From Data To Decision Making Tools: Where Design Meets Big Data

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Prologue
The Problem…
Data

1869

Information Graphic
Data

Information Graphic

1869

2014

More Data

Visualization
But why…?
Too much data.
Data Sanity Check

Doctors
Data Sanity Check

Clinicians
Data Sanity Check

Doctors + Clinicians
Deeper resolution data provides exponential combinations

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
<th>Industry</th>
<th>Occupation</th>
<th>Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>Sao Paulo</td>
<td>Health care</td>
<td>Nurse</td>
<td>$1,200</td>
</tr>
</tbody>
</table>

\[
14 \text{ years} \times 6,312 \text{ locations} \times 778 \text{ Industries} \times 3,745 \text{ occupations} = +250 \text{ Billion combinations}
\]
Looking at the world differently by increasing resolution
Chapter 1
The Observatory of Economic Complexity

http://atlas.media.mit.edu
The Observatory of Economic Complexity makes international trade data and economic complexity indicators available through millions of interactive visualizations.
Import origins of Refrigerators to Brazil
Total Country Trade: $340M

China: 23.82%
South Korea: 14.55%
Japan: 2.19%
United States: 22.98%
Mexico: 13.76%
Argentina: 4.11%
Chapter 2
Using Networks to Identify Opportunity
Shortest path = 5 stops
Shortest path by weight = 6 stops

- Boston
- NYC
- Cleveland
- Nashville
- Chicago
- Buffalo
- Missoula
- S.F.
- Seattle
- L.A.
- Las Vegas
- Phoenix
- Dallas
The Product Space
The Product Space
The Product Space
Lather. Rinse. Repeat.
Chapter 3
DataViva
Subnational data for the Brazilian Economy
http://dataviva.info/
Where are people getting hired in Minas Gerais?
Visualize employment data now.

Quick Links

Occupations by Highest Average Wage
Where are people getting hired in Minas Gerais?
Visualize employment data now.

Quick Links
- Refrigerators
- Manufacture of stoves, refrigerators, washers and dryers
- Manufacture of refrigeration and ventilation equipment
- Refrigeration Installers
- Refrigeration Workers
Refrigerators

Trade Balance (Jan 2000-Dec 2014)

Exports by:
- Destination (2014)
- State (2014)

Imports by:
- Origin (2014)
- State (2014)

Economic Opportunities:
- Similar Products (2014)

Common Industries by Occupation:
- Manufacture of Stoves, Refrigerators, Washers and Dryers
- Manufacture of Refrigeration and Ventilation Equipment

2014 Stats (SECEX):
- Top Municipality by Exports: Joinville ($47.9M USD)
- Top Country by Exports: Argentina ($46.8M USD)
- Nominal Annual Growth Rate (1 year): 22%

Trade Balance of Refrigerators in Brazil (Jan 2000-Dec 2014)
Based on State Production

Trade Value ($ USD)
Occupations in Brazil employed in the Manufacture of Stoves, Refrigerators, Washers and Dryers Industry (2013)

Total Employees: 35.8k

Specialized Production Workers

67%

Data provided by RAIS

Changes the level of aggregation.

Size | Total Employees | Total Monthly Wages | Total Establishments | Depth | Main Group | Principal Subgroup | Family
---|-----------------|---------------------|----------------------|-------|------------|---------------------|-------

Color | Sector
---|---

Show Historical Data
Occupations in Brazil employed in the Manufacture of Stoves, Refrigerators, Washers and Dryers Industry (2013)

Total Employees: 35.8k

**Electrical Equipment Assemblers**

36%

**Production Line Feeders**

19%

Data provided by RAIS

Size: Total Employees | Total Monthly Wages | Total Establishments
Depth: Main Group | Principal Subgroup | Family

Color: Sector

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**Production Line Feeders**

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- Manufacture of Refrigeration and Ventilation Equipment

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Production Line Feeders

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Total Employees: 35.8k

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**2014 Stats (SECEX):**
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- Top Country by Exports: Argentina ($46.6M USD)
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Estimated Employment for the Manufacture of Stoves, Refrigerators, Washers and Dryers Industry in Minas Gerais (2013)

Estimated Employees: 875

Electrical Equipment Assemblers

Basic Values
- Employees: 5/305 (1.6%) per Establishment

Strategic Indicators
- Employees: 15117/305
- Available: 5.0e+3
- In Other Industries: 305
- Estimated: 305 Employees

Data provided by RAIS
Unintended Consequences
How to Query for Specific Data

THE BASIC CALL STRUCTURE

Below is the basic call structure for returning JSON from the data API.

This is the URL structure used: /CLASSIFICATION/TRADE_FLOW/YEAR/ORIGIN/DESTINATION/PRODUCT/.

Where CLASSIFICATION is one of these
Where TRADE_FLOW is one of these
Where ORIGIN is one of these
Where DESTINATION is one of these
Where PRODUCT is one of these
Where YEAR is one of these

You will notice that the URL structure has the following parameters: YEAR / ORIGIN / DESTINATION / PRODUCT which is a byproduct of the bilateral nature of the underlying dataset.

SAMPLE API URL:

http://atlas.media.mit.edu/CLASSIFICATION/TRADE_FLOW/YEAR/ORIGIN/DESTINATION/PRODUCT/

**URI OPTIONS**

**Classification**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>site</td>
<td>Use the SITC trade classification</td>
</tr>
<tr>
<td>hs</td>
<td>Use the HS Harmonized System trade classification</td>
</tr>
</tbody>
</table>

**Trade flows**

<table>
<thead>
<tr>
<th>Trade Flow</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>export</td>
<td>Change direction of trade flow to show export values.</td>
</tr>
<tr>
<td>import</td>
<td>Change direction of trade flow to show import values.</td>
</tr>
</tbody>
</table>

**Countries**

<table>
<thead>
<tr>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show</td>
<td>Keyword used to show all bilateral countries.</td>
</tr>
<tr>
<td>all</td>
<td>Keyword to use all bilateral countries in the query.</td>
</tr>
<tr>
<td>3_character_id</td>
<td>Search: View as list below —</td>
</tr>
</tbody>
</table>

**Products**
Beer

From Wikipedia, the free encyclopedia

This article is about the alcoholic beverage. For other uses, see Beer (disambiguation).

Beer is an alcoholic beverage produced by the saccharification of starch and fermentation of the resulting sugar. The starch and saccharification enzymes are often derived from malted cereal grains, most commonly malted barley and malted wheat.[1] Most beer is also flavoured with hops, which add bitterness and act as a natural preservative, though other flavourings such as herbs or fruit may occasionally be included. The preparation of beer is called brewing.

Beer is the world's most widely consumed alcoholic beverage,[2] and is the third-most popular drink overall, after water and tea.[3] It is thought by some to be the oldest fermented beverage.[4][5][6]

Some of humanity's earliest known writings refer to the production and distribution of beer: the Code of Hammurabi included laws regulating beer and beer parlours,[8] and "The Hymn to Ninkasi," a prayer to the Mesopotamian goddess of beer, served as both a prayer and as a method of remembering the recipe for beer in a culture with few literate people.[9][10] Today, the brewing industry is a global business, consisting of several dominant multinational companies and many thousands of smaller producers ranging from brewpubs to regional

Brewing at home is subject to regulation and prohibition in many countries. Restrictions on homebrewing were lifted in the UK in 1963,[7] Australia followed suit in 1972,[11] and the USA in 1978, though individual states were allowed to pass their own laws limiting production.[12]

Who imports Beer?

Who exports Beer?

Varieties

Main article: Beer style

While there are many types of beer brewed, the basics of brewing beer are shared across national and cultural boundaries.[13] The traditional European brewing regions—Germany, Belgium, England, and the Czech Republic—have local varieties of beer.[14]
Economy of France

The article is about the current economic situation of France. For historical information, see Economic history of France.

France has the world's fifth-largest economy by nominal figures and the ninth largest economy by PPP figures. It has the second-largest economy in Europe (behind its main economic partner Germany) in nominal figures, based on the dynamic industrial structure of the French economy. OECD is headquartered in Paris, France.

France's economy entered the recession of the late 2000s later and left it earlier than most comparable economies, only enduring four-quarters of contraction. Between January and March 2011, France's GDP growth had been stronger than expected at 0.3% but shrunk between April and June 2011 decreasing by -0.1%. In 2011, the GDP surprisingly grew at 1.85%, whereas in 2012 growth was stagnant. In the final quarter of 2013 the French economy was growing at a rate of 0.3%.

France has long been part of the world's wealthiest and most developed national economies.

As of 2010, France is the world's 8th and Europe's 2nd largest national economy by nominal GDP.

External trade

France is the second-largest trading nation in Europe (after Germany). Its foreign trade balance for goods had been in surplus from 1992 until 2001, reaching $25.4 billion (25.4 GS) in 1998; however, the French balance of trade was hit by the economic downturn, and went into the red in 2000, reaching a USD16bn deficit in 2003. Total trade for 1996 amounted to $730 billion, or 50% of GDP—imports plus exports of goods and services. Trade with European Union countries accounts for 60% of French trade.

In 1988, US–France trade stood at about $47 billion—goods only. According to French trade data, US exports accounted for 8.7%—about $25 billion—of France's total imports. US industrial chemicals, aircraft and engines, electronic components, telecommunications, computer software, computers and peripherals, analytical and scientific instrumentation, medical instruments and supplies, broadcasting equipment, and programming and franchising are particularly attractive to French importers.

The principal French exports to the US are aircraft and engines, beverages, electrical equipment, chemicals, cosmetics, luxury products and perfume. France is the ninth-largest trading partner of the US.
Economy of China

For other meanings of "China's Economy", see Economy of China (disambiguation).

The socialist market economy[18] of China is the world's second largest economy by nominal GDP and by purchasing power parity after the United States,[18] it is the world's fastest-growing major economy, with growth rates averaging 10% over the past 30 years.[17]

China is also the largest exporter and second largest importer of goods in the world. China is the largest manufacturing economy in the world,[18] outpacing its world rival in this category, the service-driven economy of the United States of America. ASEAN–China Free Trade Area came into effect on 1 January 2010. China–Switzerland FTA[19] is China's first FTA with a major European economy, while China–Pakistan Free Trade Agreement came into effect in 2007 is the first FTA signed with a South Asian state. The economy of China is the fastest growing consumer market in the world.[20]

On a per capita income basis, China ranked 87th by nominal GDP and 92nd by GDP (PPP) in 2012, according to the International Monetary Fund (IMF). The

External trade

Main article: History of trade of the People's Republic of China

Further information: List of the largest trading partners of the People's Republic of China

International trade makes up a sizeable portion of China's overall economy. Being a Second World country at the time, a meaningful segment of China's trade with the Third World was financed through grants, credits, and other forms of assistance. The principal efforts were made in Asia, especially to Indonesia, Burma, Pakistan, and Ceylon, but large loans were also granted in Africa (Ghana, Algeria, Tanzania) and in the Middle East (Egypt). However, after Mao Zedong's death in 1976, these efforts were scaled back. After which, trade with developing countries became negligible, though during that time, Hong Kong and Taiwan both began to emerge as major trading partners.

Since economic reforms began in the late 1970s, China sought to decentralize its foreign trade system to integrate itself into the international trading system. On November 1981, China joined the Asia-Pacific Economic Cooperation (APEC) group, which promotes free trade and cooperation in the economic, trade, investment, and technology spheres. China served as APEC chair in 2001, and Shanghai hosted the annual APEC leaders meeting in October of that year.

After reaching a bilateral WTO agreement with the EU and other trading partners in summer 2000, China worked on a multilateral WTO accession package. China concluded multilateral negotiations on its accession to the WTO in September 2001. The completion of its accession protocol and Working Party Report paved the way for its entry into the WTO on December 11, 2001, after 18 years of negotiations, the longest in the history of the General Agreement on Tariffs and Trade. However, U.S. exporters continue to have concerns about fair market access due to China's restrictive trade policies and U.S. export restrictions.
Exploring Trade Data

A place to showcase innovative and experimental uses of UN Comtrade data. Explore visualizations of huge volume of data and metadata, cutting-edge data extraction tools, and alternative dissemination platforms.

Data Visualization

Global Economic Dynamics Provided by Bertelsmann Foundation
The “Global Economic Dynamics” (GED) project of the Bertelsmann Foundation is intended to contribute to better understanding of the growing complexity of global economic developments. By using the latest tools and methods for measuring, forecasting and modeling global economic dynamics, the project is designed to make globalization, its economic effects and its political consequences more transparent and understandable.

The Observatory of Economic Complexity
Provided by MIT
The Observatory of Economic Complexity is a tool that allows users to quickly compose a visual narrative about countries and the products they exchange. The observatory provides access to bilateral trade data for roughly 200 countries, 50 years and 1000 different products of the Harmonized System and STIC.

Interactive Graphic System of International Economic Trends Provided by ECLAC
The Interactive Graphic System of International Economics Trends (SIGCHS) Trade Module is an easy and powerful way to generate analytical graphs, tables and indicators of international merchandise trade statistics by accessing UN Comtrade through web services in real-time. Hence, it is able to provide several trade indicators based on latest available trade data.
Data visualization made easy.

d3plus.org
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