Alumni Lecture: 
Competitive Strategies in a Changing World

Understanding Globalization from a Supply Chain Perspective 
Prague, November 12, 2014

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Overview

1. Globalization – seen from many perspectives
2. What are the real and imagined consequences?
3. Manufacturing as Agenda : the (loud) Politics
4. Does everybody have to compete on lowest cost?
5. The (hidden) Science of Supply Chain systems
6. What policymakers and other stakeholders can do
Globalization and how Nations Compete

Nations compete with one another to attract companies who create jobs, pay taxes, and build communities

Source: Edward Burtynsky, China
“...Manufacturers therefore gradually shift their places, leaving those countries and provinces which they have already enriched, and flying to others, whither they allured by the cheapness of provisions and labor, till they have enriched those also, and are again banished by the same cause...”


The historical migrations of textile production

- 1780 Manchester, England
- 1880 New England, USA
- 1930 Piedmont, USA
- 1940 and 1950 Japan (interrupted by the war)
- 1970s Hong Kong, Korea, Taiwan
- 1990 China
- Specialists profitably stayed in Italy and France and US and Spain
Jobs move from location to location (they always have!)

But

Can their “Flow” be managed?
If so: by whom?
And How?

Globalization
Stakeholder perspectives

- Unprecedented division of Labour across borders and regions
Manufacturing has no (more) Borders

Assembly
CHINA

Shell
KOREA

Lining
TAIWAN

by
Made in Hong Kong

Filler
CHINA

Zipper
JAPAN

Label, elastic,
studs, toggle
and string
HONG KONG
Globalization
Stakeholder perspectives

- Unprecedented division of Labour across borders and regions
- Consumer access to goods

The longer technology is around, the cheaper products get for consumers...
The longer technology is around, the cheaper products get for consumers...

Source: Jason Dedrick and Kenneth L. Kraemer “Innovation in Global Industries: U.S. Firms Competing in a New World”.
Figure 5. Average unit price, desktops and notebooks, 1990-2005

Globalization
Stakeholder perspectives

- Unprecedented division of Labour across borders and regions
- Consumer access to goods
- There seem to be Winners and Losers
Without Manufacturing communities become poor

On the Edge of Siberia’s Dark Blue Heart

South Siberia, Russia — For the first time in a generation, industrial plant workers in the small town of Omsk have taken to the streets to protest the closure of the local plant. The protests began on Tuesday, with thousands of workers marching and holding signs demanding that the plant be kept open. The closures have sent shockwaves through the region, as workers face the prospect of losing their jobs and the community faces the loss of its economic backbone.

With Manufacturing, workers become slaves (?)
The Latest Scandal: Primark

Primark Scandal: Second Shopper Finds 'Forced Labour' Label

UPDATE: Third shocking message describing “sweat shop” conditions found in Primark trousers in Bangladesh.

Primark investigating 'forced labor' notes found in clothing

Contact: sthakur@ethz.ch

“...what the biography of a simple product can contribute to current debates over global trade”
“…‘Who made your T-shirt? …Was it a child in Vietnam, chained to a sewing machine without food or water? Or a young girl from India earning 18 cents per hour and allowed to visit the bathroom only twice per day? Do you know that she lives 12 to a room? That she shares the bed and has only gruel to eat? That she is forced to work 90 hours each week, without overtime pay? Did you know that she has no right to speak out, no right to unionize? That she lives not only in poverty, but also in filth and sickness, all in the name of Nike’s profits?’ ”

From „The Travels of a T-Shirt In The Global Economy“ (2005), Preface vii

“(in her) pathbreaking study of England’s Industrial Revolution…(concluded) that its most significant legacy was the liberation of women…”

Similarly, researchers have found that the young rural women who powered South Korea’s and Taiwan’s economic miracle in the 1980s benefited from income but especially from increased autonomy and a chance at self-determination. ”

From „The Travels of a T-Shirt In The Global Economy“ (2005), p. 95
“The countries that have lost the race to the bottom are some of the most advanced economies in the world today, but they share a common heritage in the cotton mill and the sweatshop as the ignition switch for the urbanization, industrialization, and economic diversification that followed, as well as for the economic and social liberation of women from the farm.”

Globalization
Stakeholder perspectives

- Unprecedented division of Labour across borders and regions
- Consumer access to goods
- Jobs are "lost" and "won"
- Policymakers : Brawn is cool again

At the Top of the Agenda:
"U.S. manufacturing is in crisis"*

“At this make or break time for the middle class and our economy, we need a strong manufacturing sector that will put Americans back to work making products stamped with three proud words: Made in America”

-Obama establishes Office of Manufacturing Policy, Dec. 12, 2011

*ITIF Study
Policy or Management Decision?

Prof. Suzanne Berger, Dept. of Political Science chairs an MIT-wide faculty commission named to analyze the role of manufacturing in advanced industrial countries.

Can the United States be a "services economy" specializing in R&D and system design? Or does the ability to sustain innovation and build new companies and jobs require production to take place in the U.S.?

Only 15 years ago...
Everybody believed that the World became Flat!

“The service sector …will be further outsourced to the English-spoken abroad; manufacturing, meanwhile, will continue to be off-shored to China. As anyone who reads his column knows, Friedman agrees with the transnational business executives who are his main sources that these developments are desirable and unstoppable, and that American workers should be preparing to 'create value through leadership' and 'sell personality.' ”

-Publishers Weekly Review of The World is Flat
Firms worked very hard to eliminate Manufacturing

The Manager who didn’t take advantage of low-cost countries was a loser!

Today manufacturing remains highly centralized and concentrated in large factories and components and finished goods are transported at great cost and with high impact on the environment through long supply chains. Trends to offshoring and outsourcing have made manufacturing plants bigger and the distances goods traverse even longer.

Written Testimony of Suzanne Berger
Professor of Political Science and Co-Chair,
MIT Production in the Innovation Economy Commission
Massachusetts Institute of Technology
Before the Senate Committee on Banking, Housing, and Urban Affairs
Subcommittee on Economic Policy, December 11, 2013
Firms worked to eliminate Manufacturing, making Supply Chains longer, less agile, more Centralized

“Tomorrow we can imagine technologies that would “destroy the tyranny of bulk” and distribute manufacturing, thus making it possible to manage capacity and demand flexibly through networks of small, localized manufacturers linked by Internet.”

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Capturing Value in Global Networks

"We find that Apple continues to capture the largest share of value from these innovations.

While these products, including most of their components, are manufactured in China, the primary benefits go to the U.S. economy as Apple continues to keep most of its product design, software development, product management, marketing and other high-wage functions in the U.S."

"China’s role is much smaller than most casual observers would think. “
Capturing Value in Global Networks

“A key finding for policymakers is that there is little value in electronics assembly. Bringing high-volume electronics assembly back to the U.S. is not the path to “good jobs” or economic growth. “

Capturing Value in Global Networks: iPhone 2010

[Pie chart showing cost distribution for iPhone 2010]
Capturing Value in Global Networks: iPad

The Cost of Cheap Labour

- Do Supply Chains have to be cheap to be successful?
We tend to imagine „Business“ like this (BIG)

But there are other models: „Hidden Champions“
Mittelstand's Strategies beyond Lowest Wage

- Low Profile, small size, „old-fashioned“
- Ultraniche, unsexy, usually B2B
- Global Exports, often dominate markets
- Innovation with attention to detail
- Collaborative workforce, quality jobs, talent shortage
- Agile and tenacious
- Enduring manufacturing base
- Profitable service business

National Varieties of Capitalism*

<table>
<thead>
<tr>
<th>Coordinated / German &amp; Japanese</th>
<th>Liberal Market / Anglo-American</th>
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</thead>
<tbody>
<tr>
<td>Long-term horizons, Private financing or banks. Funding traditional activities for years.</td>
<td>Quarterly returns and short-term gains for shareholders, venture capital allocates resources to new activities.</td>
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<tr>
<td>Highly-skilled workforce, vocational education system</td>
<td>Universities decoupled from industry skills, or unskilled labor.</td>
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<td>Cooperative labor relationships</td>
<td>Combative labor relationships</td>
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<td>Company loyalty, over generations, lifetime employment</td>
<td>High job turnover, Hire and fire</td>
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<tr>
<td>Flexible production systems focusing on quality and customer requirements</td>
<td>Inflexible mass production to reduce cost. Works best in long series and large batches</td>
</tr>
<tr>
<td>Social solidarity and equality, value continuity</td>
<td>Societies tolerant of extreme inequality, disruptive change, excel at innovation</td>
</tr>
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*Source: Michel Albert “Capitalism vs. Capitalism”
Some companies are reversing Outsourcing / Offshoring decisions

<table>
<thead>
<tr>
<th>Decisions, decisions</th>
<th>Why</th>
</tr>
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<tbody>
<tr>
<td>Company</td>
<td>What and where</td>
</tr>
<tr>
<td>U.S. Bancorp</td>
<td>Production was shifted from China to Rayland in 2001. The company will export to China from there</td>
</tr>
<tr>
<td>Ford Motor Company</td>
<td>Production of medium-duty trucks is moving from Mexico to Ohio, saving 1,200 jobs. Adding extra capacity to a Michigan plant will save another 1,200</td>
</tr>
<tr>
<td>Infosys</td>
<td>A factory is being moved from Mexico to South Carolina</td>
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<td>General Electric</td>
<td>Production of large household appliances (refrigerators, washing machines) is being shifted from China and Mexico to Kentucky</td>
</tr>
<tr>
<td>Shure Audio</td>
<td>Production of high-end earphones has moved from Danpiao in China back to Florida</td>
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To keep R&D closer to manufacturing and reduce logistics costs

Thanks to an agreement with the trade union, the firm can now hire new workers at $34 an hour

Globale Produktion von einer starken Heimatbasis aus: Verlagerungsaktivitäten deutscher Unternehmen auf dem Tiefstand

Fraunhofer Institut ISI, 2 March 2013


Manufacturing Location is an Engineering Decision
And a technical problem

“... All our (outsourcing) decisions were made objectively, not privileging any location.

If we hadn’t made the decisions we made, we wouldn’t have been doing our jobs. ...”

- Director of an American Multinational, who first outsourced the production of computers to Singapore
Supply Chain Topology in 3D

Component Suppliers → Contract Manufacturers

Outsourced Logistics → Systems Producers

Distributors → Retailers

Consumers

“Make or Buy”: Logical Decision Criteria

1. Political
2. Better
3. Tax
4. Cheaper (not #1)

What would you have done?
The Engineer’s Dilemma

“We need to control and monitor performance…
We see a lot of surprises.”

A Global Supply Chain

- Supplier → ASICs
- Supplier → Boards
- Supplier → Printers
- Suppliers
- Americas
- Europe
- Asia
- Dealers

Timeframes:
- 4 weeks
- 15 weeks
- 1 day
- 3 weeks
- 1 week
The Engineer’s Dilemma: Demand Uncertainty Matching Supply to Demand

“The main focus is on cost reduction and assurance of supply.”

Consumer Electronics Supply Chain Manager
January 9, 2007
Typical day in the life of a SC engineer: Which supply chain requires less inventory?

It is not easy to make the right decision
You have to do the math – but few bother!

Cycle stock inventory:

$$CS = \frac{\mu}{2f}$$

Safety stock inventory:

$$SS = k \times \sqrt{\mu^2 \times s^2 + (L + R) \times \sigma^2}$$

DEFINITIONS:
- $L$ = mean supplier lead time
- $s$ = standard deviation of supplier lead time
- $\mu$ = mean demand per unit time
- $\sigma$ = standard deviation of forecast error per unit time
- $k$ = safety stock factor (service level)
- $R$ = review period
- $f$ = delivery frequency
National tax rates dwarf cost savings

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<tr>
<th></th>
<th>Base Case</th>
<th>Lower Wages</th>
<th>Lower Tax</th>
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<tbody>
<tr>
<td>Sales Revenue</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Costs</td>
<td>90</td>
<td>89</td>
<td>90</td>
</tr>
<tr>
<td>Operating Profit</td>
<td>10</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Net Profit</td>
<td>5</td>
<td>5.5</td>
<td>8</td>
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In order to achieve the same net profit, I have to sell 60% more!
Yet there are also examples of highly successful companies that choose not to offshore to any great extent, even in labour-intensive industries.

Zara, the main clothing brand of Inditex, a Spanish textile firm, is famous for making its high-fashion clothes in Spain itself and in nearby Portugal and Morocco. This costs more than it would in China, but a short, flexible supply chain allows the firm to respond quickly to changes in customer tastes. It sells the vast majority of its outfits at full price rather than at a discount.
Its decision to stay close to home has become its main source of competitive advantage.

Luxottica
We Calculate the Real Costs of Cheap Labor

„Our objective is to concentrate as much as possible in the Italian plants. We realized that our labor cost advantage, even in the Guangdong, China plants, was minimal if you took indirect labor costs into account.“

From: „How We Compete“ p. 122
Luxottica
We Calculate the Real Costs of Cheap Labor

„To make two lenses cost
USD 2.63 in Fuling, China;
USD 2.49 in Waterford, Ireland; and
USD 1.20 in Italy
– with the same equipment.

…The savings from centralization in Italy are so great –
the bottom line was that so many of those made in China are
defective that labor savings were canceled out."

From: „How We Compete“ p. 123

Competitive Advantage:
national educational model

Apprenticeships
Keeping up with the Schmidts

Attempts to build a mastery, German-style apprenticeship system clash into
cultural and economic differences

Apr 30th 2014 | From the print edition

All the football World Cup approaches, so too does the prospect of getting Britain
like Germany. The England team trained out of the last tournament, in men, in a humiliating
defeat to its old rival. Sport fans, however, are not the only Britons looking to learn from the
Germans. So are many in Westender, for whom the roof financial trend was the
economic equivalent of that 4-1 defeat to Germany. By broad agreement, the country needs to move away from finance and toward the sort of study and incentivizing industries in which Germany excels.

British ministers more especially to emulate their near neighbor’s apprenticeship system. Adopting what David Cameron, the prime minister, calls a “German approach”, they have increased by half the budget in workplace training and introduced £3000 (€3700) grants for each business to take on their first apprentice. The number of people starting apprenticeships in England has only soared (see chart). A similar pattern is evident in Scotland, Wales and Northern Ireland, where devolved administrations run their own skill policies.
Remember this when setting policy

- Global Supply Chains are not Zero-Sum games
- A convergence on one country or region is not inevitable
- There are hidden costs and unintended consequences of short-term optimization and “single factor solutions”.
- Expensive models can be competitive
Remember this when setting policy

- Countries compete on tax, labour engagement, specialization, product and process innovation, material flows, risk pooling, lead times, clusters, and financial plumbing, and more
- All these factors can be influenced - labour organisations, decision- and policy-makers are not powerless.
- Find your national business model, educate your policy-makers, and collaborate to succeed

- CZ competitive advantages include proximity to EU, culture, SMEs, infrastructure, political stability, natural resources, low cost.