

Data, Trade, and Growth

Dr. Michael Mandel

Progressive Policy Institute

Mack Center for Technological Innovation (Wharton)

Presented at “Measuring the Effects of Globalization”

Washington DC, March 1, 2013



Three questions:

How important is trade in data?

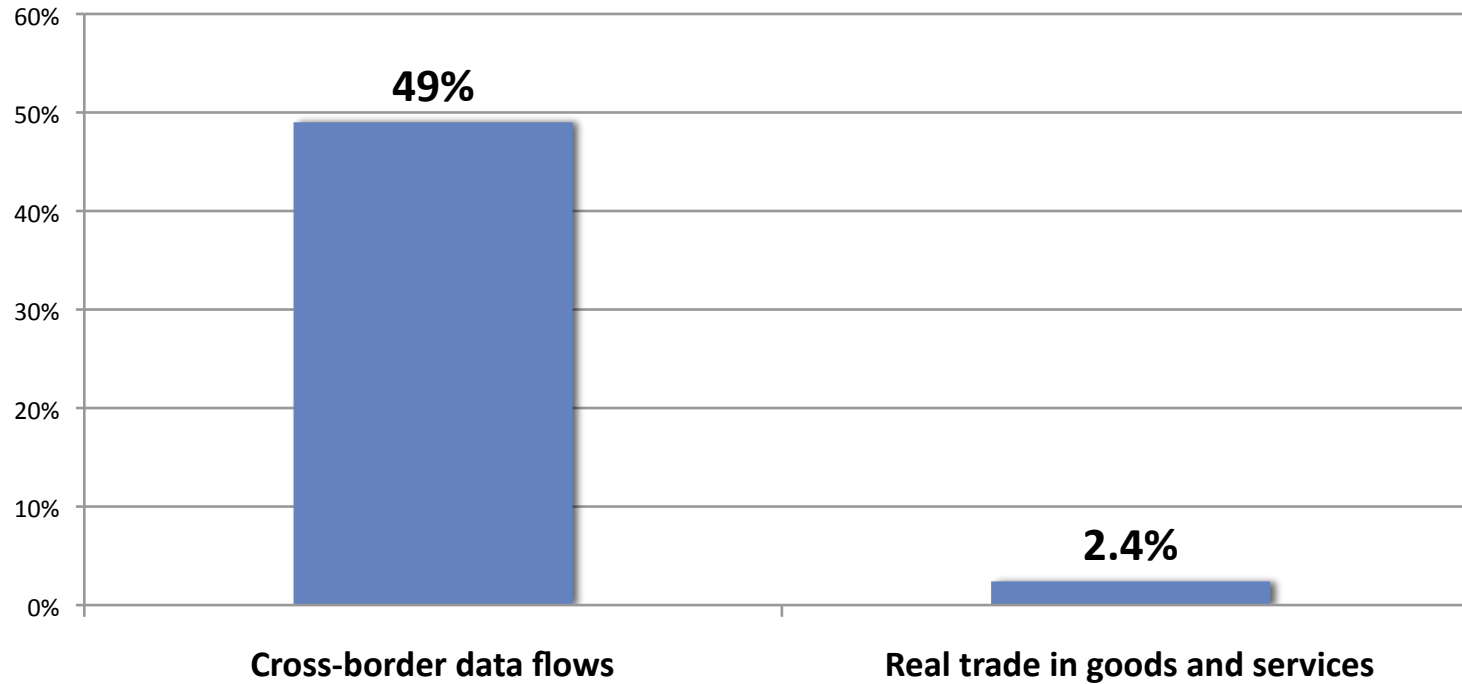
Who benefits from trade in data?

How should trade policy deal with data?

Cross-border flows of data are the fastest-growing component of international trade ...

....global demand for cross-border bandwidth rose at a 49 percent annual rate between 2008 and 2012

World Trade: Data vs Goods and Services (annual growth rate 2008-12)



Data: TeleGeography, IMF



The global economy would not be able to function without cross-border data flows

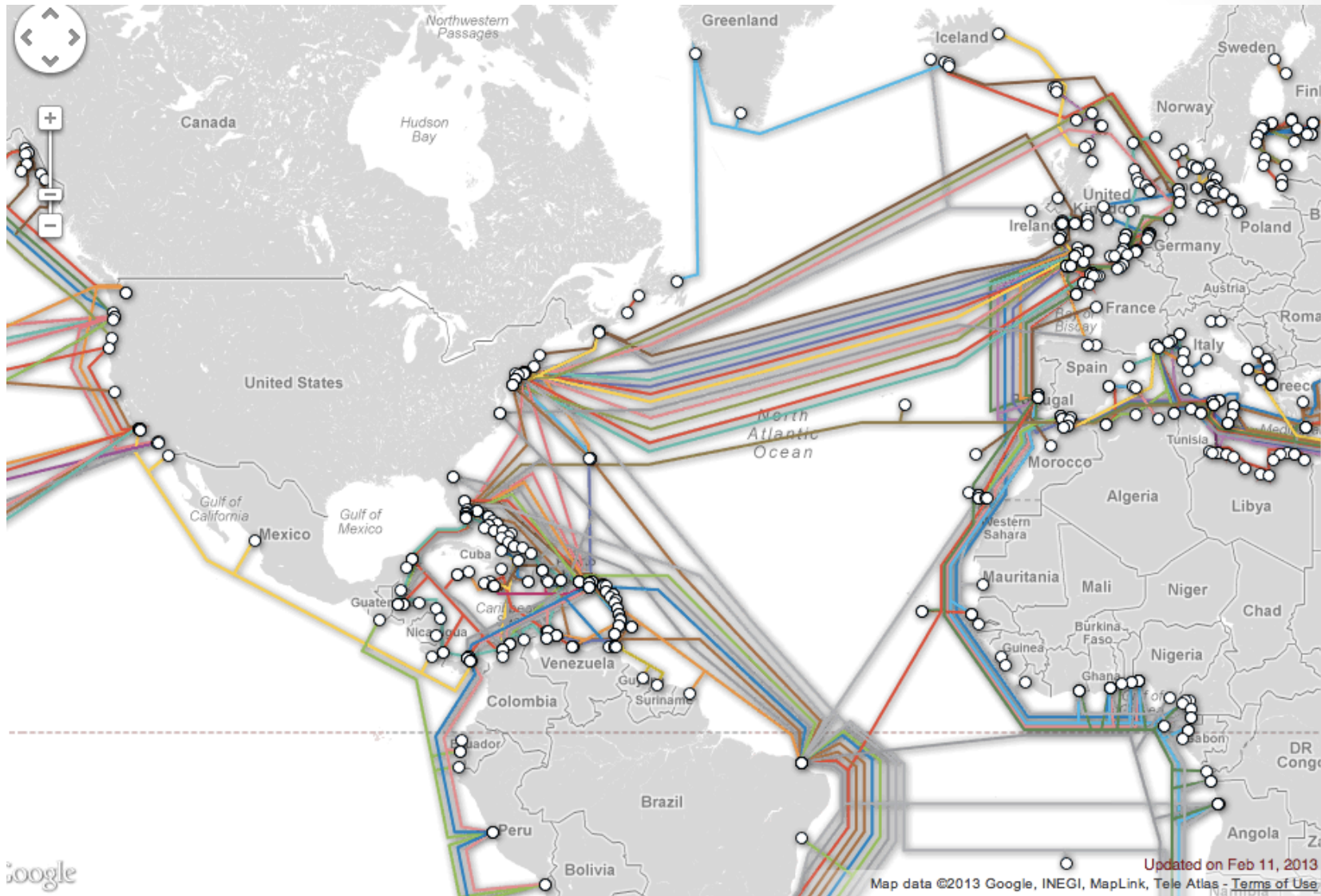
....Financial data....internal corporate data...links with offshore suppliers...webpages...video...and much more

Because cross-border flows of data are valuable, they are key for upcoming trade negotiations...

....European data privacy legislation is a major issue for transatlantic free trade agreement

In 2012 U.S. cross-border data flows averaged 6.7 terabits per second....

....or roughly 6000 DVDs per minute.

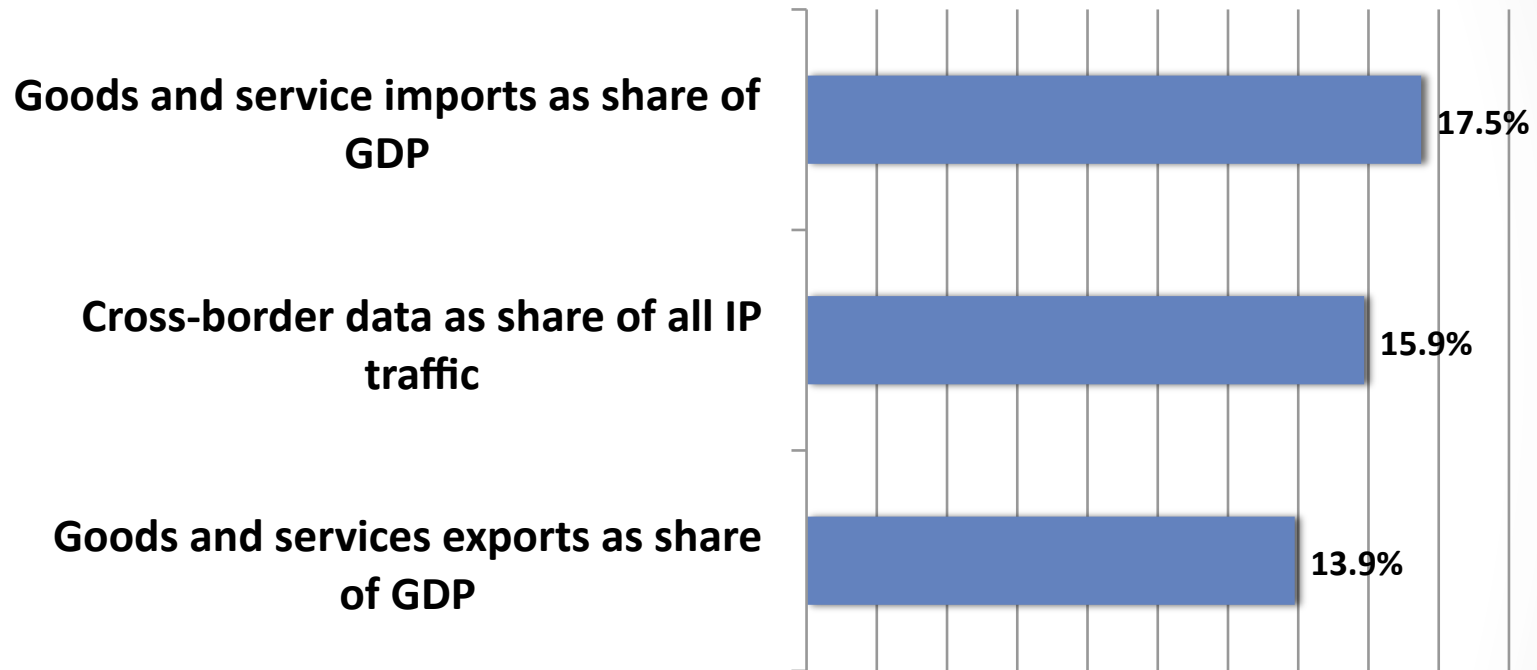


Map of Submarine Cables
by TeleGeography

U.S. cross-border data flows
were roughly 16% of U.S. total
IP traffic in 2012....

....How does that compare to
goods and services?

Importance of US trade: Data vs Goods and Services



Data: TeleGeography, Cisco, BEA

Who benefits from cross-border data flows?

Let's suppose that a European student downloads a video of a Stanford University computer science course. Is this an export or an import?

In some ways, it looks like an export, since data leaves the U.S.

--no money changes hands

-- the video is still available to U.S. citizens.

--no marginal jobs are generated in the U.S.

Let's try another approach:

It matters where the video is accessed from. If the server is closer, the user experiences less latency, shorter lags, and higher quality.

Table 2: Examples of Latency from Europe

Response time from Germany

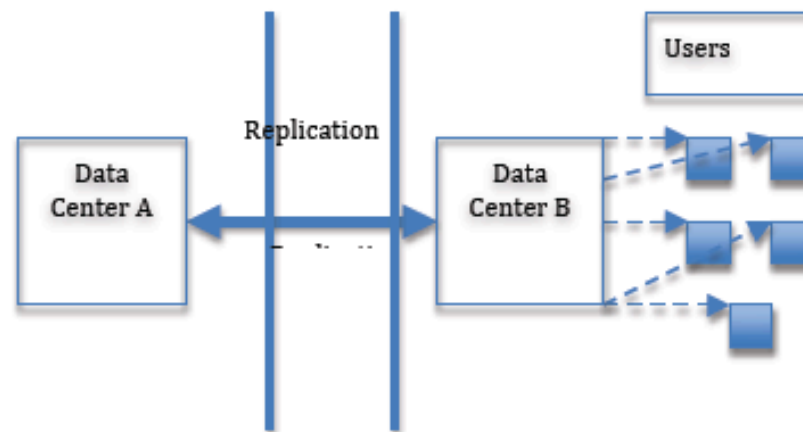
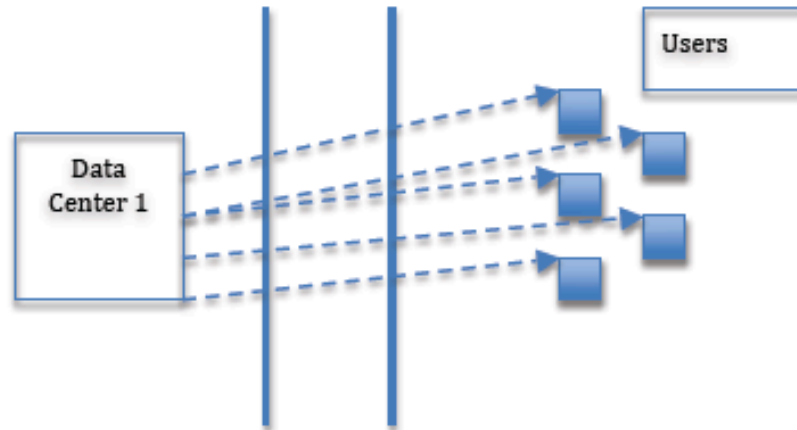
European Central Bank (www.ecb.int)	7 ms
Swiss Central Bank (www.snb.ch)	13 ms
Bank of Russia (www.cbr.ru)	57 ms
Federal Reserve (www.federalreserve.gov)	98 ms
Bank of Taiwan (www.cbc.gov.tw)	295 ms

Data: Based on data from ping.eu

How can latency of data be reduced and the quality be improved?

Data can be replicated closer to users by building a data center or a content delivery network.

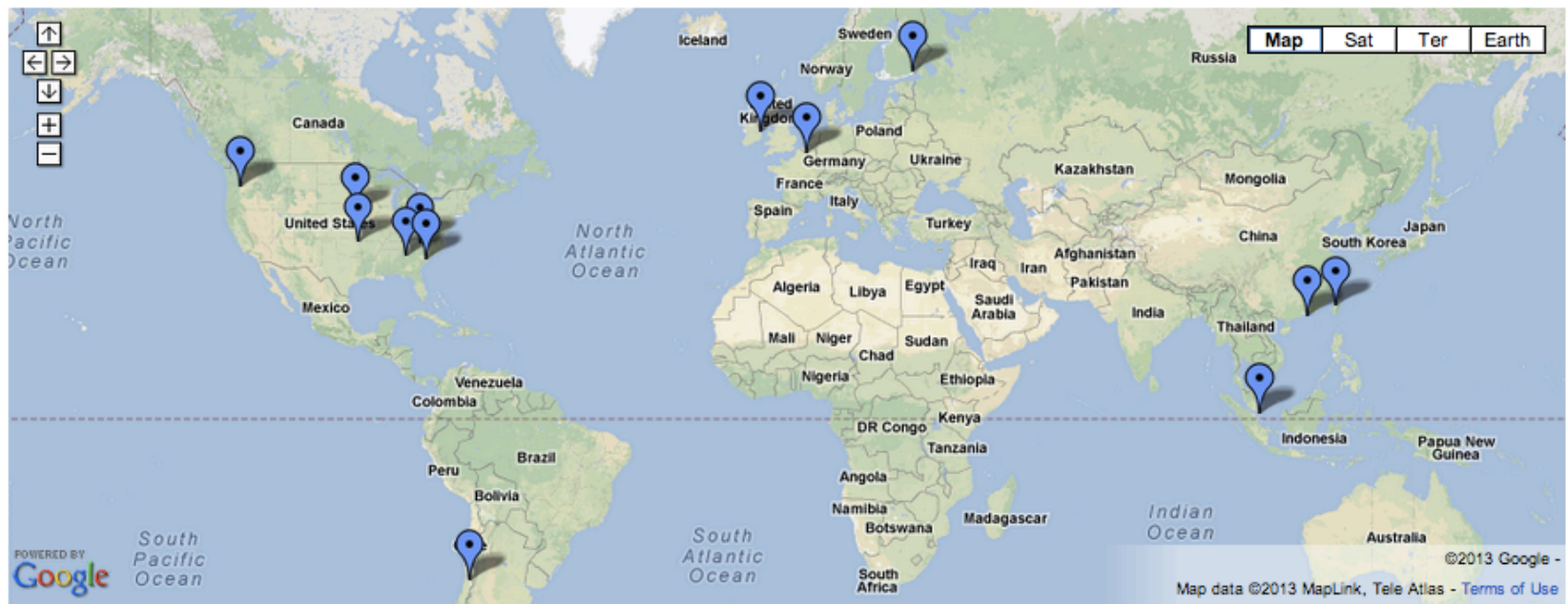
Figure 4: An Example of Replication



Building and operating a replication facility such as a data center requires an investment in equipment and communications links .

Google, Amazon, Yahoo operate data centers around the world.

Google's Data Centers



[View our data centers in a larger map.](#)

Map by Google

Building and operating a replication facility in a region increases the relative utility of data accessed through the data center or other replication facility by decreasing lags and increasing quality.

To put it another way, access to global data is equivalent to intangible capital for a region. By reducing lags by up to 90%, a data center or other replication facility in that region effectively increases intangible capital and output.

Some observations:

1. Trade in data between two regions may be better characterized by replication rather than exports and imports.

2. Building a data center or other replication facility in a region benefits businesses and individuals in that region by allowing faster and better access to global data, boosting economic output.

3. Just like consumers in a region benefit from allowing imports of goods, so do data “consumers” benefit from the construction of a data center or other replication facility in their region.

4. Google and others that build replication facilities around the world are using a relatively small amount of local data to fund the replication of a much larger quantity of useful global data in that region.

5. Trade policy should focus on reducing barriers to cross-border data flow **and** to the construction of data centers or other replication facilities.

6. For example, tight privacy restrictions in Europe will reduce the incentive to build and operate data centers in region. That will reduce quality of global data flowing into the region, and lower economic output.

Dr. Michael Mandel

mmandel@progressivepolicy.org

(202) 656-7633

