

Globalization of Entrepreneurship and Innovation

Dr. Jack M. Wilson, Distinguished Professor of Higher Education, Emerging Technologies, and Innovation



Why study international entrepreneurship?

- World markets are **larger and faster growing** than domestic ones.
- **Changes in technology, transportation, and trade** liberalization have made international trade more accessible to companies, especially new entrepreneurial firms.
- In a global economy, **consumers worldwide** choose from a wide variety of goods and services.
- Collectively, the movement of goods, labor and capital across national borders is part of a growing trend toward globalization—the creation of an **integrated interdependent** world economy.
- Entrepreneurs are on the cutting edge in creating international businesses; they are often the first movers into new markets, new products, and new services.
- Firms that choose to remain domestic miss great opportunities and often face increased risks.
 - For example, a company that has achieved the enviable position of having one-third of the US consumer market for its products has only a 1.5% share of the global market, 98.5% of the market is still available.
 - <http://data.worldbank.org/indicator/IC.BUS.NREG/countries>

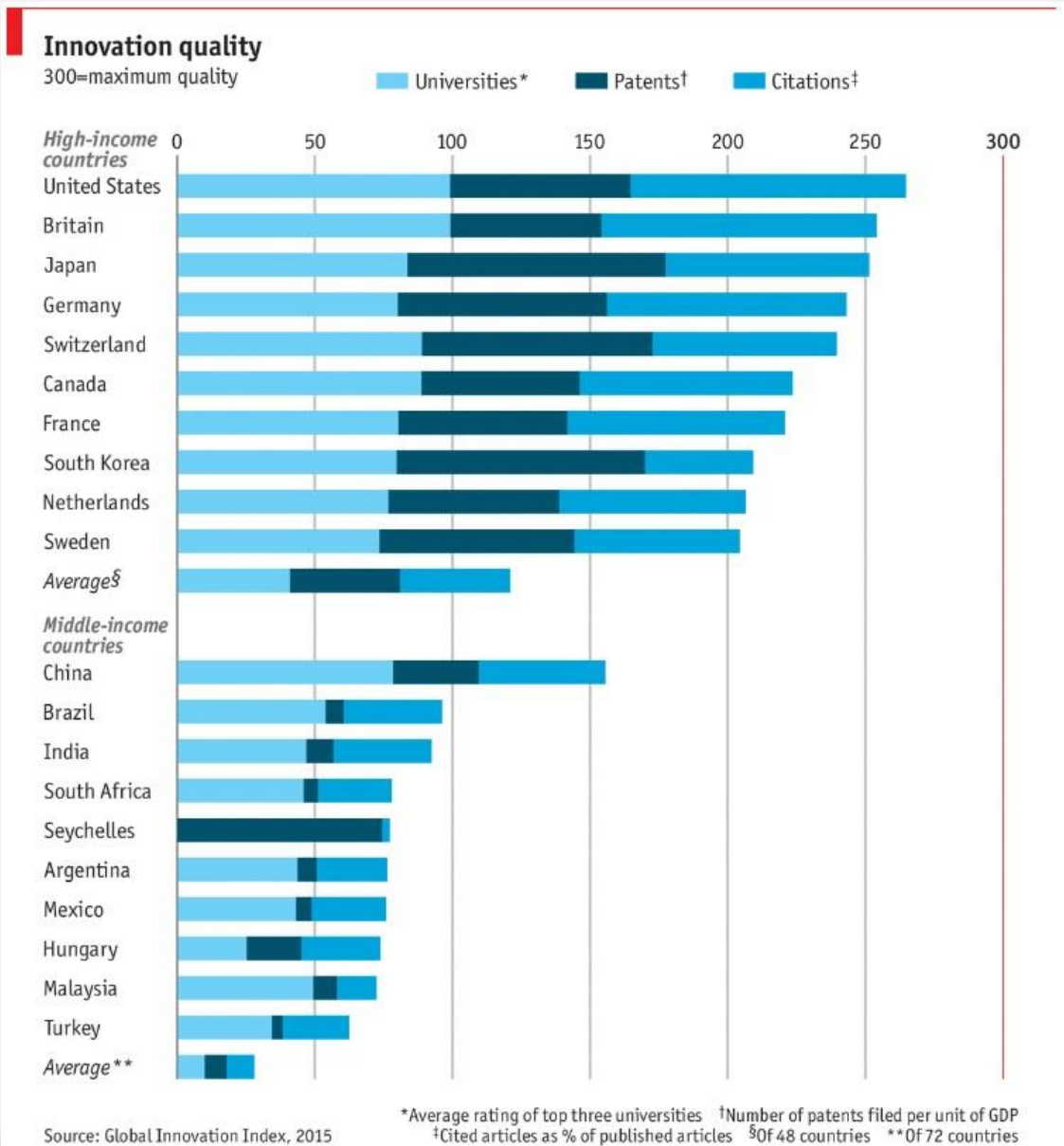
Four factors in success of organizations (Bessant and Tidd)

- The **national system of innovation** in which the firm is embedded, and which in part defines its range of choices in dealing with opportunities and threats.
- The power and **market position** within the *international value chain*, which in part defines the innovation based opportunities and threats that it faces.
- The **capability and processes** of the firm, including research, design, development, production, marketing, and distribution.
- **External awareness**: The ability to identify and exploit *external sources of innovation*, especially international networks.
 - *Innovation and Entrepreneurship*, 3rd ed., by John Bessant and Joe Tidd; John Wiley and Sons; West Sussex, UK (2007).

Global Entrepreneurship

- Global Entrepreneurship has flourished over the last 50 years. Major changes in world governments, economic systems, and cultural interactions have created an environment in which entrepreneurship has become a significant factor in regional economic development, global geo-politics, and even cultural change.
- There have been three significant issues that have enabled much of this innovation.
 - **Technology advances:** The incredible advances in technology –particularly in computing and the internet, but also in the life and medical sciences.
 - **Trade Liberalization:** The dismantling of barriers to trade and the movement of goods and ideas across borders that has found expression in world trade organizations like the WTO and in multi-national trade agreements like the European Union (EU), North American Free Trade Agreement (NAFTA) and many others.
 - **Freer movement of people:** The opening of borders to a much freer movement of people who emigrate and immigrate to find better opportunities in education and employment.

Great Research Universities are a key to innovation quality.



<http://www.economist.com/blogs/graphicdetail/2015/09/global-innovation-rankings?fsrc=scn%2Ffb%2Fte%2Fpe%2Fed%2Ftheinnovationgame>

Technological Advances

- It is hard to over state the importance of the rise of computing, communication, and internet technologies to the creation of the world we live in today.
- Tom Friedman in his book “The World is Flat” gives one of the best expositions of how technology and globalization have changed the world.
 - I cover his work and some of the criticisms of his work in more detail in my text on Global Entrepreneurship in the chapter: “[Types of Opportunities for Global Entrepreneurship](#),”.
- The internet has been an enabler of the global supply chain as we shall see later in this chapter.
- As social media has spread around the world, it has enabled like minded individuals to communicate without regard to borders and has enabled the good, the bad, and the ugly. It facilitates global business, global political movements, internet dating, and even terrorism.
- Medicine has become a global issue with both disease propagation and enabling collaborative efforts to use advances in the life sciences to fight disease.

Eliminating Restrictions on Trade and Investment

- For most of the past half century, the trend has been to remove barriers to trade and the movement of goods and ideas across borders.
- Toward that end the world has created global organizations like the World Trade Organizations (WTO) which creates a framework for rules for trade amongst nations that adhere to the WTO.
- The General Agreement on Tariffs and Trade (GATT) set out rules for tariffs and trade and eventually merged into the WTO.
- The World Bank was created to provide capital to developing countries to enable them to join the groups of trading nations.
 - In my Global Entrepreneurship (GLE) text a chapter on [Global Finance](#) considers some of the methods that can be used to finance global ventures for those who wish to explore in more detail.
- Multi-national trade agreements like the European Union (EU), North American Free Trade Agreement (NAFTA) and many others created trade openings among the signatories.
- The Southern Common Market (Mercosur) was formed in 1991 to enable trade among South American nations.
- By 2016 this movement toward free trade was beginning to encounter some resistance from populist movements in many countries. In the US, it became an issue in the Presidential campaigns. It was a factor in leading the United Kingdom (UK) to vote to leave the European Union (EU). Populist movements in many of the EU countries are threatening to derail many of the changes we have seen over the past half century.
- My GLE text has a chapter on [Free Trade](#), I consider the economic theories underlying free trade and also some of the critiques that threaten to disrupt the former global consensus.

Freer Movement of People Across Borders

- The ability of people to move across borders to find opportunities in education, employment, and entrepreneurship has enabled entrepreneurship in ways that did not exist in the past.
- Later in this chapter, we will look at the role that emigration and immigration has had on the development of entrepreneurship and how it has affected both the home country and the host country.
- In my online text for Global Entrepreneurship, [Chapter 2](#) addresses in more detail the effects of global changes like:
 - The opening of China to the west after President Nixon’s visit in 1972.
 - Educational exchanges like the Chinese US Physics Education Agreement (CUSPEA) brought thousands of Chinese students to US universities. Trade and foreign direct investment began soon thereafter.
 - The end of the cold war and the dissolution of the former Soviet Union.
 - This allowed freer movement of people and ideas across borders and re-created nations in eastern Europe that embraced capitalism and entrepreneurship as a potential path toward catching up with the economic development of the west.
 - The formation of the European Union with a common market and borders that were opened under the [Schengen Agreement](#).
 - A movement toward democratic capitalism and away from socialist oligarchies.

Global Supply Chains often allow smaller firms to find a spot.

- Companies produce goods and services in a value-chain, a sequence of value added steps.
- Example: An auto manufacturer would purchase raw materials, manufacture sub-assemblies, assemble complete cars, transport them to markets, sell, and service them. Traditionally, these steps were conducted in a single location, but no longer is that the case.
- As trade barriers were reduced, communication and transportation expenses began to fall. This made it easier to have an interconnected (or “Flat”) world.
- In an interconnected world with free trade, firms could begin to move parts of their value chain to different locations -locations where entrepreneurs could offer more innovative or cost effective solutions than local suppliers.

The free flow of people and ideas

- The free flow of people and ideas has enabled a globalization of research and development.
- The world's largest firms perform only about 25% of their innovative activities outside of the home country. Overall, the proportion of R&D expenditure made outside the home nation is growing, albeit slowly, from less than 15% in 1995. (Bessant and Tidd)
- Since the late 1990s, European firms –and especially those from France, Germany, and Switzerland –have been performing an increasing share of their innovative activities in the USA, in large part in order to tap into local skills and knowledge in such fields as biotech and IT.
 - Boston has been a huge beneficiary of that trend –especially in BioTech.
 - GE recently decided to move its headquarters to Boston to move closer to a center of research on the internet of things (IOT).
 - Microsoft opened an R&D Center on the edge of Tsinghua University in Beijing China.

The cross border movement of intellectual property

- Intellectual property—patents, trademarks, copyrights, and other proprietary process—represent the top of the economic food chain.
- Intellectual property can move across borders without transportation costs, giving it high profit potential.
- By every measure, the transfer of intellectual property across borders is increasing at record rates.
- Many countries, and China is an example, require that companies entering their markets do so with joint ventures that require some formal technology transfer.
- Informal, or even illegal, technology transfer is an increasing challenge to firms who are globalizing.
- **Spillovers:** Movement of ideas and know how from one part of the economy to others. While it often just happens, many countries have policies to make it more intentional.
- Theft of intellectual property through cyber methods, both criminally and state sponsored, is an increasing challenge for companies and for the world's law enforcement agencies –including the FBI in the US.
- Balancing these risks against reward is one of the great challenges of global entrepreneurship.

The Boston area has benefited from R&D and Globalization.

- The Boston/Cambridge area has particularly benefited from the second bullet as biotech firms have wanted to locate in Kendall Square to be near to the very best R&D on the subject.
 - Biogen, Genzyme, Amgen, Novartis, Alnylam, Vertex, Microsoft, Google, Millennium.. And 150 others!
- There is a thriving, albeit much smaller, biotech cluster in Worcester that depends upon the presence of the UMass Medical School for its Nobel Prize winning research and the UMass Medical Center as a suitable place for clinical trials.
- The UMass Lowell Mass Medical Device Development Center (M2D2) benefits both from its links to the UMass Medical School and its proximity to the eastern Mass medical industry.



US Companies also want to be close to the sources of innovation

Microsoft, for example, made a huge investment in China with 500 engineers on the edge of the Tsinghua University Campus and did this at a time when they were not able to sell much in China at all. They wanted to be close to what they saw as a significant source of intellectual capital and intellectual property.

Many countries, especially including China, demand that any foreign direct investments in their country be accompanied by opportunities for technology transfer in the other direction.

They want access to outside intellectual property.

China produces 75,000 people with higher degrees in engineering or computer science and India 60,000 every year.

Major countries cannot afford to be provincial. They cannot ignore globalization.



The Economist: *The World Turned Upside Down*

- *“The world's biggest multinationals are becoming increasingly happy to do their research and development in emerging markets. Companies in the Fortune 500 list have 98 R&D facilities in China and 63 in India. Some have more than one. General Electric's health-care arm has spent more than \$50m in the past few years to build a vast R&D center in India's Bangalore, its biggest anywhere in the world. Cisco is splashing out more than \$1 billion on a second global headquarters—Cisco East—in Bangalore, now nearing completion. Microsoft's R&D center in Beijing is its largest outside its American headquarters in Redmond. Knowledge-intensive companies such as IT specialists and consultancies have hugely stepped up the number of people they employ in developing countries. For example, a quarter of Accenture's workforce is in India. “*
- *“Both Western and emerging-country companies have also realized that they need to try harder if they are to prosper in these booming markets. It is not enough to concentrate on the Gucci and Mercedes crowd; they have to learn how to appeal to the billions of people who live outside Shanghai and Bangalore, from the rising middle classes in second-tier cities to the farmers in isolated villages. That means rethinking everything from products to distribution systems. “*
 - <http://www.economist.com/node/15879369>

Innovation at the “Bottom of the Pyramid”

- In the restaurant business it is well known that there are many more customers at the bottom of the income pyramid than there are at the top.
 - McDonalds has many more customers than Legal Seafood.
- Conventional wisdom is that those at the bottom of the pyramid cannot afford goods and services at prices that make firms profitable.
- U of Michigan professor C.K. Prahalad debunked that notion.
 - *The Fortune at the Bottom of the Pyramid*; C.K. Prahalad; University of Michigan; 2004.
- Bill Gates comments that this *"offers an intriguing blueprint for how to fight poverty with profitability."*
- Three billion people (almost half the world) live on less than \$2.50 per day.
 - <http://www.globalissues.org/article/26/poverty-facts-and-stats>

Examples of Innovation at the Bottom of the Pyramid

- The Tata Nano Car
 - <http://www.jackmwilson.net/Entrepreneurship/Cases/Case-Tata-Nano.pdf>
- Selco –Harish Hande -UML Graduate
 - <http://www.jackmwilson.net/Entrepreneurship/Cases/Case-SolarElectricLight-HarishHand.pdf>
- D-Light
 - <http://www.jackmwilson.net/Entrepreneurship/Cases/Case-d-light.pdf>
- EcoSchool
 - <http://www.jackmwilson.net/Entrepreneurship/Cases/Case-EcoSchool-Africa.pdf>
- Grameen Banks and Industries –Muhammad Yunas
 - <http://www.jackmwilson.net/Entrepreneurship/Cases/Case-MuhammadYunas.pdf>
- GE hand held EKG device
- The BioBubbler is a low cost water filtration device invented by a UML student who won the 2014 Difference Maker Competition for “Significant Social Impact.”
 - <https://www.uml.edu/Innovation-Entrepreneurship/DifferenceMaker/Meet-the-DifferenceMakers/DM-BioBubbler.aspx>

National Systems of Innovation

- We see significant variation in how companies and countries participate in global innovation.
- Innovation (using patents as a proxy variable) is positively influenced by
 - Size of the economy
 - Foreign competition in the domestic market.
 - Public Expenditure on R&D
 - Availability of Venture Capital
- Innovation is negatively impacted by
 - Large numbers of small and medium size firms (fragmented market)
 - High corporate tax rates
 - High levels of economic prosperity (Complacency?)
- Some factors lead to specific innovative opportunities
 - High levels of local demand (particular when face to face contact is required.)
 - Local availability of natural resources
 - Local pricing variation
 - High prices drive desire for substitutes
 - Local availability of specific skill sets –especially in machinery and manufacturing.

The trade-off of competition versus domination

- Germany is a leader in Chemicals with three large firms –BASF, Bayer, Hoechst. The rivalry keeps them competitive.
- Japan has strength in consumer electronics and automobiles with a cluster of strong firms in each.
- Companies often work to reach a near monopolistic position by acquiring or simply defeating their rivals.
- This often leads to reduced competition and reduced innovation.
- In the long term this can be deadly to the company when other competitors (often in other countries) emerge and the former monopoly finds it hard to innovate and compete.
 - The auto industry in the 70s and 80s was an example.

Governance and management styles

- Anglo Saxon vs Nippon-Rhineland
 - Michel Albert in Capitalism vs Capitalism

| (from text) | Anglo Saxon (Best practiced in the USA and UK) | Nippon-Rhineland (Japan, Germany, Switzerland, Sweden) |
|-------------|---|--|
| Ownership | Individual, Pension funds, insurers | Companies, individuals, banks, (employees) |
| Control | Dispersed, arms length | Concentrated, close, direct |
| Management | Business schools (US) accountants (UK) | Engineers with business training |
| Eval. R&D | Published information | Insider knowledge |
| Strengths | Responsive to radically new technological opportunities Efficient use of capital | Higher priority to R&D than to dividends Remedial investment in failing firms |
| Weaknesses | Short term view points Inability to evaluate firm specific intangible assets. | Slow to deal with poor investment choices Slow to exploit radically new technologies. |

The Rise and Fall of the BRICS

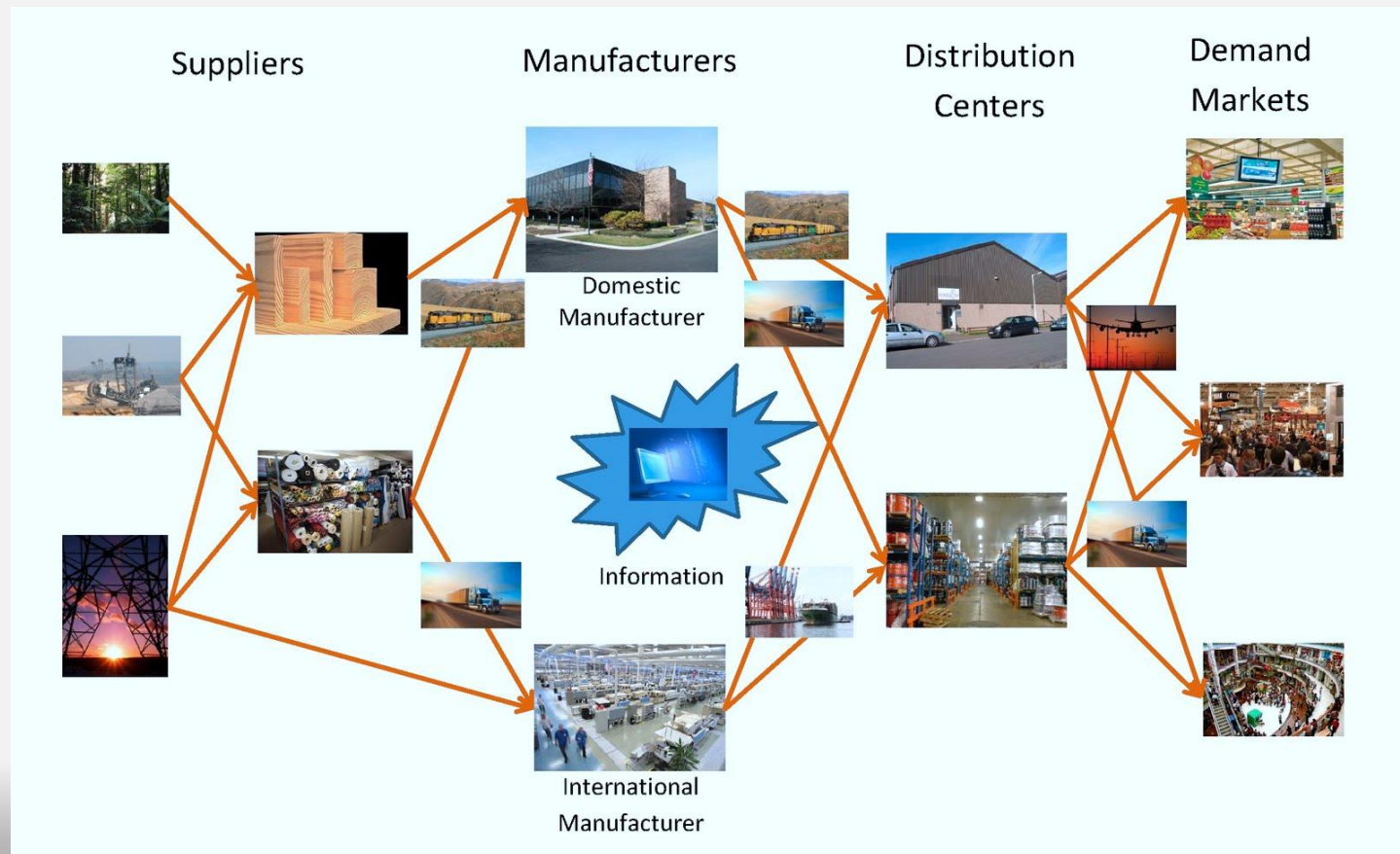
- BRICS: Brazil, Russia, [India](#), [China](#), and South Africa
- The term was introduced by Goldman Sachs in 2001 as “BRIC”
 - South Africa was added in 2010 after petitioning to join what had become a formal group.
- In 2006 the heads of state met formally while attending a meeting at the United Nations.
- Their first formal meeting occurred on June 16, 2009 in Yekaterinburg Russia at the invitation of Dimitri Medvedev.
- These emerging economies were seen by many as the engines of global growth. With that recognition came increased influence.
- The group has called for the replacement of the dollar as the main reserve currency and has entered a variety of political frays.
- By 2015, we were seeing Russia suffering from world economic sanctions, Brazil mired in a corruption and constitutional crisis, China experiencing slow growth, and South Africa struggling politically and economically.
- The story continues to unfold.
 - <http://www.bloomberg.com/news/articles/2016-03-18/zuma-and-rousseff-united-in-misery-as-corruption-threaten-gains>
- More information on the BRICS can be found in the area chapters of my text on [Globalization: Brazil](#), Russia, [India](#), [China](#), and [South Africa](#)

The rise of small-firm supply chain networks

- *Global sourcing* is the process of partnering with world's best suppliers to provide customers with the best quality product or service at the best possible cost.
 - Global sourcing is a critical tool for firms in developed countries as it allows them to lower the average labor cost by mixing high paying knowledge jobs in the developed economy with lower paying lower-skilled jobs in the lesser developed country.
- Global supply chain management is more comprehensive than global sourcing.
 - In global supply chain management, firms integrate their entire supply chain globally -- from raw materials to finished delivered goods -- to provide high levels of customer satisfaction and higher profits. Firms increasingly rely on supplier networks around the globe to improve their quality and efficiency.

Supply Chain Management

- Anna Nagurney, UMass Amherst Professor, has provided an excellent analysis of the role that networks and information flow can play in creating a global supply chain.
 - <http://annanagurney.blogspot.com/2012/01/how-us-can-compete-and-win-in-global.html>
- Role of Networks and Information in the Supply Chain
 - <http://supernet.isenberg.umass.edu/dart.html>



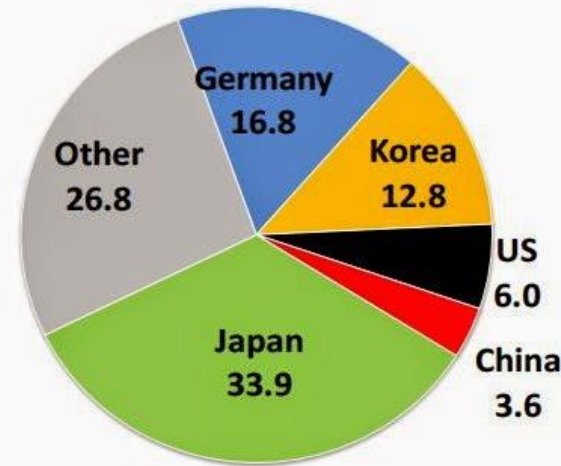
Apple Global Supply Chain -iPhone

Table 1 . Apple iPhone 3G's Major Components and Cost Drivers

| Manufacturer | Component | Cost (USD) |
|----------------------------------|---|-----------------|
| Toshiba (Japan) | Flash Memory | \$24.00 |
| | Display Module | \$19.25 |
| | Touch Screen | \$16.00 |
| Samsung (Korea) | Application Processor | \$14.46 |
| | SDRAM-Mobile DDR | \$8.50 |
| Infineon (Germany) | Baseband | \$13.00 |
| | Camera Module | \$9.55 |
| | RF Transceiver | \$2.80 |
| | GPS Receiver | \$2.25 |
| | Power IC RF Function | \$1.25 |
| Broadcom (USA) | Bluetooth/FM/WLAN | \$5.95 |
| Numonyx (USA) | Memory MCP | \$3.65 |
| Murata (Japan) | FEM | \$1.35 |
| Dialog Semiconductor (Germany_) | Power IC Application Processor Function | \$1.30 |
| Cirrus Logic (USA) | Audio Codec | \$1.15 |
| Rest of Bill of Materials | | \$48.00 |
| Total Bill of Materials | | \$172.46 |
| Manufacturing costs | | \$6.50 |
| Grand Total | | \$178.96 |

http://tomjconley.blogspot.com/2014_10_01_archive.html

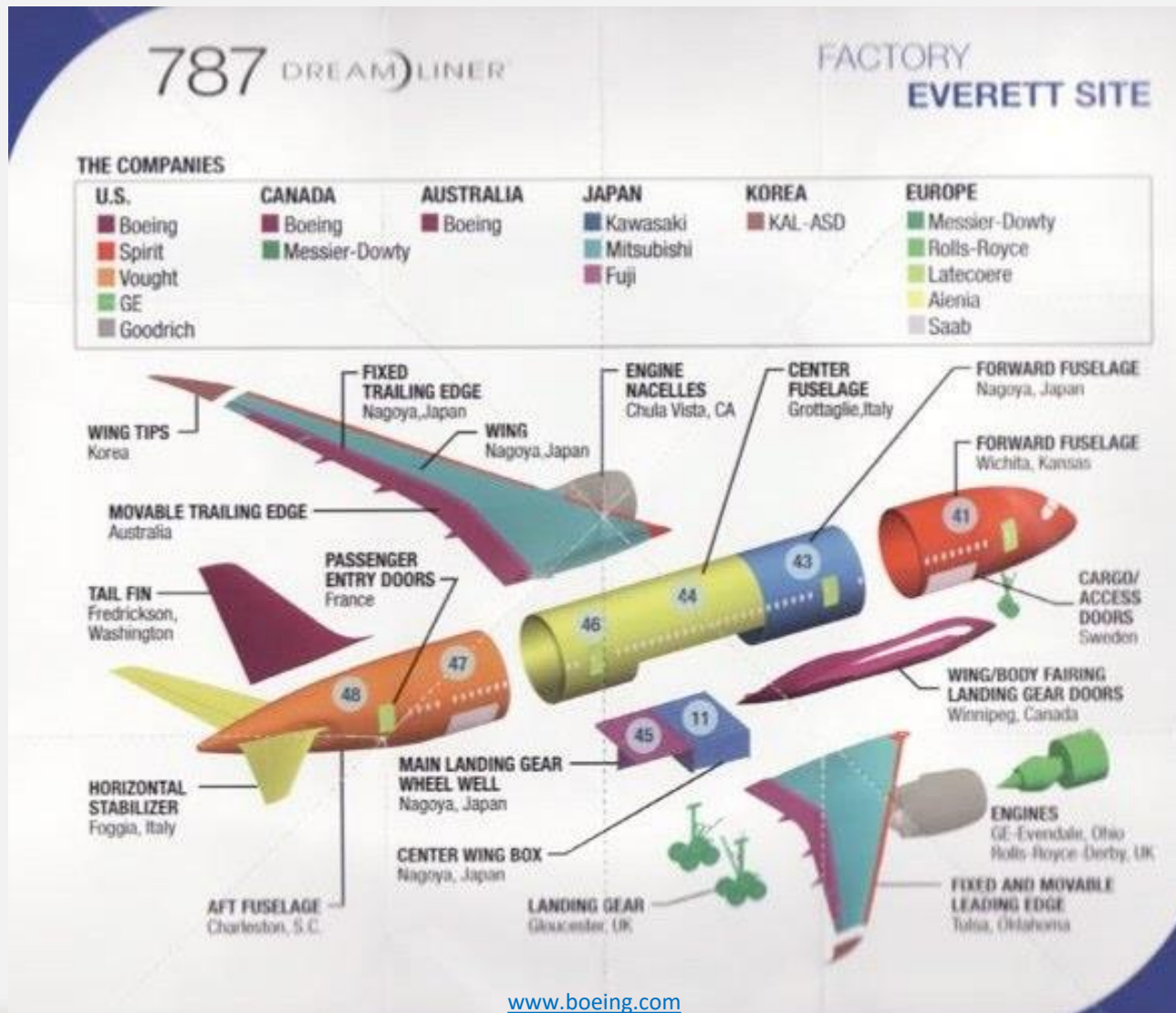
iPhone Manufacturing Cost Distribution by County (%)



Source: Xing and Detert (2010)



The Boeing 787 is another great supply chain example



Global supply chain management

- For small entrepreneurs to succeed in a global supply chain environment, they need to be interconnected with their dominant buyers and suppliers across the globe. They also need to cost effectively transport their goods and services to distant markets.
- A few decades ago commercial airfreight was not an option, but today, air cargo is the most reliable and cost effective means of shipping. Many modern production management practices, including the just-in-time inventory techniques so important to multinational corporations, rely heavily on global air cargo.
- Ocean shipping costs have fallen by as much as 80% over the last fifty years. Sea freight has become seamlessly integrated with domestic rail and truck transportation; firms can now ship goods as easily across the globe as they once did across town.
- Because of deregulation and new technologies, telecommunication costs have dropped significantly in the post WWII era. New communications technologies have made it cost efficient to separate value-adding steps of production and use --the value chain--in ways that were not previously feasible.

Global supply chain management

- The global economy has also become interconnected along the Internet. Recent data shows over 800 million people use the Internet worldwide, and that number will top 1 billion users in 2006.
- The Internet has become a dynamic force in both business-to-consumer (B2C) and business-to-business (B2B) markets.
- B2B e-commerce now generates in excess of \$1.5 billion in revenues.
 - E-commerce is not just for large business; Evertek Computer Corporation, which sells new and refurbished computers and parts, has business in more than 80 countries, booked through internet portals.
 - MacNeill Engineering Company, headquartered in Marlboro MA discovered that the golf shoe companies to which they had sold spikes and other components had moved their manufacturing to China. Rather than close their doors, they created a global company with some of the manufacturing being done closer to the customers and also created a retail line of goods for the US and international markets. [[Case Study](#)]

Entrepreneurship is an Emigrant thing too.

- **Migrant Brainpower**

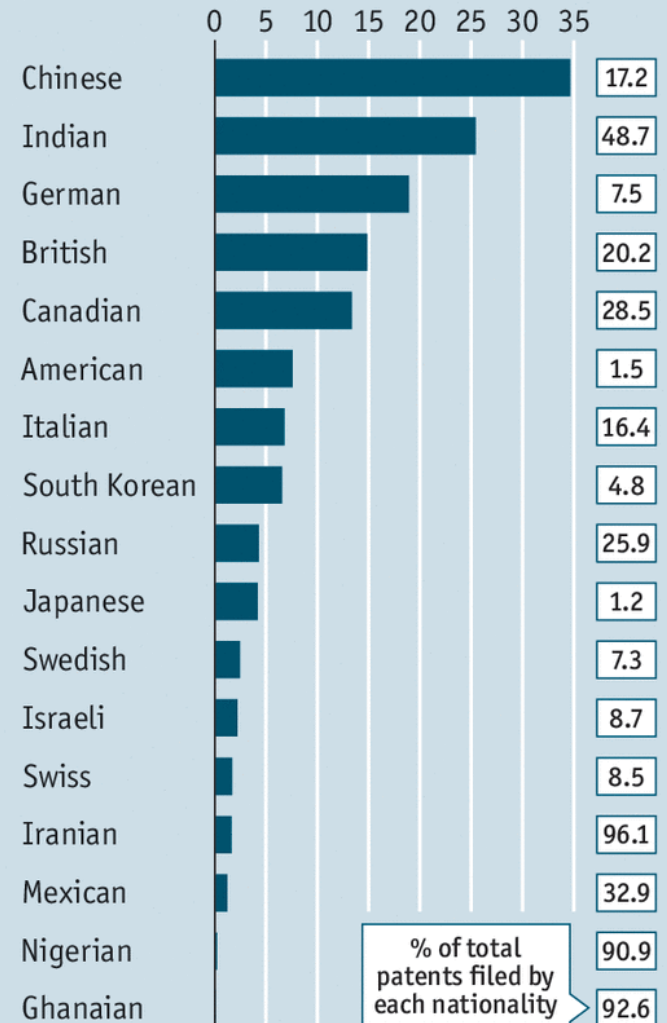
<http://www.economist.com/news/international/21656175-migrant-brainpower>

<http://www.economist.com/news/international/21656176-governments-believe-their-diasporas-can-solve-all-sorts-problems-they-are-picky>

- It is interesting that Indian inventors seem to need to leave home to file a patent (48.7%) while the German inventor usually does so at home -only 7.5% are done abroad.
- Technically, this only shows patents and not entrepreneurship, but it indicates how influential immigration is upon innovation.
- This **diaspora** of innovation often becomes a source for new ventures as well as a built in support structure.

Patents filed by emigrants

2007-12*, '000



Source: WIPO

*To September

How Diaspora Networks Help Start-Ups Go Global

- “Many entrepreneurs have taken advantage of ethnic networks to formulate and execute a global strategy. The culture, values, and social norms members hold in common forge understanding and trust, making it easier to establish and enforce contracts.”
- “Through diaspora networks, global entrepreneurs can quickly gain access to information, funding, talent, technology—and, of course, contacts. In the late 1990s, for instance, “
- “Boston-based **Desh Deshpande**, who had set up several high-tech ventures in the United States, was keen to start something in his native India. In April 2000, he met an optical communications expert, Kumar Sivarajan, who had worked at IBM’s Watson Research Center before returning to India to take up a teaching position at the Indian Institute of Science in Bangalore. Deshpande introduced Sivarajan to two other Indians, Sanjay Nayak and Arnob Roy, who had both worked in the Indian subsidiaries of American high-tech companies. The trust among the four enabled the creation of the start-up Tejas Networks in two months’ time. Deshpande and Sycamore Networks, the major investors, wired the initial capital of \$5 million, attaching few of the usual conditions to the investment. Tejas Networks has become a leading telecommunications equipment manufacturer, generating revenues of around \$100 million over the past year.”
 - From: Harvard Business Review; Daniel Isenberg; Dec.2008

Some Videos

- The Global Entrepreneurs Program | AIESEC
 - A student's viewpoint
 - <https://www.youtube.com/watch?v=aH8oZxBml6Y>
- Mark Zuckerberg Live with President Obama after the Global Entrepreneurship Summit at Stanford
 - <https://www.youtube.com/watch?v=6ByyepnhOil>
- INTERNATIONAL ENTREPRENEURSHIP - John Kraft
 - <https://www.youtube.com/watch?v=feX59UcgyP4>
- How To Become A Global Entrepreneur
 - <https://www.youtube.com/watch?v=Den6AfP4sPY>
- International entrepreneurship in the information age (Lucia Piscitello)
 - <https://www.youtube.com/watch?v=gDTu3nlpnJg>