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# The Links between Business Environment, Economic Growth and Social Equity: A Study of African Countries

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## ABSTRACT

This paper examines the relationship between the business environment, economic growth, urbanization, female labor force participation, and child mortality in African countries. Our method is to estimate the dependent variables, that is, growth and development factors, regressed on various groups of independent variables, that is, business development indicators. Our results show that the business environment has an impact on these economic and social variables. Specifically, stronger economic growth is associated with improvements in the environment for starting a business. Female labor force participation improves under conditions of better contract enforcement. Decreased child mortality is likewise associated with improvements in ease of starting a business, access to permits, and contract enforcement. The rate of urbanization shows weaker correlation with business environment variables suggesting that it is driven by other broader factors. We posit policy implications based on the reported correlations and associations, tying social equity and economic benefits to strengthened business environment variables.

## KEYWORDS

Business environment; economic growth; social equity; urbanization; female labor force participation; child mortality; poverty

## 1. Introduction

The policy syndrome or problem statement in this article is how institutional structures affect social equity and the ability of individuals to engage in economic activities. Institutions determine “rules of the game” (North, 1990) upon which the business environment is premised (Campbell, 2004; Crouch, 2005). In the absence of strong institutions the compelling question on the impact of the business environment on social equity and economic growth has been insufficiently answered, which constitutes a gap in the literature. Whilst social equity can capture a variety of variables (Adelman & Morris, 1973; Aghion, Caroli, & Garcia-Penalosa, 1999; Ranis, Stewart, & Ramirez, 2000), our empirical focus is on GDP growth, female workforce participation, child mortality, and urban population, intended to identify and address shortcomings in our understanding. These dimensions are tied to the business environment given the prior literature linking business facilitation to regulatory compliance and corruption (Hallward-Driemeier & Pritchett, 2015). To address the gaps in the literature we evaluate how economic growth,

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urbanization, and social equity characterized by female labor force participation and child mortality are affected by business environment factors such as ease of starting a business, getting construction permits, enforcing contracts, paying taxes, and getting credit. We show how our enhanced understanding is relevant for policy. African country data is used in the analysis.

Institutions and the structures they provide are relevant for economic growth and activity for a number of reasons. First, institutions are important for growth and social outcomes. Second, these institutions are typically measured indirectly or in ways that link very poorly to actual policies countries can pursue. Third, indicators for doing business are an attempt to directly measure how well various aspects of institutions work, in ways that link to government regulatory policies. Fourth, the literature on the importance of the various “doing business” indicators for growth and social outcomes is mixed. We believe that the record of “doing business” indicators in growth regressions is weak, see e.g. Naude (2013) and Izurieta (2017).

We contribute to this literature by reporting on factors independently considered in prior developmental economic modeling (Meier, 2000; Todaro & Smith, 2009) that certain business environment elements affect economic growth positively in relation to starting a business. Female labor force participation improves under conditions of better contract enforcement. Decrease in child mortality is associated with improvements in ease of starting a business, access to permits, and contract enforcement. The rate of urbanization shows weak correlation with business environment variables. Our findings reinforce the view that there are positive economic benefits for countries to be derived from fine tuning aspects of the business environment.

The business development indicators in our study are selected from five informative categories: Starting a Business, Dealing with Construction Permits, Paying Taxes, Enforcing Contracts, and Getting Credit. This aligns with prior research approaches (see Hermes & Lensink, 2013; and also; La Porta & Shleifer, 2014). These categories constitute what we consider to be the key features of enabling business environments. Each of these categories includes a summarizing measure known as the distance to frontier and for each of these categories, except Getting Credit, we include additional influencing variables.

The paper is organized as follows: Section 2 provides a literature review and discussion. Section 3 presents the data, research design, models, and conducts regression analysis. Section 4 shows regression results which are discussed. Section 5 concludes.

## 2. Literature review and discussion

### 2.1. What do we know about poverty, institutions, and economic growth?

Recent studies demonstrate the relationship between growth and institutions (Powelson, 2015; Weintraub, 2016). Empirical evidence supports the notion of a positive relationship between democracy and economic growth (Acemoglu, Gallego, & Robinson, 2014; De Haan & Siermann, 1995; Knutsen, 2013; Lewis, 2013). A number of scholars show specifically that political institutions have an impact on growth, especially in Africa (Fosu, 2015; Herbst, 2014; Rodrik, Subramanian, & Trebbi, 2004; Scully, 2014). Resource-rich countries stand out by exhibiting poor economic growth due to poor institutions

(see Barma, Kaiser, & Le, 2012; Bhattacharyya & Hodler, 2014; Keefer, 2004; Mkandawire, 2015; North, 1990; Olson, 1993). These studies reveal that institutional factors of significance include governance and promoting the rule of law. Largely, these factors are commonly weak in many African countries, contributing to poor economic growth and persistently high poverty levels.

Growth theorists identify certain factors that influence growth as institutions, geography, trade (Auer, 2013; Francois & Manchin, 2013; Levchenko, 2013; Rodrik et al., 2004). Institutions in particular have a principal effect that persists in the post-colonial periods (Austin, 2015; Jerven, 2015; Jones, 2013; Michalopoulos & Papaioannou, 2013). Other analyses extend on institutional factors covering political, regional, religious, and historical factors (Berg, Ostry, & Zettelmeyer, 2012; Delgado, Ketels, Porter, & Stern, 2012; Dollar, Kleineberg, & Kraay, 2015) as well as clusters (Dasanayaka & Sardana, 2015). O'Connell (2004) summarizes the findings of case studies undertaken in 27 African countries, under the African Economic Research Consortium (AERC) "Explaining African Economic Growth" project. First, it was found that weak institutions in Africa have produced volatility in economic growth. Second, in line with the interest-group theory, the findings reveal that in cases where power is occupied by narrow interest groups, these groups are capable of choosing ruinous growth policies. Third, cycles in government expenditure have contributed to non-sustainability and reversals in economic growth. Finally, inefficient transfers have been used to "buy peace" in geographically polarized situations.

It is known that regulatory and institutional environments imposed by governments and the political and economic environment, influence the growth of entrepreneurship activity (George, Kotha, Parikh, Alnuaimi, & Bahaj, 2015; Kalantaridis & Fletcher, 2012). We categorize micro institutions as those that affect the operations of private enterprises and entrepreneurship activities more directly. Past research indicates that in low-income countries, businesses face more regulation than in higher income countries. On average, businesses face three times the administrative costs and nearly twice as many bureaucratic procedures as in high-income countries (Morisset & Lumenga-Neso, 2002; World Bank, 2005). Second, in low-income countries complex regulatory mechanisms force small businesses to operate in the informal sector. Finally, regulatory reform and relaxation of bureaucratic requirements allow small businesses to spend less time on regulatory issues and more on business issues. Our focus on social equity stems from the UN sustainable development goals' (SDGs) notion of that which is good and desirable in society. Holden, Linnerud, and Banister (2016) expand on this noting that a model for sustainable development should be based on three moral imperatives: "satisfying human needs, ensuring social equity, and respecting environmental limits". We consider social equity within this perspective of countries seeking to balance economic activity with human behavior and social targets that enable social equity.

Some interplay also exists between groups in their ability to influence policies in their favor (Gilpin, 2016; Peltzman, 1976; Stigler, 1971; Thomson, 2016). According to this perspective, the impact of policies and institutions on poverty-reduction depends on the ability of the poor to influence outcomes in their favor. Female workforce participation has been argued to play a significant role as

a measure of social equity as much as a driver of economic growth (Doepke & Tertilt, 2014; Duflo, 2012; Elborgh-Woytek et al., 2013). In the same spirit, Acemoglu and Robinson (2013) and Acemoglu et al. (2014) argue that it is those who have lost political power who block technological progress, leading to what may be termed a “political loser hypothesis”. The process of diffusion of power and the extension of democracy assists in avoiding social unrest (Halpern, 2015; Hart, 2015; Haynes, 2013; Salehyan & Linebarger, 2015). Field et al., (2017) examine a large sample of borrowers in India from 1999–2015. They find that access to loans has a substantial impact on female labor force participation in the long-run, and significantly increases female participation in household businesses. These findings suggest that financial systems and policies could have strong social impact.

Some argue for a “big-bang” approach where specific initial conditions among countries, in 1960, are considered and found to be determinants of economic growth over time (see Levine & Renelt, 1992; Sala-I-Martin, 1997; Sala-I-Martin, Doppelhofer, & Miller, 2004). These studies run cross-country regression equations which include initial conditions such as initial real per capita income, initial life expectancy at birth, and initial primary school enrollment ratio. Similarly, Ncube, Anyanwu, and Hausken (2014) show that decreased economic growth and increased poverty follow from income inequality, and that decreased economic growth follows from low previous growth rate, unfavorable exchange rate, high government consumption expenditure or government burden, low initial per capita GDP, high inflation and low primary education.

## 2.2. Theoretical foundations

The growth and development literature is vast. Our approach rests on the approaches used by developmental economists interested in growth and social equity issues and the business environment. Let us consider a few examples. Thirlwall and Pachero-Lopes (2017) provide a rigorous introduction to the theory of development economics and the experience of developing countries. Todaro and Smith (2009) offer a leading textbook, with a balanced introduction to economic development and policy issues. Meier (2000) attempts to bridge the old and new generations of development economists. Hopwood, Mellor, and O’Brien (2005) map different approaches to sustainable development, combining environmental and socio-economic issues. Sala-i-Martin (2006) estimates income distributions, poverty rates, and inequality and welfare indices for African countries for the period 1970–2000. He showed that African poverty is falling and is falling rapidly toward achievement of development goals. He also shows that the growth spurt that began in 1995 decreased African income inequality instead of increasing it. Sala-i-Martin (2006) also shows that African poverty reduction cannot be explained by a large country effect or indeed by endowment with some beneficial geographical or historical characteristics. However, the conditions for doing business as a driver of growth and poverty reduction, and general social equity, have not been analyzed and a number of these issues remains unresolved.

### 3. Data, research design and regression analysis

#### 3.1. Data and descriptive statistics

The data for this study was extracted from two sources. The four dependent variables are obtained from the World Bank development indicators 2004–2011.<sup>1</sup> The 16 independent explanatory variables were extracted from the WB Doing Business Indicators 2004–2011.<sup>2</sup> The study is comprehensive in covering 54 countries over eight years (periods).<sup>3</sup> Table 1 contains the descriptive statistics for all the data, that is, for the four dependent and 16 independent variables for the 54 countries over the eight years 2004–2011. Multiplying 54 countries with eight years gives 432 as the theoretical maximum number  $N$  of units for each of the  $4 + 16 = 20$  variables. This number  $N$  of units is shown in column 2 from the left in Table 1 Panel B. For 18 of the 20 variables the number  $N$  is lower than 432 due to missing data for some countries and years. We have complete data for only two dependent variables, *Mort\_under5<sub>it</sub>* and *Urban\_Pop<sub>it</sub>*. The unit of analysis is the individual country per year. The average growth rate in Africa during the period under study is 5% per annum. In 2008 the lowest GDP growth was recorded in Zimbabwe at –17.7% and the highest growth of 38% was recorded in 2004 in Equatorial Guinea.

Female labor force participation reflects the number of females aged 15–64 years as a percentage of the total labor force. This measure averages 42% but there is wide inter-country variation with the largest being 54% (Mozambique in 2004) and the lowest being 14.7% (Angola in 2004). In many African countries, the informal economies are large and significant and therefore the numbers are underreported. Data quality of female labor participation may be compromised and needs scrutiny. We acknowledge that this measure only partially conveys the economics contribution (International Labour Organization [ILO], 2010; Verick, 2014). Casale and Posel (2002) discuss “measuring women’s labour force participation,” literature and trends, data issues, and the feminization of the labor force between 1995 and 1999. They state: “Two main possible sources of data are the Census and the October Household Surveys. Neither data source is without problems, but the Census is perhaps less appropriate for a study of labour market activity” (page 160).

On wellbeing, as measured by child mortality, again there is wide variation from 13.7 out of 1,000 (Seychelles consistently over the sample period) to 219.5 out of 1,000 (Sierra Leone consistently over the period), with the average being 102.5 out of 1,000.

On the rate of urbanization as measured by % of urban population again we see wide inter-country variation from 9.1% (Burundi over the entire period) to 86.1% (Gabon) and averaging 40.3% across the sample.

The business development indicators are selected from four categories: Starting a Business, Dealing with Construction Permits, Paying Taxes, Enforcing Contracts, and Getting Credit. These categories constitute what we consider to be the key binding business environment. Each of these variables incorporates the notion of distance to frontier. In addition to these there are additional explanatory variables as shown in Table 1.

<sup>1</sup><https://data.worldbank.org/indicator?tab=all>, retrieved March 12, 2019.

<sup>2</sup><http://www.doingbusiness.org/en/data>, retrieved March 12, 2019.

<sup>3</sup>South Sudan is the newest African country and there is no data available.

**Table 1. Panel A:** Data Source, Variable Names, Description, and Metric for the Four Dependent and 16 Independent Variables. The Data for This Study Was Extracted from Two Sources. The Four Dependent Variables are Obtained from the World Bank Development Indicators 2004–2011. The 16 Independent Explanatory Variables are Extracted from the World Bank Doing Business Indicators 2004–2011.

4 + 16 variable names	Description	Metric
<b>Four dependent variables</b>		
<i>GDP_Growth<sub>it</sub></i>	GDP growth	Annual %
<i>Labor_FemalePart<sub>it</sub></i>	Labor force, female	% of total labor force
<i>Mort_under5<sub>it</sub></i>	Mortality rate, under-5 yrs old	per 1,000
<i>Urban_Pop<sub>it</sub></i>	Urban population	% of total
<b>16 independent variables</b>		
<i>SB_DTF<sub>it</sub></i>	Starting a Business Distance to Frontier	Real number between 0 (minimum performance) and 100 (maximum performance)
<i>SBProcs<sub>it</sub></i>	Starting a Business number of procedures	Integer number 0,1,2, ...
<i>SBTimedays<sub>it</sub></i>	Starting a Business time measured by number of days	Integer number 0,1,2, ...
<i>SBCost<sub>it</sub></i>	Starting a Business cost	% of income per capita
<i>SBPIC<sub>it</sub></i>	Starting a Business paid-in minimum capital	% of income per capita
<i>CP_DTF<sub>it</sub></i>	Dealing with Construction Permits Distance to Frontier	Real number between 0 (minimum performance) and 100 (maximum performance)
<i>CPProcs<sub>it</sub></i>	Dealing with Construction Permits number of procedures	Integer number 0,1,2, ...
<i>CPTimedays<sub>it</sub></i>	Dealing with Construction Permits time measured by number of days	Integer number 0,1,2, ...
<i>EC_DTF<sub>it</sub></i>	Enforcing Contracts Distance to Frontier	Real number between 0 (minimum performance) and 100 (maximum performance)
<i>ECTimedays<sub>it</sub></i>	Enforcing Contracts time measured by number of days	Integer number 0,1,2, ...
<i>ECCostofclaim<sub>it</sub></i>	Enforcing Contracts cost	% of claim
<i>PT_DTF<sub>it</sub></i>	Paying Taxes Distance to Frontier	Real number between 0 (minimum performance) and 100 (maximum performance)
<i>PTPayperyr<sub>it</sub></i>	Paying Taxes Payments (number per year)	Integer number 0,1,2, ...
<i>PThrsperyr<sub>it</sub></i>	Paying Taxes Time (hours per year)	Integer number 0,1,2, ...
<i>PTtax_profit<sub>it</sub></i>	Paying Taxes Total tax rate	% of profit
<i>GC_DTF<sub>it</sub></i>	Getting Credit Distance to Frontier	Real number between 0 (minimum performance) and 100 (maximum performance)

**Panel B:** Descriptive statistics of the four dependent and 16 independent variables. See Table 1 Panel A for variable name abbreviations.

<b>Dependent Left Hand Side variables</b>	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>GDP_Growth<sub>it</sub></i>	404	5.00	4.56	−17.67	38.00
<i>Labor_FemalePart<sub>it</sub></i>	416	42.25	8.83	14.73	54.50
<i>Mort_under5<sub>it</sub></i>	432	102.55	48.70	13.70	219.50
<i>Urban_Pop<sub>it</sub></i>	432	40.32	17.53	9.15	86.15
<b>Independent Right Hand Side Variables</b>	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>SB_DTF<sub>it</sub></i>	383	52.68	21.17	1.47	92.27
<i>SBProcs<sub>it</sub></i>	383	10.35	2.83	4	18
<i>SBTimedays<sub>it</sub></i>	383	50.87	44.78	6	260
<i>SBCost<sub>it</sub></i>	383	163.74	233.71	1.4	1540.2
<i>SBPIC<sub>it</sub></i>	383	202.08	294.04	0	1964.2
<i>CP_DTF<sub>it</sub></i>	299	57.48	15.32	13.28	86.52
<i>CPProcs<sub>it</sub></i>	299	14.65	5.07	7	40
<i>CPTimedays<sub>it</sub></i>	299	199.98	94.95	74	599

(Continued)



**Table 1.** (Continued).

**Panel B:** Descriptive statistics of the four dependent and 16 independent variables. See Table 1 Panel A for variable name abbreviations.

<i>EC_DTF<sub>it</sub></i>	383	48.75	11.76	25.22	66.86
<i>ECTimedays<sub>it</sub></i>	383	682.05	267.37	230	1715
<i>ECCostofclaim<sub>it</sub></i>	383	49.30	34.57	14.3	151.8
<i>PT_DTF<sub>it</sub></i>	305	53.45	19.62	11.98	91.45
<i>PTPayperyr<sub>it</sub></i>	305	38.20	12.91	8	67
<i>PTThrsperyr<sub>it</sub></i>	305	327.78	195.55	66	1120
<i>PTtax_profit<sub>it</sub></i>	305	70.02	69.43	14.2	339.1
<i>GC_DTF<sub>it</sub></i>	346	30.44	18.07	6.25	81.25

As can be seen in Table 1 there is wide variation in each of these variables across countries, which the distance to frontier also captures. Table 2 contains the correlations for the dependent and independent variables. In Table 2 Panel A five of six correlations are statistically significant at 10% or lower. In Table 2 Panel B 72 of 120 correlations are statistically significant at 10% or lower. The correlations are not individually high enough to cause concern of redundancy of variables.

Figures 1–4 present scatter plots of the four dependent variables, *GDP\_Growth<sub>it</sub>*, *Labor\_FemalePart<sub>it</sub>*, *Mort\_under5<sub>it</sub>*, and *Urban\_Pop<sub>it</sub>* against the five independent summary measures, *SB\_DTF<sub>it</sub>*, *CP\_DTF<sub>it</sub>*, *EC\_DTF<sub>it</sub>*, *PT\_DTF<sub>it</sub>*, and *GC\_DTF<sub>it</sub>*.

### 3.2. Justifications and explanation of variables

Our study incorporates a number of measures that directly or indirectly address social equity and development. The justifications for the presence of the various variables in the model are discussed here. Difficulty in getting credit influences female labor force participation (Heath & Jayachandran, 2017). Research and regulatory policy indicate that having high access to loans increases labor force participation by 7%, compared to those with low access (Field et al., 2017). Our getting credit variable measures the degree of ease of access to credit.

There are no singularly accepted measures of social equity as transferable in the mainstream development literature. Different studies employ different measures based on the economies and specific contexts they are examining. Examining social welfare and equity in the Philippines, Son (2011) uses a range of measures that broadly captures growth, price and expenditure. The extant literature uses a range of measures and variables that captures various aspects of wellbeing such as measures of health and sanitation, availability of credit, and housing conditions. Our chosen measures of mortality under 5 years of age and extent of urbanization work well as proxies for social equity, while simultaneously complementing the traditional measures of GDP growth and access to credit.

### 3.3. Definitions of terminology

Our definitions are to the extent possible those used by the World Bank development indicators 2004–2011 and the WB Doing Business Indicators 2004–2011. Further definitions are as follows: Social equity is defined as a situation where all people



**Table 2. Panel A:** Correlation of the Four Dependent Left Hand Side Variables. See Table 1 Panel A for Variable Name Abbreviations. Notes: \*, \*\*, and \*\*\* Represent Statistical Significance at the 10%, 5%, and 1% Level, Respectively.

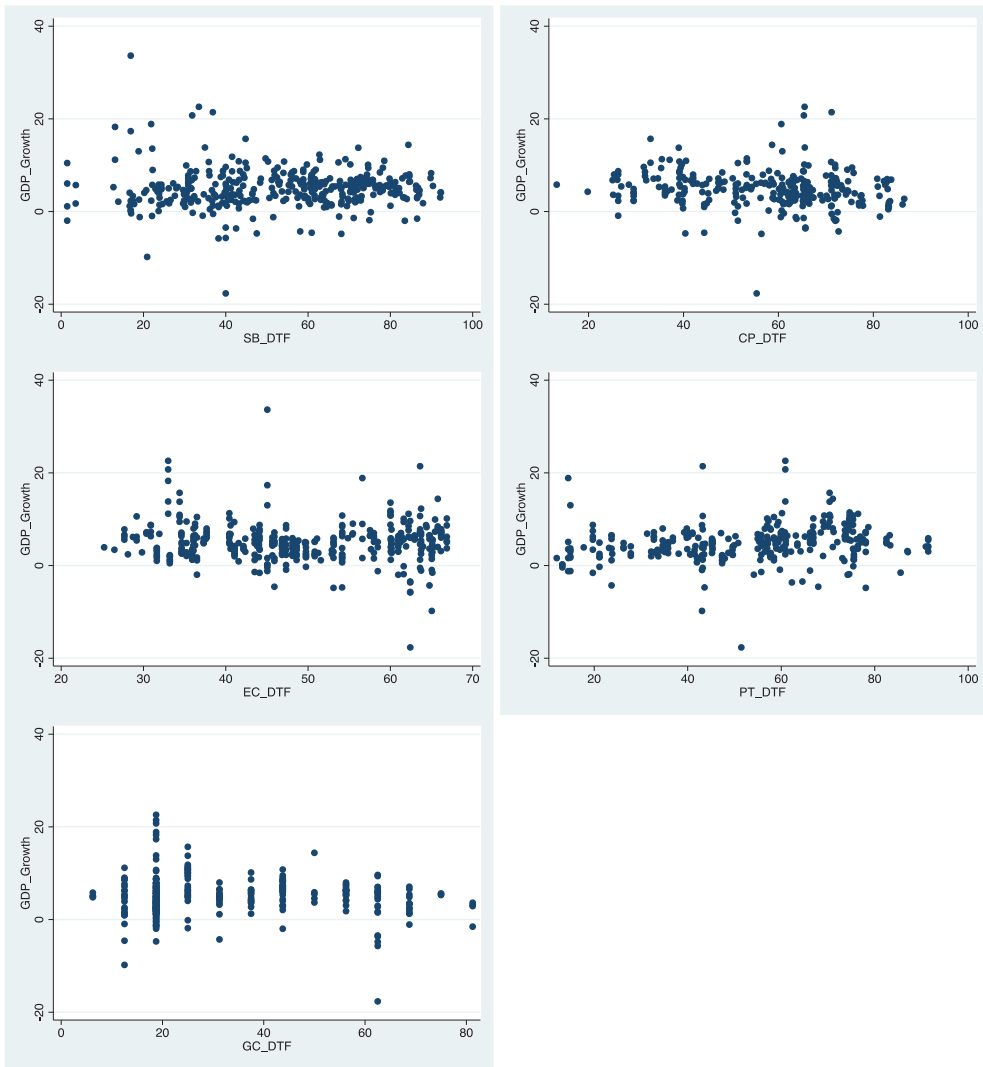
	GDP_Growth <sub>it</sub>		Labor_FemalePart <sub>it</sub>	Mort_under5 <sub>it</sub>	Urban_Pop <sub>it</sub>
GDP_Growth <sub>it</sub>	1				
Labor_FemalePart <sub>it</sub>	0.09*	1			
Mort_under5 <sub>it</sub>	0.10**	0.41***	1		
Urban_Pop <sub>it</sub>	-0.07	-0.37***	-0.40***	1	

**Panel B:** Correlation of the 16 independent Right Hand Side variables. See Table 1 Panel A for variable name abbreviations.

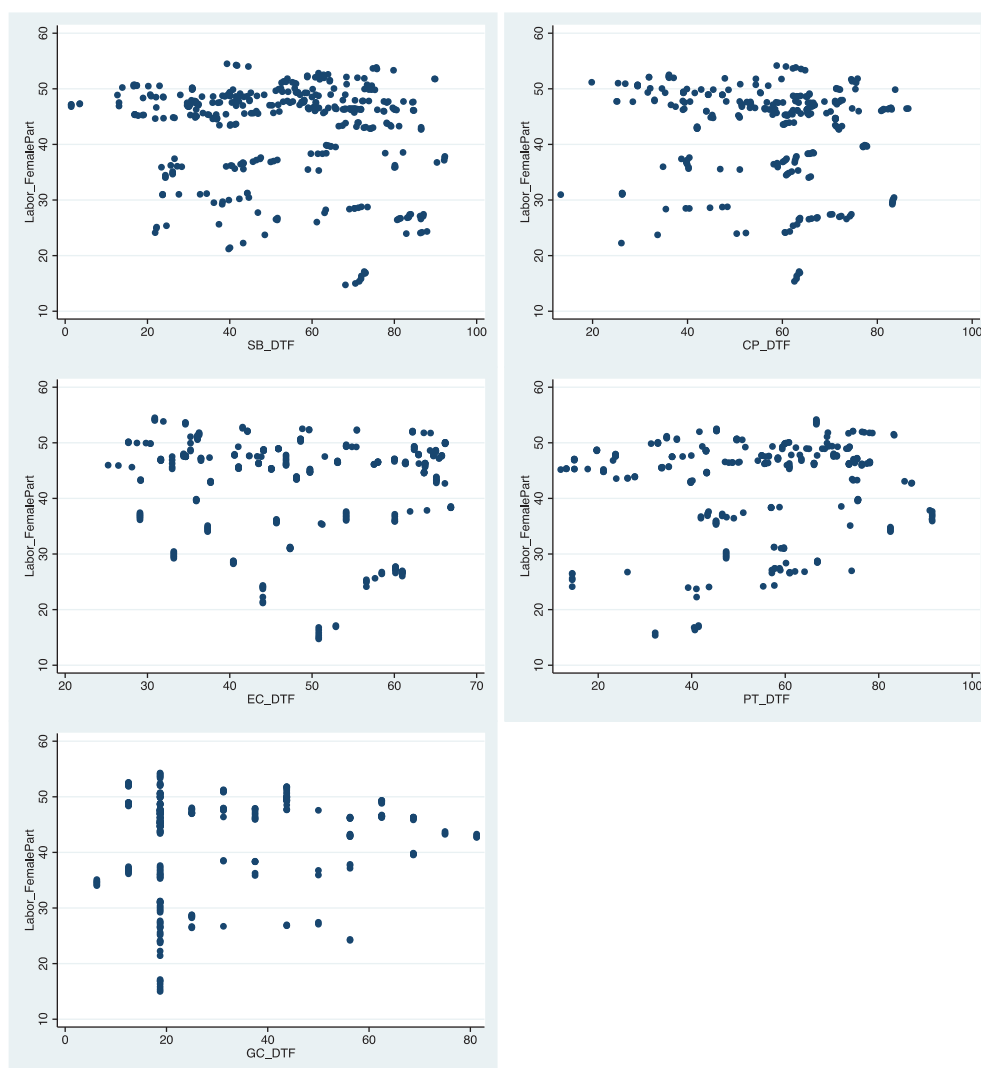
	SB_DTF <sub>it</sub>	SBProcS <sub>it</sub>	SBTimeDays <sub>it</sub>	SBCost <sub>it</sub>	SBPC <sub>it</sub>	CP_DTF <sub>it</sub>	CPProcS <sub>it</sub>	CPTimeDays <sub>it</sub>	EC_DTF <sub>it</sub>	ECTimeDays <sub>it</sub>	ECCostofclaim <sub>it</sub>	PT_DTF <sub>it</sub>	PTPayperY <sub>it</sub>	PTThrsperY <sub>it</sub>	PTTrax_profi <sub>it</sub>	GC_DTF <sub>it</sub>
SB_DTF <sub>it</sub>	1															
SBProcS <sub>it</sub>	-0.57***	1														
SBTimeDays <sub>it</sub>	-0.54***	0.56***	1													
SBCost <sub>it</sub>	-0.51***	0.22***	0.31***	1												
SBPC <sub>it</sub>	-0.67***	0.22***	0.13*	0.16**	1											
CP_DTF <sub>it</sub>	0.15**	0.05	0.10	-0.15*	-0.26***	1										
CPProcS <sub>it</sub>	0.11	-0.12	-0.23***	0.12*	0.00	-0.51***	1									
CPTimeDays <sub>it</sub>	-0.13*	-0.10	0.05	0.12*	-0.01	-0.40***	0.07	1								
EC_DTF <sub>it</sub>	0.40***	-0.08	-0.23***	-0.39***	-0.17**	0.06	0.03	-0.03	1							
ECTimeDays <sub>it</sub>	-0.22***	0.117*	0.44***	0.08	0.16**	-0.04	-0.08	0.03	-0.53***	1						
ECCostofclaim <sub>it</sub>	-0.15**	-0.01	0.02	0.48***	-0.07	-0.00	-0.01	0.03	-0.59***	-0.142*	1					
PT_DTF <sub>it</sub>	0.45***	-0.17**	-0.10	-0.30***	-0.26***	-0.02	-0.08	-0.07	0.25***	0.19**	-0.18**	1				
PTPayperY <sub>it</sub>	-0.52***	0.26***	0.22***	0.16**	0.31***	-0.17**	-0.01	0.30***	-0.15*	-0.09	0.05	-0.70***	1			
PTThrsperY <sub>it</sub>	-0.12*	0.03	0.05	-0.00	0.07	0.02	0.01	-0.00	-0.15*	-0.13*	0.07	-0.69***	0.36***	1		
PTTrax_profi <sub>it</sub>	-0.19**	-0.02	-0.04	0.56***	-0.03	-0.03	0.10	0.09	-0.13*	-0.16**	0.43***	-0.51***	0.12*	0.02	1	
GC_DTF <sub>it</sub>	0.51***	-0.16**	-0.09	-0.25***	-0.46***	0.23***	-0.03	-0.12*	-0.25***	-0.25***	-0.07	0.42***	-0.30***	-0.10	-0.25***	1

Notes. \*, \*\*, and \*\*\* represent statistical significance at the 10%, 5%, and 1% level, respectively.



**Figure 1.** Scatter Plots of  $GDP\_Growth_{it}$  against the Five DTF Summary Measures.

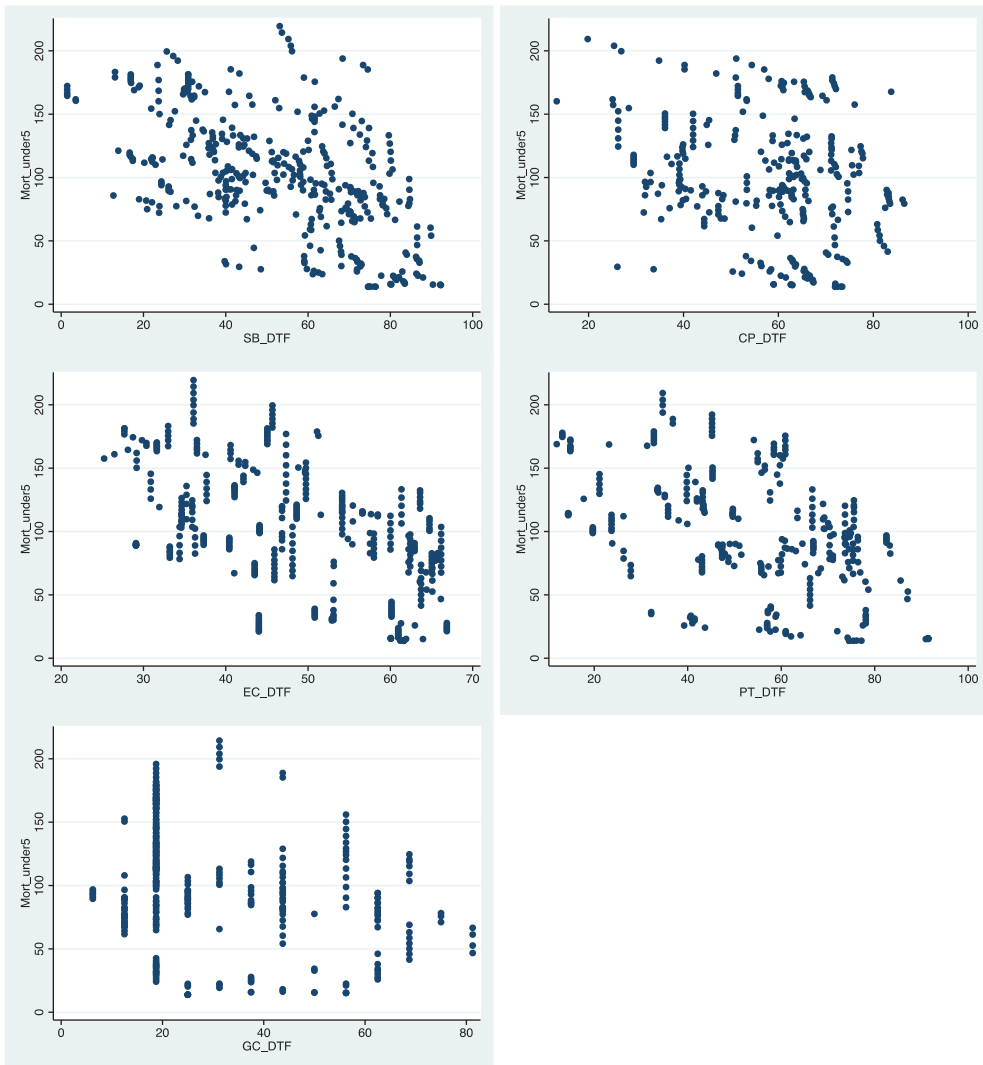
within a specific society have the same status regarding access to business opportunities, civil rights, freedom of speech, equal access to social goods and services, and general institutional access. No single set of measures for the various development and societal constructs, with associated ranges, has been accepted in the literature. Business environment is defined as the socio-economic, political and regulatory environment that influences the process of doing business in any country. Starting a Business time is measured by the number of days it takes to register and start a business, from 0 and upwards. Starting a Business cost is measured as the cost of starting a business as % of income per capita. Starting a Business paid-in minimum capital is measured as a % of income per capita. All percentages are between 0% and 100%.



**Figure 2.** Scatter Plots of  $Labor\_FemalePart_{it}$  against the Five DTF Summary Measures.

Dealing with Construction Permits time is measured by the number of days it takes to obtain a construction permit. Enforcing Contracts time is measured by the number of days it takes to enforce a contract through the legal system. Enforcing Contracts cost is measured as a % of the total claim on the contract. Paying Taxes Number of Payments is measured in number per year, from 0 and upwards. Paying Taxes time is measured in hours per year. Paying Taxes Total tax rate is measured as a % of profit.

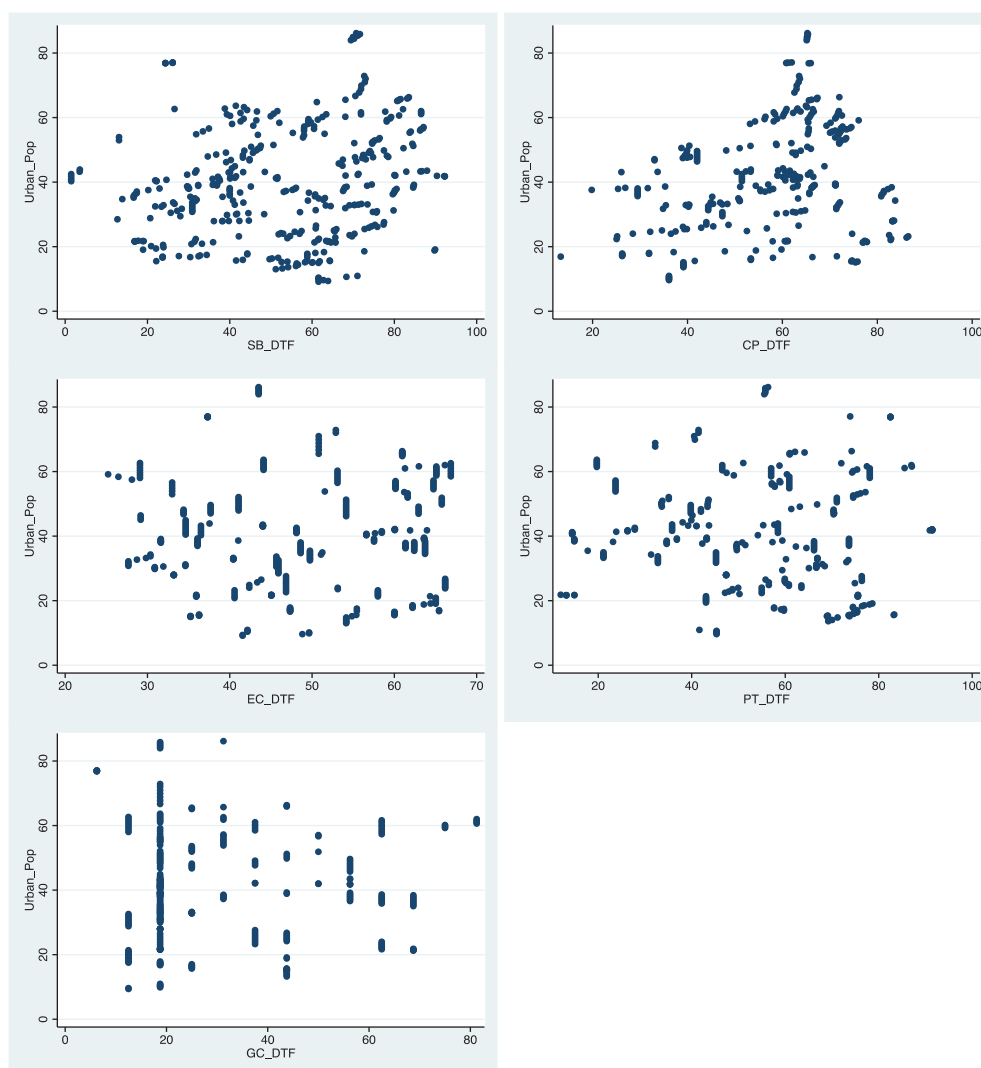
Distance to Frontier is defined as the distance between 0 (minimum performance) and 100 (maximum performance) of each economy to the “frontier,” which represents the best performance observed on each of the indicators across all economies in the *Doing*



**Figure 3.** Scatter Plots of  $Mort\_under5_{it}$  against the Five DTF Summary Measures.

*Business* sample since 2005 (Doing Business onwards).<sup>4</sup> Doing Business 2017 is the 14th in a series of annual reports investigating regulations enhancing and constraining

<sup>4</sup>The following explanation of the Distance to Frontier measurement is obtained from the World Bank Doing Business website: "The distance to frontier score aids in assessing the absolute level of regulatory performance and how it improves over time. This measure shows the distance of each economy to the "frontier," which represents the best performance observed on each of the indicators across all economies in the Doing Business sample since 2005. This allows users both to see the gap between a particular economy's performance and the best performance at any point in time and to assess the absolute change in the economy's regulatory environment over time as measured by Doing Business. An economy's distance to frontier is reflected on a scale from 0 to 100, where 0 represents the lowest performance and 100 represents the frontier. For example, a score of 75 in Doing Business in 2015 means an economy was 25 percentage points away from the frontier constructed from the best performances across all economies and across time. A score of 80 in Doing Business in 2016 would indicate the economy is improving. In this way the distance to frontier measure complements the annual ease of doing business ranking, which compares economies with one another at a point in time." <http://www.doingbusiness.org/data/> and <http://www.worldbank.org/en/news/press-release/2016/10/25/georgia-among-top-global-improvers-says-latest-doing-business-report>, retrieved March 12, 2019.



**Figure 4.** Scatter Plots of  $Mort\_under5_{it}$  against the Five DTF Summary Measures.

business activity. Doing Business presents quantitative indicators compared across 190 economies, measuring aspects of regulation. Doing Business also measures attributes of labor market regulation. The indicators enable analyzing economic outcomes, to identify reforms of business regulation that work, where and why.

Getting Credit measures the degree of ease for access to credit, measured as a percentage. More specifically, Getting Credit Distance to Frontier “denotes the distance of each economy to the “frontier,” which represents the highest performance observed on the getting credit indicator across all economies included in Doing Business” (World Bank, 2005). The Getting Credit variable accounts for credit from all sources, including the banking sector, private investors, government institutions, various informal sources, etc.

Economic growth is defined as the annual GDP growth as a percentage. Female labor force participation is defined as the percentage of the total labor force that is female. Child mortality is defined as the number of children below the age of 5 years who dies annually, for every 1000 children. Urbanization is defined as the percentage of the population in a country that lives in urban areas.

### 3.4. Research design and regression analysis

The data is prepared in panel format where observations of multiple phenomena are obtained over multiple years for the same set of countries. To address our research question we perform regression analysis with a robustness control for outliers and country fixed effects. The econometric technique used in this article is the reg in stata with robust and cluster options on panel data.<sup>5</sup> Within that we run different combinations of independent variables to address specific questions.

Table 1 Panel A provides data source, variable names, description, and metric for the four dependent variables  $GDP\_Growth_{it}$ ,  $Labor\_FemalePart_{it}$ ,  $Mort\_under5_{it}$ ,  $Urban\_Pop_{it}$  and 16 independent variables  $SB\_DTF_{it}$ ,  $SBProcs_{it}$ ,  $SBTimedays_{it}$ ,  $SBCost_{it}$ ,  $SBPIC_{it}$ ,  $CP\_DTF_{it}$ ,  $CPProcs_{it}$ ,  $CPTimedays_{it}$ ,  $EC\_DTF_{it}$ ,  $ECTimedays_{it}$ ,  $ECCostofclaim_{it}$ ,  $PT\_DTF_{it}$ ,  $PTPayperyr_{it}$ ,  $PThrsperyr_{it}$ ,  $PTtax\_profit_{it}$ ,  $GC\_DTF_{it}$ .

We are concerned with the association between business development indicators (the independent variables) and the growth and development factors (the dependent variables). We estimate each of the dependent variables regressed on various groups of independent variables with five models. This means setting up equations with one dependent variable on the left hand side, labeled  $DEP\_VAR_{it}$ , and weighted sums of various groups of independent variables, a constant  $\alpha_0$ , and an error term  $\varepsilon_{it}$  for country  $i$  at time  $t$  in years,  $i = 1, \dots, 54$ ,  $t = 1, 2, \dots, 8$  on the right hand side. The dependent variable  $DEP\_VAR_{it}$  refers to  $GDP\_Growth_{it}$ ,  $Labor\_FemalePart_{it}$ ,  $Mort\_under5_{it}$ ,  $Urban\_Pop_{it}$ .

The first four models isolate four groups of independent variables to analyze the separate impact of these on the four independent variables. The four groups pertain to Starting a Business (SB), Construction Permits (CP), Paying Taxes (PT), and Distance to Frontier (DRF). The fifth model incorporates all the 16 independent variables.

Model (1) confines attention to the five independent variables starting with SB, that is, Starting a Business, to isolate that impact on the four dependent variables. These are  $SB\_DTF_{it}$ ,  $SBProcs_{it}$ ,  $SBTimedays_{it}$ ,  $SBCost_{it}$ ,  $SBPIC_{it}$ , which gives

$$DEP\_VAR_{it} = \alpha_0 + \alpha_1 SB\_DTF_{it} + \alpha_2 SBProcs_{it} + \alpha_3 SBTimedays_{it} + \alpha_4 SBCost_{it} + \alpha_5 SBPIC_{it} + \varepsilon_{it} \quad (1)$$

Model (2) confines attention to the three independent variables starting with CP, that is, Construction Permits, to isolate that impact on the four dependent variables. These are  $CP\_DTF_{it}$ ,  $CPProcs_{it}$ ,  $CPTimedays_{it}$ , which gives

<sup>5</sup>See <https://www.stata.com/manuals13/rregress.pdf>, retrieved March 12, 2019. With the robust option, the point estimates of the coefficients are equivalent to when applying the ordinary least squares method, but the standard errors take into account issues concerning heterogeneity and lack of normality. Using the cluster option shows that the observations are clustered into countries and that the observations are correlated within countries, and independent between countries.

$$DEP\_VAR_{it} = \alpha_0 + \alpha_1 CP\_DTF_{it} + \alpha_2 CPProcs_{it} + \alpha_3 CPTimedays_{it} + \varepsilon_{it} \quad (2)$$

Model (3) confines attention to the five independent variables starting with *PT*, that is, Paying Taxes, to isolate that impact on the four dependent variables. These are *PT\_DTF<sub>it</sub>*, *PTPaypery<sub>it</sub>*, *PTThrspery<sub>it</sub>*, *PTtax\_profit<sub>it</sub>*, *GC\_DTF<sub>it</sub>*, which gives

$$DEP\_VAR_{it} = \alpha_0 + \alpha_1 PT\_DTF_{it} + \alpha_2 PTPaypery_{it} + \alpha_3 PThrspery_{it} + \alpha_4 PTtax\_profit_{it} + \alpha_5 GC\_DTF_{it} + \varepsilon_{it} \quad (3)$$

Model (4) incorporates only the distance to frontier summary variables. That is, Model (4) confines attention to the five independent variables starting with *DTF<sub>it</sub>*, that is, Distance to Frontier, to isolate that impact on the four dependent variables. These are *SB\_DTF<sub>it</sub>*, *CP\_DTF<sub>it</sub>*, *EC\_DTF<sub>it</sub>*, *PT\_DTF<sub>it</sub>*, *GC\_DTF<sub>it</sub>*, which gives

$$DEP\_VAR_{it} = \alpha_0 + \alpha_1 SB\_DTF_{it} + \alpha_2 CP\_DTF_{it} + \alpha_3 EC\_DTF_{it} + \alpha_4 PT\_DTF_{it} + \alpha_5 GC\_DTF_{it} + \varepsilon_{it} \quad (4)$$

Finally, Model (5) incorporates all the 16 independent variables to obtain:

$$\begin{aligned} DEP\_VAR_{it} = & \alpha_0 + \alpha_1 SB\_DTF_{it} + \alpha_2 SBProcs_{it} + \alpha_3 SBTimedays_{it} + \alpha_4 SBCost_{it} \\ & + \alpha_5 SBPIC_{it} + \alpha_6 CP\_DTF_{it} + \alpha_7 CPProcs_{it} + \alpha_8 CPTimedays_{it} \\ & + \alpha_9 EC\_DTF_{it} + \alpha_{10} ECTimedays_{it} + \alpha_{11} ECCostofclaim_{it} \\ & + \alpha_{12} PT\_DTF_{it} + \alpha_{13} PTPaypery_{it} + \alpha_{14} PThrspery_{it} \\ & + \alpha_{15} PTtax\_profit_{it} + \alpha_{16} GC\_DTF_{it} + \varepsilon_{it} \end{aligned} \quad (5)$$

## 4. Regression results and discussion

### 4.1. Results

Each cell in Tables 3–5 contains two numbers. The first number is the regression coefficient which reflects the association of the independent variable in the column with the dependent variable in the row. The second number is the t-statistic. Statistical significance of 1%, 5% and 10% is reported with \*, \*\*, and \*\*\* respectively in each cell. Table 3 comprises Panels A, B, C, and D and contains summary results from the regression analyses of Models (1), (2), and (3).

Panel A shows a result from regressing the dependent variables GDP growth, female Labor force participation, child mortality rate, and urban population against the variables in the “Starting a Business” category.

Regarding *GDP\_Growth<sub>it</sub>* the most significant variables are *SBProcs<sub>it</sub>*, *SBCost<sub>it</sub>*, *SBPIC<sub>it</sub>*, and *SB\_DTF<sub>it</sub>*, all of which are positive. This probably shows that the fastest growing African countries operate under less than ideal conditions and against the odds for *SBProcs<sub>it</sub>* and *SBCost<sub>it</sub>*. The positive coefficient for the DTF shows that as countries improve their efficiency in processing new business start-ups, a positive impact on economic growth ensues. The results show that as more capital is invested in starting a business, the higher the rate of growth, but marginally so.

On labor force participation for females, *Labor\_FemalePart<sub>it</sub>*, the results show that the cost of starting a business is critical for female labor participation and therefore, in the



**Table 3.** Summary Results from Regressing Growth and Development Factors against Different Subgroups of Business Development Indicators Used in This Study.

<b>Panel A: Starting a Business Variables (Model (1)).</b>				
	<i>GDP_Growth<sub>it</sub></i>	<i>Labor_FemalePart<sub>it</sub></i>	<i>Mort_under5<sub>it</sub></i>	<i>Urban_Pop<sub>it</sub></i>
<i>SB_DTF<sub>it</sub></i>	0.079*** 2.882	-0.154 -1.275	-1.387*** -3.62	0.128 0.728
<i>SBProcs<sub>it</sub></i>	0.326** 2.362	-0.495 -0.759	-1.904 -1.038	-1.25 -1.183
<i>SBTimedays<sub>it</sub></i>	0.001 0.127	0.019 0.789	-0.128 -1.218	0.103** 2.194
<i>SBCost<sub>it</sub></i>	0.004** 2.276	0.005** 2.125	0.073*** 6.585	-0.006 -1.148
<i>SBPIC<sub>it</sub></i>	0.003* 1.741	-0.011 -1.403	-0.022 -1.396	-0.002 -0.181
Constant $\alpha_0$	-3.899 -1.354	56.379*** 4.572	194.376*** 4.964	41.848** 2.225
N	374	377	383	383
R-squared	0.06	0.151	0.465	0.103
Adjusted R-squared	0.0474	0.14	0.458	0.0911
F-test	3.02	3.96	24.48	1.58
F-test p-value	0.02	0.00	0.00	0.18
<b>Panel B: Dealing with Construction Permit variables (Model (2)).</b>				
	<i>GDP_Growth<sub>it</sub></i>	<i>Labor_FemalePart<sub>it</sub></i>	<i>Mort_under5<sub>it</sub></i>	<i>Urban_Pop<sub>it</sub></i>
<i>CP_DTF<sub>it</sub></i>	-0.071** -2.512	-0.173* -1.807	-1.139** -2.631	0.620*** 3.772
<i>CPPProcs<sub>it</sub></i>	-0.092 -1.475	-0.563* -1.884	-1.613 -0.927	1.218*** 3.266
<i>CPTimedays<sub>it</sub></i>	-0.008** -2.177	-0.006 -0.799	-0.015 -0.266	0.043** 2.148
Constant $\alpha_0$	11.913*** 4.278	61.860*** 7.276	191.257*** 4.137	-21.095 -1.475
N	291	293	299	299
R-squared	0.054	0.091	0.096	0.199
Adjusted R-squared	0.044	0.0814	0.0864	0.191
F-test	2.26	1.73	2.94	6.22
F-test p-value	0.09	0.17	0.04	0.00
<b>Panel C: Paying Taxes variables and Getting Credit Distance to Frontier (Model (3)).</b>				
	<i>GDP_Growth<sub>it</sub></i>	<i>Labor_FemalePart<sub>it</sub></i>	<i>Mort_under5<sub>it</sub></i>	<i>Urban_Pop<sub>it</sub></i>
<i>PT_DTF<sub>it</sub></i>	0.156*** 4.069	0.331 1.607	1.193** 2.173	-0.094 -0.26
<i>PTPayperyr<sub>it</sub></i>	0.058 1.519	0.352* 1.865	2.038*** 3.302	-0.265 -0.879
<i>PTThrsperyr<sub>it</sub></i>	0.008*** 3.994	0.01 0.956	0.082** 2.465	0.013 0.741
<i>PTtax_profit<sub>it</sub></i>	0.011** 2.424	0.055** 2.174	0.346*** 2.961	-0.039 -0.729
<i>GC_DTF<sub>it</sub></i>	-0.049** -2.415	0.033 0.647	-0.534* -1.975	-0.077 -0.466
Constant $\alpha_0$	-7.547** -2.013	3.572 0.164	-77.751 -1.286	56.472 1.604
N	297	299	305	305
R-squared	0.087	0.137	0.37	0.06
Adjusted R-squared	0.0714	0.123	0.359	0.0439
F-test	4.46	1.31	6.26	0.71
F-test p-value	0.00	0.27	0.00	0.62

Notes. See Table 1 Panel A for variable name abbreviations. \*, \*\*, and \*\*\* represent statistical significance at the 10%, 5%, and 1% level, respectively.

efforts to enclose the gender gap. Therefore, countries with the higher female labor participation are exhibiting a higher cost of setting up a business which highlights how much needs to be done to reduce the cost of entering business.

**Table 4.** Summary Results from Regressing Growth and Development Factors against All the *Distance to Frontier* Summary Measures Used in This Study (Model (4)).

	GDP_Growth <sub>it</sub>	Labor_FemalePart <sub>it</sub>	Mort_under5 <sub>it</sub>	Urban_Pop <sub>it</sub>
<i>SB_DTF<sub>it</sub></i>	0.015 0.764	−0.120* −1.747	−0.799*** −3.44	0.195 1.47
<i>CP_DTF<sub>it</sub></i>	−0.01 −0.445	−0.089 −1.358	−0.513* −1.787	0.340*** 2.767
<i>EC_DTF<sub>it</sub></i>	−0.025 −0.697	−0.07 −0.728	−1.689*** −4.333	0.065 0.36
<i>PT_DTF<sub>it</sub></i>	0.046** 2.488	0.025 0.371	−0.680*** −3.218	−0.038 −0.241
<i>GC_DTF<sub>it</sub></i>	−0.028* −1.296	0.156** 2.226	0.522** 2.112	−0.246 −1.423
Constant $\alpha_0$	4.232** 2.321	51.567*** 8.885	274.077*** 10.588	17.12 1.663
N	297	299	305	305
R-squared	0.056	0.12	0.553	0.166
Adjusted R-squared	0.040	0.105	0.545	0.152
F-test	2.20	1.22	24.23	2.50
F-test p-value	0.07	0.31	0.00	0.04

Notes. See Table 1 Panel A for variable name abbreviations. \*, \*\*, and \*\*\* represent statistical significance at the 10%, 5%, and 1% level, respectively.

On wellbeing as measured by child mortality for children below five years old, *Mort\_under5<sub>it</sub>*, an improvement in the efficiency of setting up a business (measured by *SB\_DTF<sub>it</sub>*) results in lower child mortality.

The results also show that the countries with the lowest wellbeing indicator have also the highest cost of entering into business. The cost of setting up a business as predicted is equally significant and positive. This implies that as the cost of doing business increases, so does child mortality.

Urban population, *Urban\_Pop<sub>it</sub>*, is significantly positively correlated with time delays, where increasing urbanization pressures increase the time it takes to set up a business.

*Panel B* presents regression results when the category of business indicators is from “Dealing with Construction Permits”.

As the Distance to Frontier, *CP\_DTF<sub>it</sub>*, increases, the country grows faster as shown by the negative and significant coefficient of  $-0.071$ , showing that countries that are improving efficiencies in the award of construction contracts are not necessarily the fastest growing. This is one area where lack of rule of law and fair-play may be part of the explanation as awarding these permits could be tainted by corruption and nepotism.

As the time delay in obtaining construction permits increases, GDP growth is negatively impacted. The results also show that as the distance to frontier increases and the number of procedures increases, the percentage of female labor force participation falls but the impact is marginal (significant at the 10% level).

Increases in efficiencies in awarding construction permits as measured by the increase in the distance to frontier is associated with lower child mortality, as shown by the negative coefficient. Impact on child mortality could be through construction related job creation.

Higher urbanization is associated with an improvement in the efficiency of awarding construction contracts as measured by the positive coefficient on *CP\_DTF<sub>it</sub>*.

**Table 5.** Summary Results from Regressing Growth and Development Factors against a Wider Range of Business Development Indicators Including All Those Previously Used in This Study (Model (5)).

	GDP_Growth <sub>it</sub>	Labor_FemalePart <sub>it</sub>	Mort_under5 <sub>it</sub>	Urban_Pop <sub>it</sub>
<i>SB_DTF<sub>it</sub></i>	0.044	−0.249**	−0.650*	−0.019
	1.565	−2.389	−1.866	−0.083
<i>SBProcs<sub>it</sub></i>	0.164	−0.645	−0.104	−1.339**
	1.228	−1.558	−0.071	−2.15
<i>SBTimedays<sub>it</sub></i>	0.007	−0.007	−0.03	0.036
	0.862	−0.322	−0.264	0.633
<i>SBCost<sub>it</sub></i>	0.004	−0.001	0.031	0.003
	1.106	−0.13	1.25	0.294
<i>SBPIC<sub>it</sub></i>	−0.001	−0.014**	0.008	−0.01
	−0.185	−2.025	0.427	−1.518
<i>CP_DTF<sub>it</sub></i>	−0.047	−0.222**	−0.896**	0.647***
	−1.642	−2.63	−2.641	3.472
<i>CPProcs<sub>it</sub></i>	−0.053	−0.502**	−1.115	1.335***
	−1.04	−2.274	−1.286	3.366
<i>CPTimedays<sub>it</sub></i>	−0.007*	−0.023**	−0.047	0.032
	−1.788	−2.284	−1.054	1.555
<i>EC_DTF<sub>it</sub></i>	−0.039	0.473***	−0.627	0.421
	−0.658	2.721	−0.852	1.451
<i>ECTimedays<sub>it</sub></i>	−0.003	0.012*	0.005	0.026**
	−1.458	1.835	0.186	2.383
<i>ECCostofclaim<sub>it</sub></i>	−0.007	0.177***	0.338	−0.045
	−0.356	4.126	1.608	−0.591
<i>PT_DTF<sub>it</sub></i>	0.104**	0.079	−0.05	0.002
	2.087	0.459	−0.082	0.004
<i>PTPayperyr<sub>it</sub></i>	0.037	0.188	0.71	−0.044
	0.86	1.41	1.324	−0.146
<i>PTThrsperyr<sub>it</sub></i>	0.004*	0.002	0.022	0.02
	1.699	0.185	0.633	0.84
<i>PTtax_profit<sub>it</sub></i>	−0.002	0.006	0.095	−0.02
	−0.201	0.228	0.99	−0.353
<i>GC_DTF<sub>it</sub></i>	−0.056***	0.084*	0.31	−0.251*
	−3.823	1.86	0.989	−1.987
Constant $\alpha_0$	2.542	35.104	171.266*	−40.452
	0.308	1.578	1.678	−0.851
N	291	293	299	299
R-squared	0.151	0.464	0.671	0.499
Adjusted R-squared	0.102	0.433	0.652	0.471
F-test	7.47	3.13	14.14	5.06
F-test p-value	0.00	0.00	0.00	0.00

Notes. See Table 1 Panel A for variable name abbreviations. \*, \*\*, and \*\*\* represent statistical significance at the 10%, 5%, and 1% level, respectively.

Urbanization pressures increases across the board are associated with longer time delays and number of procedures.

*Panel C* incorporates “Paying Taxes” variables and the “Getting Credit” Distance to Frontier.

Column 1 shows that an efficient tax regime as measured by a high *PT\_DTF<sub>it</sub>* is positive for GDP growth and significant. The results also show that a more time consuming tax system is also associated with higher growth, suggesting that it might be more effective in tax collection. This is also linked to the next result where a higher tax rate is associated with a higher GDP growth rate.

That better access to formal credit as measured by *GC\_DTF<sub>it</sub>* is not associated with higher GDP growth is challenging to explain. One possible explanation is that some of the credit is obtained from informal sources. In commodity producing economies with

high rates of GDP growth access to formal credit is low and therefore weakening the positive causal effect of credit access on growth. Future research may scrutinize the  $GC\_DTF_{it}$  variable to determine from which source the credit is acquired. Another possible explanation is that access to credit is so expensive and risky that acquiring credit does not cause higher GDP growth. A third possible explanation is that credit may be allocated to recipients who should not receive credit, which may be detrimental to GDP growth.

Female labor force participation is marginally positively associated with number of tax payments per year. It also has a positive and significant association with a higher tax rate.

On child mortality, counter intuitively, countries that are not efficient with tax collection and have a lower tax rate, have lower child mortality. Untabulated correlation statistics show that  $PT\_DTF_{it}$  and child mortality have a negative correlation of -46%.

Finally, urbanization and tax variables have no association as shown by the insignificant results.

Table 4 presents results where only the  $DTF$  summary measures are included as explanatory variables as shown in Model (4). The magnitude and significance of the summary measures are broadly consistent with the subsequent results obtained in Table 5. The exception to this is in the 3<sup>rd</sup> column where the dependent variable is  $Mort\_under5_{it}$ . In this specification all the explanatory variables are significant whereas in Table 5,  $PT\_DTF_{it}$  and  $GC\_DTF_{it}$  are not significant.

Finally, in Table 5 we include all the explanatory variables in all the four categories as shown in Model (5).

Where a country is positioned relative to the best country for that category of indicator indicates the significance of individual indicators. This is particularly true for the drivers of GDP growth where we find the  $PT\_DTF_{it}$  and  $GC\_DTF_{it}$  are the most significant and the rest are not.

There are nuances around female labor force participation that are not purely driven by market measures but influenced by social, socio-cultural, and religious norms. Thirlwall and Pachero-Lopes (2017) consider prior studies in different developmental contexts, which also suggest these contingent influencing factors. Gaddis and Klasen (2014) and Tam (2011) find evidence of structural changes being correlated with female labor force participation. There is little evidence on how structural factors are associated with female labor participation in developing countries (Angrist & Evans, 1998; Bloom, Canning, Fink, & Finlay, 2009; Cruces & Galiani, 2007; Priebe, 2010).

## 4.2. Diagnostics and robustness

The study performs a number of robustness checks using different types of analysis. We note that the minimum value of  $SBPIC_{it}$  is zero and this is the reported value for a number of observations. To ensure that this was not in fact a substitute for a missing value, in untabulated additional analysis we replace the zero with missing values and rerun the regressions. The number of observations drops to approximately 240 from 374 in Table 3, Panel C. However, adjusted R-squared values and the main inferences remain unchanged. Specifically  $SB\_DTF_{it}$  continues to be the significant when  $GDP\_Growth_{it}$  and  $Mort\_under5_{it}$  are dependent variables. When  $GDP\_Growth_{it}$  is the dependent variable,  $SBCost_{it}$  is no longer significant.

In addition, we conduct robust regress analysis where a Cook's D for each observation is calculated. Through an iterative process any observation with Cook's D distance greater than 1 is dropped. This helps address issues around outliers and high leverage data points. We also conduct analysis with year fixed effects, whereas the main analysis uses country cluster or fixed effects. The inferences remain broadly similar to those obtained from our primary findings. To test for overall goodness of fit we include the overall F-statistic of each regression model in the relevant tables. Overall, the results suggest that the most comprehensive model as shown in Table 5 provides the best fit. The sub-selection of *Paying Taxes* and *Getting Credit* variables shows the weakest fit. Overall, the results suggest strong fit of models.

In addition to econometric concerns such as those discussed above, empirical tests such as these are intrinsically prone to omitted variable bias. For this reason our tests are conducted on a whole selection of independent variables as well as sub-selections of these variables.<sup>6</sup>

#### 4.3. Theoretical contribution, policy implications, discussion and future research

Generally, a belief among the authors and in the literature has been that the following two relationships are somehow valid:

- (1) Business development indicators impact Growth and development factors
- (2) Business environment impacts Economic and social variables

Since these two relationships are insufficiently detailed, the current paper has ventured one step further and established the following more precise relationships:

- (3) Improvements in the environment for starting a business impact Stronger economic growth
- (4) Better contract enforcement impacts Female labor force participation
- (5) Ease of starting a business, access to permits, and contract enforcement impact Decrease in child mortality
- (6) Business environment and other broader factors impact the rate of urbanization

These four relationships translate directly into policy implications. First, to strengthen economic growth, the environment for starting a business should be improved. This involves handling challenges faced by entrepreneurs, such as ease in terms of bureaucracy, time, competence and manpower to initiate businesses; ease of acquiring office space and labor; financial support, tax breaks, support networks, suitable incentives, etc. Second, that improved female labor force participation being associated with contract enforcement is probably surprising, as other factors may also be present. This involves strengthening the judicial sector through all phases; from laws, regulations, to enforcement by the parties themselves, actors in their surroundings,

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<sup>6</sup>The constant is arbitrary and its magnitude can be shifted by scaling the independent variables. Since the focus is on the independent variables which are selected based on practitioner and extant literature we allow the constant term to move freely.

government officials, the police, and the courts through adequate punishment for breach of contract both as a deterrent, and to remove contract breakers from the business environment. Third, that decrease in child mortality correlates with ease of starting a business, access to permits, and contract enforcement, is also surprising. This involves possibly handling entrepreneurs' challenges, often involving extreme time delays, in acquiring permits and licenses. Perhaps some of these can be dispensed with, or provided temporarily. Fourth, and more generally since the relationship is weaker, the rate of urbanization depends e.g. on the business environment. That relationship has policy implications for urban planners which may consider, perhaps incorrectly, many other factors, e.g. availability of housing, schools, hospitals, electricity, water, and labor of various kinds.

*Omitted variables.* Although the level of per capita income might presumably be included in the growth regression, we surmise that would not alter the results substantially. We believe it is likely highly correlated with the various Right Hand Side variables. It may thus have a theoretical and empirical basis for belonging in future research. Some of the signs such as on  $SBProcs_{it}$  when regressed with GDP growth are unintuitive and suggest that the fastest growing African countries operate under less than ideal conditions. These counter intuitive findings may also suggest that omitted variables could be playing a part. One such variable to investigate in future research is per capita GDP. Furthermore, given the possibility that the “doing business” indicators may themselves be endogenous, future research could test other possible standard growth determinants to see if the “doing business” indicators add information.

*Causality and interpretation.* Our discussion in the previous section often jumps to reverse causality when interpreting the results, e.g. for female labor participation. More generally, future research should develop a methodological discussion that explains the thinking about endogeneity. However, the inclusion of a lagged dependent variable, at least for the growth regression, could cause complications that would need to be addressed through approaches such as SGMM, First Difference Instrumental Variable (FDIV), etc.

*Organization of the data.* The data is organized in panel format with observations obtained over eight years for 54 countries.

*Regression technique.* Reasons also exist for the common use of fixed effects, which we address through the country clustering command. Other methods may be applied in future research. Alternatively, methods may be used to address endogeneity of regressors (FDIV, SGMM, or the existence of lagged dependent variable).

*Diagnostics.* Future research may also test whether the errors are reasonably well-behaved. For example, if heteroscedasticity or serial correlation exists, other “robust” or generalized methods may be used.

*Inclusion of variables.* This paper has chosen the approach of including all the variables in a given category (e.g. starting a business costs), along with the corresponding “distance to frontier” variable. Alternative model specifications certainly exist and our analysis explores some of these such as only including the DTF summary variables on the right hand side as in Model (5). A range of other approaches and inclusion of other variables may potentially address further challenges involved in interpreting the results.

## 5. Conclusion

Our study has considered the relationship between the business environment, economic growth, urbanization, and female labor force participation in African countries. We argue based on our results that the business environment is associated with economic and social equity variables. Stronger economic growth is associated with improvements in the environment for starting a business and this supports other studies in different contexts. Female labor force participation aligns with conditions of better contract enforcement. Decreases in child mortality are found to be associated with improvements in ease of starting a business, as well as, access to permits and contract enforcement. The rate of urbanization shows weaker correlation with business environment variables. This may be because the rate of urbanization is driven by other broader factors.

We attempt to relate our analysis to African countries where institutions are regarded generally to be weak and these have been argued to have contributed to poor growth performance and high levels of poverty. Ultimately, the key to improving growth and reducing poverty in Africa is the development, reform, and strengthening of institutions. Institutions, as reported by others, trump growth factors such as geography and trade. While institutions have been shown to have a direct impact on economic growth, we argue in this paper for a direct relationship between business environment, economic growth, and social equity – factors that are tied to institutional structure. Our results extend some of the extant findings on institutions and growth.

There are fundamental institutional and cultural differences between North African and Sub-Saharan African countries. Since this paper focuses on correlation rather than causation, we believe that positive associations overarch cultural specificities. Future studies could consider cultural factors and how they might mediate the results.

Future research in this area should consider how socio-economic factors influence the shaping of sustainable institutions, and how they in turn impact growth and poverty-reduction in Africa. Further research should also consider non-African countries and test for homogeneity of coefficients or various “Africa” or “Weak institution” (or low per-capita-income) interaction terms within a broader sample.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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