several advantages; the former does not rely on a stable money-inflation relationship, it uses more information with the potential to produce better policy settings, and it is better understood by the public increasing the transparency of monetary policy and the credibility of Central Banks [32].

After initial adoption by New Zealand in 1990, a growing number of central banks in developed and developing countries have adopted inflation targeting. More recently, there have been active debates on central bank transparency, optimal long-run level of inflation, the role of central banks on sharp asset fluctuations, and the impact globalization will have on monetary effectiveness [33,34,35], all of them with direct impact on institutional infrastructure and a doing business environment.

2. METHODOLOGY

The variables and the data sources used in this study are presented in Appendix A. The dataset is also available from the authors. A major feature of using the data set we do is that it was freely available and easier to assemble than that used by the Ease of Doing Project.² We have a unique dependent variable, ease of doing business ranking, which is measured as ordinal data. We want to preserve the ordinal nature of these data and thus it is not possible to estimate a single equation model like OLS or logit and maintain the ordinal nature of the dependent variable. Thus, we do not treat each ease of business ranking as if it were nominal data and individual unrelated values. We collapse the rankings to make it more manageable into 6 categories: top 10%, next 20%, next 20%, next 20%, next 20%, bottom 10%.

We develop a single equation model with the ease of doing business category as the dependent variable. This gives us a model with an ordinal measured variable as the dependent variable. Estimation techniques have been well developed and expressed in the literature [36]. The basic model [37, p. 486] is based on estimating a linear function of cutoff points and independent variables. This is done by formulating the “probability of observing outcome i which corresponds to the probability that the estimated linear function, plus random error, is within the range of the cutoff points estimated for the outcome:

$$\Pr(\text{outcome}_j = i) = \Pr(k_{i-1} < \beta_1 x_{1j} + \beta_2 x_{2j} + \dots + \beta_k x_{kj} + u_j < k_i)$$

u_j is assumed to be logistically distributed in order logit. We estimate coefficients:

$\beta_1, \beta_2, \dots, \beta_k$ together with the cutpoints k_1, k_2, \dots, k_{i-1} , where k is the number of possible outcomes.

We use the ordinal logit (OLOGIT) routine in STATA 12.0 to estimate this model.³ The estimated models indicate how the business infrastructure variables influence the ease of doing business. We include the following variables as independent variables in our model: Log of Real GDP per capita, Inflation, Size of Government (as measured by expenditure share in GDP), Openness, Corruption Control, Voice, Effective, Stability, Rule of Law, Secondary Enrollment, Rural Population (as percent of total population), Index of Health, and Population Growth Rate. Based on the review in Section II above, we hypothesized that all independent variables are positively related to the ease of doing business category except for the size of government which is hypothesized to have a negative relationship.

²A large set of indicators (8,967) are published each year by the Doing Business team. Perhaps one of the challenges and complexities of the Doing Business index is making the historical data comparable across time and consistent with the updates and changes on the methodology. Then, historical data are continuously checked, corrected, and adjusted accordingly. The World Bank publishes correction rates making the Doing Business index one of the most transparent data set available.

³We also estimated the model using OPROBIT, but the results were very similar to the OLOGIT, thus we only present the OLOGIT.

3. RESULTS AND DISCUSSION

3.1 Model Estimates

The estimates of the ordinal logit are presented in Tables 1. Estimation is done by maximum likelihood. For the ordinal logit model (Table 1) only 8 coefficients are significant at the 10 % level or better as determined by z-tests based on a standard normal distribution. All coefficients that are significant have the expected sign. The most important variables are regulatory quality, share of rural population, real GDP per capita, rule of law, and secondary enrollment. Fiscal and monetary policy (as represented by share of government expenditure and inflation, respectively) along with health, corruption control, and voice are found not to be statistically significant. The coefficients on both Effective and Stability do not have the expected sign.

Table 1. Estimates of the ordinal logit model

Variable	Coef.	Std. Err.	z	P>z	
RegQuality	0.060845	0.015065	4.04	0.0000	***
lgdp09	0.821142	0.312344	2.63	0.0043	***
seced	0.022782	0.009922	2.3	0.0107	**
RuralPop	0.021457	0.009688	2.21	0.0136	**
RuleofLaw	0.042925	0.01995	2.15	0.0158	**
Effect	-0.02983	0.021055	-1.42	0.0778	*
openk	0.004113	0.003219	1.28	0.1003	*
Stability	-0.01232	0.00971	-1.27	0.1020	*
inflation	0.02633	0.021707	1.21	0.1131	
Voice	-0.00893	0.010428	-0.86	0.1949	
popgrowth	0.076186	0.105345	0.72	0.2358	
CorrControl	0.009693	0.01637	0.59	0.2776	
kg	-0.00555	0.019795	-0.28	0.3897	
Healthindex	0.011942	0.065632	0.18	0.4286	

Note: *** is significant at the 1% level, ** is significant at the 5% level, * is significant at the 10% level.

The estimated coefficients signs and the associated tests of significance reveal whether a variable makes it easier to do business in a country. For example, the coefficient on Regulatory Quality is 0.0608 and is statistically significant at the 1% level. Regulatory Quality leads to the likelihood of a higher ease of business ranking (regulatory quality plays in a part in making it easier to do business in a particular country). An estimate with a negative sign and statistically significant, such as Effective, indicates that the less effective public services are the easier it is to business in a country. This would mean that business can offer more effectively similar services than the public sector can and that there is a degree of substitutability between public and private sector offerings of the same service.

3.2 Model Predictions

After the estimates of the model are obtained, the probability of a country being in each of the 6 categories was determined. This is used to find the likelihood of a country's ranking being correctly categorized. That is given the predictions of the model, what is the likelihood that the model correctly predicts the actual ease of business category of a particular country. These classifications are summarized in Table 2. The top half of Table 2 lists each category and the percentage of countries within that category that were correctly classified based on the actual ease of business ranking and the highest likelihood obtained. The 6 categories are: Category 6: top 10%, Category 5: next 20%, Category 4: next 20%, Category 3: next 20%, Category 2: next 20%, Category 1: bottom 10%. The data used in this table comes from Appendix B. Using the first county listed, Afghanistan, one can see that a probability of being in each of the six categories has been derived and that the probabilities sum to 1. The category with the highest probability is category 1 (0.50397), but Afghanistan is actually in category 2, so this is an incorrect classification in category 2. Using Albania, the highest probability is in category 4 (0.4028224) and since Albania is in category 4, this is counted as a correct classification in category 4. All probabilities are based on a logit probability density function.

Table 2. Summary of probability of classifications by category: ordinal logit model

Category	Predicted Correctly
1	56.25%
2	67.74%
3	38.46%
4	36.00%
5	52.17%
6	64.29%
Category	Probability Of Correct Classification
2 categories below	3.91%
1 category below	21.23%
Actual	46.93%
1 category above	24.58%
2 categories above	3.35%

Note: Category 6: top 10%, Category 5: next 20%, Category 4: next 20%, Category 3: next 20%, Category 2: next 20%, Category 1: bottom 10%.

The model had very good prediction rates for categories 1, 2, 5, and 6. The model did not predict well for categories 3 and 4. Most likely, it is difficult to discriminate among countries in the "middle" and easier to separate those that are on one end or the other of the rankings. This is explored further in the bottom portion of Table 2. Almost 47% of all countries were correctly classified. However, another 46% only classified either one category below or on category above their actual ranking. Thus, 93% of the countries are correctly classified or

within 1 category of their actual ranking. Only a very small number of countries were misclassified by 2 categories. No country was misclassified by more than 2 categories.

3.2.1 Outliers

The following countries were classified 2 categories lower than they actually were: Azerbaijan, Belarus, Fiji, Georgia, Pakistan, Solomon Islands, and Thailand. For these countries, it would seem that level of the business infrastructure is not able to support doing business as easily as its ranking might suggest. Micro-elements of the business seem to be present that would lead to some success of a running a business, the question of longer term sustainability needs to be considered for these countries.

The following countries were classified 2 categories higher than the actually are: Cape Verde Islands, Cost Rica, Croatia, Greece, and Seychelles. This suggests that the business infrastructure in these countries can support and sustain easement of doing business. However, the micro-elements of running a business are too restrictive to allow this. In the first case, the business infrastructure needs to be improved, in the second case micro-elements of business success need to be reformed.

4. CONCLUSION

Our findings indicate that: 1) business infrastructure data may be just as good as complicated surveying techniques; 2) policies to foster corruption control, increase freedoms, improve education and health, reduce the size of government, increased globalization, and focus on the rural population will improve a country's ease of doing business and; 3) business infrastructure tells us a lot about how easy it is to do business in a country.

The business infrastructure tells us a lot about how easy it is to business in a country. Our findings suggest that one does not need complicated surveying techniques to determine how easy it is to business in a country. Policies to foster regulatory quality, increase the rule of law, improve education and health, reduce the size of government, increased globalization, and focus on the rural population will improve a country's ease of doing business in both short and long run. Interestingly enough, we did not find a significant relationship between Voice (a measure of democracy) or Control of Corruption and the Doing Business index. This is consistent with some prior studies that suggest that corruption may actually make a country more attractive to do business since corruption may be a tool to navigate through complex bureaucracy [38,39].

We therefore see a need for the elements of business infrastructure to be included with the micro-elements of doing business to get a better sense of overall sustainability that can contribute to meaningful income generating opportunities for both workers and owners of business enterprises.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Anonymous. Doing Business: Measuring Business Regulations (2012). Methodology and Doing Business 2012 Data Notes. The World Bank Group. Accessed 30, August 2012. Available: <http://www.doingbusiness.org/methodology/methodology-note>
2. Acemoglu D, Johnson S, Robinson J. Reversal of fortune: geography and institutions in the making of the modern world income distribution. *Quarterly Journal of Economics*. 2002;117(4):1231–1294.
3. Leon H, Smith R. Macroeconomic stability and growth with equity first caribbean development round table, Port of Spain, Trinidad and Tobago, Sept 13, 2011.
4. Barro RJ. Determinants of Economic Growth. A Cross-Country Empirical Study, Cambridge: MIT Press; 1997.
5. Kelley AC, Schmidt RM. Economic and demographic change: a synthesis of models, findings, and perspectives in Birdsall N, Kelley A.C., Sinding S.W., eds. *Population matters: demographic change, economic growth, and poverty in the developing world*. Oxford: Oxford University Press; 2001.
6. Dollar D, Kraay A. Trade, growth and poverty. The World Bank Development Research Group, Washington; 2000, mimeo.
7. Yanikkaya H. Trade openness and economic growth: a cross-country empirical investigation. *Journal of Development Economics*. 2003;72(1):57–89
8. Down I. Trade Openness, Country Size and Economic Volatility: The Compensation Hypothesis Revisited *Business and Politics*. 2007;9(2):1-20.
9. Przeworski A, Alvarez M, Cheibub J-A, Limongi F. *Democracy and Development: Political Institutions and Well-Being in the World, 1950-1990*. Cambridge; 2000.
10. Mulligan C, Ricard G, Sala-i-Martin X. Do Democracies Have Different Public Policies than Nondemocracies? *Journal of Economic Perspectives*, American Economic Association. 2003;18(1):51-74.
11. Asiedu E. Foreign direct investment in Africa: the role of the natural resources, market size, Government Policy. *Institutions and Political Instability*, *World Economy*, 2006;29(1):63-77.
12. Olson M. *The rise and decline of nations*. New Haven: Yale University Press, 1982
13. Baumol W. Entrepreneurship: productive, unproductive and destructive. *Journal of Political Economy*. 1990;98:893–921.
14. Murphy K, Shleifer A, Vishny R. Why is rent-seeking so costly to growth? *American Economic Review*, *Papers and Proceedings*. 1993; 83(2):409–14.
15. Mauro P. The effects of corruption on growth, Investment and Government Expenditure, in Kim-(Eds) *Corruption and the World Economy*; 1996.
16. Méon P-G, Sekkat K. Does corruption grease or sand-the-wheels of growth? *Public Choice*. 2003;122(1-2):69–97.
17. Campbell K. A statistical analysis of public sector corruption and economic growth. *Journal of Transdisciplinary Writing and Research*. 2013;2(1):Article 6.
18. Campbell S. Perception is Not Reality: The FCPA, Brazil, and the Mismeasurement of Corruption Minnesota. *Journal of International Law*. 2013;22(1):247.
19. Freytay A, Thurig R. Entrepreneurship and its determinants in a cross-country setting. *Journal of Evolutionary Economics*. 2007;17:117-131.
20. Desai S, Acs Z. A theory of destructive entrepreneurship. *Jena Economic Research Papers*. 2007;N°085.
21. Pritchett L. Population, factor accumulation and productivity. *World Bank Policy Research Working Papers*; 1995.
22. Ancok D. Social Environment and Business; 2008. Available: <http://ancok.staff.ugm.ac.id/main/social-environment-and-business/>

23. Becker GS. Human Capital, 3rd Ed. New York, NY: Columbia University Press, 1993.
24. Lucas RE. On the mechanics of economic growth. *Journal of Monetary Economics*. 1998;22:3-42.
25. Romer PM. Idea gaps and object gaps in economic development. *Journal of Monetary Economics*. 1993;3:543-573.
26. Bloom D, Canning D. Health, human capital and economic growth, commission on macroeconomics and health. Mimeo; 2000.
27. Easterly W, Levine R. Tropics, germs, and crops: how endowments influence economic development (unpublished; Washington: Center for Global Development and Institute for International Economics); 2003.
28. Klenow P, Rodríguez-Clare A. The neoclassical revival in growth economics: has it gone too far? *NBER Macroeconomics Annual*; 1997.
29. Lingelbach DC, De La Vina L, Asel, P. What's Distinctive about Growth-Oriented Entrepreneurship in Developing Countries; 2005.
30. Barro, RJ. Democracy and growth. *Journal of Economic Growth*. 1996;1:1-27.
31. Akerlof GA, Dickens WT, Perry GL. Near-rational wage and price setting and the optimal rates of inflation and unemployment. *Brookings Papers on Economic Activity*. 2000;(1):1-60.
32. Mishkin FS. *Monetary Policy Strategy*, MIT Press Books, The MIT Press, edition 1, volume 1, number 0262134829, December 2007.
33. Boivi J, Kiley T, Mishkin FS. How has the monetary transmission mechanism evolved over time? *Handbook of Monetary Economics*. 2011;369-422.
34. Mishkin FS. Monetary policy flexibility, risk management, and financial disruptions. *Journal of Asian Economics*. 2010;23:242-246.
35. Mishkin FS, Westelius N. Inflation band targeting and optimal inflation contracts. *Journal of Money, Credit and Banking*. 2008;40(4):557-582.
36. Long JS, Freese J. *Regression Models for Categorical Dependent Variables Using Stata*. 2nd ed. College Station, TX: Stata Press; 2006.
37. *Stata Base Reference Manual I-P, Volume 2, Release 10*. College Station, TX: Stata Press; 2007.
38. Frye T, Schleifer A. The invisible hand and the grabbing hand. *American Economic Review*. 1997;87:354-358.
39. Egger P, Winner H. Evidence on corruption as an incentive for foreign direct investment. *European Journal of Political Economy*. 2005;21(4):932-952.

APPENDIX

Appendix A – Data Sources

1. Ease of Doing Business Ranking: <http://www.scribd.com/doc/19551901/Management-World-Bank-Doing-Business-Ranking-09>
2. Real GDP per capita: RGDPLTT, Real GDP per capita terms of trade adjusted 2009, from http://pwt.econ.upenn.edu/cic_main.html
3. Inflation: Annual Percentage change in implicit GDP Deflator, 2009, <http://data.worldbank.org/data-catalog/world-development-indicators>
4. Size of Government: Share of government expenditure in GDP averaged over 1970 to 2009 http://pwt.econ.upenn.edu/cic_main.html
5. Openness: Share of exports plus imports expenditure in GDP averaged over 1970 to 2009 http://pwt.econ.upenn.edu/cic_main.html
6. Health: Index of How Healthy <http://hdrstats.undp.org/en/tables/>
7. Education: Secondary Enrollment Ratio of how many attend of total averaged over 1970 to 2009 <http://www.unesco.org/new/en/education/>
8. Population Growth Rate: Annual average growth rate 1970 to 2009 from http://pwt.econ.upenn.edu/cic_main.html
9. Rural population: Share of rural population in total population <http://data.worldbank.org/data-catalog/world-development-indicators>
10. Corruption Control: Index of exercising public power for personal gain www.govindicators.org
11. Voice: Index of freedom of choice and expression, freedom of media www.govindicators.org
12. Regulatory Quality: Index of government ability to provide quality regulations to promote private sector www.govindicators.org
13. Effective: Index of effectiveness of public services www.govindicators.org
14. Stability: Index of perception that government will be overthrown www.govindicators.org
15. Rule: Index of perception of how well people follow rules, enforce contracts and property rights www.govindicators.org

Appendix B: Country Specific Classification Probabilities from the Ordinal Logit Model

Country	Actual Category	Estimated Probability of Being in a Category						Category with Highest Probability
		Bottom 10%	Next 20%	Next 20%	Next 20%	Next 20%	Top 10%	
Afghanistan	2	0.50937	0.42106	0.059324	0.008856	0.001298	9.19E-05	1
Albania	4	0.009133	0.096997	0.355537	0.402822	0.125266	0.010245	4
Algeria	2	0.08751	0.465146	0.346572	0.085931	0.013848	0.000994	2
Angola	1	0.415842	0.485832	0.083453	0.012848	0.001891	0.000134	2
Antigua and Barbuda	5	0.000173	0.002045	0.013582	0.09088	0.53725	0.35607	5
Argentina	3	0.080475	0.44947	0.360684	0.093131	0.015151	0.001089	2
Armenia	5	0.010258	0.107531	0.373144	0.386726	0.11322	0.009121	4
Australia	6	4.75E-05	0.000564	0.003788	0.027427	0.30053	0.667644	6
Austria	5	9.51E-05	0.001128	0.007546	0.052979	0.43741	0.500841	6
Azerbaijan	5	0.02537	0.225745	0.456657	0.239643	0.048933	0.003652	3
Bahamas,	4	0.000948	0.011126	0.069042	0.315266	0.512247	0.091371	5
Bahrain	6	0.000254	0.00301	0.01984	0.126505	0.57748	0.272912	5
Bangladesh	3	0.137817	0.535294	0.263889	0.054042	0.008361	0.000597	2
Belarus	4	0.06836	0.417562	0.386321	0.108448	0.018011	0.001299	2
Belgium	5	0.00018	0.002138	0.014191	0.094504	0.543096	0.34589	5
Belize	4	0.013677	0.137883	0.411809	0.342275	0.087524	0.006833	3
Benin	1	0.351518	0.523214	0.105827	0.016783	0.002482	0.000176	2
Bhutan	3	0.075797	0.43794	0.370402	0.09855	0.016149	0.001162	2
Bolivia	2	0.231972	0.563564	0.170104	0.0296	0.004445	0.000316	2
Bosnia	3	0.002891	0.033112	0.176447	0.454961	0.300731	0.031859	4
Botswana	5	0.00338	0.038484	0.198025	0.461398	0.271354	0.027358	4
Brazil	3	0.00709	0.077148	0.31495	0.432533	0.155096	0.013185	4
Brunei	4	0.000303	0.003583	0.023516	0.145866	0.587143	0.239589	5
Bulgaria	5	0.002161	0.02498	0.140571	0.432126	0.357968	0.042194	4
Burkina and Faso	2	0.044881	0.332194	0.436784	0.156313	0.027803	0.002026	3
Burundi	1	0.600133	0.350688	0.042069	0.006148	0.000898	6.36E-05	1
Cambodia	2	0.088797	0.467814	0.344058	0.084722	0.013631	0.000978	2
Cameroon	1	0.362319	0.517479	0.101638	0.016028	0.002368	0.000168	2
Canada	6	0.000127	0.001504	0.010032	0.069038	0.490001	0.429298	5
Cape Verde	2	0.009356	0.099111	0.359269	0.399586	0.122678	0.010001	4
Central African Republic	1	0.664735	0.297588	0.032286	0.004663	0.00068	4.81E-05	1
Chad	1	0.534467	0.4022	0.054059	0.008018	0.001174	8.31E-05	1
Chile	5	0.00036	0.004261	0.027822	0.167193	0.59104	0.209325	5
China	4	0.009094	0.096633	0.354882	0.403381	0.125722	0.010288	4
Colombia	5	0.004972	0.0555	0.256887	0.458342	0.205563	0.018737	4
Comoros	2	0.577164	0.369026	0.045998	0.006755	0.000987	6.99E-05	1
Congo, Dem.Rep.	1	0.61266	0.340558	0.040033	0.005836	0.000852	6.03E-05	1

Country	Actual Category	Estimated Probability of Being in a Category						Category with Highest Probability
		Bottom 10%	Next 20%	Next 20%	Next 20%	Next 20%	Top 10%	
Congo, Rep.	1	0.572124	0.373006	0.046897	0.006894	0.001008	7.13E-05	1
Costa Rica	3	0.00143	0.016679	0.099439	0.380167	0.439808	0.062478	5
Côte d'Ivoire	2	0.444568	0.467021	0.075162	0.011448	0.001683	0.000119	2
Croatia	3	0.001599	0.018619	0.109498	0.396074	0.418001	0.056209	5
Czech Republic	4	0.000307	0.003634	0.023842	0.147527	0.587676	0.237014	5
Denmark	6	6.92E-05	0.000822	0.005508	0.039315	0.37472	0.579567	6
Djibouti	2	0.184717	0.560093	0.209903	0.038951	0.005915	0.000421	2
Dominica	4	0.00386	0.043684	0.217458	0.463412	0.247558	0.024029	4
Dominican Republic	3	0.02672	0.234541	0.457402	0.231343	0.046531	0.003463	3
Ecuador	2	0.297206	0.5477	0.13031	0.021379	0.003179	0.000226	2
Egypt	3	0.00578	0.06389	0.281362	0.449914	0.182909	0.016146	4
El Salvador	4	0.028575	0.246229	0.457605	0.220776	0.043583	0.003233	3
Equatorial Guinea	1	0.19696	0.562629	0.198432	0.036123	0.005467	0.000389	2
Eritrea	1	0.468281	0.450715	0.068948	0.010418	0.00153	0.000108	1
Estonia	5	0.000177	0.002097	0.013918	0.092882	0.540539	0.350387	5
Ethiopia	3	0.212113	0.564077	0.185422	0.03305	0.004984	0.000354	2
Fiji	5	0.054684	0.372313	0.416324	0.132313	0.02272	0.001647	3
Finland	6	7.02E-05	0.000833	0.005584	0.039832	0.37748	0.576201	6
France	5	0.000165	0.00196	0.013026	0.087541	0.531424	0.365884	5
Gabon	2	0.131124	0.529208	0.273187	0.056999	0.008851	0.000632	2
Georgia	6	0.003601	0.040887	0.207175	0.462759	0.259861	0.025718	4
Germany	5	0.000117	0.001384	0.009241	0.063997	0.475468	0.449793	5
Ghana	4	0.018071	0.17357	0.439678	0.295891	0.067633	0.005157	3
Greece	3	0.000373	0.004414	0.02879	0.171795	0.591122	0.203507	5
Grenada	4	0.001225	0.014329	0.086875	0.356712	0.468686	0.072173	5
Guatemala	3	0.024703	0.221308	0.456077	0.243949	0.050211	0.003753	3
Guinea	1	0.466307	0.452097	0.069445	0.0105	0.001542	0.000109	1
Guinea-Bissau	1	0.776448	0.20169	0.018777	0.002669	0.000388	2.75E-05	1
Guyana	3	0.032557	0.269857	0.455529	0.200893	0.038337	0.002827	3
Haiti	2	0.491384	0.434242	0.063372	0.009509	0.001394	9.87E-05	1
Honduras	2	0.037661	0.297508	0.449378	0.17985	0.033171	0.002432	3
Hong Kong	6	6.67E-05	0.000792	0.005313	0.037983	0.367453	0.588393	6
Hungary	5	0.000337	0.003984	0.026068	0.158675	0.590215	0.220722	5
Iceland	6	0.000322	0.003814	0.024987	0.153308	0.589212	0.228357	5
India	3	0.015227	0.150876	0.423847	0.324598	0.079319	0.006132	3
Indonesia	2	0.031278	0.262472	0.456514	0.206906	0.039884	0.002946	3
Iran	2	0.132245	0.530283	0.271596	0.056485	0.008765	0.000626	2
Iraq	2	0.396405	0.497888	0.089606	0.013906	0.00205	0.000145	2
Ireland	6	3.65E-05	0.000434	0.002915	0.021258	0.252087	0.723271	6

Country	Actual Category	Estimated Probability of Being in a Category						Category with Highest Probability
		Bottom 10%	Next 20%	Next 20%	Next 20%	Next 20%	Top 10%	
Israel	5	0.000273	0.003233	0.02128	0.134218	0.582139	0.258857	5
Italy	4	0.000637	0.007511	0.047868	0.250226	0.56363	0.130128	5
Jamaica	4	0.005136	0.057218	0.262121	0.456856	0.200524	0.018146	4
Japan	6	0.000338	0.003999	0.026164	0.159145	0.590285	0.22007	5
Jordan	3	0.002125	0.024571	0.138654	0.430395	0.361368	0.042888	4
Kazakhstan	4	0.014337	0.143469	0.417276	0.334566	0.083837	0.006516	3
Kenya	4	0.047391	0.343174	0.431781	0.149433	0.026308	0.001914	3
Kiribati	4	0.052405	0.363623	0.421257	0.137256	0.023737	0.001722	3
Korea	5	0.000487	0.005749	0.037123	0.208786	0.584076	0.16378	5
Kuwait	5	0.000595	0.007016	0.044877	0.239339	0.570059	0.138113	5
Kyrgyz	4	0.039028	0.304449	0.447268	0.174903	0.032008	0.002344	3
Laos	1	0.255002	0.560132	0.154423	0.02624	0.003925	0.000279	2
Latvia	5	0.000722	0.008501	0.053778	0.270405	0.549966	0.116629	5
Lebanon	3	0.006808	0.074326	0.308279	0.436501	0.160359	0.013728	4
Lesotho	3	0.059493	0.389503	0.405776	0.122898	0.020824	0.001506	3
Liberia	2	0.570284	0.374455	0.047228	0.006946	0.001016	7.19E-05	1
Lithuania	5	0.000844	0.009915	0.062074	0.295994	0.529642	0.101532	5
Luxembourg	5	2.61E-05	0.00031	0.002089	0.015337	0.197213	0.785025	6
Macedonia,	4	0.005202	0.057906	0.264184	0.456222	0.198568	0.017919	4
Madagascar	2	0.118042	0.51487	0.292757	0.063652	0.009967	0.000712	2
Malawi	2	0.079326	0.446723	0.363049	0.094411	0.015386	0.001106	2
Malaysia	5	0.003465	0.039401	0.201552	0.462013	0.266861	0.026709	4
Maldives	4	0.025412	0.226022	0.456689	0.239378	0.048855	0.003646	3
Mali	1	0.085308	0.460441	0.350922	0.088074	0.014233	0.001022	2
Marshall	3	0.040369	0.311083	0.445054	0.17029	0.030941	0.002263	3
Mauritania	2	0.186268	0.560489	0.208398	0.038574	0.005855	0.000417	2
Mauritius	5	0.000553	0.006519	0.041852	0.22783	0.576074	0.147173	5
Mexico	4	0.008695	0.092826	0.34786	0.409199	0.13066	0.01076	4
Micronesia	3	0.087777	0.465704	0.346049	0.085678	0.013802	0.000991	2
Moldova	3	0.008345	0.08946	0.34135	0.414321	0.135314	0.01121	4
Mongolia	4	0.01529	0.15139	0.424276	0.323917	0.079021	0.006107	3
Montenegro	4	0.005072	0.056556	0.260118	0.457445	0.202439	0.018369	4
Morocco	2	0.013858	0.139421	0.41336	0.340135	0.086482	0.006743	3
Mozambique	2	0.283916	0.552351	0.137342	0.022761	0.00339	0.000241	2
Namibia	5	0.005815	0.064254	0.282363	0.449491	0.182029	0.016049	4
Nepal	3	0.130027	0.528134	0.274755	0.05751	0.008936	0.000638	2
Netherlands	5	4.94E-05	0.000586	0.003938	0.028474	0.307998	0.658954	6
New Zealand	6	7.35E-05	0.000872	0.005844	0.041602	0.386665	0.564944	6

Country	Actual Category	Estimated Probability of Being in a Category						Category with Highest Probability
		Bottom 10%	Next 20%	Next 20%	Next 20%	Next 20%	Top 10%	
Nicaragua	3	0.046904	0.341085	0.432769	0.150722	0.026585	0.001935	3
Niger	1	0.168987	0.554737	0.226078	0.043144	0.006586	0.000469	2
Nigeria	3	0.190626	0.561482	0.204252	0.037544	0.005692	0.000405	2
Norway	6	0.0001	0.001189	0.007946	0.055608	0.447362	0.487795	6
Oman	4	0.000962	0.011293	0.06999	0.317745	0.509881	0.090128	5
Pakistan	4	0.081921	0.452848	0.357734	0.091564	0.014865	0.001068	2
Palau	3	0.015604	0.153965	0.426371	0.320529	0.07755	0.005983	3
Panama	4	0.004743	0.053097	0.249363	0.460162	0.213008	0.019626	4
Papua New Guinea	3	0.171049	0.555587	0.223857	0.042553	0.006491	0.000462	2
Paraguay	3	0.045432	0.334647	0.435706	0.154754	0.027461	0.002001	3
Peru	4	0.005051	0.05633	0.259429	0.457642	0.203102	0.018447	4
Philippines	2	0.023311	0.211847	0.454356	0.253408	0.053097	0.003981	3
Poland	4	0.000759	0.008934	0.056336	0.278621	0.543793	0.111557	5
Portugal	5	0.000335	0.003966	0.025956	0.158122	0.59013	0.221491	5
Puerto Rico	5	0.000611	0.007206	0.046024	0.243569	0.567644	0.134946	5
Qatar	5	0.000192	0.002275	0.015084	0.099752	0.550742	0.331956	5
Romania	5	0.000892	0.010476	0.065313	0.305192	0.521561	0.096567	5
Russian Federation	3	0.025175	0.224455	0.456503	0.240887	0.0493	0.003681	3
Rwanda	2	0.05805	0.384502	0.408952	0.125589	0.021361	0.001546	3
Samoa	4	0.005215	0.058046	0.2646	0.456091	0.198176	0.017873	4
São Tomé and Príncipe	1	0.195959	0.56247	0.199336	0.036342	0.005502	0.000391	2
Saudi Arabia	6	0.001542	0.01796	0.106111	0.39098	0.425211	0.058197	5
Senegal	2	0.074903	0.435626	0.372288	0.099652	0.016354	0.001177	2
Serbia	3	0.005383	0.059789	0.269736	0.454382	0.193387	0.017323	4
Seychelles	3	0.00163	0.018972	0.111297	0.398675	0.414226	0.055199	5
Sierra Leone	2	0.384593	0.504916	0.093584	0.0146	0.002154	0.000153	2
Singapore	6	3.41E-05	0.000405	0.002722	0.019885	0.240159	0.736795	6
Slovakia	5	0.000645	0.007602	0.04841	0.252152	0.562422	0.12877	5
Slovenia	5	0.000211	0.002497	0.016524	0.108063	0.561068	0.311638	5
Solomon Islands	4	0.300765	0.546353	0.128505	0.021029	0.003126	0.000222	2
South Africa	5	0.002536	0.02918	0.159609	0.446352	0.326159	0.036164	4
Spain	5	9.88E-05	0.001173	0.007841	0.05492	0.444816	0.491151	6
Sri Lanka	3	0.004748	0.053152	0.249536	0.460124	0.212835	0.019605	4
St. Kitts and Nevis	4	0.000789	0.009275	0.058342	0.284859	0.538882	0.107854	5
St. Lucia	5	0.000699	0.00823	0.052171	0.265089	0.553777	0.120035	5
St. Vincent and the Grenadines	4	0.001265	0.014783	0.08934	0.361654	0.462884	0.070074	5
Sudan	2	0.38388	0.505333	0.093831	0.014643	0.00216	0.000153	2
Suriname	2	0.036677	0.292388	0.450794	0.183582	0.03406	0.0025	3
Swaziland	3	0.017742	0.171018	0.438194	0.298983	0.068809	0.005254	3

Country	Actual Category	Estimated Probability of Being in a Category						Category with Highest Probability
		Bottom 10%	Next 20%	Next 20%	Next 20%	Next 20%	Top 10%	
Sweden	6	0.000111	0.001312	0.008762	0.060916	0.465749	0.463151	5
Switzerland	5	0.000121	0.001435	0.009572	0.066113	0.481766	0.440994	5
Syria	2	0.101254	0.490801	0.320858	0.074426	0.011815	0.000846	2
Tajikistan	2	0.068193	0.417073	0.386684	0.108691	0.018057	0.001302	2
Tanzania	2	0.145851	0.541618	0.253319	0.050823	0.007832	0.000558	2
Thailand	6	0.002253	0.026015	0.145364	0.436203	0.34963	0.040536	4
The Gambia	2	0.068637	0.41837	0.385719	0.108047	0.017935	0.001293	2
Timor-Leste	1	0.3728	0.511686	0.097754	0.015336	0.002264	0.000161	2
Togo	2	0.244981	0.561962	0.160996	0.027628	0.004139	0.000294	2
Tonga	5	0.009511	0.100574	0.361792	0.397346	0.120939	0.009837	4
Trinidad and Tobago	4	0.000859	0.010099	0.06314	0.299068	0.526986	0.099848	5
Tunisia	4	0.004569	0.05126	0.243448	0.461324	0.219037	0.020361	4
Turkey	4	0.002791	0.03201	0.171818	0.452932	0.307487	0.032963	4
Uganda	3	0.020927	0.194968	0.449518	0.271273	0.058871	0.004444	3
Ukraine	2	0.031413	0.263262	0.456423	0.206255	0.039715	0.002933	3
United Arab Emirates	5	0.00032	0.003782	0.024786	0.152303	0.58898	0.22983	5
United Kingdom	6	0.000103	0.001226	0.008195	0.057234	0.453229	0.480012	6
United States	6	0.00012	0.001417	0.009458	0.065383	0.479627	0.443996	5
Uruguay	3	0.005222	0.058121	0.264824	0.45602	0.197965	0.017849	4
Uzbekistan	2	0.141172	0.53806	0.259398	0.052657	0.008133	0.00058	2
Vanuatu	4	0.02737	0.238688	0.457573	0.227535	0.045455	0.003379	3
Venezuela	1	0.307782	0.54358	0.125037	0.020362	0.003024	0.000215	2
Vietnam	3	0.020151	0.18929	0.447336	0.277584	0.061022	0.004618	3
Yemen	3	0.082363	0.453865	0.356836	0.091094	0.01478	0.001062	2
Zambia	3	0.106861	0.499638	0.311079	0.070491	0.011134	0.000797	2
Zimbabwe	2	0.852336	0.134394	0.011412	0.001608	0.000234	1.65E-05	1

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