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## Entrepreneurship in Africa through the Eyes of GEDI

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## **Entrepreneurship in Africa through the Eyes of GEDI**

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## **Abstract**

Since the 1990s, several new indices like the Index of Economic Freedom, Doing Business, Global Competitiveness Index, have been created to achieving real progress in modernizing the business climates of developed and developing countries alike. These indicators however are focused largely on ameliorating burdens for current business, addressing issues with property rights, processes, etc. While necessary conditions, in the public effort to improve the economic incentives and create employment, they remain insufficient to foster the economic font of development: entrepreneurship. It has to be clear that entrepreneurship, and entrepreneurship policy is not merely about small business, or even at times about business at all, but about creating environments where people are able to perceive entrepreneurial opportunities, opportunities to improve their lives and be empowered by the environment to act upon their visions. While much has been written about the Global Entrepreneurship Monitor (GEM) and increasingly about the Global Entrepreneurship Development Index (GEDI), this paper represents the first attempt to examine private enterprise development in Africa.

Keywords: Africa; GEDI; GEM; Development; Entrepreneurship.

## Introduction

In 2002, the World Bank developed and launched the now famous Doing Business indicators (World Bank 2012). While the technical merits of the indicators have been debated for over a decade (Fauvarque-Cosson and Kerhuel (2009); Michaels (2009); Kaufmann and Kraay (2008), the index has proven to be an invaluable tool in aiding those attempting to achieving real progress in modernizing the business climates of developed and developing countries alike. When combined with other indices and measurements such as the Heritage Foundation's Index of Economic Freedom, development professionals and policy makers have concrete goalposts to enable the creation of tools aimed at improving the overall business climates in countries around the globe. This enables the use of economic reform and a friendly competition between governments in order to begin laying the foundations for meaningful poverty relief for billions and by attracting commercial development. These indicators however are focused largely on ameliorating burdens for current business, addressing issues with property rights, processes, etc. While necessary conditions, in the public effort to improve the economic incentives and create employment, they remain insufficient to foster the economic font of development: entrepreneurship.

Entrepreneurship is a multifaceted phenomenon, which has been studied in disciplines including psychology, sociology, anthropology, economic development, geography and economics. Within economics it has a long history including the works of Richard Cantillon, Jean-Baptiste Say, Adam Smith as well as a long lineage of Austrian economists because of their focus on methodological individualism. It has in recent years experienced a resurgence based in no small part on the awareness of the work of Joseph Schumpeter (1934, 1942), but this does not equate with being a discipline whose roots extend from the period following the second world war (Naudé 2010). It is, however, curiously missing from the work of giants such as J.M. Keynes, whose work was the parent of development economics, and for largely practical reasons "for many years, the entrepreneur was largely an implied element in economic theory and empirical research (Baumol, 1968, 1993, Minniti 2004; Jackson 2010). It is therefore not overly surprising that the entrepreneur might be overlooked in development economics given its post-WWII genesis and the prevailing thinking of that time which has been described as following "the Newtonian paradigm of an ever-equilibrating economy" (Witt 2002, p.7) instead of a more dynamic conceptualization of economies as complex, adaptive systems with characteristics more akin to ecologies than machines. The function of entrepreneurship has been described as that of converting innovation into economic goods (Audretsch, et. als. 2002), and ranges in scale from a more process oriented Kirznerian to the more transformative Schumpeterian, "creative destruction" forms.

Naudé (2010, 2011) has pointed out precisely that entrepreneurship as defined by the rather atomistic types of small business ownership commonly found informal in developing countries is not a binding constraint to growth. We would agree, and in fact, this definition

of entrepreneurship is both too narrow and empirically unimportant in part because it does not differentiate conceptually between the entrepreneur and the small business owner (Carland, et. al. 1984) and secondly because it does not provide room for social entrepreneurship. A focus on both the management literature alone and regression analysis betrays a poor grasp of the entrepreneurship literature over-emphasizing what Shane (1996) calls "the rates school". It is important to note that whether something is significant in a regression should not be confused with whether it is significant in practice. As Minniti (2004, 2005) points out, entrepreneurship is a path dependent, non-ergodic process whose significance is unknowable in the present period and whose occurrence is plagued by simultaneity problems. Thus, there are elements in entrepreneurship that occur in the here and now such as the using/freeing up of resources in the economic milieu, but the economic significance of an entrepreneurial act may not be borne out until much later. An example of this was the march from obscurity to its position of global leadership by Microsoft beginning in 1975 until the present. No one save possibly Bill Gates and Paul Allen would have envisioned in 1975 that Microsoft would one day employ 90,000 people in 105 countries, and no regression analysis would have found the firm to be statistically significant prior to its alliance with IBM in 1978.

Idiosyncratic events like an entrepreneurial decision are neither random nor probabilistic but are sandwiched in an economic environment or milieu. This does not diminish the significance of the event or the milieu, it merely points out that nothing happens in a vacuum and illustrates a very important point about both entrepreneurship and development. The milieu does not create the event, but it can support, ignore or suppress it. (Baumol 1990) No serious scholar of entrepreneurship doubts the importance of institutions in everything from the availability of knowledge, the rule of law to the ability of the entrepreneur to act upon their intuition in a productive and legal manner. Instead entrepreneurship is about the actors, and actors are as important to development as are institutions. (Eggertsson 2005) We simply offer here a tool to help focus the activities of the developer with respect to fostering an environment for positive entrepreneurship which will also benefit other areas within the economic environment.

While it is important not to romanticize "penniless entrepreneurs", (Naude 2010; Banerjee and Duflo 2007), it is an equal risk of ignoring, marginalizing and dismissing them as unimportant. You forget that "when you hold the world in your palm and inspect it only from a bird's eye view, you tend to become arrogant – you do not realize that things get blurred when seen from an enormous distance."(Yunis and Jolis 1999, p., ix) Being so blinded you might ignore the conditions which lead someone like Mouhamed Bouazizi, a poor penniless entrepreneur, to take the steps he did, because in the moment he set himself ablaze he was an entrepreneur, marshalling the emotions of millions of his kinsmen across the Arab world and simultaneously set that world on fire.

We therefore contend that entrepreneurship is not merely about commercial activities but also includes social phenomenon (Austin, Stevenson and Wei-Skillern 2006). In one sense, the development of Facebook illustrates both of these facets well (Mezrich 2009). Facebook was a novel technological form representing a tremendous commercial opportunity to its founders evolving from a small, localized college based program run by a

lone college student to a global social network phenomenon employing hundreds of staff in a few short years. At the same time, the social networking that Facebook enabled has resulted in at times tremendous political upheaval and meaningful social change as evidenced by the events of the spring of 2011 (CFR 2011). From this it must be clear that entrepreneurship, and entrepreneurship policy is not merely about small business, or even at times about business at all, but about creating environments where people are able to perceive entrepreneurial opportunities, opportunities to improve their lives and be empowered by the environment to act upon their visions. While much has been written about the Global Entrepreneurship Monitor and increasingly about the Global Entrepreneurship Development Index (GEDI), this paper represents the first attempt to examine private enterprise development in Africa through the lens of the GEDI. It will explore the extant data for African countries and suggest how they might be used from the perspective of an individual country with brief examples.

## **Methodology**

While a universally accepted definition of entrepreneurship does not exist, most scientists agree that entrepreneurship is a multifaceted or complex phenomenon (Fortunato and Adles 2011, Acs and Audretsh 2010). Guided by this consensus and drawn from the arguments about the definition, the measurement, and the support of entrepreneurship, Acs and Szerb (2011, 2012) and Acs et al (2013) developed the Global Entrepreneurship and Development Index (GEDI). The GEDI methodology is predicated on entrepreneurship as a complex, multifaceted phenomenon, and thus, holds that the proper measure of entrepreneurship should be a complex, composite index incorporating the quality aspects of entrepreneurship. The GEDI views country level entrepreneurship from a system perspective involving both the individual and the institutional sides. Formally we define country-level entrepreneurship as "...the dynamic, institutionally embedded interaction between entrepreneurial attitudes, entrepreneurial abilities, and entrepreneurial aspirations by individuals, which drives the allocation of resources through the creation and operation of new ventures." (Acs et al 2012 p. 11) It endeavors to capture the complex social interaction between the entrepreneurial skills and aspirations of the individual entrepreneur and the social milieu in which entrepreneurial activity transpires.

Like other composite indexes the GEDI has a multilevel structure consisting of (1) variables, (2) pillars, (3) sub-indices, and, finally, (4) the super-index. All three sub-indices contain many pillars which can be interpreted as quasi-independent building blocks of this entrepreneurship index. The three sub-indices of attitudes, abilities, and aspiration constitute the entrepreneurship super-index, which we call the Global Entrepreneurship and Development Index.

While the abilities and aspiration sub-indices (outlined below) capture actual entrepreneurship abilities and aspiration as they relate to nascent and startup business activities, the entrepreneurial attitude (ATT) sub-index aims to identify the attitudes of a country's population as they relate to entrepreneurship. For example, the pillar known as opportunity perception potential is essential to recognizing and exploring novel business

opportunities. It is also critical to have the proper startup skills and personal networks to exploit these opportunities. Moreover, fear of failure to start a business can have a negative effect on entrepreneurial attitudes, even when opportunity recognition and startup skills exist. Entrepreneurial attitudes are believed to be influenced by the crucial institutional factors of market size, level of education, the level of risk in a country, the population's access to information as measured by the population's rate of internet use, and culture, all of which are interaction variables of the indicator.

The entrepreneurial abilities (ABT) sub-index is principally concerned with measuring some important characteristics of the entrepreneur and the startup with high growth potential. This high growth potential is approached by quality measures, including opportunity motivation for startups that belong to a technology-intensive sector, the entrepreneur's level of education, and the level of competition. The country level institutional variables include the freedom to do business, the technology adsorption capability, the extent of staff training, and the dominance of powerful business groups.

<b>GLOBAL ENTREPRENEURSHIP AND DEVELOPMENT INDEX</b>																													
<b>Entrepreneurial Attitudes Sub-Index</b>					<b>Entrepreneurial Abilities Sub-Index</b>					<b>Entrepreneurial Aspirations Sub-Index</b>																			
<b>Pillars</b>																													
<b>Opportunity Perception</b>	<b>Start-up Skills</b>	<b>Non-fear of Failure</b>	<b>Networking</b>	<b>Cultural Support</b>	<b>Opportunity Startup</b>	<b>Tech Sector</b>	<b>Quality of Human Resources</b>	<b>Competition</b>	<b>Product Innovation</b>	<b>Process Innovation</b>	<b>High Growth</b>	<b>Internationalization</b>	<b>Risk Capital</b>																
															<b>Variables</b>														



<i>Informal Investment</i>
Depth of capital market
<i>Export</i>
Globalization
<i>Gazelle</i>
Business Strategy
<i>New Tech</i>
GERD
<i>New Product</i>
Technology Transfer
<i>Competitors</i>
Market Dominance
<i>Educational Level</i>
Staff Training
<i>Technology Level</i>
Tech Absorption
<i>Opportunity Motivation</i>
Economic Freedom
<i>Career Status</i>
Corruption
<i>Know Entrepreneurs</i>
Internet Usage
<i>Risk Acceptance</i>
Business Risk
<i>Skill Perception</i>
Tertiary Education
<i>Opportunity Recognition</i>
Market Agglomeration

Source: Acs et al 2013 p.217

Figure 1. The structure of the Global Entrepreneurship and Development Index

Table 1. The description of the GEDI index pillars

Pillar name	Description
<b>Opportunity Perception</b>	Opportunity Perception refers to the entrepreneurial opportunity perception potential of the population weighted with the size and the level of agglomeration of that country reflecting the potential size of the market.
<b>Start-up Skills</b>	Start-up Skill captures the perception of start-up skills in the population and weights this aspect with the quality of human resources available for entrepreneurial processes in the country.
<b>Non-fear of Failure</b>	Non-fear of Failure captures the inhibiting effect of fear of failure of the population on entrepreneurial action combined with a measure of the country's business risk.
<b>Networking</b>	This pillar combines two aspects of Networking: (1) a proxy of the ability of potential and active entrepreneurs to access and mobilize opportunities and resources and (2) the possible use of the internet.
<b>Cultural Support</b>	The Cultural Support pillar combines how positively a given country's inhabitants view entrepreneurs in terms of status and career choice and how the level of corruption in that country affects this view.
<b>Opportunity Startup</b>	The Opportunity Startup pillar captures the prevalence of individuals who pursue potentially better quality opportunity-driven start-ups (as opposed to necessity-driven start-ups) and weights this against regulatory constraints.
<b>Tech Sector</b>	The Technology Sector pillar reflects the technology-intensity of a country's start-up activity combined with a country's capacity for firm-level technology absorption.
<b>Quality of Human Resources</b>	The Quality of Human Resources pillar captures the quality of entrepreneurs as weighing the percentage of start-ups founded by individuals with higher than secondary education with a qualitative measure of the propensity of firms in a given country to train their staff.
<b>Competition</b>	The Competition pillar measures the level of the product or market uniqueness of start-ups combined with the market power of existing businesses and business groups.

<b>Product Innovation</b>	The Product Innovation pillar captures the tendency of entrepreneurial firms to create new products. This pillar was created by weighting the percentage of firms that offer products that are new to at least some of their customers with a complex measure of innovation.
<b>Process Innovation</b>	The Process Innovation pillar captures the use of new technologies by start-ups combined with the Gross Domestic Expenditure on Research and Development (GERD). GERD serves as measurement of the systematic research activity as opposed to easy to copy technological improvements.
<b>High Growth</b>	The High Growth pillar is a combined measure of (1) the percentage of high-growth businesses that intend to employ at least ten people and plan to grow more than 50 percent in five years and (2) business strategy sophistication.
<b>Internationalization</b>	The Internationalization pillar captures the degree to which a country's entrepreneurs are internationalized, as measured by businesses' exporting potential weighted by the level of economic globalization of the country.
<b>Risk Capital</b>	The Risk Capital pillar combines two measures of finance: informal investment in start-ups and a measure of the depth of capital market. Availability of risk capital is to fulfill growth aspirations.

*Source: Adopted from Autio et al (2012) pp. 29-30*

The entrepreneurial aspiration (ASP) sub-index refers to the distinctive, qualitative, strategy-related nature of entrepreneurial activity. Entrepreneurial businesses are different from regularly managed businesses, thus it is particularly important to be able to identify the most relevant institutional and other quality-related interaction variables. The newness of a product and of a technology, internationalization, high growth ambitions, and informal finance variables are included in this sub-index. The institutional variables measure the technology transfer and R&D potential, the sophistication of a business strategy, the level of globalization, and the depth of capital market.<sup>1</sup>

There are two methodological novelties in the calculation of the GEDI points. First, GEDI is created for public policy use. Viewing the fourteen pillars of entrepreneurship it means that the marginal improvement of the pillar values should be the same for all the pillars. However, the pillar averages are quite different ranging from 0.31 (Risk capital) to 0.67 (Opportunity perception). It means that reaching the same value in Risk capital as compared to Opportunity perception requires more than two times more effort and probably resources. For equating the marginal effects we need a transformation to equate the average values of the fourteen pillars. Equation 1 shows the calculation of the average value of a pillar  $\bar{x}$

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n} . \quad (1)$$

<sup>1</sup> This description of the index structure is based on Acs et al 2013, Chapter 6.

We want to transform the  $x_i$  values such that the potential minimum value is 0 and the maximum value is 1:

$$y_i = \begin{cases} 0 & \text{if } x_i = 0 \\ 1 - (1 - x_i) \frac{n - k - n\bar{y}}{n - k - n\bar{x}} & \text{otherwise} \end{cases} \quad (2)$$

where  $k$  denotes the number of countries with the minimal original value. The  $y_i$  transformed values meet with the required assumptions, but they cannot exceed 1. It means that  $\bar{y} < 1 - \frac{k}{n}$ .

Another unique feature of the GEDI approach is the systemic view of entrepreneurship. The Penalty for Bottleneck (PFB) methodology has been developed to quantify the interaction effect of the 14 pillars of entrepreneurship. According to the PFB the entrepreneurial performance of a particular country is more dependent on the harmonization of the pillars than it is of the strength of any individual pillar. Consequently, the optimal entrepreneurial performance can be reached by equalizing the normalized values of the 14 pillars. The most important feature of the PFB methodology is the assumption that the performance of the system is determined by the lowest performing or lowest-value pillar which constitutes a bottleneck and thereby limits the output of the system by constraining the performance of the other pillars. The imbalance prevents the full realization of the capacity of the better performing pillars and the magnitude of the penalty is a function of the magnitude of the bottleneck: The larger the difference between a particular pillar and the bottleneck pillar the larger the penalty. By assuming an exponential penalty function the penalized pillar values can be calculated in the following way:

$$h_{(i),j} = \min y_{(i),j} + 1 - e^{-(y_{(i),j} - \min y_{(i),j})} \quad (3)$$

where  $h_{i,j}$  is the modified, post-penalty value of pillar  $j$  in country  $i$

$y_{i,j}$  is the normalized value of index component  $j$  in country  $i$

$y_{min}$  is the lowest value of  $y_{i,j}$  for country  $i$ .

$i = 1, 2, \dots, n =$  the number of countries

$j = 1, 2, \dots, m =$  the number of pillars

It is also possible to calculate a summary measure of the unbalance. The Average Bottleneck Efficiency (ABE) is defined as how close a country's pillars are to its best performing pillar score, on average. ABE is expressed in terms of percentages. Higher ABE values imply more balanced performance and therefore more efficient use of the

available resources while lower ABE values mean substantial imbalances over the fourteen pillars of the GEDI.<sup>2</sup> Equation 5 describes the calculation of ABE:

Equations 4a and 4b technically describe the general form of the calculation:

$$ABG_i = \frac{100 * \sum(\max_{i,j} - y_{(i,j)})}{(j-1) * \max_{i,j}} \quad (4a)$$

$$ABE_i = 100 - ABG_i \quad (4b)$$

for all  $j$ , the number of pillars

where  $ABG_i$  is the Average Bottleneck Gap for country  $i$

where  $ABE_i$  is the Average Bottleneck Efficiency for country  $i$

There are some important policy related consequences of the PFB methodology. First, the different pillars cannot be fully substituted with each other. In other words, the performance of the better performing pillar may only partially compensate for the performance of the bottleneck pillar. Second, the whole GEDI index score can be improved the most by increasing the score of the bottleneck pillar. The magnitude of the enhancement depends on the relative size of the bottleneck as compared to the other pillars. Third, for policy makers it means that the enhancement of the worst performing bottleneck pillar is the most important priority for entrepreneurship policy.<sup>3</sup>

## Data and Tables

### Data description

As mentioned previously, individual variables are based on the GEM Adult Population Survey dataset. Of the 120 countries, 87 participated in the survey in the 2006-2012 time period. Out of these 87 countries they were fourteen African countries. If data were available both in 2011 and 2012 we calculated the individual variable values by averaging these two years data. In Africa, there was only three such countries, Algeria, Nigeria and South Africa. In all the other cases, we used a single year individual data. For the details view Table 2. The distribution of the sample by African countries and the calculation of the individual variables.

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<sup>2</sup> Average Bottleneck Efficiency appears as Average Bottleneck Gap in the GEDI United Kingdom 2012 report (Autio et al 2012). However, it is more appropriate to call it efficiency then gap measure because the higher ABE value is associated with better performance not with higher lag.

<sup>3</sup> For more information about the methodology see Acs et al (2013).

*Table 2. The distribution of the sample by African countries and the calculation of the individual variables*

<b>Country/year</b>	<b>2009</b>	<b>2011</b>	<b>2012</b>	<b>Individual variable way of calculation</b>
<b>Algeria</b>		3373	4984	Average of 2011-2012
<b>Angola</b>			2489	2012 data
<b>Benin</b>				Average of Nigeria, Ghana and Malawi
<b>Botswana</b>			2003	2012 data
<b>Burkina Faso</b>				Average of Ghana Uganda and Malawi
<b>Burundi</b>				Average of Ghana Uganda and Malawi
<b>Cameroon</b>				Average of Nigeria and Ghana and Malawi
<b>Chad</b>				Average of Ghana Uganda and Malawi
<b>Côte d'Ivoire</b>				Average of Ghana Uganda and Malawi
<b>Egypt</b>			2501	2012 data
<b>Ethiopia</b>			3003	2012 data
<b>Gabon</b>				Average of Namibia and Botswana
<b>Gambia</b>				Average of Ghana Uganda and Malawi
<b>Ghana</b>			2213	2012 data
<b>Kenya</b>				Average of Ghana Uganda and Malawi
<b>Liberia</b>				Average of Ghana Uganda and Malawi
<b>Madagascar</b>				Average of Ghana Uganda and Zambia
<b>Malawi</b>			1847	2012 data
<b>Mali</b>				Average of Ghana Uganda and Malawi
<b>Mauritania</b>				Average of Ghana Uganda and Malawi
<b>Morocco</b>	1500			2009 data
<b>Mozambique</b>				Average of Ghana Uganda and Malawi
<b>Namibia</b>			1959	2012 data
<b>Nigeria</b>		2056	2651	Average of 2011-2012
<b>Rwanda</b>				Average of Ghana Uganda and Malawi
<b>Senegal</b>				Average of Ghana Uganda and Malawi
<b>Sierra Leone</b>				Average of Ghana Uganda and Malawi
<b>South Africa</b>		2724	2655	Average of 2011-2012
<b>Swaziland</b>				Average of Namibia and Angola
<b>Tanzania</b>				Average of Ghana Uganda and Malawi
<b>Tunisia</b>			2000	2012 data
<b>Uganda</b>			2343	2012 data
<b>Zambia</b>			2155	2012 data
<b>Sum</b>	1500	8153	32803	42456

In total 33 - out of these 19 African - countries', individual variables are estimated by using similar or nearby country data. Since the availability of the institutional data also limited the selection of the countries, we could involve only those nations that participated in the World Economic Forum 2011-2012 or 2012-2013 Global Competitiveness Report (GCR) survey. 24 of these 142 GCR countries were left out because the lack of similar or nearby GEM countries. The size of the sample in different years, the participating African countries and the calculation of the individual variables, including the 19 non GEM countries, are also reported in Table 2. The distribution of the sample by African countries and the calculation of the individual variables

While it seems peculiar to investigate so many countries with estimated individual data, we believe the validity of our approach and analysis because of three reasons. First, many African countries are similar to one another in many respects that could imply similarities in individual entrepreneurial performances. Second, we do have the institutional data for all the involved 33 African countries. As we know from previous analyses that institutional variables are the major determinants of the pillar scores, the sub-index values and the GEDI points missing individual data may seem to be less problematic than the lack of institutional data (Acs et al 2013). Since data about the African continent countries are limited we think that a partially limited analysis still can provide useful results as compared to a situation of completely missing analysis.

*Table 3. The Global Entrepreneurship and Development Index Rank of the Countries, 2011*

GEDI ranking	Country	Per capita GDP	GEDI	GEDI ranking	Country	Per capita GDP	GEDI
1	United States	42486	79.4	61	Macedonia	9451	38.0
2	Denmark	32582	77.1	62	Mexico	12814	37.9
3	Australia	34396	74.3	63	Jordan	5268	36.2
4	Sweden	35170	71.5	64	Serbia	9830	35.6
5	Taiwan		68.4	65	Botswana	13021	35.4
6	France	29819	68.2	66	Albania	7861	35.3
7	United Kingdom	32863	67.8	67	Namibia	5986	34.5
8	Switzerland	39412	67.3	68	Panama	13766	34.4
9	Netherlands	37112	66.1	69	Thailand	7635	34.2
10	Iceland	33516	66.0	70	Russia	14821	33.6
11	Finland	32027	65.7	71	Indonesia	4094	33.3
12	Singapore	53591	65.1	72	Nigeria	2237	33.3
13	Norway	46982	65.1	73	Kazakhstan	11568	33.0
14	Belgium	33127	64.1	74	Moldova	2975	32.8
15	Germany	34603	63.1	75	India	3203	32.6
16	Chile	15251	62.5	76	Trinidad & Tobago	22142	32.6
17	Ireland	36145	61.6	77	Morocco	4373	32.4
18	Austria	36139	61.5	78	Jamaica	7839	32.3
19	Puerto Rico	17300	59.4	79	El Salvador	6032	31.9
20	Israel	26720	58.0	80	Ukraine	6365	31.8
21	Estonia	18129	57.8	81	Gabon	13998	31.8
22	Qatar	77987	53.1	82	Bolivia	4503	31.6
23	Slovenia	24967	52.8	83	Algeria	7643	31.3
24	Korea	27541	52.2	84	Egypt	5547	30.8
25	Oman	25330	51.2	85	Paraguay	4858	30.7
					Bosnia and		
26	Saudi Arabia	21430	51.1	86	Herzegovina	7607	30.4
27	Bahrain		50.7	87	Ecuador	7655	29.7
28	Poland	18087	50.5	88	Philippines	3638	29.6
29	Colombia	8860	50.0	89	Brazil	10279	29.6
30	Lithuania	16877	49.9	90	Zambia	1431	28.9
31	Turkey	13468	49.7	91	Angola	5227	28.0
	United Arab						
32	Emirates11	42293	48.7	92	Venezuela	11258	28.0
33	Latvia	13773	48.7	93	Swaziland	5349	27.7
34	Kuwait	47935	48.5	94	Iran	6360	27.3
35	Spain	26917	47.8	95	Ghana	1652	26.7

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45	Malaysia	14174	43.3	105	Tanzania	1336	22.5
46	Lebanon	12900	42.6	106	Gambia	1597	22.4
47	Peru	9037	42.4	107	Rwanda	1132	22.1
48	Croatia	15954	41.5	108	Mozambique	861	21.6
49	Italy	27072	41.3	109	Côte d'Ivoire	1580	21.5
50	Cyprus	26046	41.2	110	Malawi	789	21.3
51	Barbados	16148	40.7	111	Ethiopia	979	21.1
52	Montenegro	10469	40.7	112	Madagascar	853	21.0
53	South Africa	9678	39.6	113	Burkina Faso	1149	20.9
54	Greece	22301	39.5	114	Mali	964	20.5
55	China	7418	39.5	115	Mauritania	2255	20.3
56	Tunisia	8258	39.2	116	Uganda	1188	20.1
	Dominican						
57	Republic09	8651	39.0	117	Sierra Leone	769	19.0
58	Argentina	15501	38.9	118	Bangladesh	1569	18.6
59	Brunei Darussalam	45707	38.5	119	Burundi	533	17.0
60	Costa Rica	10735	38.0	120	Chad	1343	16.5

Legend: African countries are highlighted in blue cells.

Per capita GDP is in 2005 constant price international \$ purchasing power parity

### What does this mean for Africa...

Before we launch into a discussion of the situation in Africa it is important to remember that Africa is not a country. This may seem obvious, but sometimes in the political dialogue of the day there is a tendency to over-aggregate and generalize about a continent which houses no less than 2,110 (30.5%) of the world's living languages (ethnologue 2012) and ethnic groups and countries whose borders were defined to varying degrees arbitrarily by foreign powers without consideration for local institutions. Nearly all of these countries achieved their independence to varying degrees between the 1960s and 1980s. If complex problems are like peeling an onion, with layers of subtleties, then discussing Africa is more like separating the seeds in a pomegranate with hundreds of compartmentalized variations.

Probably the most enduring colonial legacy for Africa however is not the centuries of war, forced deportation, subjugation, etc., but the legal regimes established by the colonial powers, primarily with the purpose of extracting resources for a diminishingly small group of elites. (Eggertson 2005) Regimes designed thusly are easily captured by political parties, revolutionaries or by more enterprising groups of armed men intent on extracting

the wealth for a much more narrow set of benefits than the greater public good (Marques 2011).

An example of this is how the influence of the second Portuguese republic's policies related to entrepreneurship, may have led to the creation of systems of business policy in the modern African states which were under Portuguese colonial rule. Recognizing that entrepreneurship may in fact lead to alternate sources of wealth and thus alternate sources of power, some southern Europe states have been particularly suspicious of entrepreneurial activity, and thus, endeavored to limit it. (Malefakis 1995) An example of this was the industrial regulation law of the second Portuguese republic which required any project designed to improve productivity or the transfer of industrial license or sale of a business to a foreign entity be approved by the government in advance Redford (2012). The Portugal of the second republic is the Portugal that these African states were most recently familiar with. Today, according to the 2012 Doing Business Indicators, these four states have some of the worst business rankings in the world with Cape Verde ranked the highest at (119), followed by Mozambique (139), Angola (172) and Guinea-Bissau (176) out of 184 countries reported.

In recent years, Africa has seemed to be on the mend. Several of Africa's countries have achieved substantial economic growth rates, and some, like Mozambique and Angola have been identified as rising economic stars (Economist 2012). Given this up and coming status, one could reasonably begin to ask, what can we say, continent wide about Africa with respect to a culture of entrepreneurship? In a continent where the vast majority of the economic activities of the countries are housed in the informal sectors, where bone grinding poverty is the reality for the vast majority of the continents population and where political stability seems more often a myth than a reality, what can we say about entrepreneurship policy to the extent that it is entirely different than business or even small enterprise policy, and what insights does the GEDI provide?

One approach might be to explore what insights are there from the GEDI and PFB approach for factor driven economies? These are economies where efficiency in basic factor production remains a challenge and where process innovation is crucial to their intermediate and long term success. In addition, Africa in one manner of speaking must compete with other developing regions in its efforts to assemble its talent and resources efficiently to create the entrepreneurship necessary to pull it into the 21st century. Figure II helps to illustrate visually what the ABE metric is capturing: how far out of alignment the entrepreneurship production process is in the factor driven economies. At present, most of the African economies except Angola, Morocco, Namibia, South Africa, Swaziland and Tunisia are treated as factor driven economies as they are thought to have entrepreneurial framework conditions where economic development is driven primarily by basic requirements like institutional development, basic infrastructure, macroeconomic stability, health and primary education. The approach of the PFB methodology is to suggest that the appropriate approach to policy is to focus on "rounding the circle" in Figure II in order to optimize the entrepreneurial ecology.



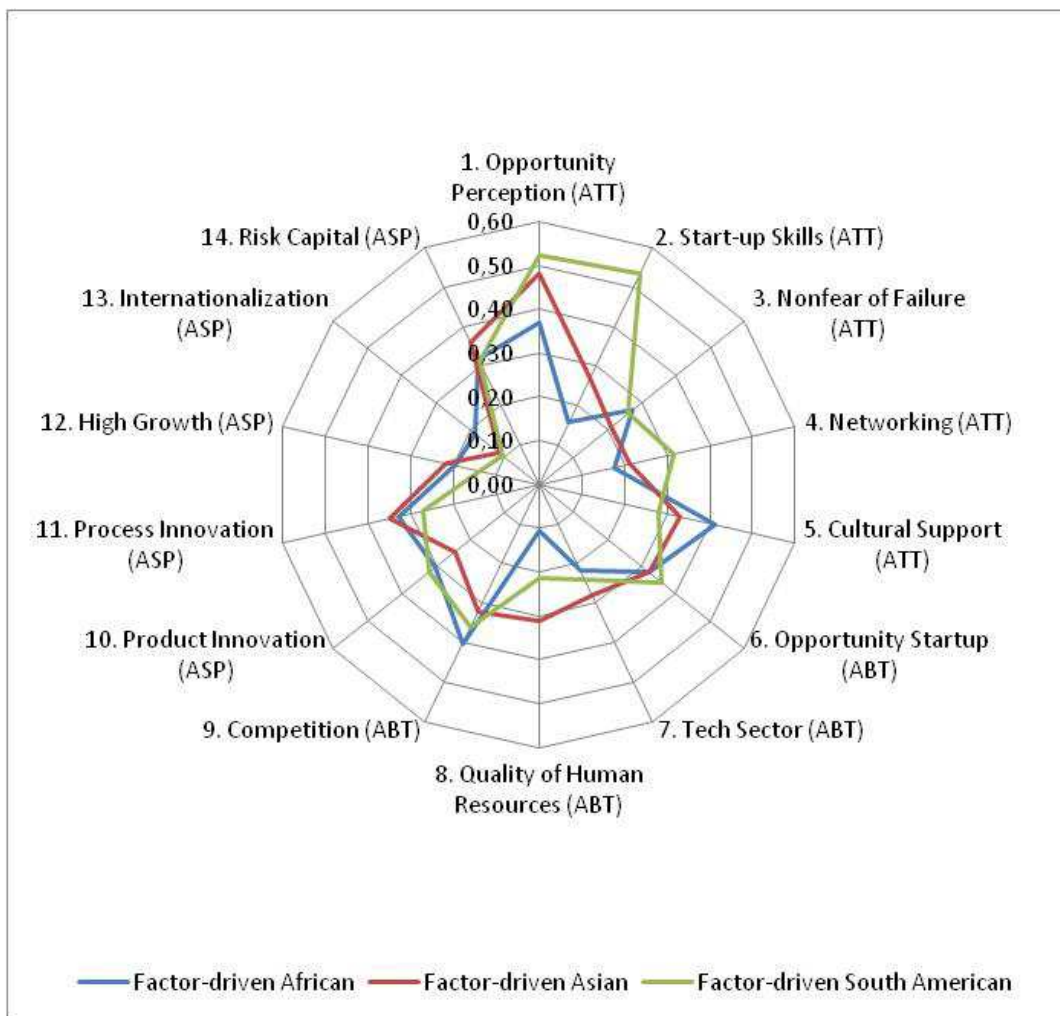


Figure II. *Relative Efficiency of Entrepreneurship Pillars in Factor Driven Economies (normalized scores)*

There are some general observations about what seem to be the big problems in Africa associated with the pillars of the model. Using the mode instead of the average to minimize the effects of outliers for the data in Table 2 The normalized score values of the 14 pillars of entrepreneurship in the African countries, the most depressed pillars are (1) Quality of Human resources (0.11), (2) Startup Skills (0.16) and (3) Networking (0.04), whereas the best pillars are (1) Cultural support (0.41), (2) Competition (0.40) and (3) Opportunity perception.

*Table 2 The normalized score values of the 14 pillars of entrepreneurship in the African countries (After equalizing the pillar averages)*

Country	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Algeria	0.68	0.39	0.45	0.23	0.40	0.36	0.32	0.15	0.26	0.31	0.28	0.23	0.21	0.50
Angola	0.63	0.06	0.23	0.29	0.24	0.31	0.22	0.25	0.23	0.38	0.46	0.23	0.63	0.39
Benin	0.38	0.24	0.41	0.09	0.44	0.28	0.22	0.11	0.45	0.35	0.28	0.21	0.15	0.31
Botswana	0.52	0.11	0.51	0.12	0.70	0.42	0.30	0.35	0.50	0.35	0.32	0.66	0.45	0.31
Burkina Faso	0.27	0.07	0.29	0.08	0.47	0.36	0.20	0.04	0.37	0.28	0.29	0.11	0.13	0.31
Burundi	0.10	0.06	0.14	0.05	0.23	0.34	0.19	0.04	0.39	0.21	0.31	0.10	0.10	0.31
Cameroon	0.58	0.23	0.28	0.12	0.31	0.29	0.22	0.14	0.49	0.36	0.28	0.22	0.15	0.31
Chad	0.21	0.04	0.14	0.06	0.23	0.15	0.19	0.04	0.34	0.27	0.27	0.11	0.12	0.31
Côte d'Ivoire	0.51	0.15	0.29	0.07	0.36	0.25	0.20	0.05	0.36	0.27	0.27	0.12	0.14	0.31
Egypt	0.50	0.41	0.22	0.34	0.39	0.24	0.28	0.19	0.28	0.28	0.31	0.61	0.20	0.34
Ethiopia	0.20	0.11	0.22	0.05	0.40	0.40	0.20	0.19	0.39	0.21	0.38	0.21	0.02	0.31
Gabon	0.68	0.12	0.36	0.15	0.38	0.34	0.29	0.24	0.39	0.34	0.44	0.39	0.48	0.34
Gambia	0.30	0.08	0.14	0.22	0.42	0.35	0.20	0.06	0.50	0.33	0.26	0.14	0.15	0.31
Ghana	0.63	0.22	0.42	0.23	0.57	0.42	0.21	0.05	0.40	0.14	0.27	0.28	0.17	0.31
Kenya	0.31	0.07	0.29	0.52	0.33	0.34	0.20	0.05	0.44	0.33	0.33	0.14	0.14	0.31
Liberia	0.21	0.81	0.14	0.08	0.50	0.33	0.20	0.05	0.49	0.33	0.35	0.14	0.09	0.31
Madagascar	0.32	0.08	0.29	0.06	0.39	0.37	0.19	0.04	0.39	0.28	0.28	0.12	0.12	0.31
Malawi	0.15	0.01	0.15	0.09	0.45	0.23	0.20	0.04	0.47	0.64	0.81	0.03	0.10	0.31
Mali	0.33	0.11	0.14	0.06	0.42	0.29	0.20	0.04	0.43	0.29	0.30	0.11	0.13	0.31
Mauritania	0.28	0.08	0.29	0.11	0.38	0.25	0.20	0.04	0.36	0.26	0.35	0.12	0.14	0.31
Morocco	0.52	0.21	0.51	0.66	0.46	0.55	0.18	0.07	0.36	0.15	0.40	0.31	0.71	0.31
Mozambique	0.31	0.09	0.29	0.10	0.38	0.37	0.20	0.04	0.46	0.26	0.29	0.11	0.14	0.31
Namibia	0.32	0.14	0.56	0.24	0.52	0.40	0.29	0.17	0.42	0.61	0.42	0.31	0.61	0.36
Nigeria	0.81	0.19	0.13	0.63	0.31	0.35	0.26	0.34	0.44	0.37	0.32	0.42	0.31	0.32
Rwanda	0.18	0.12	0.14	0.15	0.65	0.38	0.20	0.05	0.44	0.33	0.27	0.14	0.11	0.31
Senegal	0.41	0.15	0.43	0.33	0.44	0.33	0.21	0.04	0.43	0.32	0.34	0.14	0.15	0.31
Sierra Leone	0.25	0.04	0.29	0.05	0.38	0.30	0.20	0.04	0.35	0.22	0.27	0.11	0.11	0.31
South Africa	0.51	0.13	0.59	0.20	0.46	0.47	0.27	0.25	0.68	0.71	0.58	0.57	0.64	0.34
Swaziland	0.14	0.07	0.11	0.35	0.41	0.43	0.25	0.21	0.39	0.42	0.34	0.29	0.51	0.42
Tanzania	0.34	0.04	0.43	0.24	0.43	0.28	0.20	0.05	0.39	0.31	0.33	0.12	0.11	0.31
Tunisia	0.36	0.45	0.56	0.38	0.54	0.48	0.45	0.41	0.43	0.61	0.43	0.41	0.17	0.32
Uganda	0.21	0.17	0.28	0.26	0.35	0.25	0.18	0.05	0.31	0.16	0.31	0.07	0.16	0.31
Zambia	0.36	0.08	0.28	0.26	0.39	0.39	0.20	0.33	0.38	0.35	0.33	0.15	0.72	0.31

Legend: 1. Opportunity Perception (ATT), 2. Start-up Skills (ATT), 3. Nonfear of Failure (ATT), 4. Networking (ATT), 5. Cultural Support (ATT), 6. Opportunity Startup (ABT), 7. Tech Sector (ABT), 8. Quality of Human Resources (ABT), 9. Competition (ABT), 10. Product Innovation (ASP), 11. Process Innovation (ASP), 12. High Growth (ASP), 13. Internationalization (ASP), 14. Risk Capital (ASP)

The colors demonstrate the relative position of the particular country with respect to the representative pillar from the disadvantageous red position to the favorable green one. Here we are dealing only with the African countries. In the colors we can begin to see the relative position of countries with respect to their level of optimization across pillars.

If using the frequency of occurrences in the individual three worst pillars (Table 5), the most frequent three categories are the same. The quality of human resources seems inherently tied to education, and education in Africa is complicated. In addition to general concerns about how to build effective education systems that combine both access and quality, in recent years there has been considerable public debate in particular in South

Africa about the diminishing quality of education and specifically poor primary and secondary schooling (Taylor 2008). While space does not permit a robust discussion of this subject, from the perspective of an employer, finding qualified workers, educated locally at even a basic level can be a substantial challenge for any potential employer in many of the countries in the region and in particular the natural resource economies where competition for labor from cash rich mineral companies is fierce. This is even more complicated when the employer is a multinational located in a country with a less widely used official language (e.g. Portuguese), in part, because the more restricted the official language in terms of its global presence, the less access the country's educational system has to source materials, particularly in mathematics and the physical sciences as the lingua franca of the sciences is English.

In the GEDI, the quality of human resources is measured by the percentage of new firms started by individuals with education beyond the secondary level and within firm training. This measure stems from a vast literature pointing out the strong correlation with advanced education and successful entrepreneurial activity. It however points to a secondary consideration, the quality of tertiary education in Africa and by extension primary and secondary education. One way to evaluate the quality of secondary education is to ask to what extent are African countries seen as destinations for foreign students seeking degrees. This measure is important because exchange students are rarely talent limited, would perform well in nearly any academic environment, and are not typically financially constrained. As a result, their selection of school will be in some measure a function of the acceptability of the program as a credential in their home country or the suitability of coursework done in the exchange location as transfer credit at their home universities, and therefore, the exchange locations perceived quality – equal to that of the home country or university. While the US remains the country with the largest number of international students (Choudaha and Chang 2012), according to the 2011 Open Doors report and the Institute for International Education, South Africa (#13) with 4,313 US exchange students is the only African country which houses a substantial number of US international students and thus whose educational quality is deemed by American universities as adequate to accept for credit in their current accreditation scheme. This suggests that other African countries tertiary systems may be less than adequate with respect to quality and thus part of the reason for the poor performance of Africa in this respect. The relatively low academic qualification of entrepreneurs in this context may also explain the lack of within firm training provided by employers as less educated employers may not value education and training as highly, and may also be constrained in their business models to relatively low value added activities.

Given the importance of quality advanced education with respect to high value added entrepreneurship, programs intended to diminish poverty through entrepreneurship and micro-finance may in fact be ill conceived. A more successful approach might be to focus development assistance to medium size enterprises which have already addressed the basic start-up and labor force issues and have a business model that is relatively successful within the relevant operating and institutional milieu. It is also probable that the resources required to allow a firm of 100 people to add 10 additional positions is less than that required to create five or ten, stable, growing one to two person firms.

Table 3. *The worst three pillars of the GEDI index in the African countries*

<i>Countries</i>	<i>1st worst pillar</i>	<i>2nd worst pillar</i>	<i>3rd worst pillar</i>
<b>Algeria</b>	Quality of Human Resources	Internationalisation	Networking
<b>Angola</b>	Startup Skills	Tech Sector	Competition/High Growth
<b>Benin</b>	Networking	Quality of Human Resources	Internationalisation
<b>Botswana</b>	Startup Skills	Networking	Tech Sector
<b>Burkina Faso</b>	Quality of Human Resources	Startup Skills	Networking
<b>Burundi</b>	Quality of Human Resources	Networking	Startup Skills
<b>Cameroon</b>	Networking	Quality of Human Resources	Internationalisation
<b>Chad</b>	Quality of Human Resources	Startup Skills	Networking
<b>Côte d'Ivoire</b>	Quality of Human Resources	Networking	High Growth
<b>Egypt</b>	Quality of Human Resources	Internationalisation	Nonfear of Failure
<b>Ethiopia</b>	Internationalisation	Networking	Startup Skills
<b>Gabon</b>	Startup Skills	Networking	Quality of Human Resources
<b>Gambia</b>	Quality of Human Resources	Startup Skills	High growth/Nonfear of Failure
<b>Ghana</b>	Quality of Human Resources	Product Innovation	Internationalisation
<b>Kenya</b>	Quality of Human Resources	Startup Skills	High growth/Internationalisation
<b>Liberia</b>	Quality of Human Resources	Networking	Internationalisation
<b>Madagascar</b>	Quality of Human Resources	Networking	Startup Skills
<b>Malawi</b>	Startup Skills	High Growth	Quality of Human Resources
<b>Mali</b>	Quality of Human Resources	Networking	Startup Skills/High growth
<b>Mauritania</b>	Quality of Human Resources	Startup Skills	Networking
<b>Morocco</b>	Quality of Human Resources	Product Innovation	Startup Skills
<b>Mozambique</b>	Quality of Human Resources	Startup Skills	Networking
<b>Namibia</b>	Startup Skills	Quality of Human Resources	Networking
<b>Nigeria</b>	Startup Skills	Nonfear of Failure	Cultural Support
<b>Rwanda</b>	Quality of Human Resources	Startup Skills	Internationalisation
<b>Senegal</b>	Quality of Human Resources	High Growth	Startup Skills/Internationalization
<b>Sierra Leone</b>	Startup Skills	Quality of Human Resources	Networking
<b>South Africa</b>	Startup Skills	Networking	Quality of Human Resources
<b>Swaziland</b>	Startup Skills	Nonfear of Failure	Opportunity Perception
<b>Tanzania</b>	Startup Skills	Quality of Human Resources	Internationalisation
<b>Tunisia</b>	Internationalisation	Risk Capital	Opportunity Perception
<b>Uganda</b>	Quality of Human Resources	High Growth	Product Innovation/Internationalisation
<b>Zambia</b>	Startup Skills	High Growth	Tech Sector

On the plus side, Africa scores well with respect to cultural support, competition and opportunity perception. This may result from not only the market uniqueness but also the propensity for African firms to be small and its industries unconsolidated, having yet to achieve a critical mass or a dominant design, and despite some notable African multinationals in agriculture, banking and basic materials with the potential to improve

overall sector organization. Cultural support for entrepreneurship may stem from the ubiquity of the small firm by which we include the street vendor and a general lack of hostility in Africa for business people. Despite many African countries being seen as highly corrupt, Africans themselves may not cite corruption as an impediment to business as much as other entrepreneurs in other parts of the world; however, the emergence of informality in the present era as the dominant industrial design may be a reaction to corruption and reflect the relative ease of extracting rents from larger commercial entities. Competition as a strength may not be inherently obvious as many African markets may be more oligopolistic, controlled by powerful elites; however, these markets often do not really serve the vast majority of the population leaving open huge market segments for a new entrant aimed at the underserved marketplace.

Opportunity perception in particular may result from the increasingly positive market potential of Africa countries relative to the West (Economist 2012), and the cultural support resulting from the fact that nearly everyone is involved in some sort of business activity. Another factor influencing opportunity perception could be the very rapid urbanization of most African countries over the decades since independence. Many of Africa’s cities are among the largest urban agglomerations in the world, such as, Lagos, Cairo, Kinshasa, and the higher scoring countries in this category tend to have populations which are highly concentrated.

### So, what to make of the ABE efficiencies: Case examples

As can be observed from Table 6, the average bottleneck efficiencies for the African countries range from 67.5% in Tunisia to 27.3% in Malawi. This is a measure of how efficiently aligned the various pillars of entrepreneurship (Figure I) are to one another.

**Table 6.** *The Average Bottleneck Efficiency values for the African countries (ABE values are in percentages)*

Country	ABE	Country	ABE	Country	ABE
Algeria	46.2	Gabon	48.3	Namibia	59.9
Angola	47.7	Gambia	45.0	Nigeria	41.6
Benin	58.9	Ghana	45.4	Rwanda	33.4
Botswana	54.0	Kenya	48.9	Senegal	62.4
Burkina Faso	45.9	Liberia	30.5	Sierra Leone	51.3
Burundi	43.3	Madagascar	55.6	South Africa	62.2
Cameroon	45.5	Malawi	27.3	Swaziland	58.2
Chad	48.7	Mali	48.7	Tanzania	56.1
Côte d’Ivoire	42.6	Mauritania	56.0	Tunisia	67.5
Egypt	50.1	Morocco	50.9	Uganda	59.7
Ethiopia	55.3	Mozambique	48.8	Zambia	40.6

As noted earlier, the average bottleneck efficiency speaks to the relative skew of the entrepreneurship policies with the higher values corresponding to the more efficiently aligned policy environments.

We consult Table 7 to determine the ‘optimal’ allocation of and total effort required by pillar to achieve a 5 increase in the GEDI score. In Table 8 the row designated by the letter A reflects the required increase in the specific pillar and the letter B reflects the percentage of the total effort. In Egypt a total effort of 0.54 or 12% will be required to increment the GEDI index by 5%. Focusing in nearly equal measure on improving the Quality of Human Resources by 0.13 and Internationalization 0.12 pillars will cover 46% of the required effort followed by nearly equal efforts in enhancing Startup Skills by 0.09 and Opportunity Startup by 0.08. Minor increases in Competition and Product Innovation and Tech Sector policies will complete the task.

**Table 7. Simulation of ‘optimal’ policy allocation to increase the GEDI score by 5 in the African countries**

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total effort
Algeria	A	0	0	0	0.07	0	0	0	0.15	0.05	0	0.03	0.07	0.09	0	0.46
	B	0%	0%	0%	15%	0%	0%	0%	33%	11%	0%	7%	15%	20%	0%	9.64%
Angola	A	0	0.19	0.02	0	0.01	0	0.03	0	0.03	0	0	0.03	0	0	0.31
	B	0%	61%	6%	0%	3%	0%	10%	0%	10%	0%	0%	10%	0%	0%	6.81%
Benin	A	0	0.01	0	0.15	0	0	0.03	0.13	0	0	0	0.04	0.1	0	0.46
	B	0%	2%	0%	33%	0%	0%	7%	28%	0%	0%	0%	9%	22%	0%	11.70%
Botswana	A	0	0.16	0	0.15	0	0	0	0	0	0	0	0	0	0	0.31
	B	0%	52%	0%	48%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5.50%
Burkina Faso	A	0	0.11	0	0.1	0	0	0	0.14	0	0	0	0.07	0.05	0	0.47
	B	0%	23%	0%	21%	0%	0%	0%	30%	0%	0%	0%	15%	11%	0%	14.44%
Burundi	A	0.06	0.1	0.02	0.11	0	0	0	0.13	0	0	0	0.07	0.06	0	0.55
	B	11%	18%	4%	20%	0%	0%	0%	24%	0%	0%	0%	13%	11%	0%	21.50%
Cameroon	A	0	0.04	0	0.14	0	0	0.05	0.13	0	0	0	0.04	0.11	0	0.51
	B	0%	8%	0%	27%	0%	0%	10%	25%	0%	0%	0%	8%	22%	0%	12.82%
Chad	A	0	0.13	0.03	0.11	0	0.03	0	0.13	0	0	0	0.07	0.06	0	0.56
	B	0%	23%	5%	20%	0%	5%	0%	23%	0%	0%	0%	13%	11%	0%	22.53%
Côte d’Ivoire	A	0	0.05	0	0.13	0	0	0	0.15	0	0	0	0.08	0.06	0	0.47
	B	0%	11%	0%	28%	0%	0%	0%	32%	0%	0%	0%	17%	13%	0%	14.09%
Egypt	A	0	0	0.09	0	0	0.08	0.03	0.13	0.04	0.04	0.01	0	0.12	0	0.54
	B	0%	0%	17%	0%	0%	15%	6%	24%	7%	7%	2%	0%	22%	0%	11.77%
Ethiopia	A	0	0.09	0	0.15	0	0	0	0.01	0	0	0	0	0.18	0	0.43
	B	0%	21%	0%	35%	0%	0%	0%	2%	0%	0%	0%	0%	42%	0%	13.08%
Gabon	A	0	0.18	0	0.15	0	0	0	0.05	0	0	0	0	0	0	0.38
	B	0%	47%	0%	39%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	7.71%
Gambia	A	0	0.13	0.06	0	0	0	0	0.15	0	0	0	0.06	0.06	0	0.46
	B	0%	28%	13%	0%	0%	0%	0%	33%	0%	0%	0%	13%	13%	0%	13.34%
Ghana	A	0	0	0	0	0	0	0.02	0.17	0	0.08	0	0	0.05	0	0.32
	B	0%	0%	0%	0%	0%	0%	6%	53%	0%	25%	0%	0%	16%	0%	7.40%
Kenya	A	0	0.13	0	0	0	0	0	0.15	0	0	0	0.06	0.06	0	0.4
	B	0%	33%	0%	0%	0%	0%	0%	38%	0%	0%	0%	15%	15%	0%	10.53%
Liberia	A	0	0	0.04	0.1	0	0	0	0.14	0	0	0	0.05	0.09	0	0.42
	B	0%	0%	10%	24%	0%	0%	0%	33%	0%	0%	0%	12%	21%	0%	10.42%
Madagascar	A	0	0.1	0	0.12	0	0	0	0.14	0	0	0	0.06	0.06	0	0.48

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Malawi	B	0%	21%	0%	25%	0%	0%	0%	29%	0%	0%	0%	13%	13%	0%	14.83%
	A	0	0.13	0	0.05	0	0	0	0.1	0	0	0	0.12	0.04	0	0.44
Mali	B	0%	30%	0%	11%	0%	0%	0%	23%	0%	0%	0%	27%	9%	0%	12.01%
	A	0	0.07	0.04	0.12	0	0	0	0.14	0	0	0	0.07	0.05	0	0.49
Mauritania	B	0%	14%	8%	24%	0%	0%	0%	29%	0%	0%	0%	14%	10%	0%	15.44%
	A	0	0.11	0	0.09	0	0	0	0.15	0	0	0	0.07	0.05	0	0.47
Morocco	B	0%	23%	0%	19%	0%	0%	0%	32%	0%	0%	0%	15%	11%	0%	14.89%
	A	0	0.01	0	0	0	0	0.05	0.15	0	0.07	0	0	0	0	0.28
Mozambique	B	0%	4%	0%	0%	0%	0%	18%	54%	0%	25%	0%	0%	0%	0%	5.18%
	A	0	0.1	0	0.08	0	0	0	0.15	0	0	0	0.08	0.05	0	0.46
Namibia	B	0%	22%	0%	17%	0%	0%	0%	33%	0%	0%	0%	17%	11%	0%	13.74%
	A	0	0.16	0	0.07	0	0	0.01	0.13	0	0	0	0	0	0	0.37
Nigeria	B	0%	43%	0%	19%	0%	0%	3%	35%	0%	0%	0%	0%	0%	0%	6.89%
	A	0	0.12	0.19	0	0	0	0.05	0	0	0	0	0	0.01	0	0.37
Rwanda	B	0%	32%	51%	0%	0%	0%	14%	0%	0%	0%	0%	3%	0%	0%	7.12%
	A	0.01	0.07	0.05	0.04	0	0	0	0.15	0	0	0	0.06	0.08	0	0.46
Senegal	B	2%	15%	11%	9%	0%	0%	0%	33%	0%	0%	0%	13%	17%	0%	13.22%
	A	0	0.06	0	0	0	0	0	0.17	0	0	0	0.07	0.05	0	0.35
Sierra Leone	B	0%	17%	0%	0%	0%	0%	0%	49%	0%	0%	0%	20%	14%	0%	8.68%
	A	0	0.14	0	0.12	0	0	0	0.13	0	0	0	0.06	0.06	0	0.51
South Africa	B	0%	27%	0%	24%	0%	0%	0%	25%	0%	0%	0%	12%	12%	0%	17.45%
	A	0	0.15	0	0.08	0	0	0.02	0.03	0	0	0	0	0	0	0.28
Swaziland	B	0%	54%	0%	29%	0%	0%	7%	11%	0%	0%	0%	0%	0%	0%	4.37%
	A	0.09	0.16	0.12	0	0	0	0	0.02	0	0	0	0	0	0	0.39
Tanzania	B	23%	41%	31%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	9.00%
	A	0	0.15	0	0	0	0	0	0.14	0	0	0	0.06	0.08	0	0.43
Tunisia	B	0%	35%	0%	0%	0%	0%	0%	33%	0%	0%	0%	14%	19%	0%	12.04%
	A	0.02	0	0	0	0	0	0	0	0	0	0	0	0.21	0.07	0.3
Uganda	B	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	70%	23%	0%	5.02%
	A	0.01	0.04	0	0	0	0	0.03	0.16	0	0.06	0	0.14	0.05	0	0.49
Zambia	B	2%	8%	0%	0%	0%	0%	6%	33%	0%	12%	0%	29%	10%	0%	15.94%
	A	0	0.18	0	0	0	0	0.06	0	0	0	0	0.11	0	0	0.35
	B	0%	51%	0%	0%	0%	0%	17%	0%	0%	0%	0%	31%	0%	0%	7.72%

Legend: A = required increase in pillar; B = percentage of total effort. 1. Opportunity Perception (ATT), 2. Start-up Skills (ATT), 3. Non-fear of Failure (ATT), 4. Networking (ATT), 5. Cultural Support (ATT), 6. Opportunity Startup (ABT), 7. Tech Sector (ABT), 8. Quality of Human Resources (ABT), 9. Competition (ABT), 10. Product Innovation (ASP), 11. Process Innovation (ASP), 12. High Growth (ASP), 13. Internationalization (ASP), 14. Risk Capital (ASP)

In Gabon a total effort of 0.38 units is required to increment the index by 5, but unlike in Egypt where the systems is less completely aligned, efforts in Burundi will require a narrower effort covering 3 of the 14 pillars. Where should the authorities in Gabon begin? As Table 7 suggests, the authorities in Gabon will get the biggest return on their policy investment by focusing their efforts sequentially on improving startup Skills followed by Networking. This will comprise 86% of the necessary effort to raise the index by 5 units. The Quality of Human Resources requires the remaining 13% of the total effort.

### A middle case: Angola

Angola is a land of contradictions. With approximately M18 inhabitants on 1.247 million square kilometers it is nearly twice the size of the USA state of Texas with 20% fewer people. The country has vast land, water and other natural resources. Most of its population is concentrated within 100 miles of the coast in its six major cities: Luanda, Benguela, Huambo, Lubango, Cabinda City and Namibe. It, along with its cousin

Mozambique, is one of Africa's fastest growing economies, and like Mozambique relatively recently emerged from a long, bloody civil war. Together they may represent two of Africa's rising economic powerhouses. To illustrate the point, the Economist (2011) recently noted that Portuguese citizens, hard pressed to find work in their native country, were heading to Angola to look for jobs, and Mozambique has been growing at an annual rate of 8% for 15 years with no indication of slowing (Economist 2012b).

Real GDP growth in the country has ranged from 3.1% in 2001 to 20.6% in 2005 and its growth remained positive through the period of the global economic crisis; however, there are wild swings in annual growth rates and some fears of currency instability linger. At first glance one may be tempted to think this growth is driven largely by the oil sector, and oil and diamonds do represent Angola's export economy, but Angola's non-oil sectors have grown since 2001 at rates between 25.9% in 2006 and 7.8% in 2002. Inflation, while still high, has fallen to the low teens. Despite this, Angola, which has recently improved its sovereign debt ratings to within shot of investment grade and moved into the club of the middle income countries, continues to have some of the worst social indicators in Africa.

From a policy perspective, the country's government accounts for 40-50% of GDP and its state oil monopoly, Sonangol, is often tasked with chores outside of its parent industry – like the construction of houses. The government has a strong grasp on the commercial environment, and yet, seems at times to lack the human capital to pursue multiple policy objectives simultaneously. With respect to entrepreneurship policy, Angola's government has focused largely on the financial sector enhancements, recently authoring a new foreign investment law and beginning increasingly to put efforts in greater financial transparency. These efforts may be why Risk Capital in the GEDI methodology is not considered a constraint to entrepreneurship in the country.

Because of this and its ABE score of 47.7%, Angola begins to represent what we might call a middle case in the efficient production of positive entrepreneurial activity. Angola requires a total effort of 0.31 in order to increment the index by 5 points. Examining Angola's scaled scores in Table 4 The normalized score values of the 14 pillars of entrepreneurship in the African countries it is easily observed that the country's scores range rather dramatically from 0.63 (Opportunity Perception and Internationalization) to 0.06 (Startup Skills). Its best GEDI pillars are Opportunity Perception (0.63), Internationalization (0.63) and Process Innovation (0.46), and its areas of greatest needs are Start-up Skills (0.06) Tech Sector (0.22) and Competiton and High growth (0.23). This does not mean that areas such as Risk Capital (0.39) are not suitable for investment or that their distribution is not unequal, it is merely that investment in these areas will not have as big a payback as investing in other more neglected areas of the economy, and unlike a strategy that picks key sectors, entrepreneurial firms are supra-sectoral as neither small firms nor entrepreneurial firms constitute an economic sector in the production sense of the usage.

Of the 6.8% effort required to raise the GEDI by 5 and improve the balance in the country's entrepreneurship policy environment, Angola should focus most of its effort (61%) on Startup Skills (0.06). This represents the lowest hanging fruit in terms of return on effort in enhancing the entrepreneurship landscape. The country has a nascent effort with USAID



to create an entrepreneurship curriculum in the public primary-secondary educational system, an international MBA-like curriculum at the Catholic University of Angola and several, highly uncoordinated business incubator projects around the country. Improving such programs and coordinating their capacity to build entrepreneurial skills within the population, including among its better educated citizenry would provide the greatest payoff in terms of entrepreneurial capacity. Examples of how this might be accomplished would be to build exchange partnerships with US and European business schools, secondary entrepreneurial education programs including those like the US junior achievement, 4-H and Future Farmers of America and working with programs like the Global Small Business Development Center at the University of Texas at San Antonio. In addition, placing greater efforts on improving basic numeracy and literacy is a key component in being able to address the Start-up Skill pillar to improve both job skill based instruction and basic numeracy and literacy in the current adult population as well as in the country's youth. At present, Angola's access to technology and its inter-regional trade is severely constrained by a general lack of English literacy throughout the population. This limits its ability to seek, find and exploit novel technologies for its own advancement and limits the population's capacity to engage more broadly in both inter-regional and international trade, as well as, constrains the options available to its young people to pursue advanced education in leading technology countries.

Subsequently, Angola could focus on improving the access of small firms and business in general to novel technology thereby addressing the Tech Sector pillar (0.22) of the GEDI. The Tech Sector pillar could for example be enhanced not only by improving access to business technologies like IT but also by incorporating well targeted basic agricultural research aimed at developing enhanced strains of agriculturally important plants and livestock, improved dry farming techniques and agricultural product processing. Additionally, the development of an entrepreneurship observatory aimed at improving the development and use of novel technological resources by entrepreneurs such as mobile banking, marketing and business services could round out a strategy for address Tech Sector weaknesses in the entrepreneurial milieu.

After addressing Start-up Skills and Tech Sector, Angola could then move in turn to the next group of pillars: Non-fear of Failure (0.23), Competition (0.23), High Growth (0.23) and Cultural Support (0.24).

### **What does a development glide path look like with GEDI ...**

As we think about how to use the insights gleaned from GEDI in a development context, we are first struck by the ability of the index to help us begin to sort through the myriad of possible approaches and make sense of a very complex environment. While we have, at least initially, treated Africa as a whole, nothing could be farther from the truth – Africa is no monoculture. This makes formulating coherent, cross-country development policy and remediating skill gaps among entrepreneurs difficult at best. This is especially true if development is to be broad based across the full ethnic and social landscape. It is however important to remember that development is an idiosyncratic phenomenon, unique

to the particular country and its context. The specific steps necessary will depend on the specific, evolving environment, but the GEDI assists us in knowing where our focused efforts should yield their greatest returns and avoid simply shopping around a particular development snake-oil for all those who will buy it.

We are also struck with the recurrence of three primary analytical pillars: Quality of Human Resources, Start-up skills, Networking. These three areas are primarily, optimally remediated via different types of education and knowledge accumulation measures such as the post secondary education enrollment, staff training and development and internet penetration. It worth noting that two out of these three pillars belong to the Entrepreneurial Attitudes sub-index and the Quality of Human Resources belongs to the Entrepreneurial Ability sub-index. So Africa's major problem is not to improve the Entrepreneurial Aspirations related finance or innovation but to develop education and basic infrastructure. Basic knowledge capital accumulation can be translated into simple approaches like the incorporation of mobile technology into basic business activities like finance, improving overall business processing as well as improving the stock of basic knowledge necessary to adapt advanced technology to the local natural and commercial environments.

Future policy work should involve fleshing out in greater detail potential policy prescriptions consistent with our findings, testing the substitutability of the various pillars, but also because we presently only have data for a fraction of Africa's countries further investment in the instruments and analytical techniques are warranted.

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