Question & Answer
“Visualizing Global Trade”

Section 1: Insights

Q: What are the key takeaways from this data visualization?

A: While this visualization does not presuppose evidence of a causal relationship, it allows us to visualize outcomes for individual countries and compare them at a state-state or global level. What we see is that global trade and positive social and economic outcomes can coexist in countries around the world.

What this visualization also makes clear is that big countries have their own unique stories to tell about how they engage in global trade. For example, the United States is a major domestic producer and consumer. While the country’s volume of imports and exports is large by global comparison, they are small relative to the size of its economy. Comparatively speaking, China is a country that has heavily utilized global trade. Its economic growth in recent years is driven by its reliance on global trade, rather than reliance on domestic consumption.

Q: Why was this data visualization created?

A: Rather than state the impact of global trade and foreign investment on economic and social conditions around the globe, the intent of this data visualization is to demonstrate it. The purpose of this tool is to make otherwise intangible conversations about global trade flows relatable to all users.

We live in a global economy where goods, services and ideas cross international borders everyday. It’s one thing to express the economic and social impacts of global trade as a quantity. For example, global merchandise trade was valued at a high of $18 trillion in 2011 (“World Trade Report 2013,” World Trade Organization). The literature on the subject is bountiful.

Q: What information is included in this data visualization?

A: This data visualization aggregates four independent, publicly available data sets that analyze these conditions from the following sources:

1. Trade reliance (Calculated using the following formula for each country: imports + exports / GDP)
   b. GDP: World Bank
2. World Bank’s Doing Business Project
3. World Economic Forum’s Global Competitiveness Report
4. United Nation's Human Development Index

The purpose of this visualization is to examine the relationships between global trade and the social and economic factors within and between countries around the world. The data were all adjusted onto one common scale, which allows the user to compare dissimilar data sets (i.e. # days vs. time).

Q: What makes this data visualization unique?

A: Aggregating dissimilar data sets and adjusting them to allow for a common comparison is no small task. But that’s exactly what we set out to do in creating this tool – it allows you to compare apples to oranges. The point of this project is to begin a new conversation about the relationships between trade, global investment and local economies, rather than simply relying on a single peer-edited data set and preexisting conversations.

Q: What can I learn from this tool?

A: Every country has its own story to tell about its development, and part of that story includes its use of global trade. What this visualization makes very clear is that the placement of a country on its development path matters a great deal. As you interact with this visualization, be on the lookout for relationships between and among countries that seem counterintuitive to you. When you encounter these comparisons, think about where certain countries are in their development to better understand how their reliance on trade could influence certain social or economic outcomes.

For example, try comparing Australia and Eritrea. Based on trade reliance, they look quite similar at .49 and .46 respectively. However, these two countries could not be more different when it comes to the economic and social attributes compared in the visualization because Australia is much farther down its development path than Eritrea.

Q: Does global trade help countries to grow and prosper?

A: While this visualization does not attempt to assert causal relationships, the stories of development in countries like Ghana demonstrate how global trade, social conditions and economic development relate to each other.

Ghana is a good example of how a country’s emergence as a global trader contributes to rule of law and development institutions. Ghana’s discovery of oil catalyzed greater foreign investment in the country, which then led to a greater commitment to strong governmental institutions and political transitions (as evidenced by four consecutive successful elections). Today, the country is more open to global trade, but is working to meet international political and institutional standards to ensure continued foreign investment.
Section 2: General overview of purpose and functionality

Q: How do I interact with this data?

A: The range slider beneath the map illuminates countries in increments of 10 percent based on their trade reliance. Countries illuminated near the left side of the scale engage in less trade relative to the size of their overall economies compared to countries illuminated on the right.

The placement of the U.S. versus the placement of Singapore on the trade reliance scale is a good example of how different economies interact with trade. The U.S. is both the world’s largest economy and one of the world’s largest importers and exporters, but trade as an overall percentage of the total U.S. economy is low compared to domestic production and consumption.

Conversely, while Singapore’s volume of imports and exports is a fraction of what the United States’, the percentage of trade to its overall economy is significantly higher. For that reason, Singapore is illuminated on the far right of the visualization.

Toggle a data set beneath the slider to explore a country’s trade reliance relates to its social and economic attributes. The strength of each set of attributes is expressed through opacity on the map. As such, countries with dark color saturation exhibit high values for each attribute, while countries lighter in color saturation experience lower values for each attribute.

For example, Australia has a relatively favorable business climate, according to the Doing Business data. It is very easy to start a business and contracts are well enforced. Therefore, the country is illuminated in a deep shade of blue. It falls on the lower end of the trade reliance scale because its volume of trade is small relative to the size of its economy.

Because some countries are too small for the naked eye to see, countries selected within the range selector are also illuminated in the grid above the map. Within the range selected, the country with the highest trade reliance is highlighted red on the grid, and the country with lowest trade reliance is highlighted green.

Q: What is “trade reliance”?

A: “Trade reliance” represents the weight of trade in a country’s overall economy. It accounts for a country’s exports, driven by domestic producers, and it’s imports, determined by its dependence on the foreign supply chain for goods and services.
For the purposes of this visualization, a country’s “trade reliance” is determined by first calculating the sum of its imports and exports divided by GDP. Based on that calculation, each country received a value between 0 and 4 to represent their “trade reliance.”

A value of 0 represents a low reliance on trade. That is, imports and exports as a proportion of a given country’s economy is low.

It is important to note that “trade reliance” refers to a country’s volume of trade relative to its own economy, not relative to other countries. In this way, some countries with a large GDP like the U.S. fall on the lower end of the “trade reliance” scale. The U.S. has the largest economy in the world and is one of the largest global importers and exporters. However, since trade as a relative portion of the overall U.S. economy is low, the U.S. has a low “trade reliance”.

Q: Where did the other data in this visualization come from?

A: This visualization aggregates three independently created sets of data from the World Bank, the World Economic Forum and the United Nations. All of these data sets were published in 2011.

The World Bank Doing Business Project examines business climates through regulation and enforcement. Read more about this data set [here](#).

The World Economic Forum’s Global Competitiveness Report examines the drivers of growth and prosperity within countries. Read more about the data [here](#).

The United Nation’s Human Development Index was created as a way to measure social and economic development. Read more about the Index [here](#).

Section 3: Elements of the data visualization

Q: What is this visualization showing me?

A: This visualization depicts three layers of data. By selecting the name of a country in the column to the right of a country card, you can compare data and attributes between two countries.

The first, denoted by the gray color scheme, indicates a country’s reliance on trade.

The second layer examines a variety of social and economic conditions within individual countries using data sets created by the World Bank, the World Economic Forum and the United Nations. These conditions, or attributes,
examine a country’s business environment; the strength of a country's institutions and infrastructure; and quality of life factors for people within each country.

The third layer, referred to as a country’s “data card,” provides a snapshot of a selected country’s trade reliance. The card also identifies the strength of social and economic attributes within the World Bank, World Economic Forum and United Nations data sets. The card also includes total import and export volumes, as well as a country’s relative wealth (expressed in GDP per capita). World averages are also noted for comparison.

**Q:** What is a country data card?

**A:** A country’s “data card,” provides a snapshot of a selected country’s trade reliance. The card also identifies the strength of social and economic attributes within the World Bank, World Economic Forum and United Nations data sets. The card also includes total import and export volumes, as well as a country’s relative wealth (expressed in GDP per capita). World averages are also noted for comparison.

By selecting the name of a country in the column to the right of a country card, you can compare data and attributes between two countries.

**Q:** What is the color key?

**A:** Each attribute was assigned a corresponding primary color. Doing Business attributes are blue; Global Competitiveness attributes are red; and Human Development attributes are yellow.

When a single attribute is toggled on, countries on the map will illuminate in the assigned color based on the range selected for trade reliance. The opacity, or color saturation, for each country corresponds to the relative strength or weakness of the attributes within a selected country.

The colors assigned to each attribute will blend accordingly if multiple attributes are toggled on simultaneously. For example, toggling both Doing Business (blue) and Global Competitiveness (red) creates a purple color scheme on the map. Countries with stronger attributes will appear darker and more saturated, while countries with comparatively weaker attributes will appear lighter.

Section 4: Data analysis

**Q:** Are you asserting causal relationships between attributes like global competitiveness and a country’s heavy reliance on trade?
A: No. We acknowledge there are several explanations for positive trends in this analysis and we are not asserting that these are, in any way, causal relationships.

That said, a bivariate analysis was conducted for each attribute in this data set to identify the strength of its correlation to trade reliance.

Q: How were the data sets normalized to allow for cross-comparisons?

A: In order to compare data across multiple variables and scales (ex.: days, steps, financial values), we standardized the data to identify the relationships within and between variable values.

Data values were normalized, centered, and scaled so each variable has mean 0, standard deviation 1. No data is changed or altered in this process. It simply standardizes the data to represent a common value and isolate the relationships between variables.

Q: Why are the three attributes (Doing Business, Global Competitiveness, and Human Development) grouped into quartiles on the country data cards?

A: To simplify and more clearly show comparisons between countries, we grouped countries into quartiles based on performance level per variable. Each country falls into the first, second, third or fourth quartile for each variable, which allows for a simple comparison on a common performance basis.

The average values for a selected range of countries on the trade scale were then calculated by averaging the quartile values. These values appear beneath the range selector. As the range selector moves to the right of the trade reliance scale, the values of each attribute generally increase.

Q: Why did you select the calculation you used for trade reliance?

A: In order to examine how social and economic conditions might relate to a country’s trade patterns, we first needed to quantify the volume of trade in each country. The calculation used in this analysis (Imports + Exports / GDP) represents weight of imports and exports in a country’s economy.

While this calculation provides an imprecise but helpful gauge of a country’s openness to trade, it can be misleading for certain large economies like the U.S., who rely on producing goods and services domestically.

In designing this visualization, we did consider using tariff averages and the total trade variable as baselines for measuring the amount of trade in individual countries. However, using tariff averages make the assumption that import
variations are the same for all commodities. Plus, tariff barriers are no longer as significant as some non-tariff barriers. The shortcoming with the total trade variable calculation is that it does not account for the impact of trade relative to the size of the economy.

Q: How does the range selector work?

A: Based on the trade reliance calculation, each country was assigned a value from 0-4. Most country’s trade reliance fell between 0 and 1.

For the purposes of clarity in the display, these values are expressed on a logarithmic scale on the range selector, grouped in increments of 10 percent.

Q: What do the percentages beside each attribute mean and why do they change as I move the slider to the left or right?

A: Countries were grouped into quartiles based on performance level per variable. Based on the range of countries selected, the value of the attributes beneath the slider will increase or decrease. The average values for a selected range of countries on the trade scale were then calculated by averaging the quartile values. These values appear beneath the range selector. As the range selector moves to the right of the trade reliance scale, the values of each attribute generally increase.