

Vision Statement



Diego Comin is an associate professor at Harvard Business School. **Bart Hobijn** is a senior research adviser at the Federal Reserve Bank of San Francisco.

How Early Adoption Has Increased Wealth—Until Now

Data by **Diego Comin** and **Bart Hobijn**; visualization by **Open** (notclosed.com)

It makes sense: Societies that utilize new tools quickly are likely to be more productive. To help understand this relationship, Diego Comin and Bart Hobijn have spent years creating the Cross-country Historical Adoption of Technology (CHAT) data set, which examines when 161 countries adopted 104 technologies, from steam power to PCs, over the past two centuries.

Their analysis provides three important findings. First, on average, countries adopted a new technology 45 years after its invention. Second, variation in adoption rates is larger than you might expect and accounts for 25% of differences in countries' per capita income today. Third, adoption lags have shortened in recent years. What does that mean? Over time, the West's advantages from being a consistent early adopter may decrease.

For the timeline below, we've chosen eight countries and nine inventions. ▾

HBR Reprint F1203Z



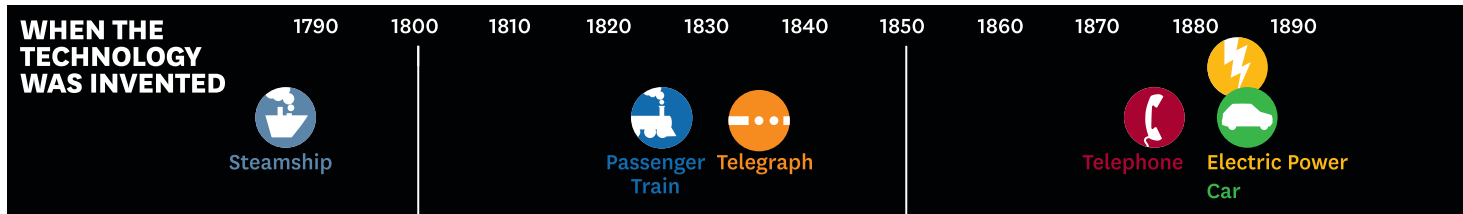
STEAMSHIP
Permitted large volumes of cargo to be moved great distances, expanding international trade.

In 1819 a transatlantic crossing took 26 days. By 1850 it took less than one week.



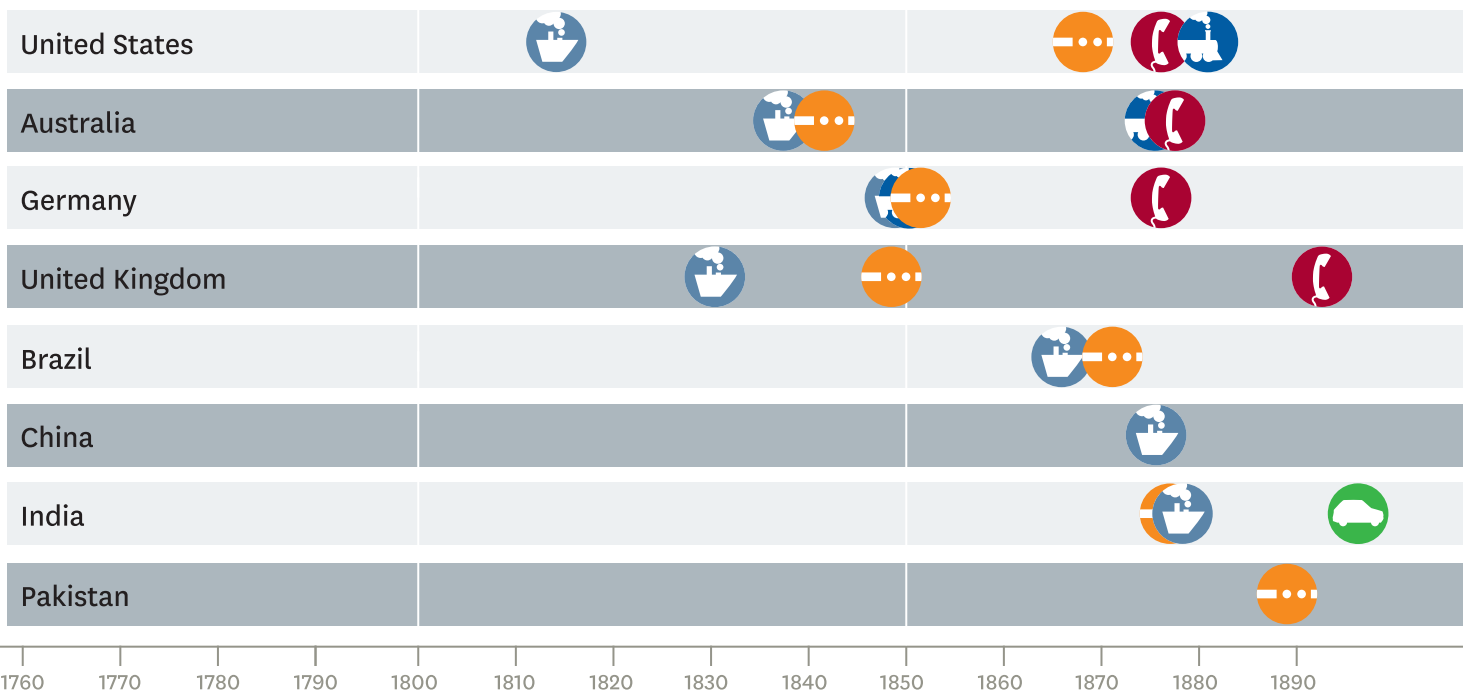
PASSENGER TRAIN
Expanded travel for everyone and made once-isolated cities accessible, thus spurring growth.

Varying rail gauges meant that a passenger crossing Australia in 1917 had to change trains six times.



WHEN THE TECHNOLOGY WAS ADOPTED

Adoption lags for initial and subsequent versions of a technology are averaged to arrive at a country's adoption date.





TELEGRAPH
Cut communication time dramatically and was used early on to relay information about stock and commodity pricing.
Samuel Morse beat competitors by getting Congress to grant \$30,000 to lay the first cable.



TELEPHONE
Enabled rapid communication regardless of distance; business efficiency soared.
Transatlantic calling was done via radio until 1956, when the first under-sea line was completed.



ELECTRIC POWER
Raised living standards and made possible some of the world's most important innovations.
The U.S. National Academy of Engineering called it the greatest achievement of the 20th century.



CAR
Transformed employment, shopping patterns, social interactions, and city planning.
In 2009 China displaced the U.S. as the largest auto market.



PASSENGER AVIATION
Shrank the world and facilitated international business.
The first U.S. flight attendants were young (or short) men. The first female attendants were nurses.



CELL PHONE
Allowed instant communication anytime from anywhere, radically changing business and social interactions.
In 2011 China had nearly three times as many cell phones as the U.S.



PC
Brought the power of mainframes to small businesses and consumers.
The open-source movement made software affordable for the first time in impoverished areas such as Pakistan.

