



Manufacturing Competitiveness

Critical Elements for Competing Globally and
New Challenges for Developed Economies

Fourth Bruges European
Business Conference -
“Europe as a Location for
Industry and Innovation”

Tim Hanley
Global Leader, Manufacturing
Deloitte .

23 April 2013



Manufacturing Competitiveness

Critical Elements for Competing Globally and
New Challenges for Developed Economies

1. Our research background to discuss manufacturing competitiveness
2. Where are we and how did we get here?
3. Does manufacturing still matter?
4. What trends are shaping competitiveness today? In the future?

Manufacturing Competitiveness

Critical Elements for Competing Globally and
New Challenges for Developed Economies

1. Our research background to discuss manufacturing competitiveness
2. Where are we and how did we get here?
3. Does manufacturing still matter?
4. What trends are shaping competitiveness today? In the future?

Comments Today Drawn From Two Primary Sources


2 year Collaboration with The World Economic Forum



5 year Collaboration with The Council of Competitiveness



The Future of Manufacturing Initiative - Davos 2012



WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD

The Future of Manufacturing Opportunities to drive economic growth

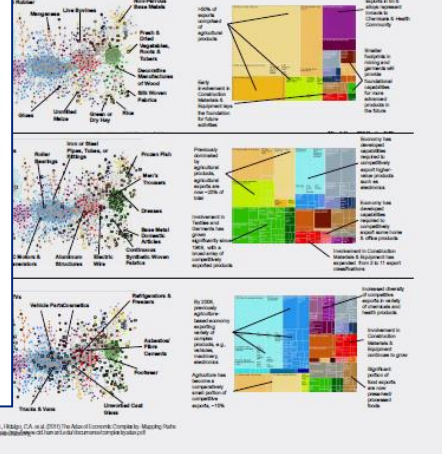
A World Economic Forum Report in collaboration with Deloitte Touche Tohmatsu Limited
April 2012

By Action: Thailand as a Case Example

Examples, representing one of the fastest since 1980, have emerged and illustrate why so many and how they show the state of the world and 2008 (Figure 3) and clearly demonstrate prosperity, increasing economic complexity, manufacturing capabilities, and more advanced and more advanced products.

These exports reflected lower complexity and at the periphery of the Product Space Map. Moving north focused on agricultural economy, capabilities that would ultimately drive the economy forward.

Product Space and Trade Map



By 1980, competitive exports reflected an increased complexity and entry into key high-complexity product communities (e.g., electronics, machinery, construction material and equipment, and jewelry). In 1980, Thailand's exports were primarily in low-complexity industries and prepared Thailand for an improved role in producing and exporting more complex, higher value products and participating in higher value chains.

In 2008, competitive exports reflected considerably higher complexity as evidenced by clusters of products being exported from the core of the Product Space Map. Knowledge accumulation and capability development have allowed Thailand to develop an increasingly complex economy more competitively manufacturing and exporting complex machinery and electronics.

Helps Open the Door to Rapid Growth

Free trade agreements (FTAs) serve as substitutes for a new global economy to grow, access to global markets and products are essential to drive innovation, serve new customers, and have been instrumental in recognizing their potential in this action. In fact, free trade agreements (FTAs) extend

Figure 11: Snapshots in Time – Regional Trade Agreements for Six Target Countries

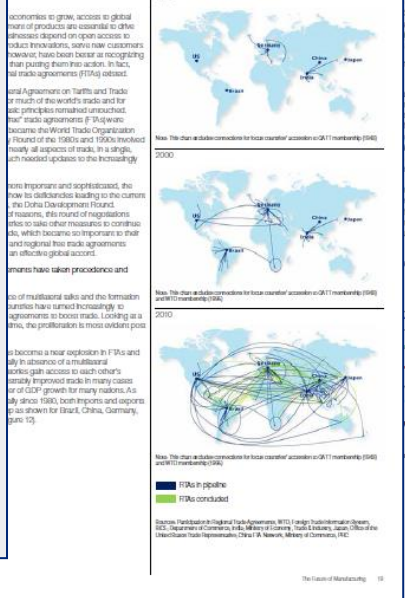


Figure 11: Snapshots in Time – Regional Trade Agreements for Six Target Countries

1980: Shows trade agreements for Thailand, China, India, Brazil, Russia, and the US.

2000: Shows trade agreements for Thailand, China, India, Brazil, Russia, and the US.

2010: Shows trade agreements for Thailand, China, India, Brazil, Russia, and the US.

Source: Deloitte analysis based on data from the U.S. Energy Information Administration (EIA) and World Bank Commodity Data.

Renewables will be the highest growth energy sector

Due in part to government subsidies, renewable energies, led by hydro and wind, are projected by the International Energy Agency to account for half of the new capacity installed between 2010 and 2035 to meet growing demand (Figure 47). Despite being expected to grow faster than any other source in relative terms, total supply of renewable energy is still not projected to reach the level of any single fossil fuel by 2035.¹⁴ This has not discouraged the government of China from implementing policies that have made China the world leader in renewable energy, with 2010 investments reaching US\$ 46.9 billion (in comparison, all of Europe increased US\$ 35.2 billion and North America increased US\$ 30.1 billion in the same year).

Rising energy prices are making energy costs and consumption a top priority for manufacturers

As energy consumption rises, prices are also rising at a faster rate than inflation. The price of oil, for example, grew as fast as three times the Consumer Price Index in 2010. Natural gas and coal also outpaced inflation (Figure 48). For companies, energy costs are taking up a bigger portion of overall costs.

Figure 47: Annual Increase in World Energy Consumption by Fuel Type

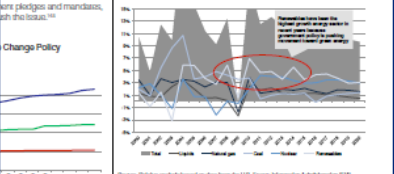
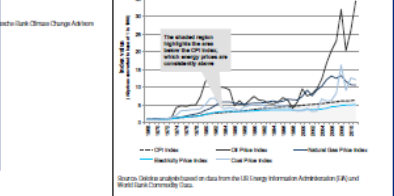


Figure 48: Fuel Price Indices Increase Well Above Rate of Inflation



Source: Deloitte analysis based on data from the U.S. Energy Information Administration (EIA) and World Bank Commodity Data.

The Future of Manufacturing Initiative explained:

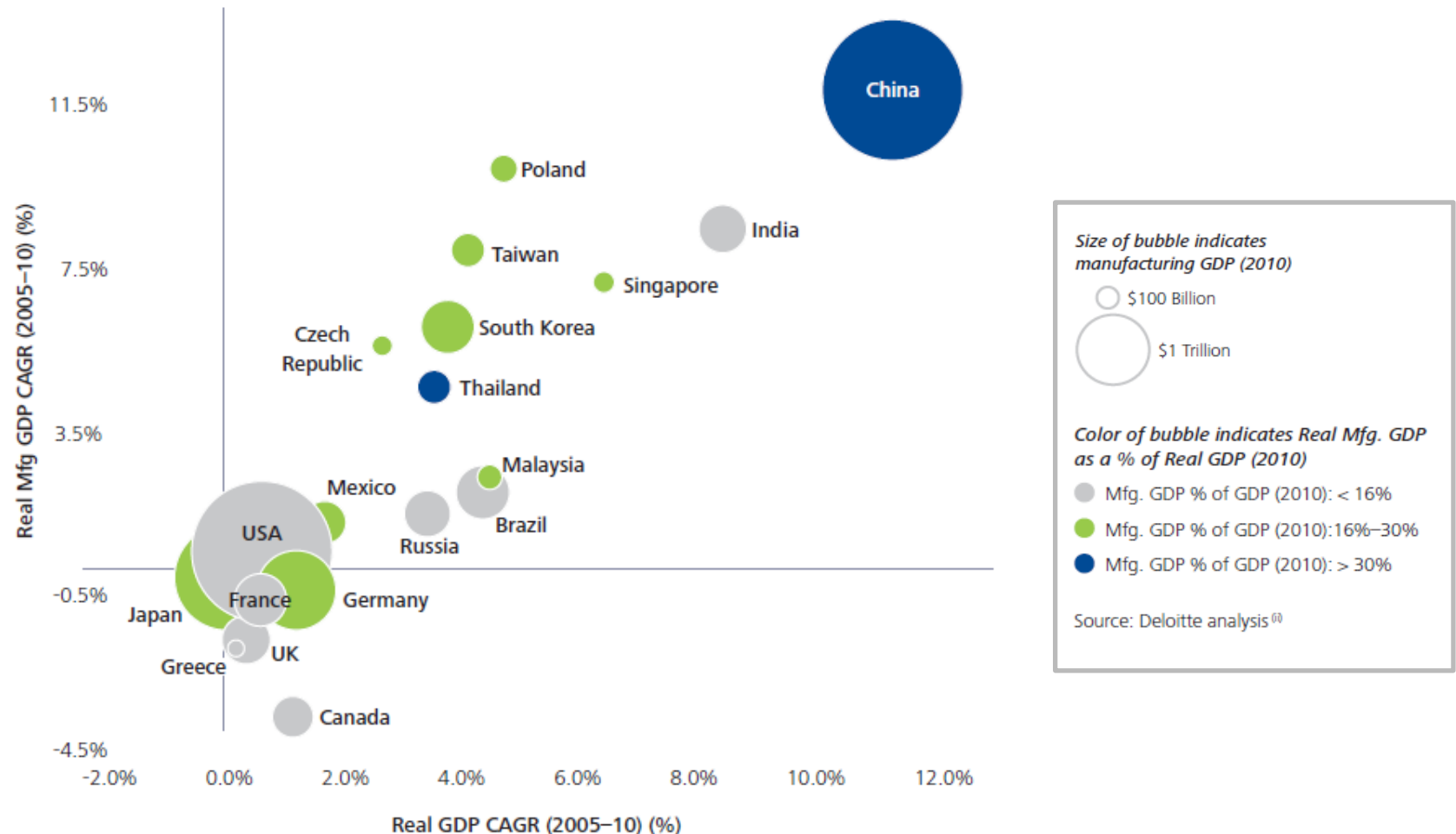
1. The World of Manufacturing Competitiveness today
2. Key Trends shaping future Global Competition

Manufacturing Competitiveness

Critical Elements for Competing Globally and
New Challenges for Developed Economies

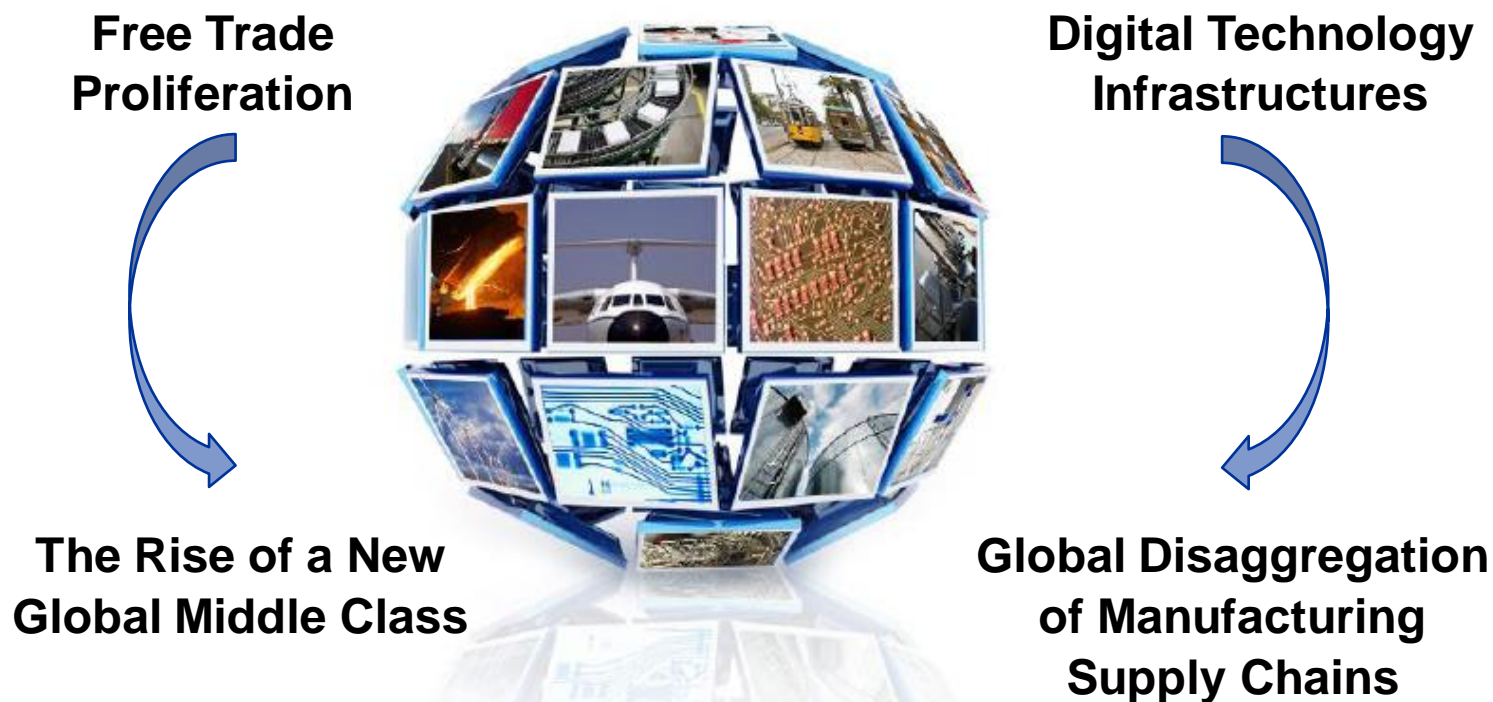
1. Our research background to discuss manufacturing competitiveness
2. Where are we and how did we get here?
3. Does manufacturing still matter?
4. What trends are shaping competitiveness today? In the future?

Manufacturing GDP has grown dramatically for emerging economy nations over the most recent pastdriving higher total *real* GDP



What were the primary drivers of manufacturing's rapid globalization?

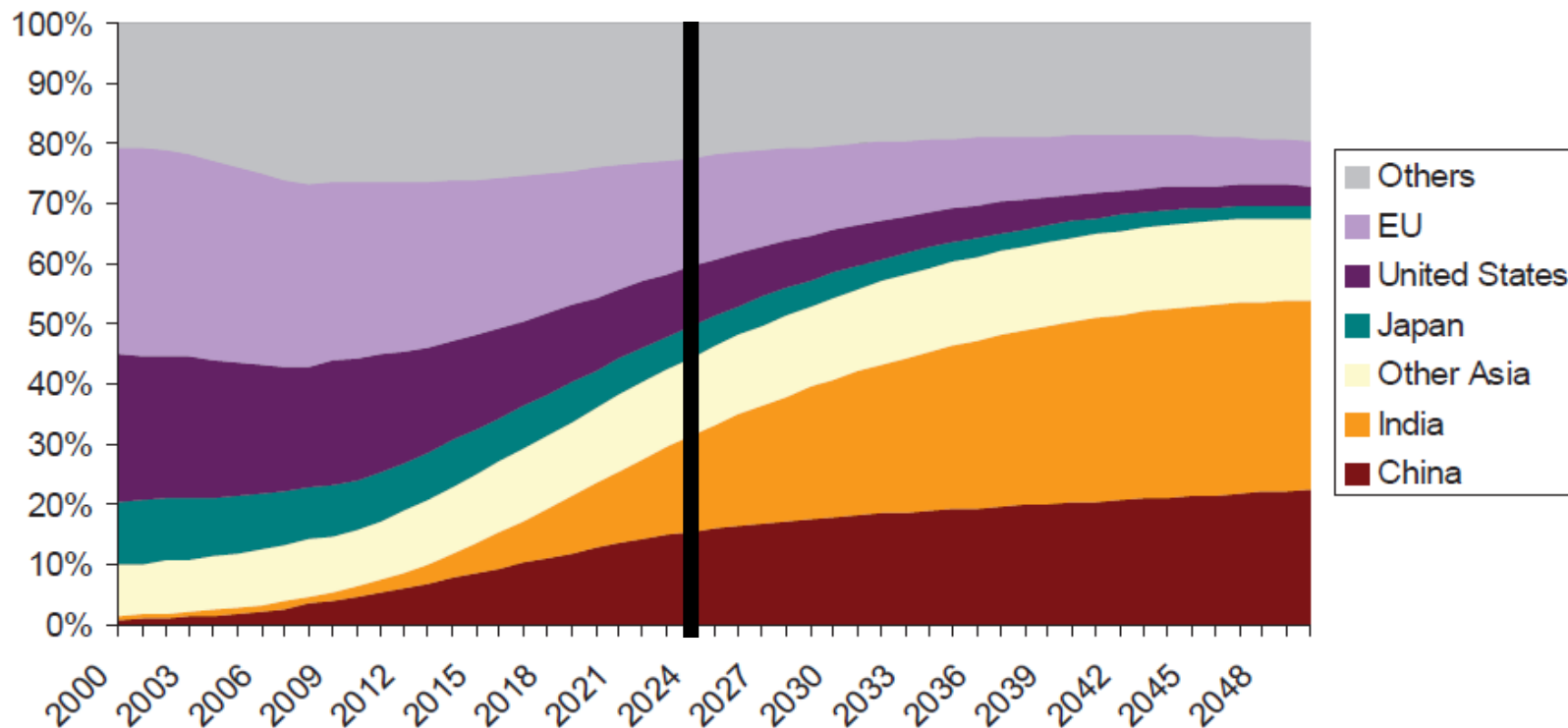
Over the past 20 years, rapid globalization has occurred and the global manufacturing eco-system has experienced more change, impacting the prosperity of more companies, nations and people than at any time since the Industrial Revolution.



Rapid globalization has changed the economic fabric of the world, and manufacturing supply chains, in profound and significant ways

Global middle class growth will precipitate a dramatic shift in consumption over the coming decades

Shares of Global Middle Class Consumption 2000-2050



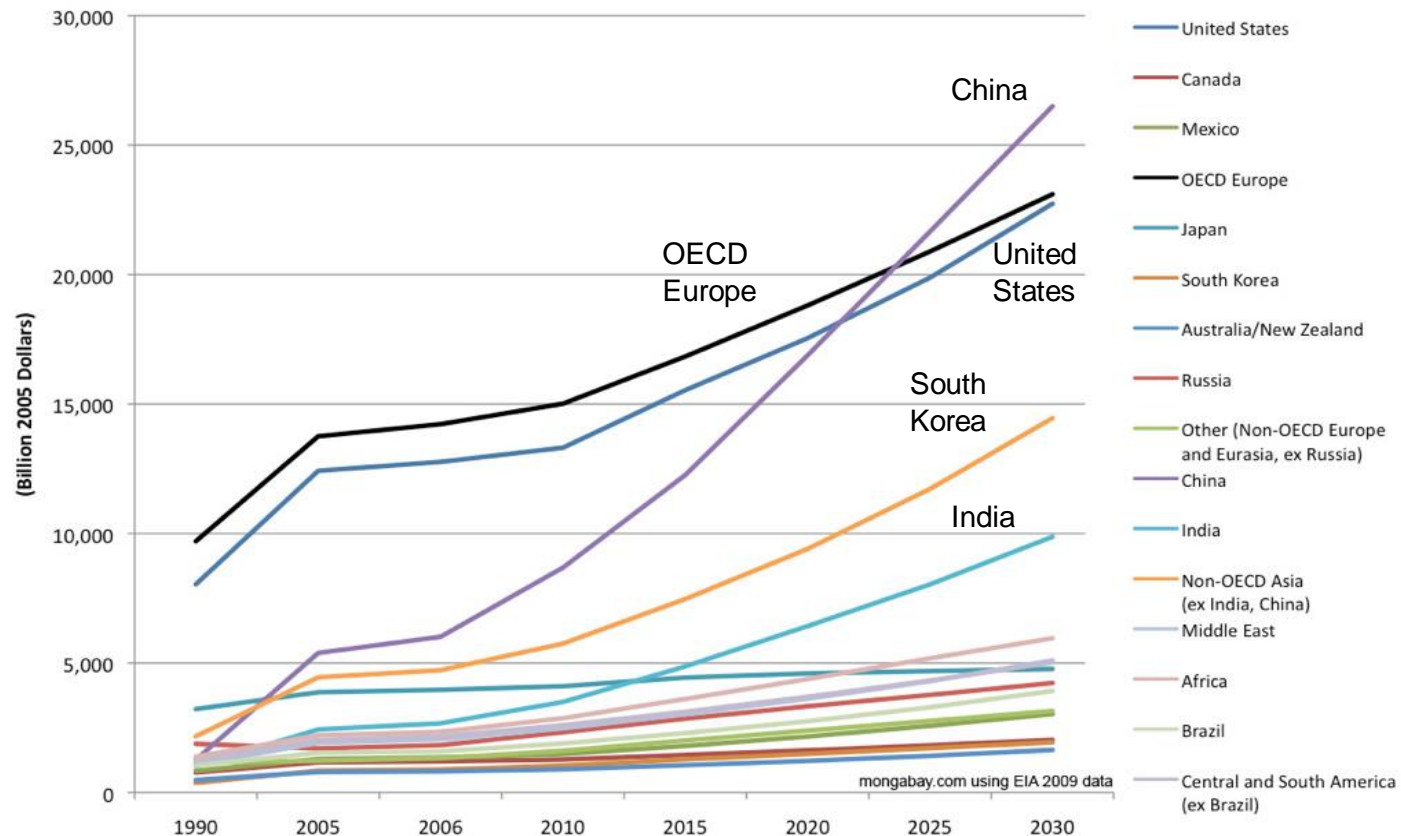
Globally, middle class demand may grow from US\$ 21 trillion to US\$ 56 trillion by 2030, with 80% of growth from Asia – presenting the potential for significant changes in supply chains around the world.....

But how will those supply chains be configured?

GDP projections also demonstrate the ‘Big Shift’ in process, with emerging economy nations growing rapidly

New “demand centers” are emerging as populations of middle class consumers grow around the world

World GDP by Region, 1990-2030
Expressed in Purchasing Power Parity



Source: mongabay.com using EIA 2009 data

Manufacturing Competitiveness

Critical Elements for Competing Globally and
New Challenges for Developed Economies

1. Our research background to discuss manufacturing competitiveness
2. Where are we and how did we get here?
3. Does manufacturing still matter?
4. What trends are shaping competitiveness today? In the future?

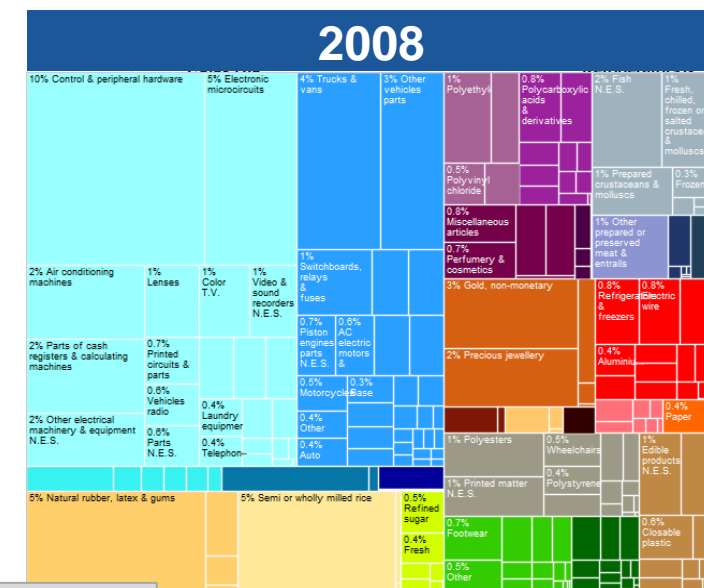
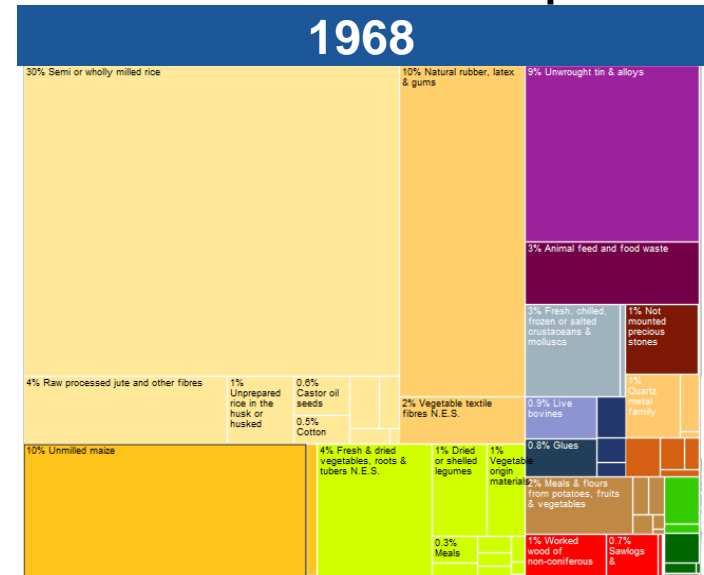
The Future of Manufacturing also answered the question: Does Manufacturing Still Matter?

The Answer: YES!

Based on research done by Harvard and the MIT Media Lab regarding **Economic Complexity**, numerous implications in the context of manufacturing and the linkage to economic growth emerged.:

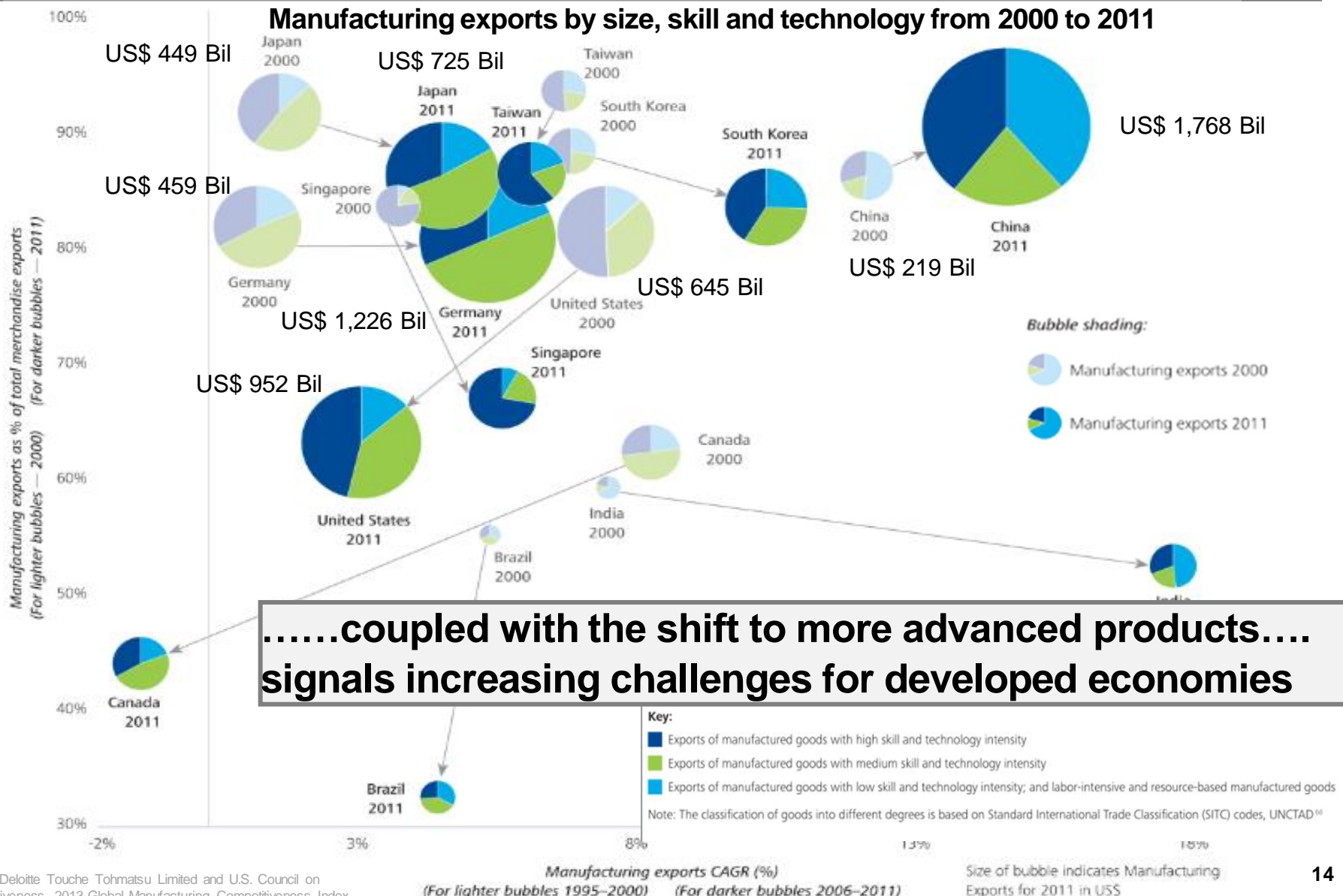
- ***The advancement of manufacturing capabilities is the most important link to increasing the economic prosperity of a nation:*** advanced manufacturing capabilities directly determines the ability to accelerate economic development.
- ***Many emerging economies are primed for rapid growth,*** enabled by the complex economic infrastructures they have developed and the manufacturing knowledge and capabilities accumulated.
- ***Competition for high value jobs will intensify*** as nations and companies build more and more advanced manufacturing capabilities, ***...leading to more and more competition for talent***
- ***The proverbial “bar” will continue to be set higher and higher.*** Developed nations must also continue to advance their manufacturing capabilities, knowledge and skills in order to innovate, create more robust economies and to stay competitive.

Thailand: ‘Tree’ Maps



[illegible]

While manufacturing exports have grown for developed economy nations, the rapid growth of exports by emerging economies....



Manufacturing Competitiveness

Critical Elements for Competing Globally and
New Challenges for Developed Economies

1. Our research background to discuss manufacturing competitiveness
2. Where are we and how did we get here?
3. Does manufacturing still matter?
4. What trends are shaping competitiveness today? In the future?

2013

Global Manufacturing
Competitiveness Index

**Council on Competitiveness and Deloitte
Over 550 CEO Respondents Around the World**



Ranking by CEOs of the most competitive manufacturing nations

Table 1: Global CEO Survey: 2013 Country manufacturing competitiveness index rankings

Executives believe China leads overall and emerging markets will become more competitive in the near future

Current competitiveness			Competitiveness in five years		
Rank	Country	Index score 10 = High 1 = Low	Rank	Country	Index score 10 = High 1 = Low
1	China	10.00	1	China	10.00
2	Germany	7.98	2	India	8.49
3	United States of America	7.84	3	Brazil	7.89
4	India	7.65	4	Germany	7.82
5	South Korea	7.59	5	United States of America	7.69
6	Taiwan	7.57	6	South Korea	7.63
7	Canada	7.24	7	Taiwan	7.18
8	Brazil	7.13	8	Canada	6.99
9	Singapore	6.64	9	Singapore	6.64
10	Japan	6.60	10	Vietnam	6.50
11	Thailand	6.21	11	Indonesia	6.49
12	Mexico	6.17	12	Japan	6.46
13	Malaysia	5.94	13	Mexico	6.38
14	Poland	5.87	14	Malaysia	6.31
15	United Kingdom	5.81	15	Thailand	6.24
16	Australia	5.75	16	Turkey	5.99
17	Indonesia	5.75	17	Australia	5.73
18	Vietnam	5.73	18	Poland	5.69
19	Czech Republic	5.71	19	United Kingdom	5.59
20	Turkey	5.61	20	Switzerland	5.42
21	Sweden	5.50	21	Sweden	5.39
22	Switzerland	5.28	22	Czech Republic	5.23
23	Netherlands	5.27	23	Russia	5.04
24	South Africa	4.92	24	Netherlands	4.83
25	France	4.64	25	South Africa	4.77
26	Argentina	4.52	26	Argentina	4.58
27	Belgium	4.50	27	France	4.02

For both Today



And 5 years from now

Over 550 CEO Respondents Around the World!

33	Spain	3.66	33	Saudi Arabia	3.46
34	Saudi Arabia	3.57	34	Italy	3.45
35	Portugal	3.39	35	Egypt	3.45
36	Egypt	3.24	36	Ireland	3.03
37	Ireland	3.23	37	Portugal	2.87
38	Greece	1.00	38	Greece	1.00

A closer look at the top fifteen

Table 1: Global CEO Survey: 2013 Country manufacturing competitiveness index rankings

Executives believe China leads overall and emerging markets will become more competitive in the near future

Current competitiveness

Rank	Country	Index score
10 = High 1 = Low		
1	China	10.00
2	Germany	7.98
3	United States of America	7.84
4	India	7.65
5	South Korea	7.59
6	Taiwan	7.57
7	Canada	7.24
8	Brazil	7.13
9	Singapore	6.64
10	Japan	6.60
11	Thailand	6.21
12	Mexico	6.17
13	Malaysia	5.94
14	Poland	5.87
15	United Kingdom	5.81

Competitiveness in five years

Rank	Country	Index score
10 = High 1 = Low		
1	China	10.00
2	India	8.49
3	Brazil	7.89
4	Germany	7.82
5	United States of America	7.69
6	South Korea	7.63
7	Taiwan	7.18
8	Canada	6.99
9	Singapore	6.64
10	Vietnam	6.50
11	Indonesia	6.49
12	Japan	6.46
13	Mexico	6.38
14	Malaysia	6.31
15	Thailand	6.24

A closer look at the top fifteen

Table 1: Global CEO Survey: 2013 Country manufacturing competitiveness index rankings

Executives believe China leads overall and emerging markets will become more competitive in the near future

Current competitiveness

Rank	Country	Index score
10 = High 1 = Low		
1	China	10.00
2	Germany	7.98
3	United States of America	7.84
4	India	7.65
5	South Korea	7.59
6	Taiwan	7.57
7	Canada	7.24
8	Brazil	7.13
9	Singapore	6.64
10	Japan	6.60
11	Thailand	6.21
12	Mexico	6.17
13	Malaysia	5.94
14	Poland	5.87
15	United Kingdom	5.81

Competitiveness in five years

Rank	Country	Index score
10 = High 1 = Low		
1	China	10.00
2	India	8.49
3	Brazil	7.89
4	Germany	7.82
5	United States of America	7.69
6	South Korea	7.63
7	Taiwan	7.18
8	Canada	6.99
9	Singapore	6.64
10	Vietnam	6.50
11	Indonesia	6.49
12	Japan	6.46
13	Mexico	6.38
14	Malaysia	6.31
15	Thailand	6.24

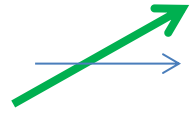
Deloitte. Other than Germany; CEOs ranked all of Europe below the top 15; with some moving up.....

Current competitiveness

Rank	Country	Index score
		10 = High 1 = Low
15	United Kingdom	5.81
16	Australia	5.75
17	Indonesia	5.75
18	Vietnam	5.73
19	Czech Republic	5.71
20	Turkey	5.61
21	Sweden	5.50
22	Switzerland	5.28
23	Netherlands	5.27
24	South Africa	4.92
25	France	4.64
26	Argentina	4.52
27	Belgium	4.50
28	Russia	4.35
29	Romania	4.09
30	United Arab Emirates	3.93
31	Colombia	3.85
32	Italy	3.75
33	Spain	3.66
34	Saudi Arabia	3.57
35	Portugal	3.39
36	Egypt	3.24
37	Ireland	3.23
38	Greece	1.00

Competitiveness in five years

Rank	Country	Index score
		10 = High 1 = Low
15	Thailand	6.24
16	Turkey	5.99
17	Australia	5.73
18	Poland	5.69
19	United Kingdom	5.59
20	Switzerland	5.42
21	Sweden	5.39
22	Czech Republic	5.23
23	Russia	5.04
24	Netherlands	4.83
25	South Africa	4.77
26	Argentina	4.58
27	France	4.02
28	Colombia	4.01
29	Romania	3.98
30	Belgium	3.63
31	Spain	3.58
32	United Arab Emirates	3.58
33	Saudi Arabia	3.46
34	Italy	3.45
35	Egypt	3.45
36	Ireland	3.03
37	Portugal	2.87
38	Greece	1.00



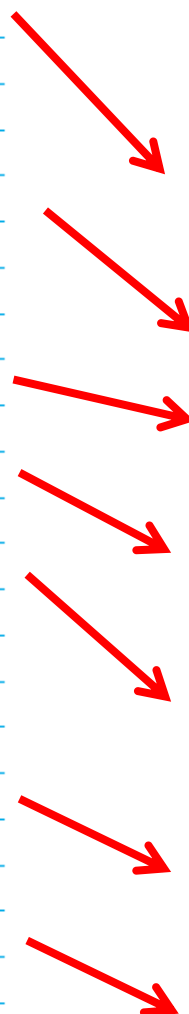
.....but most European countries are moving down, as ranked by CEOs

Current competitiveness

Rank	Country	Index score
		10 = High 1 = Low
15	United Kingdom	5.81
16	Australia	5.75
17	Indonesia	5.75
18	Vietnam	5.73
19	Czech Republic	5.71
20	Turkey	5.61
21	Sweden	5.50
22	Switzerland	5.28
23	Netherlands	5.27
24	South Africa	4.92
25	France	4.64
26	Argentina	4.52
27	Belgium	4.50
28	Russia	4.35
29	Romania	4.09
30	United Arab Emirates	3.93
31	Colombia	3.85
32	Italy	3.75
33	Spain	3.66
34	Saudi Arabia	3.57
35	Portugal	3.39
36	Egypt	3.24
37	Ireland	3.23
38	Greece	1.00

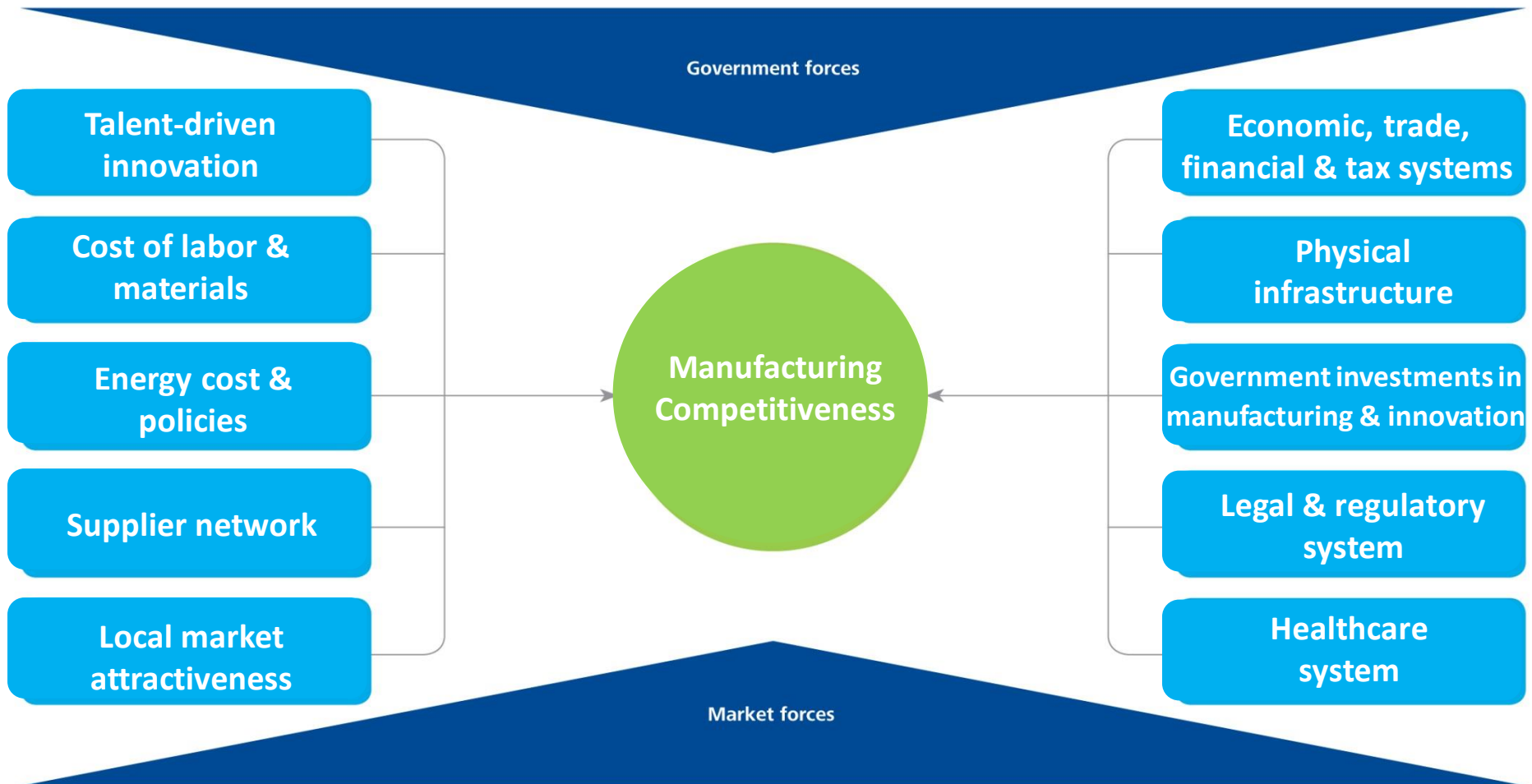
Competitiveness in five years

Rank	Country	Index score
		10 = High 1 = Low
15	Thailand	6.24
16	Turkey	5.99
17	Australia	5.73
18	Poland	5.69
19	United Kingdom	5.59
20	Switzerland	5.42
21	Sweden	5.39
22	Czech Republic	5.23
23	Russia	5.04
24	Netherlands	4.83
25	South Africa	4.77
26	Argentina	4.58
27	France	4.02
28	Colombia	4.01
29	Romania	3.98
30	Belgium	3.63
31	Spain	3.58
32	United Arab Emirates	3.58
33	Saudi Arabia	3.46
34	Italy	3.45
35	Egypt	3.45
36	Ireland	3.03
37	Portugal	2.87
38	Greece	1.00



Our Global Manufacturing Competitiveness model defines ten major drivers of a nation's competitiveness

Table 3a: Drivers of global manufacturing competitiveness



Source: Deloitte and U.S. Council on Competitiveness, 2010 Global Manufacturing Competitiveness Index

Table 3b: Global CEO Survey: Global drivers of manufacturing competitiveness index ranking

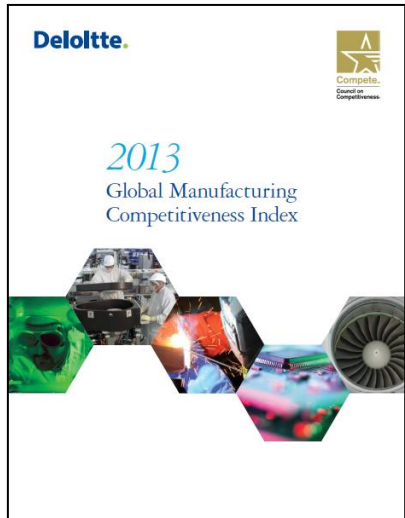
Executives rank key drivers that impact a country's ability to compete in manufacturing

Overall rank (1-10)	Overall index score	Main driver	Most important sub-components	Sub-component rank (1-40)
1	10.00	Talent-driven innovation	Quality and availability of researchers, scientists, and engineers Quality and availability of skilled labor	1 2
2	8.42	Economic, trade, financial and tax system	Tax rate burden and system complexity Clarity and stability of regulatory, tax and economic policies	3 5
3	8.07	Cost and availability of labor and materials	Cost competitiveness of materials Availability of raw materials	11 21
4	7.76	Supplier network	Cost competitiveness of local suppliers Ability of supply base to innovate in products and processes	8 9
5	7.60	Legal and regulatory system	Stability and clarity in legal and regulatory policies Labor laws and regulations	7 13
6	6.47	Physical infrastructure	Quality and efficiency of electricity grid, IT and telecommunications network Quality and efficiency of roads, airports, ports, and railroad networks	4 16
7	6.25	Energy cost & policies	Cost competitiveness of energy Ongoing investments to improve and modernize energy infrastructure	14 20
8	3.99	Local market attractiveness	Size and access of the local market Intensity of local competition	27 36
9	2.48	Healthcare system	Cost of quality healthcare for employee and society Regulatory policies (e.g., pollution, food safety, etc.) that are enforced to protect public health	26 33
10	1.00	Government investments in manufacturing and innovation	Government investments in R&D: science, technology, engineering and manufacturing Private and public sector collaboration for long-term investments in R&D: science, technology, engineering and manufacturing	29 30

Source: Deloitte and U.S. Council on Competitiveness, 2013 Global Manufacturing Competitiveness Index

Note: See Appendix B1 for full list of 40 sub-components and associated ranking

The most important driver of a nation's competitiveness



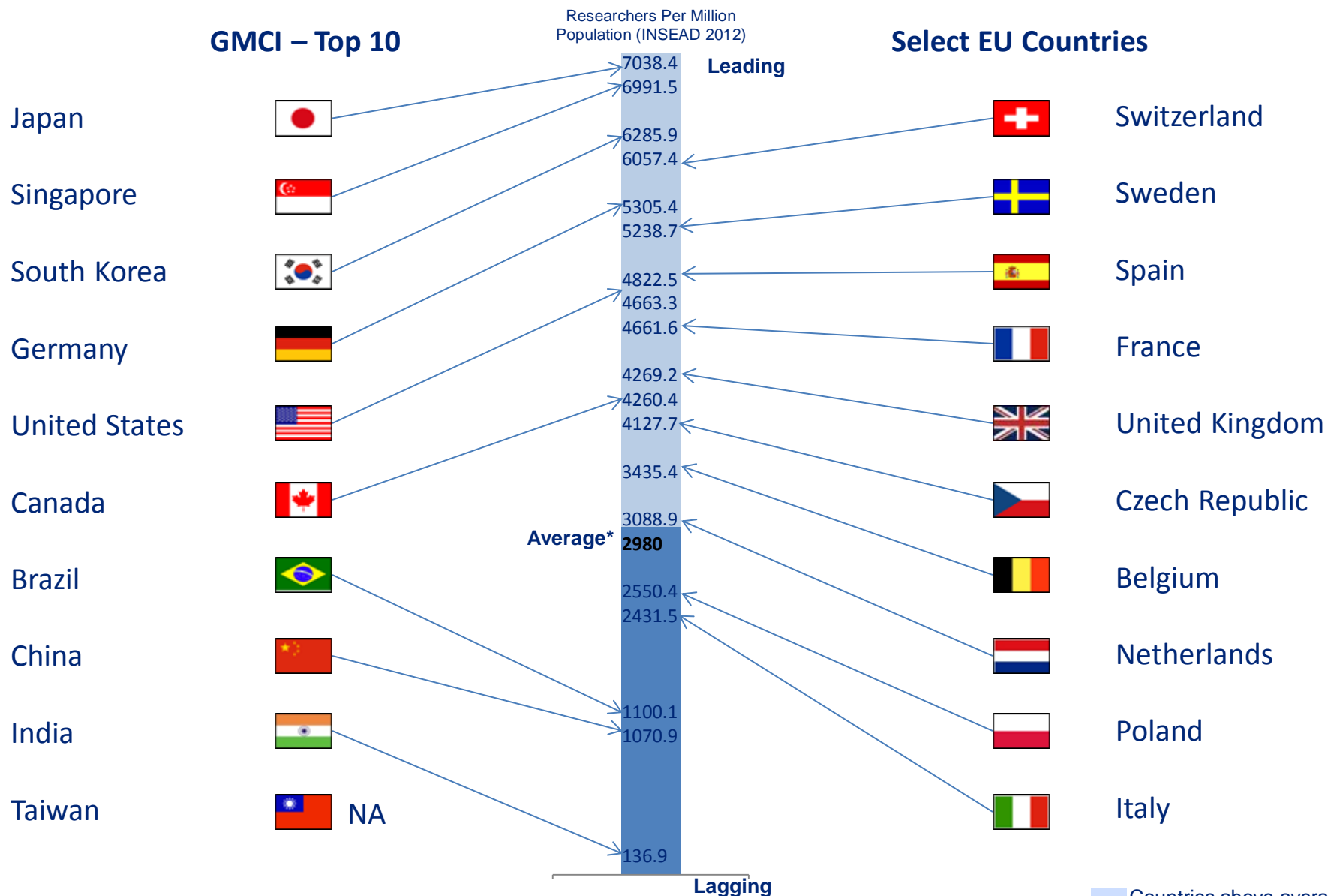
2013 Global Manufacturing Competitiveness Index Report Over 550 CEO Respondents Around the World

#1 Talent Driven Innovation

Rank

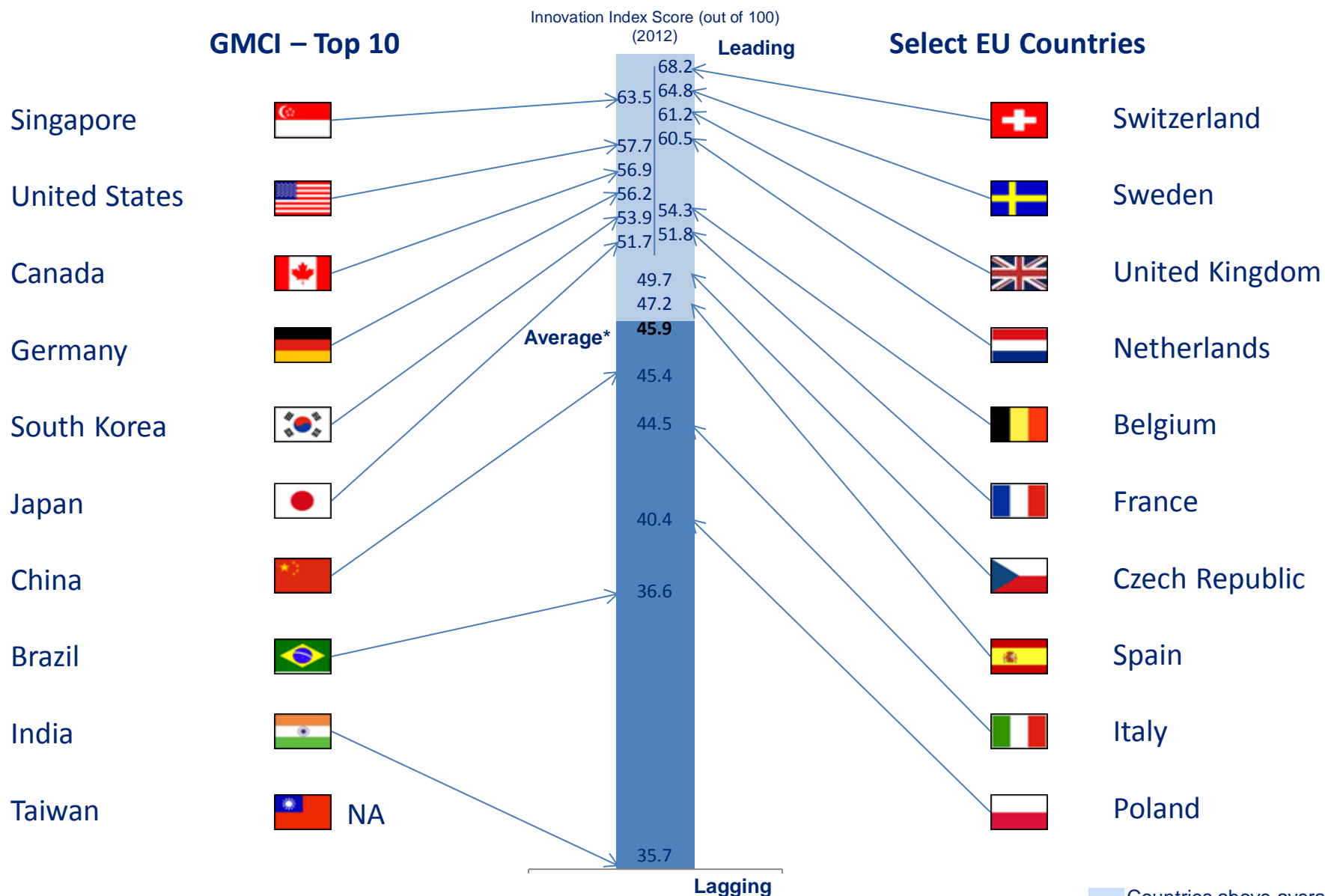
- 1 • Quality & availability of researchers, scientists, engineers
- 2 • Overall quality and availability of skilled labor
- 15 • Quality of primary & secondary schools to produce sufficient student populations proficient in science, technology and math
- 28 • Quality of colleges & universities... and their partnerships with business in research and innovation
- 40 • Effective & efficient immigration policies

Country comparison of key manufacturing macro economic indicators – Researchers per million population (2012)



Please refer to the notes section below for sources and other details
Relative positions of countries. Not to scale

Country comparison of key manufacturing macro economic indicators – Innovation Index (2012)

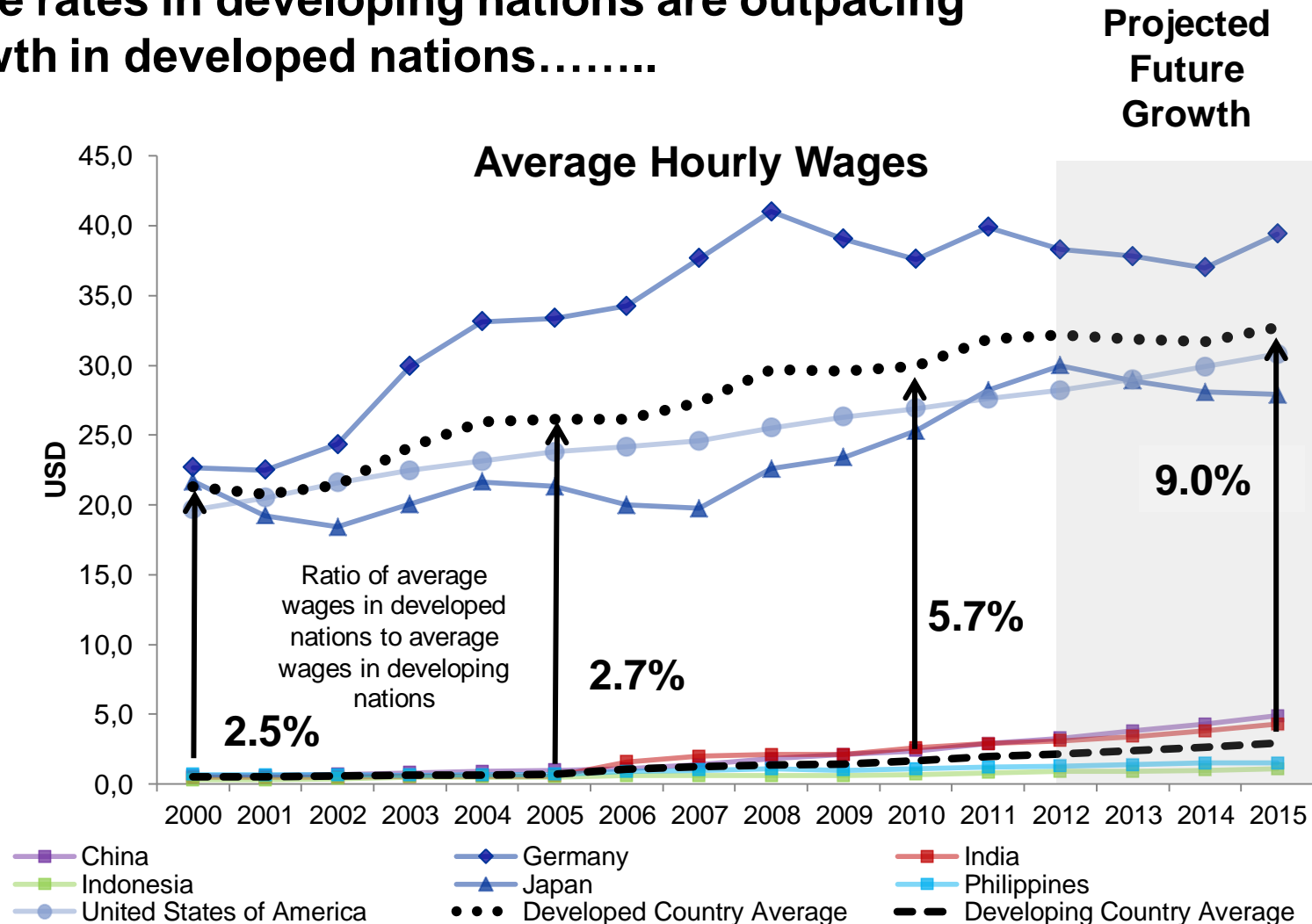


Please refer to the notes section below for sources and other details
Relative positions of countries. Not to scale

Countries above average
Countries below average

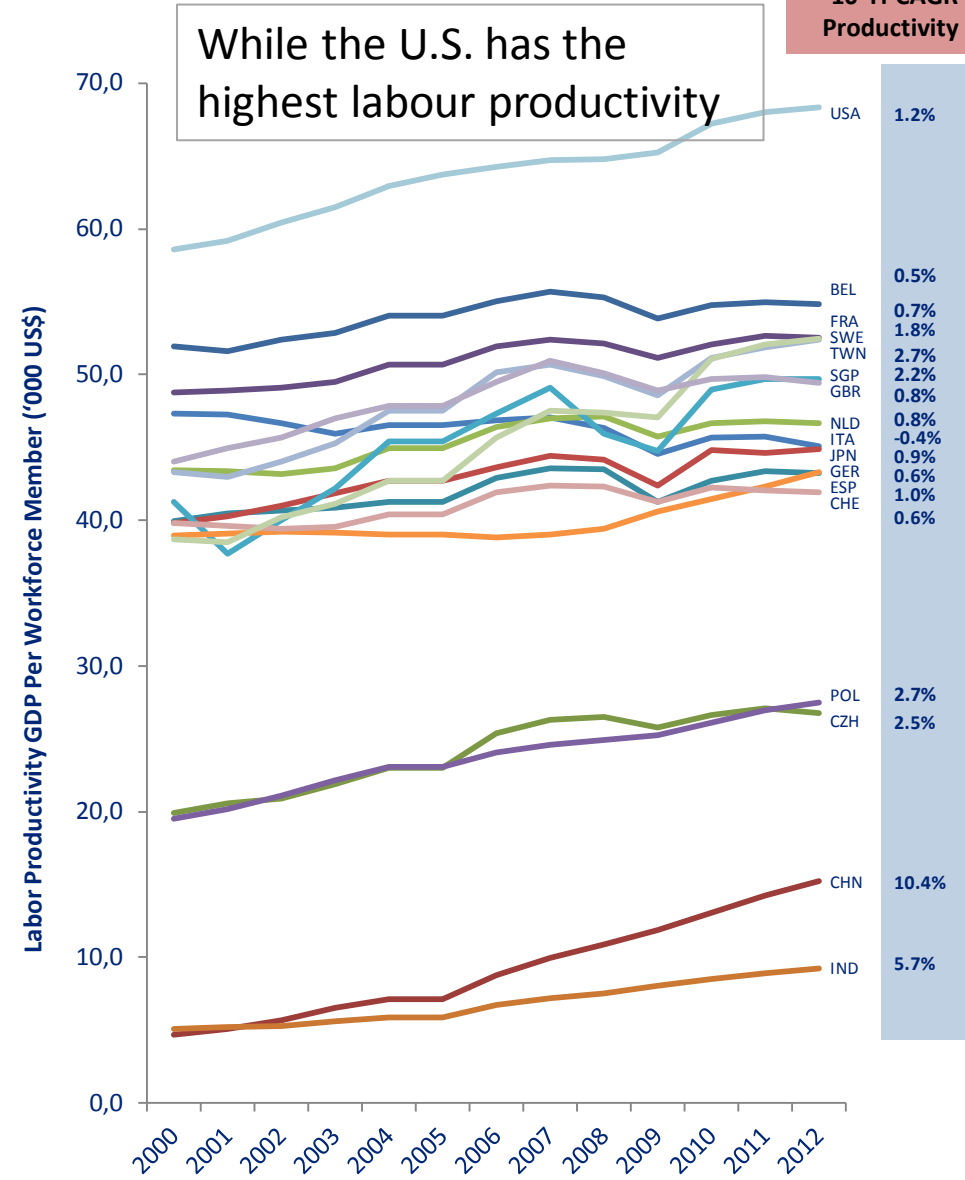
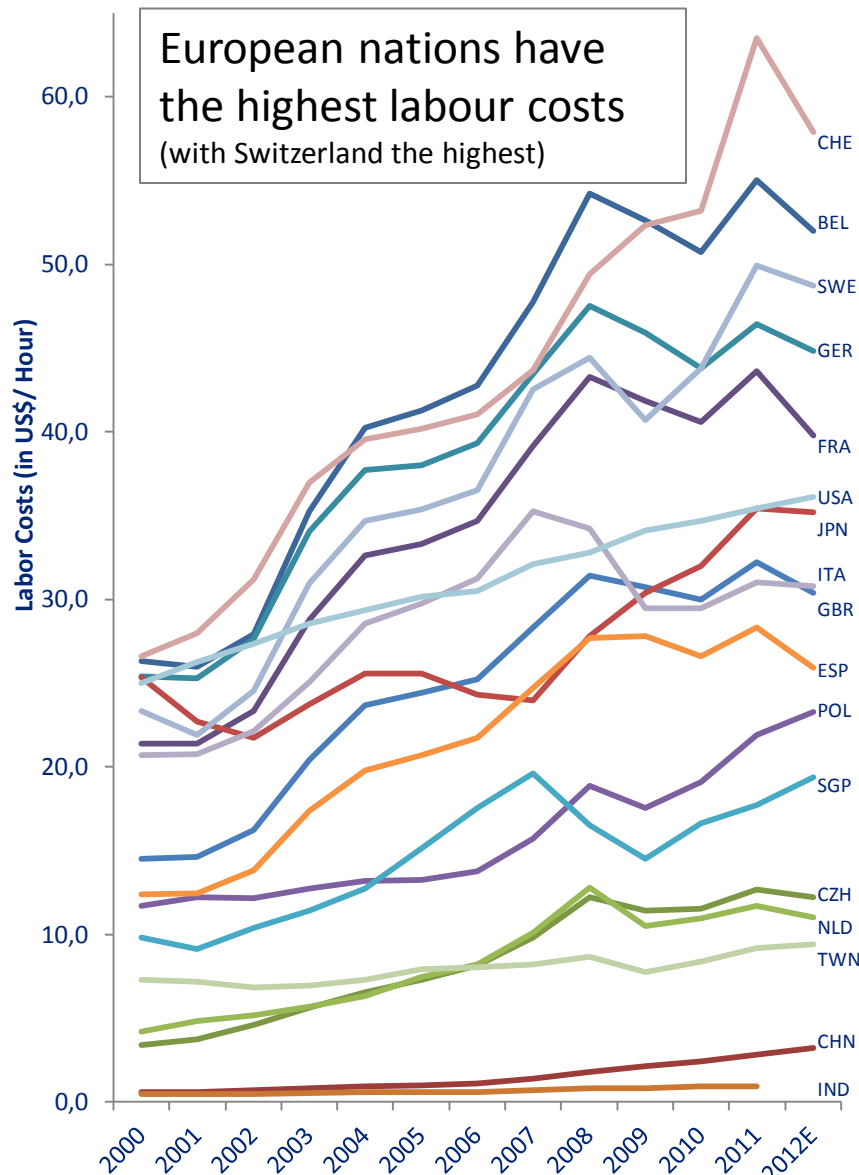
The cost of labour ranked as the 3rd most important driver

Wage rates in developing nations are outpacing growth in developed nations.....



...but wage rates are only one component of the labour equation....

Labour Costs and Labor Productivity



The Future of Manufacturing: Competition for resources, capabilities; and on public policy

As we look to the future, there are a number of key areas where both companies and countries will effectively share in the intensifying competition :



The **infrastructure** necessary to enable manufacturing to flourish and contribute to job growth will grow in importance



Competition to attract FDI will increase dramatically, raising the stakes for countries and complicating the decision processes for companies



Growing **materials resources competition** will serve as a catalyst to significant materials sciences breakthroughs



Affordable **clean energy strategies and effective energy policies** will be an important differentiator of highly competitive countries and companies



More innovative companies will achieve higher market share and better improve profitability, and **countries more successful at fostering innovation** will have greater GDP growth



Companies are struggling to fill advanced manufacturing jobs with the right talent and access to **the best human capital** will become increasingly important



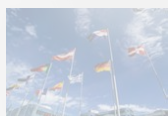
The strategic use of **public policy as an enabler** of economic development will place a premium on collaboration between policymakers and business leaders

The Future of Manufacturing: Competition for resources, capabilities; and on public policy

As we look to the future, there are a number of key areas where both companies and

Overall Conclusions:

1. **Manufacturing and Innovation are key drivers of prosperity**
2. **Competition for advanced manufacturing will intensify**
3. **Developed nations will be increasingly challenged by emerging economy nations over the next twenty-five years along all of these dimensions of competitiveness.**



The strategic use of **public policy as an enabler** of economic development will place a premium on collaboration between policymakers and business leaders



About Deloitte

Deloitte refers to one or more of Deloitte Touche Tohmatsu, a Swiss Verein, and its network of member firms, each of which is a legally separate and independent entity. Please see www.deloitte.com/about for a detailed description of the legal structure of Deloitte Touche Tohmatsu and its member firms. Please see www.deloitte.com/us/about for a detailed description of the legal structure of Deloitte LLP and its subsidiaries.