

*Full Length Research Paper*

# A maturity approach for business climate: Comparative global perspective

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Received 26 November, 2012; Accepted 13 January, 2013

**Business climate, particularly ease of doing business, is a key factor to attract investments and expand business in any nation. There is, however, a lack of understanding of the significance of individual factors of overall ease of doing business. This paper quantifies the significance of business practices that encourage productivity and human development through the use of a maturity approach. Results suggest that businesses will choose those nations where importing and exporting is easy and inexpensive, filling income tax is simple and tax rates are low. Also, more businesses will open if credit is easily accessible and labor laws are reasonable.**

**Key words:** Business practices, productivity, human development, maturity, doing business.

## INTRODUCTION

Countries around the world compete on a daily basis for foreign investment. Business climate plays a key role in the attraction of Foreign Direct Investment (UN, 2009) and in the creation or expansion of local firms (World Bank, 2012). New companies, especially large corporations (and international firms) produce employment in significant amounts and demand materials and services on such a scale that they trigger a synergetic effect (supply chain) resulting in the expansion or creation of local suppliers. This results in more fiscal revenues (taxes) providing governments with resources that are ideally used to upkeep strategic infrastructure, further simplify processes and improve human wellbeing. Overall, such a chain of effects improves national competitiveness inducing an increase in country's potential for attracting more companies and doing more business (Levinson and Krizek, 2008).

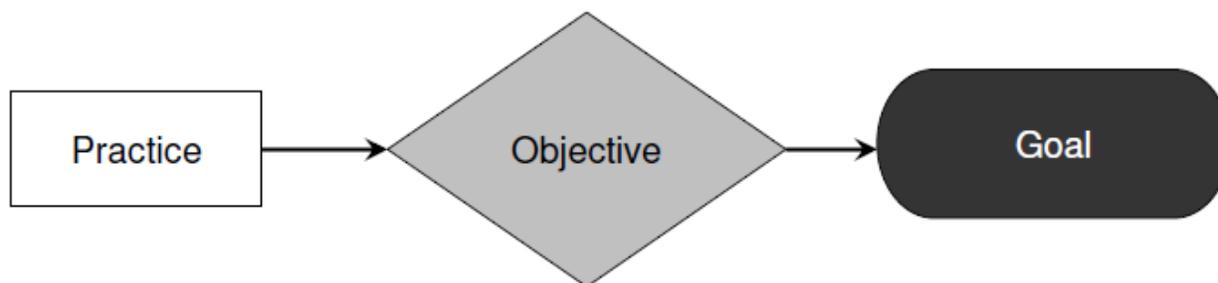
According to NAMS (2006) achieving and sustaining good levels of competitiveness requires the presence of adequate infrastructure (that is, road corridors, airports, ports, rail) to facilitate access to international markets

(exports and imports) or to simply support operations at local markets (water, energy, telecommunications). It appears that nations that have emerged from underdevelopment were capable of attaining an adequate business climate capable of attracting foreign investment in a sustained fashion (that is, Singapore). Such nations made huge investments to improve infrastructure and simplify regulations (Floyd and Summan, 2008) or in some cases (like China) created a mechanism to resolve disputes and protect investors. According to Siddharthan (2004), deregulation, transparency and simplification efforts (to ease doing business) are currently being replicated by many countries as a means of improving their economic and social development.

Even though there are significant cultural differences among countries, corporations and investors seem to care more about a well defined set of elements, when comparing possible locations and making an investment decision to establish a new subsidiary (World Bank, 2012). Corporations seeking a new location also consider the legal framework (enforcement of contracts, privately owned property, concessions, labor law, etc) and political stability.

It seems that investors may also care about the complexity of procedures and time spent dealing with the

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**Figure 1.** Relationship between a business climate and the regulatory goal of a country.

government (Globerman et al., 2004) at any level. Bureaucratic formalities from obtaining a construction permit to getting basic services or even filing and paying taxes, have been reduced or aggressively simplified by those nations leading on attraction of foreign investment (World Bank, 2012). For instance, they have moved towards risk-based construction permits (Singapore, Germany), having an organized set of building rules (Kenya, Croatia, New Zealand), putting procedures online or having a one-stop shop for new businesses; allowing electronic filling and payment of taxes, offering expedited procedures to register property and allowing access to online cadastre information (World Bank, 2012). A nation's ease of doing business is traditionally suggested for the achievement of development goals. In this regard, the existing problem is that there is a lack of global understanding of the individual significance of each of the factors (UN, 2009) and their capability to foster investment. As such, this paper aims to identify the significance of individual business climate practices in relation to their ability to encourage productivity and human development. A maturity approach to categorize practices has been adopted.

## BUSINESS PRACTICE MATURITY MODELING

Maturity modeling, more so process maturity modeling has its genesis in the software manufacturing industry (Finnemore et al., 2000) and has been credited to work done by Watts Humphreys and his colleagues at International Business Machines (IBM) in the early 1980s (Paulk et al., 1995). The business climate maturity model developed and implemented in this study is based on an adaptation of the concept of process maturity exemplified in IBM's capability maturity model. In particular, the maturity model is patterned after the Construction Industry Macro Maturity Model developed by Willis and Rankin (2010). The maturity model perceives that every country engages in various regulatory practices. A practice is a regulation adopted by a majority of local governments or institutions (that is, utilities companies or municipalities) and is usually based on laws or legal

dispositions governing the establishment and operation of local firms. The relationship between a business climate practice and the business climate goal of a country is illustrated in Figure 1. A business climate practice seeks to achieve an objective, which in turn, leads to the realization of an ease of doing business goal. Based on this, the level of implementation of a business practice will determine the extent to which its objective, *for example, simplify the process to obtain a construction permit*, is achieved. The extent to which each of the many business climate objectives are achieved will determine how well a country realizes its ease of business goal. Based on the aforementioned, it is clear that the maturity of a country with respect to its business practices will serve as a leading indicator of its performance. By looking at the maturity of business climate practices it should be possible to predict the lagging or after-the-fact ease of doing business performance of a country.

The maturity of a country with respect to an "ease of doing business practice" is determined based on the demonstrated capabilities of the country in implementing the business climate practice. The capability of a country with respect to a business climate practice determines the extent to which the practice is institutionalized and made effective, and is reflected by various outcomes/indicators. This relationship is highlighted in Figure 2, which shows that there are three capabilities concomitant with an ease of doing business practice. The existence of a capability reflects a level of maturity, which is captured by a maturity score ranging from  $\frac{1}{3}$  to 1. Obviously, if a business practice is non-existent, the maturity score is zero. The score of  $\frac{1}{3}$  represents that a country is immature with respect to a business practice. At the immature level a country is not capable of fully and consistently implementing a business practice. In other words, the implementation of a business practice is ad-hoc. The score of  $\frac{2}{3}$  represents that a country is in a state of transitional-maturity with respect to a business practice. At the transitional-maturity level a country's implementation of a business practice is standard and consistent. Also, the business practice is singular and applies to all investors in all regions of the country. The

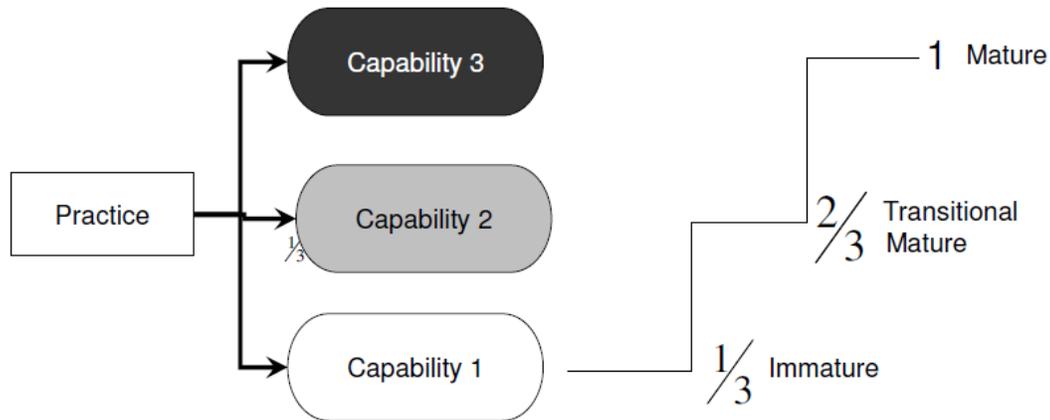


Figure 2. Capabilities concomitant with a business practice and levels of maturity.

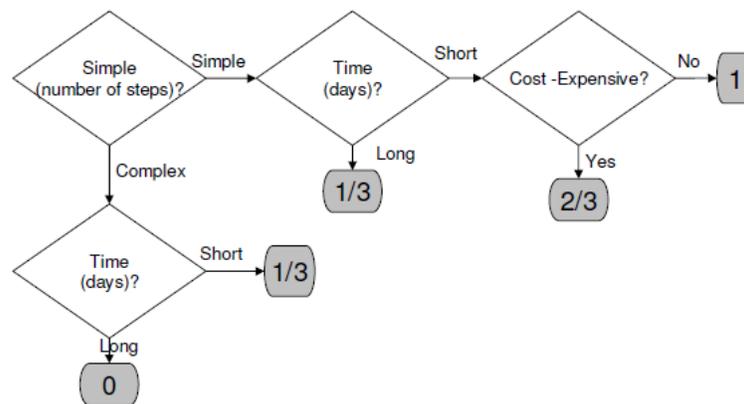


Figure 3. Generic structure of maturity score.

score of 1 represents that a country is in a state of maturity with respect to a business practice. The main indicator of maturity of an "ease of doing business practice" is represented by consistent, simple and inexpensive processes, that is, investors can anticipate with complete certainty required steps to open or expand a firm. An example of this would be paying taxes is simple, can be done online and requires a short amount of time to be accomplished.

The levels of maturity are shown in the form of a step diagram to emphasize that improving maturity is a stepwise progression. A country should pass through the transitional mature stage before it becomes mature with respect to a business practice.

## METHODOLOGY

Ten maturity scores were developed per criterion of business climate for 180 countries around the world.

Based on the results of doing business report (World Bank, 2012), each score was used as a proxy for the burden that regulatory practices impose on new investors.

The majority of practices were assessed in terms of complexity of the process (steps and time in days) and cost in US\$ (Figure 3). International trade resulted from aggregating imports and exports. Getting credit was evaluated by the strength of legal rights and coverage of credit registries (Figure 4). Protecting investors looked at disclosure and director liability indexes along with the ease of a suit (Figure 4).

Two regression analyses were conducted to correlate GDP per capita (or HDI) with ten maturity scores ( $x_1 \dots x_{10}$ ). Calibrating Coefficients ( $a_1 \dots a_{10}$ ) to local conditions were obtained. An exponential correlation was initially detected between total maturity and both indicators as suggested on Figure 5. Such a functional form was linearized employing a natural logarithmic transformation (Equation 1).

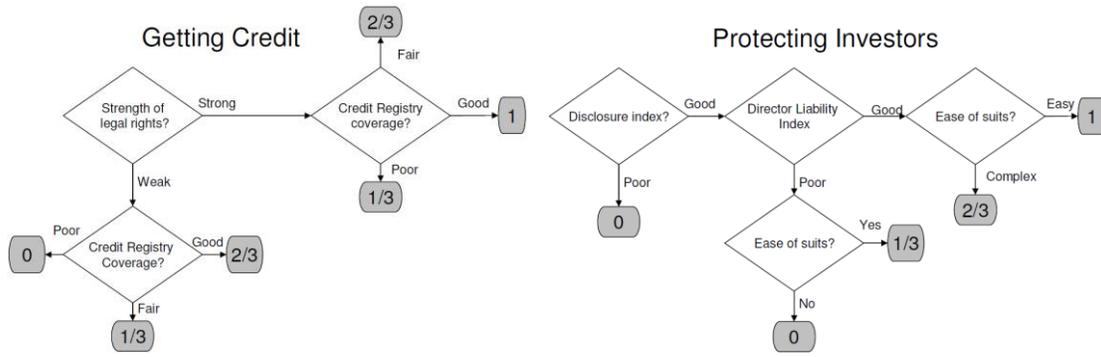


Figure 4. Maturity flow diagram for Getting Credit and Protecting Investors.

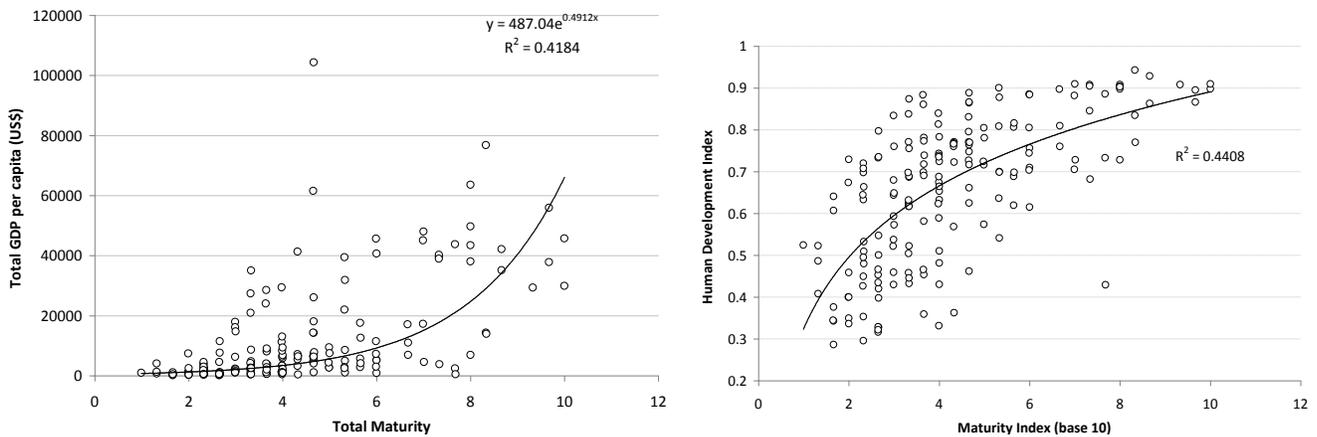


Figure 5. Total Maturity versus GDP and HDI.

$$\ln(R) = I + a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + a_5x_5 + a_6x_6 + a_7x_7 + a_8x_8 + a_9x_9 + a_{10}x_{10} \quad (1)$$

Where:

R = response (that is, gross domestic product (GDP) per capita)

I = Intercept

- x1 = Starting a business
- x2 = Construction permit
- x3 = Getting electricity
- x4 = Registering property
- x5 = Getting credit
- x6 = Protecting investors
- x7 = Paying taxes
- x8 = International Trade
- x9 = Enforcing a contract
- x10 = Laying off workers

Classical statistical analysis use P-values as an indicator of significance and compared it to a predefined level of confidence. A full Bayesian linear regression was conducted in order to validate the results from the classical approach. Two hypotheses were tested in order

to identify significant predictors. The null hypothesis set the mean of all coefficients ( $a_1, \dots, a_{10}$ ) to zero, an indication of null contribution of each term to the model descriptive and predictive capabilities. Specification of priors was non informative with a broad variance around zero mean. The alternate hypothesis was that a particular coefficient was significant at a 95% Confidence Interval (CI). Probabilistic distributions of the coefficients were used to refute or accept the null hypothesis checking if zero was at the confidence interval or at either tail. Two-hundred thousand iterations were run and a burn in phase of 100,000 iterations was removed from the analysis. Figure 6 shows model specification in OpenBUGS.

## RESULTS

Four analyses were conducted; two regressions for maturity scores versus GDP per capita and Human Development Index (HDI), and two full Bayesian models for the same indicators. A logarithmic transformation was

```

model
{
  for(i in 1 : 180) {
    R[i] ~ dnorm(mu[i],tau)
    mu[i] <- beta * exp(a1* x1[i]+a2*x2[i]+a3*x3[i] +a4*x4[i] +a5*x5[i] +a6*x6[i] +a7*x7[i] +a8*x8[i] +a9*x9[i] +a10*x10[i] )
  }
  tau ~ dgamma(0.001, 0.001)
  sigma <- sqrt(1 / tau)
  beta~ dnorm(0,0.1111)
  a1 ~ dnorm(0,0.010) #starting a business
  a2~ dnorm(0,0.010) # construction permit
  a3~ dnorm(0,0.010) # getting electricity
  a4~ dnorm(0,0.010) # registering property
  a5~ dnorm(0,0.010) # getting credit
  a6~ dnorm(0,0.010) # protecting investors
  a7~ dnorm(0,0.010) # paying taxes
  a8~ dnorm(0,0.010) # international trade
  a9~ dnorm(0,0.010) # enforcing contract
  a10~ dnorm(0,0.010) # laying off workers
}
list(a1=1,a2=1,a3=1,a4=1,a5=1,a6=1,a7=1,a8=1,a9=1,a10=1,tau=0.001, beta=0) #chain 1
list(a1=-1,a2=-1,a3=-1,a4=-1,a5=-1,a6=-1,a7=-1,a8=-1,a9=-1,a10=-1,tau=0.001, beta=12) #chain 2

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**Figure 6.** OpenBugs model source codes

**Table 1.** Summary statistics for ln (GDP per capita) versus maturity scores.

Predictor	Coefficient	Standard error of coefficients	T	P
Constant	6.072	0.217	28.01	0.000
Starting a business (x1)	0.109	0.223	0.49	0.625
Construction permit (x2)	0.151	0.219	0.69	0.490
Getting electricity (x3)	-0.274	0.247	-1.11	0.269
Registering property (x4)	0.235	0.245	0.96	0.340
Getting credit (x5)	0.978	0.295	3.32	0.001
Protecting investors (x6)	-0.195	0.230	-0.85	0.398
Paying taxes (x7)	1.156	0.292	3.97	0.000
International trade (x8)	1.741	0.245	7.11	0.000
Enforcing contracts (x9)	0.300	0.267	1.12	0.264
Employing workers (x10)	.428	0.220	1.94	0.053

**Table 2.** Summary statistics for HDI versus maturity scores.

Predictor	Coefficient	Standard error of coefficients	T	P
Constant	0.417	0.025	16.97	0.000
Starting a business (x1)	0.035	0.025	1.40	0.164
Construction permit (x2)	-0.014	0.025	-0.55	0.581
Getting electricity (x3)	-0.044	0.028	-1.57	0.117
Registering property (x4)	0.034	0.028	1.20	0.232
Getting credit (x5)	0.123	0.034	3.62	0.000
Protecting investors (x6)	-0.005	0.027	-0.18	0.859
Paying taxes (x7)	0.076	0.033	2.30	0.023
International trade (x8)	0.196	0.028	7.04	0.000
Enforcing contracts (x9)	0.045	0.031	1.45	0.148
Employing workers (x10)	0.067	0.025	2.67	0.008

applied to improve the normalization of residual plots of GDP per capita. Results from the regression analysis between maturity coefficients and GDP per capita or HDI

(Tables 1 and 2) showed good correlation ( $R^2 = 55.7\%$  and  $R^2 = 56.4\%$ , respectively). Plots of residuals for both analyses were normally distributed and homocedastic,

**Table 3.** Bayesian determination of maturity coefficients for GDP per capita.

	Mean	Standard deviation	Markov chain error	2.50%	Median	97.50%
1	0.007	0.028	4.18E-04	-0.047	0.007	0.063
a2	0.020	0.028	4.11E-04	-0.035	0.020	0.073
a3	-0.016	0.028	4.13E-04	-0.073	-0.018	0.040
a4	0.022	0.030	4.39E-04	-0.037	0.022	0.081
a5	0.150	0.032	4.93E-04	0.087	0.150	0.212
a6	-0.025	0.027	3.96E-04	-0.078	-0.025	0.028
a7	0.156	0.034	5.20E-04	0.089	0.156	0.222
a8	0.201	0.029	4.30E-04	0.144	0.201	0.259
a9	0.027	0.033	4.93E-04	-0.037	0.027	0.091
a10	0.060	0.027	4.11E-04	0.008	0.061	0.114

**Table 4.** Bayesian determination of maturity coefficients for HDI.

	Mean	Standard deviation	Markov chain error	2.5%	median	97.5%
a1	0.046	0.041	6.59E-04	-0.033	0.046	0.125
a2	-0.032	0.040	6.76E-04	-0.109	-0.032	0.044
a3	-0.060	0.042	7.35E-04	-0.145	-0.060	0.022
a4	0.042	0.043	7.23E-04	-0.042	0.042	0.127
<u>a5</u>	0.178	0.056	0.001087	<u>0.071</u>	0.177	<u>0.290</u>
a6	-0.007	0.039	6.60E-04	-0.086	-0.007	0.068
<u>a7</u>	0.109	0.051	9.23E-04	<u>0.009</u>	0.109	<u>0.209</u>
<u>a8</u>	0.279	0.042	6.55E-04	<u>0.198</u>	0.280	<u>0.360</u>
a9	0.054	0.047	8.02E-04	-0.040	0.054	0.148
<u>a10</u>	0.092	0.040	6.86E-04	<u>0.014</u>	0.092	<u>0.172</u>

therefore deeming model results acceptably valid. These plots are show in Appendix 1.

Equation 2 illustrates the regression equation obtained for GDP per capita and maturity scores, which after removing the logarithmic transformation becomes an exponential function of the independent variables ( $x_i$ ) and calibrating coefficients ( $a_i$ ) summarized in Table 1. A similar equation was obtained for HDI. From the equation is evident the relevance of coefficients for getting credit ( $x_5$ ), paying taxes ( $x_7$ ) and international trade ( $x_8$ ).

$$\ln(F) = 6.07 + 0.109x_1 + 0.151x_2 - 0.274x_3 + 0.235x_4 + 0.978x_5 - 0.195x_6 + 1.16x_7 + 1.74x_8 + 0.3x_9 + 0.428x_{10} \quad (2)$$

Both analyses suggested that international trade; tax structure and getting credit are the most significant (99% CI) factors explaining higher levels of national productivity (GDP per capita). These seem to suggest that businesses will choose to open at those locations where importing and exporting is easy and inexpensive, and filling taxes is simple, does not take too long, and tax rates are low. The analysis also suggests that more businesses will open if credit is accessible. Regulations regarding the ease to layoff workers seem to be

somewhat significant (90% CI).

### Model validation

Full Bayesian regression analysis was conducted with OpenBUGS to refute or accept the null hypothesis that each individual term (maturity score) was insignificant in explaining the response (GDP per capita or HDI). Tables 3 and 4 summarize the results for such models (GDP and HDI models, respectively). At both cases international trade, tax structure, getting credit and laying off personnel were found to refute the null hypothesis (with a 95% confidence interval) and therefore deem significant such factors to explain GDP per capita or HDI, validating the results of the classical approach.

### Conclusions

A maturity approach has been adapted to capture a country's degree of advancement on practices to encourage the development and expansion of local business and attraction of international firms.

Factors related to the ease of doing business (steps, time and cost), specifically how simple international trade (that is, exporting and importing), tax structure (tax rates, and complexity of filling taxes) and getting credit (cost and access) were found to be the most significant (99% CI), explaining higher levels of national productivity (GDP per capita) and human development, from a global perspective.

Results suggest that businesses will choose to open at those locations where importing and exporting is easy and inexpensive, filling income taxes is simple and fast, and tax rates are low. The analysis also suggests that more businesses will open if credit is accessible and labor laws are reasonable.

The analysis suggests that from a global perspective, *ceteris paribus* for other conditions that were left outside the analysis. Initial efforts placed at the abovementioned areas are more likely to make a significant difference between competing countries seeking to attract foreign investment and to encourage local development of businesses. Such comparable countries in the quest of attracting businesses and expanding their economic base should therefore devote efforts in setting in place competitive tax rates, simplified tax filling procedures, quick movement of merchandise through their ports and reasonable labor laws. Additionally, such countries should improve accessibility to credit designated for production purposes.

The significance of other elements (that is, ease of starting a business, obtaining a construction permit, getting electricity, registering property, protecting investors or enforcing a contract) could not be established from a cross sectional global analysis. However, this study by no means suggests a universal recipe to governments. Specific cases should be analyzed independently, particularly by looking at local practices and degree of disparity of such practices when compared to those of immediate competitors, which may reveal the need to strengthen other areas.

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