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Studies in Supply-Side Economics

**ON NIGERIA'S SUPPLY-SIDE
POTENTIAL**

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and Jason Yin***

Johns Hopkins Institute for Applied Economics,
Global Health, and the Study of Business Enterprise



On Nigeria's Supply-Side Potential

by Steve H. Hanke, Teja Polisetty, and Jason Yin

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About the Series

The *Studies in Supply-Side Economics* series explores the potential for tax and regulatory policy changes to provide incentives for the increased production of goods and services. The authors are mainly Fellows of the Institute and students at The Johns Hopkins University in Baltimore who conduct research under the general direction of Prof. Hanke, who was one of President Reagan's original "[supply-siders](#)."

About the Authors

Steve H. Hanke is a Professor of Applied Economics and Co-Director of the Institute for Applied Economics, Global Health, and the Study of Business Enterprise at The Johns Hopkins University in Baltimore. He is a Senior Fellow and Director of the [Troubled Currencies Project](#) at the Cato Institute in Washington, D.C., a Senior Advisor at the Renmin University of China's International Monetary Research Institute in Beijing, a Special Counselor to the Center for Financial Stability in New York, and a contributing editor at *Central Banking* in London, and a contributor at *Forbes*. Prof. Hanke is also a member of the Charter Council of the Society of Economic Measurement and of Euromoney Country Risk's Experts Panel.

In the past, Prof. Hanke taught economics at the Colorado School of Mines and at the University of California, Berkeley. He served as a Member of the Governor's Council of Economic Advisers in Maryland in 1976-77, as a Senior Economist on President Reagan's Council of Economic Advisers in 1981-82, and as a Senior Advisor to the Joint Economic Committee of the U.S. Congress in 1984-88. Prof. Hanke served as a State Counselor to both the Republic of Lithuania in 1994-96 and the Republic of Montenegro in 1999-2003. He was also an Advisor to the Presidents of Bulgaria in 1997-2002, Venezuela in 1995-96, and Indonesia in 1998. He played an important role in establishing new currency regimes in Argentina, Estonia, Bulgaria, Bosnia-Herzegovina, Ecuador, Lithuania, and Montenegro. Prof. Hanke has also advised the governments of many other countries, including Albania, Kazakhstan, and Yugoslavia.

Prof. Hanke has been awarded honorary doctorate degrees by the Bulgarian Academy of Sciences, the Universidad San Francisco de Quito, the Free University of Tbilisi, Istanbul Kültür University, and Varna Free University in honor of his scholarship on exchange-rate regimes. He is a Distinguished Associate of the International Atlantic Economic Society, a Distinguished Professor at the Universitas Pelita Harapan in Jakarta, Indonesia, a Professor Asociado (the highest honor awarded to international experts of acknowledged competence) at the Universidad del Azuay in Cuenca, Ecuador, and a Profesor Visitante at the Universidad Peruana de Ciencias Aplicadas (the UPC's highest academic honor). In 1998, he was named one of the twenty-five most influential people in the world by *World Trade Magazine*.

Prof. Hanke is a well-known currency and commodity trader. Currently, he serves as a member of the Supervisory Board of Advanced Metallurgical Group N.V. in Amsterdam and Chairman Emeritus of the Friedberg Mercantile Group, Inc. in Toronto. During the 1990s, he served as President of Toronto Trust Argentina in Buenos Aires, the world's best-performing emerging market mutual fund in 1995.

Prof. Hanke's most recent books are *Zimbabwe: Hyperinflation to Growth* (2008) and *A Blueprint for a Safe, Sound Georgian Lari* (2010), *Juntas Monetarias para Paises en Desarrollo* (2015), and *Currency Boards for Developing Countries: A Handbook* (2015).

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Introduction

The World Bank has been rigorously measuring the ease of doing business (DB) in many countries for over ten years, producing a treasure trove of empirical evidence. The Bank publishes its results identifying levels of economic freedom (read: regulatory freedom) each year in a volume entitled *Doing Business*. Ten sets of indicators that capture important dimensions of an economy's regulatory environment are quantified. The accompanying table defines each of the ten quantitative indicators. These are each measured by using standardized procedures that ensure comparability and replicability across the 189 countries studied. For each indicator, the scores range from a potential low of '0' to a high of '100'.¹

Table 1

What Doing Business measures 10 Indicators of Business Regulation	
<u>Indicator</u>	<u>What it measures</u>
Starting a business	Procedures, time, cost and paid-in minimum capital to start a limited liability company
Dealing with construction permits	Procedures, time and cost to complete all formalities to build a warehouse and the quality control and safety mechanisms in the construction permitting system
Getting electricity	Procedures, time and cost to get connected to the electrical grid, the reliability of the electricity supply and the transparency of tariffs
Registering property	Procedures, time and cost to transfer a property and the quality of the land administration system
Getting credit	Movable collateral laws and credit information systems
Protecting minority investors	Minority shareholders' rights in related-party transactions and in corporate governance
Paying taxes	Payments, time and total tax rate for a firm to comply with all tax regulations as well as post-filing processes
Trading across borders	Time and cost to export the product of comparative advantage and import auto parts
Enforcing contracts	Time and cost to resolve a commercial dispute and the quality of judicial processes
Resolving insolvency	Time, cost, outcome and recovery rate for a commercial insolvency and the strength of the legal framework for insolvency

Source: Doing Business 2017.

Prepared by Steve H. Hanke, The Johns Hopkins University.

¹ "Doing Business: Answers to Frequently Asked Questions." Doing Business. <http://www.doingbusiness.org/FAQ/Doing-Business-FAQs-answered.pdf>. Page 15

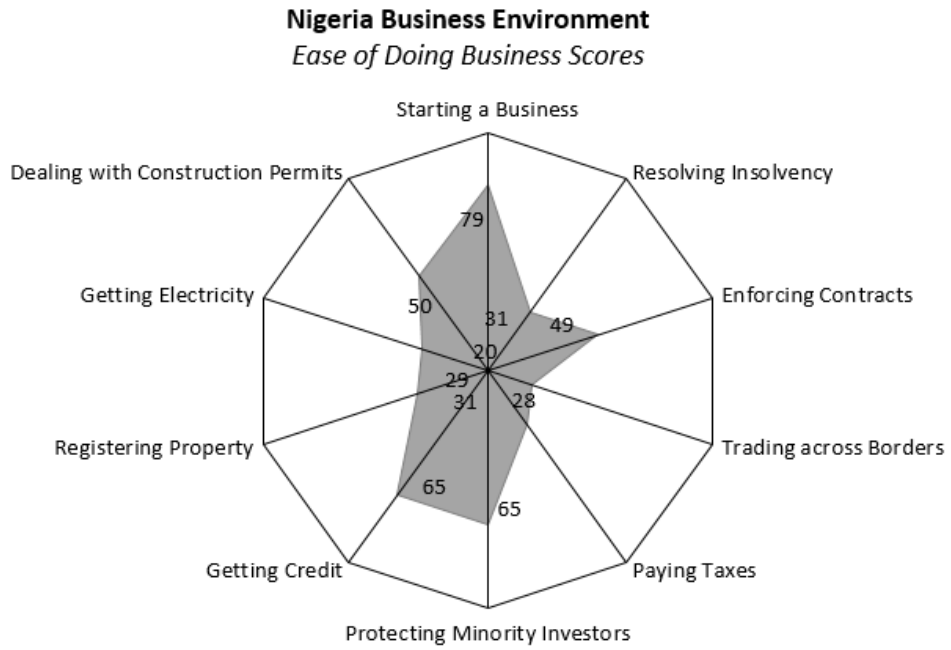
Table 2**Doing Business Scores and Rank for 2016: Nigeria**

Indicators	Doing Business Score - DTF %	Rank	Country with Best Performance
<u>Overall</u>	<u>44.63</u>	<u>169</u>	<u>New Zealand - 87.01</u>
Starting a Business	78.62	138	New Zealand (99.96)
Dealing with Construction Permits	49.63	174	New Zealand (87.40)
Getting Electricity	29.43	180	Korea, Rep (99.88)
Registering Property	31.44	182	New Zealand (94.46)
Getting Credit	65.00	44	New Zealand (100)
Protecting Minority Investors	65.00	32	New Zealand (83.33)
Paying Taxes	28.09	182	Qatar (99.44)
Trading Across Borders	19.93	181	Austria (100)
Enforcing Contracts	48.59	139	Korea, Rep (84.15)
Resolving Insolvency	30.60	140	Finland (93.89)

Source: Doing Business Report 2017.

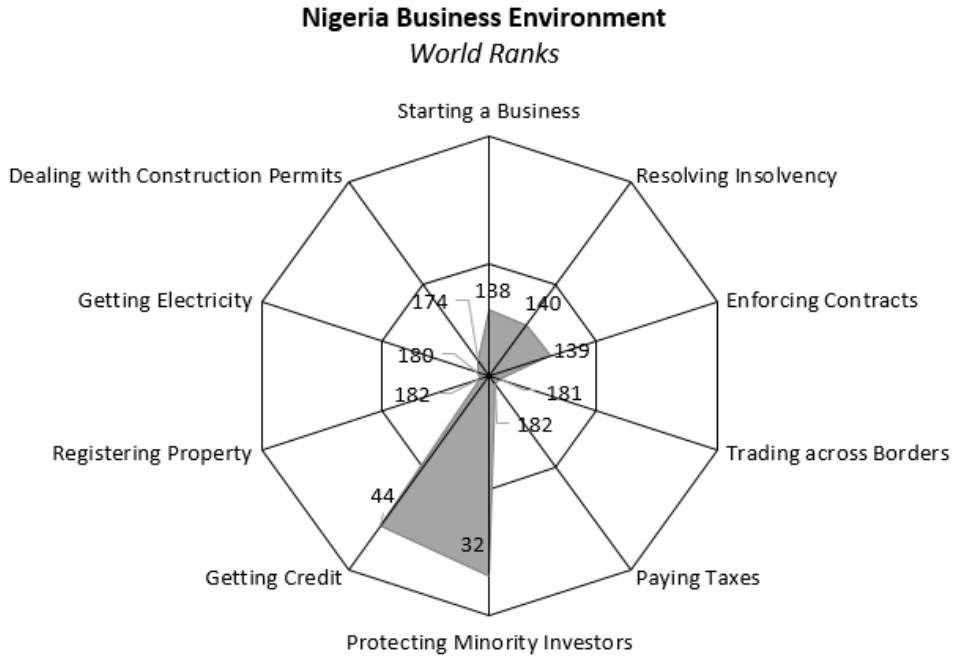
Prepared by Prof. Steve H. Hanke, The Johns Hopkins University.

Figure 1



Sources: *Doing Business 2017*. Prepared by Prof. Steve H. Hanke, The Johns Hopkins University.
Scale: Score 0 center, Score 100 outer edge.

Figure 2



Sources: *Doing Business 2017*. Prepared by Prof. Steve H. Hanke, The Johns Hopkins University.
Scale: Rank 190 center, Rank 1 outer edge.

Methodology Review of *Doing Business* and Frontier Analysis

Initially, **distance to frontier (DTF)** for each sub-indicator is calculated:

$$= \frac{(\text{worst score by a country}) - (\text{score of country of interest})}{(\text{worst score by a country}) - (\text{best score by a country AKA the frontier value})} * 100$$

For example, the DTF value for procedures in Nigeria, which requires 8 procedures, would be $[(20 - 8) / (20 - 1)] * 100 = 63.2$ out of a maximum value of 100

*Notice that if the score of country of interest is equivalent to the frontier value, then the distance to frontier value (aka. Doing Business score) would be the maximum 100 for the indicator.

**The best historical score by a country (also known as frontier value), and worst score for all sub-indicators are shown in Table 3.

The Doing Business score for each indicator (ex. Starting a Business) is calculated by assuming that every sub-indicator is of equal weight/importance:

$$= \text{AVERAGE}(\text{DTF values for all sub - indicators of the indicator})$$

For example, the distance to frontier score for Starting a Business in Ecuador would be the average of the distance to frontier score for # of Numbers of Procedures (35.3), for Time (49.74), for cost (88.98), and for paid-in capital (100), which is roughly 68.5 out of a maximum score of 100.

The overall Doing Business score for a country is calculated by assuming that every indicator is of equal weight/importance:

$$= \text{AVERAGE}(\text{DB scores for all indicators})^2$$

Using the DB scores, we can determine whether there is a relationship between a freer regulatory environment (a high DB score) and prosperity as measured by GDP per capita. The DB scores for every country is plotted with their respective GDP/capita from the *World Economic Outlook Database* to estimate the affluence the frontier would generate in terms of GDP/capita. This is done by fitting an exponential trend-line to the plots, and inputted the Frontier score of 100 (or any other score of interest) into the equation of the trend-line to estimate the generated income/capita. For the year 2016, the GDP/capita is modeled as approximately equal to $44.691 * e^{(0.0773 * (\text{DB Score}))}$.

The semi-log plot of GDP/capita vs. Doing Business Scores shows that there is a strong, positive relationship between DB scores and prosperity. A logarithmic scale is used on GDP per capita to respond to skewness towards large values, caused by the exponential trend in data.

The Frontier represents **the combination of each sub-indicator with the best observed performance across all economies in *Doing Business* sample** in which data were collected for the indicator. To emphasize, a country would set the frontier value with the best performance in a sub-indicator, NOT indicator and NOT overall. For example, New Zealand is ranked #1 in the Starting a Business indicator with a DB score of 99.96, not 100, because the country received a DTF value of 100 (by performing the best and setting the frontier) for the sub-indicators Procedures and Time, but did not receive 100 for Cost and Minimum capital as Slovenia and Australia/Columbia performed better in those areas. The Frontier is an ideal amalgamation of all the best practices in each sub-indicator, and therefore is a perfect 100 DB score in all sub-indicators, and therefore indicators and overall. A perfect score of 100 would mean a country was the best performer in every single sub-indicator, not just in each indicator.

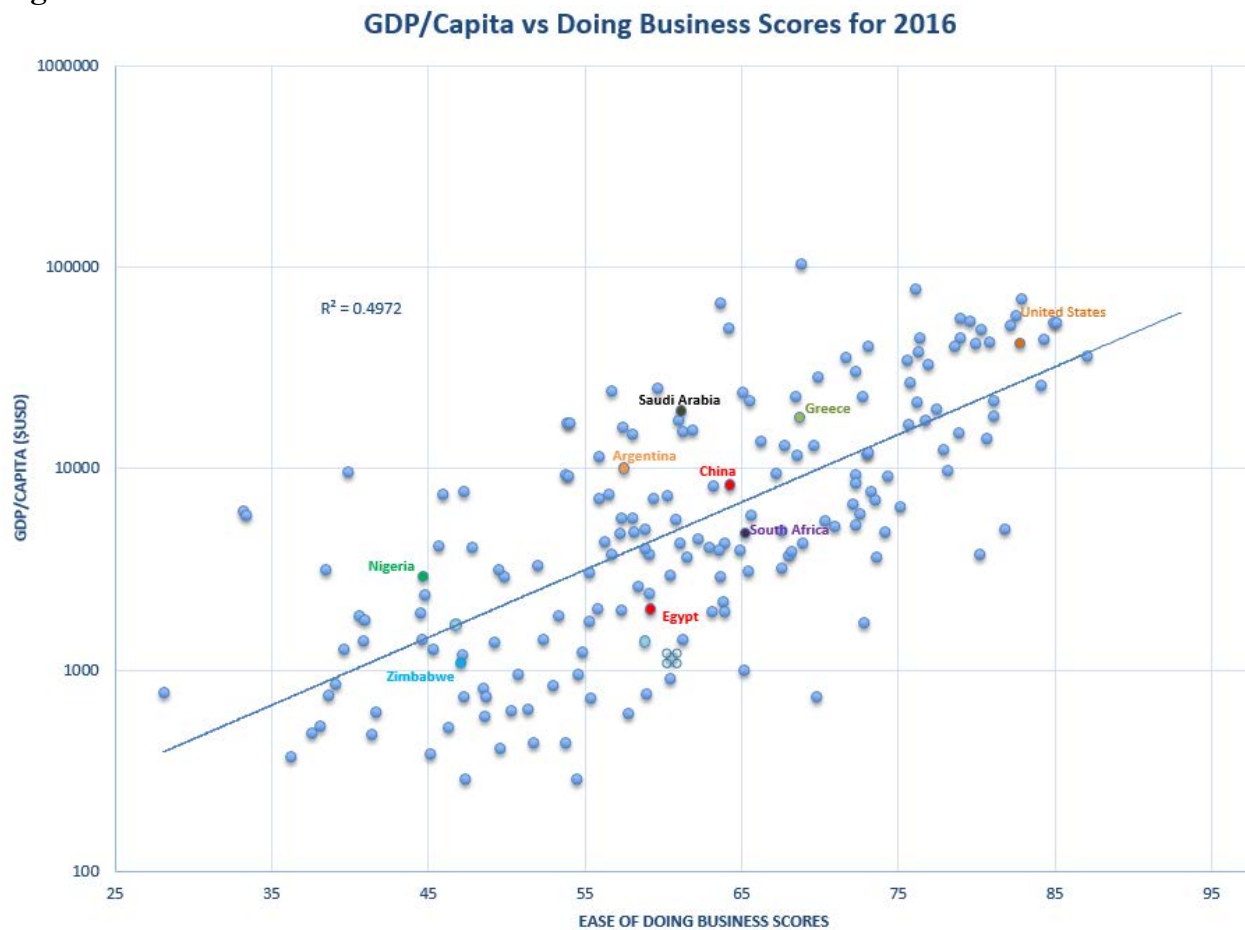
² World Bank. 2013. *Doing Business 2014: Understanding Regulations for Small and Medium-Size Enterprises*. Washington, DC: World Bank Group. DOI: 10.1596/978-0-8213-9984-2. License: Creative Commons Attribution CC BY 3.0. Page 155-158.

Table 3³

TABLE 14.1 What is the frontier in regulatory practice?			
Topic and indicator	Who set the frontier	Frontier	Worst performance
Starting a business			
Procedures (number)	New Zealand	1	18 ^a
Time (days)	New Zealand	0.5	100 ^b
Cost (% of income per capita)	Slovenia	0.0	200.0 ^c
Minimum capital (% of income per capita)	Australia; Colombia ^d	0.0	400.0 ^b
Dealing with construction permits			
Procedures (number)	No economy was at the frontier as of June 1, 2016.	5	30 ^a
Time (days)	Singapore	26	373 ^a
Cost (% of warehouse value)	No economy was at the frontier as of June 1, 2016.	0.0	20.0 ^b
Building quality control index (0–15)	Luxembourg; New Zealand	15	0 ^c
Getting electricity			
Procedures (number)	Germany; Republic of Korea ^a	3	9 ^a
Time (days)	Republic of Korea; St. Kitts and Nevis	18	248 ^b
Cost (% of income per capita)	Japan	0.0	8,100.0 ^a
Reliability of supply and transparency of tariffs index (0–8)	Belgium; Ireland; Malaysia ^a	8	0 ^c
Registering property			
Procedures (number)	Georgia; Norway; Portugal; Sweden	1	13 ^a
Time (days)	Georgia; New Zealand; Portugal	1	210 ^a
Cost (% of property value)	Saudi Arabia	0.0	15.0 ^b
Quality of land administration index (0–30)	No economy has attained the frontier yet.	30	0 ^c
Getting credit			
Strength of legal rights index (0–12)	Colombia; Montenegro; New Zealand	12	0 ^c
Depth of credit information index (0–8)	Ecuador; United Kingdom ^b	8	0 ^c
Protecting minority investors			
Extent of disclosure index (0–10)	China; Malaysia ^a	10	0 ^c
Extent of director liability index (0–10)	Cambodia	10	0 ^c
Ease of shareholder suits index (0–10)	No economy has attained the frontier yet.	10	0 ^c
Extent of shareholder rights index (0–10)	Chile; India ^a	10	0 ^c
Extent of ownership and control index (0–10)	No economy has attained the frontier yet.	10	0 ^c
Extent of corporate transparency index (0–10)	No economy has attained the frontier yet.	10	0 ^c
Paying taxes			
Payments (number per year)	Hong Kong SAR, China; Saudi Arabia	3	63 ^b
Time (hours per year)	Singapore	49	696 ^b
Total tax rate (% of profit)	Singapore ^a	26.1 ^a	84.0 ^b
Postfiling index (0–100)	No economy has attained the frontier yet.	100	0
Time to comply with VAT refund (hours)	Croatia; Netherlands ^a	0	50 ^b
Time to obtain VAT refund (weeks)	Austria	3.2	55 ^b
Time to comply with corporate income tax audit (hours)	Lithuania; Portugal ^a	1.5	56 ^b
Time to complete a corporate income tax audit (weeks)	Sweden; United States ^a	0	32 ^b
Trading across borders			
<i>Time to export</i>			
Documentary compliance (hours)	Canada; Poland; Spain ^b	1 ^a	170 ^b
Border compliance (hours)	Austria; Belgium; Denmark ^a	1 ^a	160 ^b
<i>Cost to export</i>			
Documentary compliance (US\$)	Hungary; Luxembourg; Norway ^a	0	400 ^b
Border compliance (US\$)	France; Netherlands; Portugal ^a	0	1,060 ^b
<i>Time to import</i>			
Documentary compliance (hours)	Republic of Korea; Latvia; New Zealand ^a	1 ^a	240 ^b
Border compliance (hours)	Estonia; France; Germany ^a	1 ^a	280 ^b
<i>Cost to import</i>			
Documentary compliance (US\$)	Iceland; Latvia; United Kingdom ^a	0	700 ^b
Border compliance (US\$)	Belgium; Denmark; Estonia ^a	0	1,200 ^b
Enforcing contracts			
Time (days)	Singapore	120	1,340 ^b
Cost (% of claim)	Bhutan	0.1	89.0 ^b
Quality of judicial processes index (0–18)	No economy has attained the frontier yet.	18	0 ^c
Resolving insolvency			
Recovery rate (cents on the dollar)	Norway	92.9	0 ^c
Strength of insolvency framework index (0–16)	No economy has attained the frontier yet.	16	0 ^c

³ World Bank. 2017. Doing Business 2017: Equal Opportunity for All. Washington, DC: World Bank. DOI: 10.1596/978-1-4648-0948-4. License: Creative Commons Attribution CC BY 3.0 IGO. Page 165-166.

Figure 3



Source: Doing Business Report 2017.
Prepared by Prof. Steve H. Hanke, The Johns Hopkins University.

Using the DB scores, we can determine whether there is a relationship between a freer regulatory environment (a high DB score) and prosperity as measured by GDP per capita. The semi-log plot of GDP/capita vs. Doing Business Scores shows that there is a strong, positive relationship between DB scores and prosperity. A logarithmic scale is used on GDP per capita to respond to skewness towards large values, caused by the exponential trend in data.

Therefore, in addition to the strong, positive relationship between regulatory freedom (ease of doing business) and prosperity (GDP per capita), deregulation yields **increasing returns**. Each incremental increase in the DB score yield larger and larger gains in GDP per capita. Although Nigeria is on the bottom of the pack with a DB score of 44.63 and GDP per capita of \$2,929.53, there is great potential for prosperity by slashing regulations.

Figure 4: Life Expectancy vs. Doing Business Scores



Source: Doing Business Report 2017 and World Health Organization.
 Prepared by Prof. Steve H. Hanke, The Johns Hopkins University.

Economic prosperity affects life expectancy through many channels: higher individual and national incomes produce favorable effects on nutrition, on standards of housing and sanitation, and on health and education expenditures. Since a freer regulatory environment is associated with higher levels of GDP per capita, we should observe that a freer regulatory environment (a higher DB score) is associated with higher life expectancies. The accompanying plot shows a strong and positive relationship between DB scores and life expectancy — albeit one characterized by diminishing returns (given additional increments in DB scores yield smaller and smaller gains in life expectancy.)

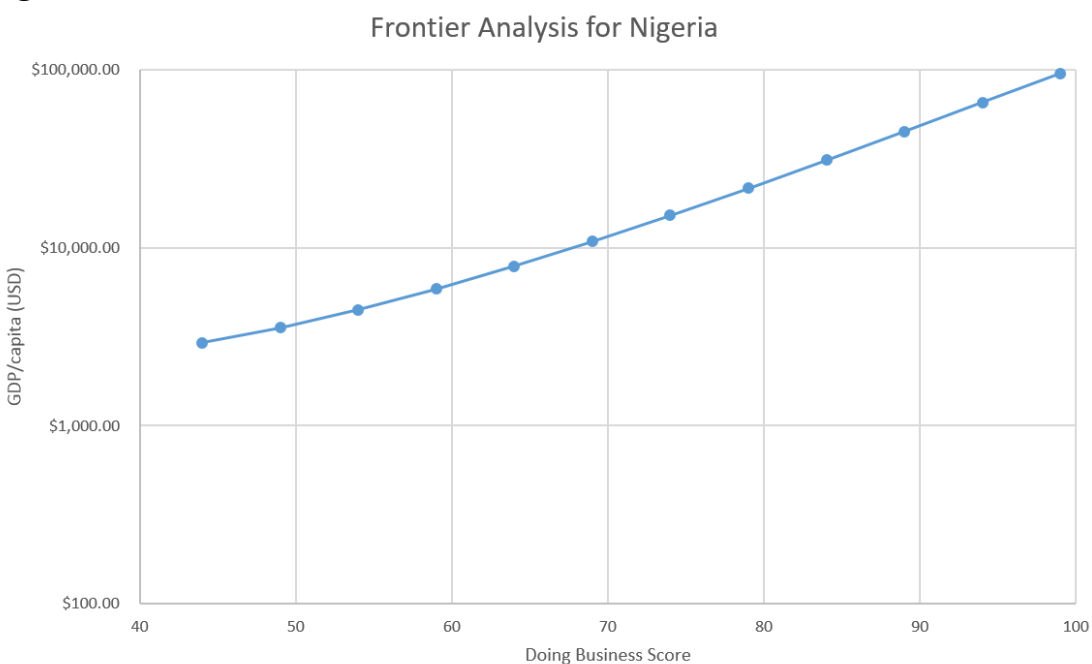
Frontier Analysis of Nigeria⁴

[See page 5 for Frontier]

To reiterate, for the year 2016, the GDP/capita is modeled as approximately equal to $44.691 * e^{(0.0773 * (\text{DB Score}))}$. This model was generated by fitting an exponential trend-line to the plot of 2017 Doing Business Score and 2016 GDP/capita of **all the countries**, which is shown with Figure 3. Hence, this model equation is based on the data sample of 190 countries. With the DB score of 44.6, Nigeria is expected to generate approximately \$1,404.38 based on this model. In actuality, Nigeria exceeds this estimation with a reported GDP/capita of \$2,929.53 according to the *World Economic Outlook (WEO) Database*. This difference is also visually observed in Figure 3 with the distance from the trend-line to the labeled data point for Nigeria in the semi-log plot.

In order to perform analysis on an individual country, we will shift this trend-line to reduce the error of the model equation and to give more significance for the country of interest. The shift differs with countries because it is equal to the amount of discrepancy between the reported data from WEO and the model estimate for each country. For Nigeria, the shift will be +1,525.15, and the new accurate model equation is $44.691 * e^{(0.0773 * (\text{DB Score}))} + 1,525.15$. This equation is then used to project the additional prosperity Nigeria would generate if they were to improve their DB score by improving the ease of doing business.

Figure 5



Source: Doing Business Report 2017.

Prepared by Prof. Steve H. Hanke, The Johns Hopkins University.

⁴ World Bank. 2017. Doing Business 2017: Equal Opportunity for All. Washington, DC: World Bank. DOI: 10.1596/978-1-4648-0948-4. License: Creative Commons Attribution CC BY 3.0 IGO. Page 14.

Table 4

Incremental Analysis of Nigeria			
Doing Business Score for 2016	GDP/Capita (\$)	Increase in GDP/Capita (\$)	Elasticity ($\Delta\% \text{ GDP}_{\text{cap}} / \Delta\% \text{ DB}$)
~44 (Current)	\$2,929.53		
49	\$3,561.65	\$632.12	1.90
54	\$4,492.01	\$930.36	2.56
59	\$5,861.34	\$1,369.33	3.29
64	\$7,876.75	\$2,015.41	4.06
69	\$10,843.07	\$2,966.32	4.82
74	\$15,208.95	\$4,365.88	5.56
79	\$21,634.76	\$6,425.81	6.25
84	\$31,092.38	\$9,457.62	6.91
94	\$65,499.94	\$20,487.63	8.10
99	\$95,654.05	\$30,154.11	8.65

Source: Doing Business Report 2017.

Prepared by Prof. Steve H. Hanke, The Johns Hopkins University.

Commentary:

The 2016 frontier (Doing Business score of 100) generates GDP/person of ~\$100,000, which is 34 times better than the GDP/person generated by Nigeria (GDP/person: \$2,929.53⁵). In other words, Nigeria's economy would have to grow at an annual rate of 15.1% for 25 years to reach the frontier.

Among 189 economies, Nigeria's worst performing categories were Getting Electricity, Trading Across Borders, Registering Property, and Paying Taxes, with each category ranking 180, 181, 182, and 182 respectively.

For Getting Electricity in Lagos, there are 9 procedures required which take 198 days and cost 422.8% of income of per capita. Lagos also scored 0 out of 8 points on the reliability of supply and transparency of tariff index as opposed to Sub-Saharan Africa's -.5 and OECD high income's 7.5. Meanwhile in the frontier economy for Getting Electricity, the Republic of Korea, getting electricity requires three procedures:

1. Request and receive internal wiring inspection: 5 calendar days
2. Submit application to Korea Electric Power Corporation and sign contract: 1 day
3. Receive external works, meter and installation and electricity flow: 12 days

Notable is the fact that KEPCO will design external wiring works, secure materials, and make a contract with the electricity contractors *without customer involvement*. Nigeria could improve on its DB scores for Getting Electricity if its utilities allowed for customers to not have to purchase cables, distribution transformer, and installation accessories. In addition, Nigeria should cut down on the time taken for procedures such as submitting the inspection certificate to the local utility, obtaining internal wiring inspection, and obtaining meter installation, which all take 30 days.

⁵ Gross Domestic Product per Capita, current prices (US Dollars) (World Economic Outlook Database Report for October 2016)

In Denmark, at the frontier for Trading Across Borders, border compliance and documentary compliance for both imports and exports cost **0 USD**. Additionally, border compliance takes **0 hours** while documentary compliance only takes **1 hour** for both imports and exports. On the other hand, in Lagos, it takes 159 hours for border compliance and 131 hours for documentary compliance for exports, and it takes 298 hours for border compliance and 173 hours for documentary compliance for imports. Additionally, it costs 1077 USD just for border compliance for imports. Evidently, Nigeria could significantly boost its DB scores if it were to cut down on costs and the absurdly long times required for trading across borders.

At the frontier for Registering Property in New Zealand, there are just two procedures:

1. Obtain a Land Information Memorandum
2. Register title through Land Information New Zealand

Both take less than a day in an online process. In Nigeria it takes 61 days just to submit an application for processing Governor's Consent and obtaining a title on top of processes for deeds and stamp duties.

At the frontier for Paying Taxes in the UAE, businesses are required to make 4 tax payments. These payments take 12 hours to file. Taxes include employer-paid social security contributions, land and vehicle registration fees, and trade license renewal fees. In Nigeria there are 59 tax payments which take 907.9 hours to file. These taxes include a corporate income tax, social security contributions, tertiary education trust fund contribution, training tax, capital gains tax, land use charge, stamp duty on checks, road license, state business levy, advertising tax, fuel tax...etc.

Nigeria still has a lot of room for improvement in the areas of Getting Electricity, Trading Across Borders, Registering Property, and Paying Taxes. Since the Doing Business 2016 report, Nigeria has not made any improvements to these four worst performing areas. Clearly, there are many processes involved in doing business in Nigeria where associated times and costs could be cut down, and with these improvements there is great potential for higher prosperity.