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Studies in Supply-Side Economics

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

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



On Germany's Supply-Side Potential

by Steve H. Hanke and Teja Polisetty

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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).

Prof. Hanke and his wife, Liliane, reside in Baltimore and Paris.

Teja Polisetty is a sophomore at The Johns Hopkins University in Baltimore, Maryland pursuing a major in Biomedical Engineering. He wrote this paper during his time as an undergraduate researcher for the Institute for Applied Economics, Global Health, and the Study of Business Enterprise in the Fall of 2016. Teja will graduate early in May 2018.

Introduction to *Doing Business* Reports

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 each year in a volume entitled *Doing Business* in which 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 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: Germany ²			
Indicators	Rank	Doing Business Score	Country with Best Performance
<u>Overall</u>	<u>17</u>	<u>79.87</u>	<u>New Zealand - 87.01</u>
Starting a Business	114	83.42	New Zealand (99.96)
Dealing with Construction Permits	12	81.45	New Zealand (87.40)
Getting Electricity	5	98.79	Korea, Rep (99.88)
Registering Property	79	65.72	New Zealand (94.46)
Getting Credit	32	70.00	New Zealand (100)
Protecting Minority Investors	53	60.00	New Zealand (83.33)
Paying Taxes	48	82.10	Qatar (99.44)
Trading Across Borders	38	91.77	Austria, France (100)
Enforcing Contracts	17	73.17	Korea, Rep (84.15)
Resolving Insolvency	3	92.28	Finland (93.89)

Source: Doing Business Report 2017.

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

² 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.

Figure 1

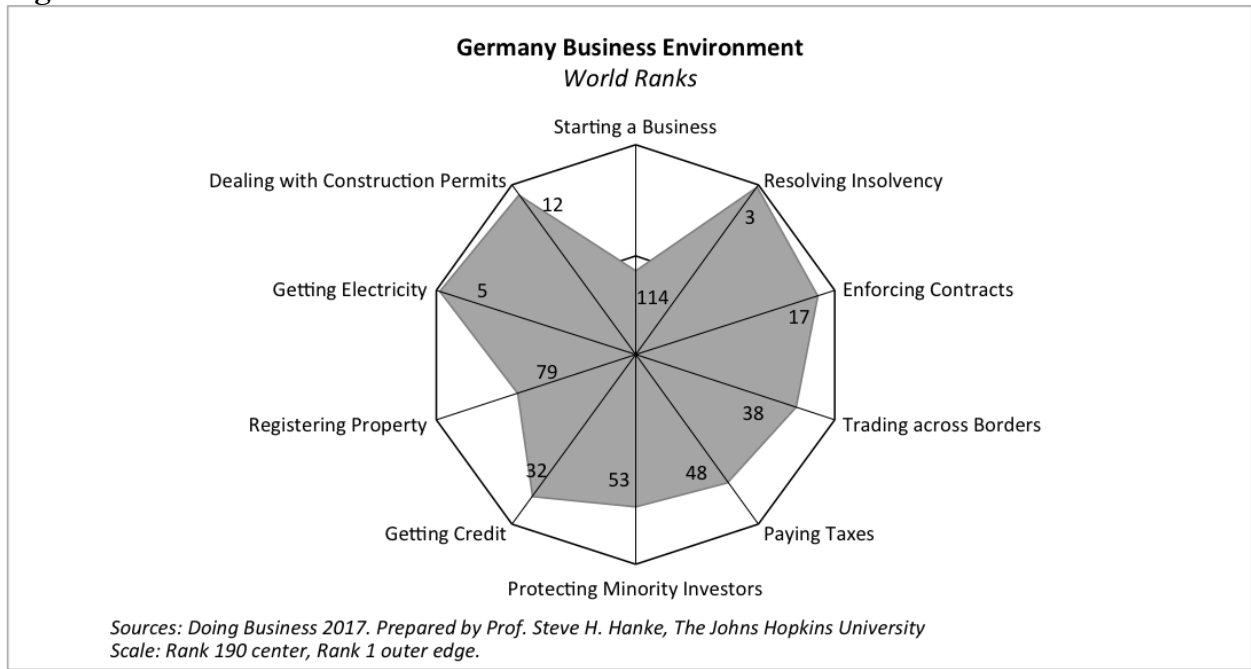
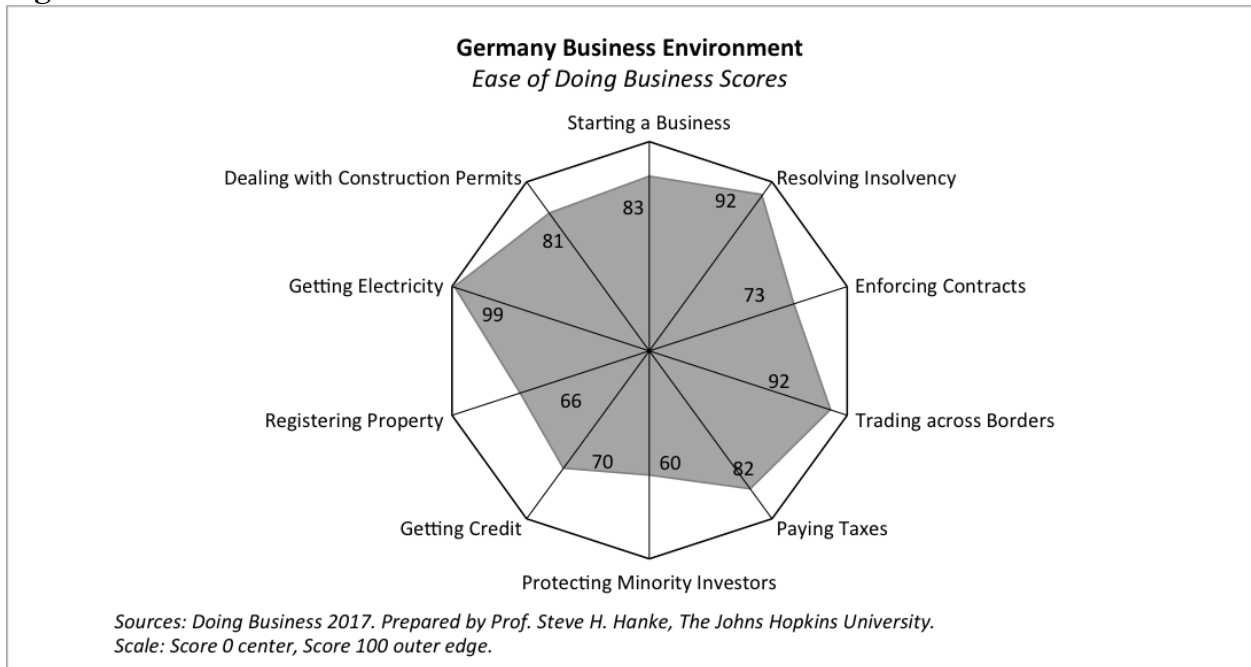


Figure 2



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 Germany, which requires 9 procedures, would be $[(18 - 9) / (18 - 1)] * 100 = 52.9$ out of a maximum value of 100

*Notice that if the score of a 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 2.

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:

$$= \text{AVERAGE}(\text{DB scores for all indicators})^3$$

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/capita. The DB scores for every country are 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 inputting 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/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 the *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

³ 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.

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.

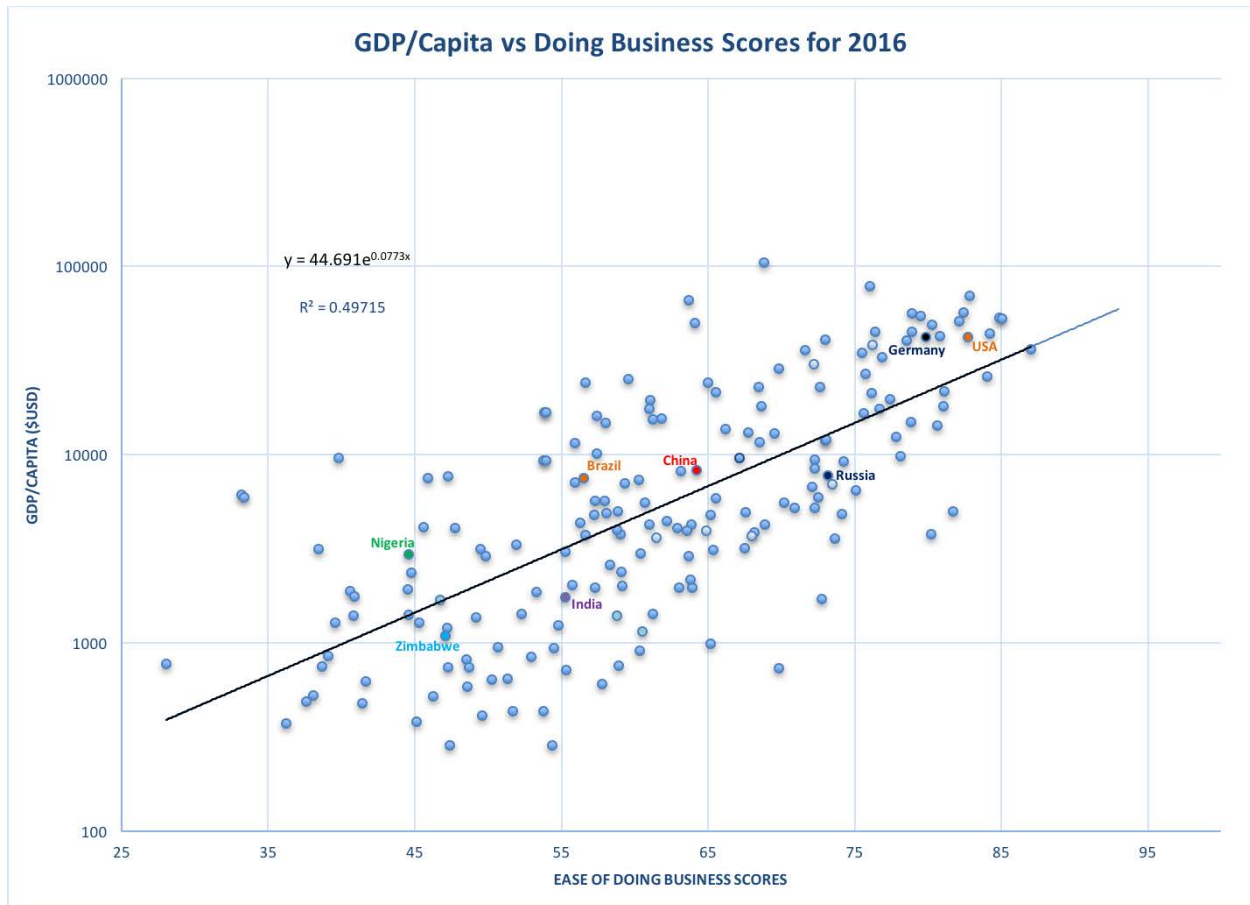
Table 3⁴

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 ^b
Minimum capital (% of income per capita)	Australia; Colombia ^c	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 ^b
Cost (% of warehouse value)	No economy was at the frontier as of June 1, 2016.	0.0	20.0 ^a
Building quality control index (0–15)	Luxembourg; New Zealand	15	0 ^d
Getting electricity			
Procedures (number)	Germany; Republic of Korea ^e	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 ^b
Reliability of supply and transparency of tariffs index (0–8)	Belgium; Ireland; Malaysia ^f	8	0 ^d
Registering property			
Procedures (number)	Georgia; Norway; Portugal; Sweden	1	13 ^a
Time (days)	Georgia; New Zealand; Portugal	1	210 ^b
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 ^d
Getting credit			
Strength of legal rights index (0–12)	Colombia; Montenegro; New Zealand	12	0 ^d
Depth of credit information index (0–8)	Ecuador; United Kingdom ^g	8	0 ^d
Protecting minority investors			
Extent of disclosure index (0–10)	China; Malaysia ^h	10	0 ^d
Extent of director liability index (0–10)	Cambodia	10	0 ^d
Ease of shareholder suits index (0–10)	No economy has attained the frontier yet.	10	0 ^d
Extent of shareholder rights index (0–10)	Chile; India ⁱ	10	0 ^d
Extent of ownership and control index (0–10)	No economy has attained the frontier yet.	10	0 ^d
Extent of corporate transparency index (0–10)	No economy has attained the frontier yet.	10	0 ^d
Paying taxes			
Payments (number per year)	Hong Kong SAR, China; Saudi Arabia	3	63 ^a
Time (hours per year)	Singapore	49 ^b	696 ^c
Total tax rate (% of profit)	Singapore ^a	26.1 ¹	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 ¹	1.5	56 ^b
Time to complete a corporate income tax audit (weeks)	Sweden; United States ^o	0	32 ^b
Trading across borders			
<i>Time to export</i>			
Documentary compliance (hours)	Canada; Poland; Spain ^q	1 ^a	170 ^b
Border compliance (hours)	Austria; Belgium; Denmark ^r	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 ¹	0	1,060 ^b
<i>Time to import</i>			
Documentary compliance (hours)	Republic of Korea; Latvia; New Zealand ^d	1 ^a	240 ^b
Border compliance (hours)	Estonia; France; Germany ^r	1 ^a	280 ^b
<i>Cost to import</i>			
Documentary compliance (US\$)	Iceland; Latvia; United Kingdom ^q	0	700 ^b
Border compliance (US\$)	Belgium; Denmark; Estonia ^a	0	1,200 ^b

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 165-166.

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 ^d
Resolving insolvency			
Recovery rate (cents on the dollar)	Norway	92.9	0 ^d
Strength of insolvency framework index (0–16)	No economy has attained the frontier yet.	16	0 ^d

Figure 3: GDP/Capita vs. Doing Business Scores



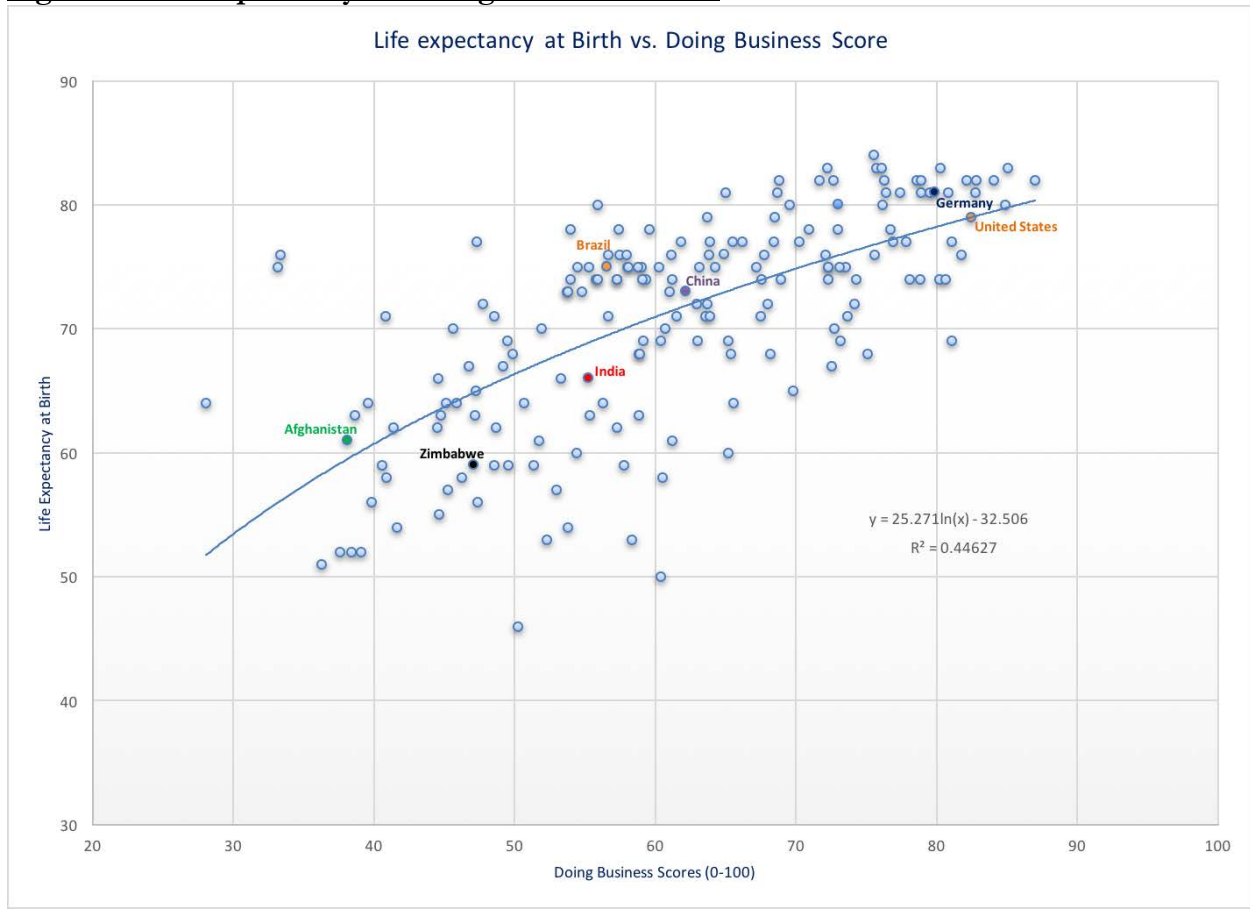
Source: Doing Business Report 2017.

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

In addition to the strong, positive relationship between regulatory freedom (ease of doing business) and prosperity (GDP/capita), deregulation yields increasing returns. Each incremental increase in the DB score yields larger and larger gains in GDP/capita. Germany is on the top of the pack with a DB score of 79.87, but still has exponential potential to increase their GDP/capita from the current \$42,320⁵ to over \$100,000, by continuing to simplify procedures and slash regulations.

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

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/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 Germany

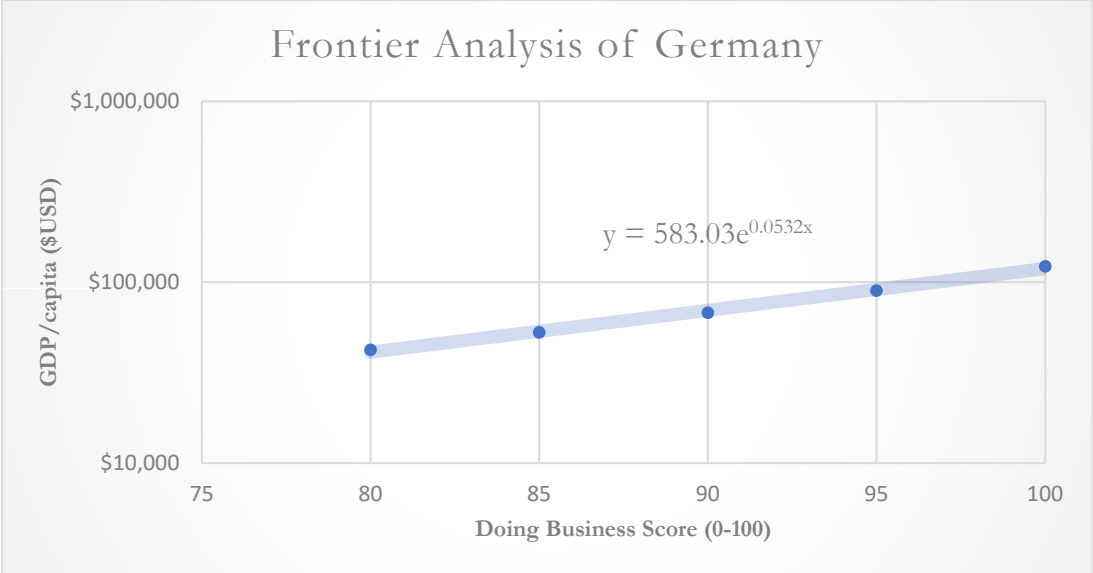
[See page 5 for Frontier]

To reiterate, for the year 2016, the GDP/capita is modeled as approximately equal to $44.691 * e^{(0.0773 * (DB \text{ Score}))}$. This model was generated by fitting an exponential trend-line to the plot of the 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 a DB score of 79.87, Germany is expected to generate approximately \$21,439 based on this model. In actuality, Germany exceeds this expectation with a reported GDP/capita of \$42,320 according to

the *World Economic Outlook (WEO) Database*. This difference can be visually observed in Figure 3 with the distance from the trend-line to the labeled data point for Germany 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 Germany, the shift will be +20881, and the new accurate model equation is $44.691 * e^{(0.0773 * (DB \text{ Score}))} + 20881$ or $583.03 * e^{(0.0532 * (DB \text{ Score}))}$. This equation is then used to project the additional prosperity Germany 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.

Elasticity is a measure of a variable's sensitivity to a change in another variable. In this case, we are interested in measuring the change in GDP/capita in relation to DB movements. The following chart shows an incremental analysis and elasticity measurement on Germany's path to achieving the frontier (a DB score of 100). Calculations show that prosperity remains highly elastic with incremental changes of 5 in DB scores.

Table 4

Incremental Analysis of Germany			
Doing Business Score for 2016	GDP/Capita (\$)	Increase in GDP/Capita (\$)	Elasticity ($\Delta\%$ GDP/Capita / $\Delta\%$ DB)
80	\$42,320	--	--
85	\$52,755	\$10,435	3.95
90	\$67,793	\$15,038	4.85
95	\$89,927	\$22,134	5.88
100	\$122,505	\$32,578	6.88

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/capita of ~\$100,000, which is 2.36 times better than the GDP/capita generated by Germany (GDP/capita: \$42,320). In other words, Germany's economy would need to grow at an annual rate of 3.5% for 25 years to reach the frontier.

Germany presents little barriers to investment or trade. However, Germany's restrictions on biotech agricultural products and agreement with the EU's Common Agricultural Policy represent hurdles for some business. Germany has pushed the EU Commission to support innovation and reduce regulatory burdens to increase EU member states' competitiveness. While government regulation is not directly discriminatory, its complexity does give a level of protection to started local suppliers. For investors, Germany's high marginal tax rates and complicated tax laws create a barrier for starting a business. Germany needs to move effective tax rates to internationally competitive levels through deductions, allowances and write-offs.

The worst performance for Germany is in Starting a Business, ranking 114th out of 190 countries. According to data collected by Doing Business, starting a business there requires 9.0 procedures, takes 10.5 days, and costs 1.9% of income per capita. For comparison, starting a business in New Zealand requires 1.0 procedures, takes 0.5 days, and costs 0.3% of income per capita. Germany should streamline procedures by setting up a one-stop shop, and make procedures simpler and faster by introducing technology and reducing minimum capital requirements. Noted, Germany has made recent progress by increasing the efficiency of communications between the notary and the commercial registry and eliminating the need to publish an announcement in a newspaper. However, they have also taken steps backwards by increasing notary fees.

Germany's second worst-performing indicator is Registering Property, ranked 79th. In 2015, Germany has made it more expensive to register property by increasing the property transfer tax. Germany should cut regulations and promote simplicity by computerizing land registries, introducing time limits for procedures, and setting low fixed fees. Countries that performed better have cut the time required substantially—enabling buyers to use or mortgage their property earlier. An example is once again New Zealand, where registering property requires 2.0 procedures, takes 1.0 days, and costs 0.1% of the property value. Germany, on the other hand, requires 6.0 procedures, takes 52.0 days, and costs 6.7% of the property value.

One of Germany's better-performing areas is Resolving Insolvency; their score is of 92.28 is ranked 3rd. The average recovery rate is 84.4 cents on the dollar, and the entire process of resolving insolvency takes only 1.2 years on average and costs 8.9% of debtor's estate. In 2013, Germany strengthened its insolvency process by adopting a new insolvency law that facilitates in-court restructurings of distressed companies and increases participation by creditors. All in all, Germany has a well-balanced bankruptcy system that is able to distinguish companies that are financially distressed but economically viable from inefficient companies that should be liquidated.