The Return of US Manufacturing

Within the next five years, the United States is expected to experience a "manufacturing renaissance." Rapidly rising wages for production workers in China and the weakening US dollar vs. the yuan, plus continued US productivity gains through automation, will fundamentally change the economics of offshoring a variety of goods to be sold in America.

By around 2015, the net labor costs for manufacturing in China and the US are expected to converge. China's cost advantage will fall to 10-15%. After factoring in logistics, China's cost advantage will largely or entirely disappear.

Many US companies are already rethinking their supply chains and production locations; support from state and local governments is helping to tip the balance. Reinvestment in the US will accelerate as it becomes one of the cheapest locations for manufacturing in the developed world.

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Executive summary

China will no longer be the default low-cost manufacturing location for supplying the US market

- China wage rates growing 15-20% per year
- China cost advantage, in competitive manufacturing regions, will fall to 10-15%, before transportation, duties and other costs

Reinvesting in the US will accelerate as it becomes one of the cheapest locations for manufacturing in the developed world

- Increasingly flexible workforce and rising productivity in the US
- State and local government incentives
- First wave of reinvestment has already started – e.g., CAT excavators, NCR ATMs

China will continue to be a major global player, even as investments for US exports decline

- Investments in manufacturing to supply China will continue, but with different capital/labor tradeoffs
- Other low-cost countries will benefit from companies seeking "cheaper" wages, but will be too small to absorb all demand

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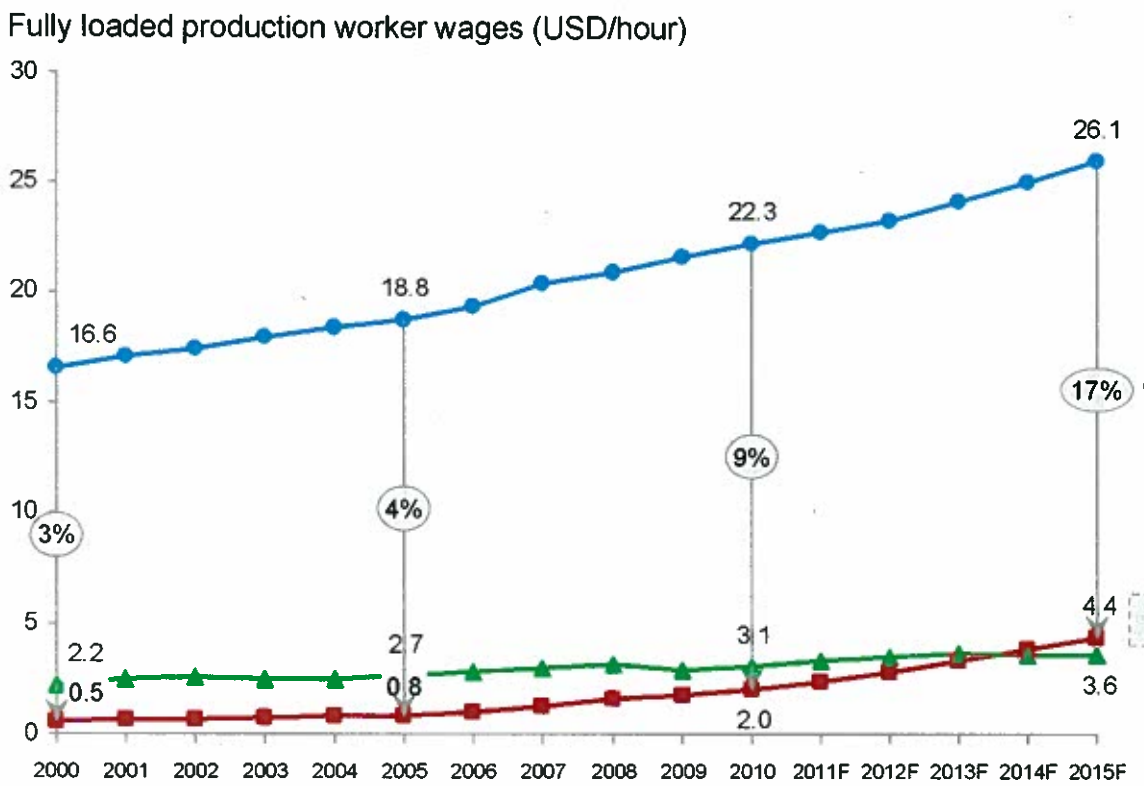
China's wage rates growing rapidly

Expected to approach ~17% of US by 2015, up from 3% in 2000; likely to exceed rates in Mexico



Ratio of China to US wage rates

	CAGR 2000-05	CAGR 2005-10	CAGR 2010-15
US[1]	2%	4%	3%
CN[2]	10%	19%	17%
MX[1]	4%	3%	3%

Growth accelerated from 2005 to 2010 and continues at same rate

1. Hourly direct pay and benefits premium based on US Bureau of Labor Statistics (BLS) data for production occupations; average benefits premium is 30% for US and 36% for MX in 2010; data for the years '09-'10 partly based on EIU data 2. Hourly compensation based on BLS special studies data; An additional compensation premium of 14% added to account for recent labor market trends and TVE data bias ; it should be noted that this figure data may be subject to some double counting due to BLS methodology for benefits calculations
Source: EIU, BLS, selected company data, BCG Analysis

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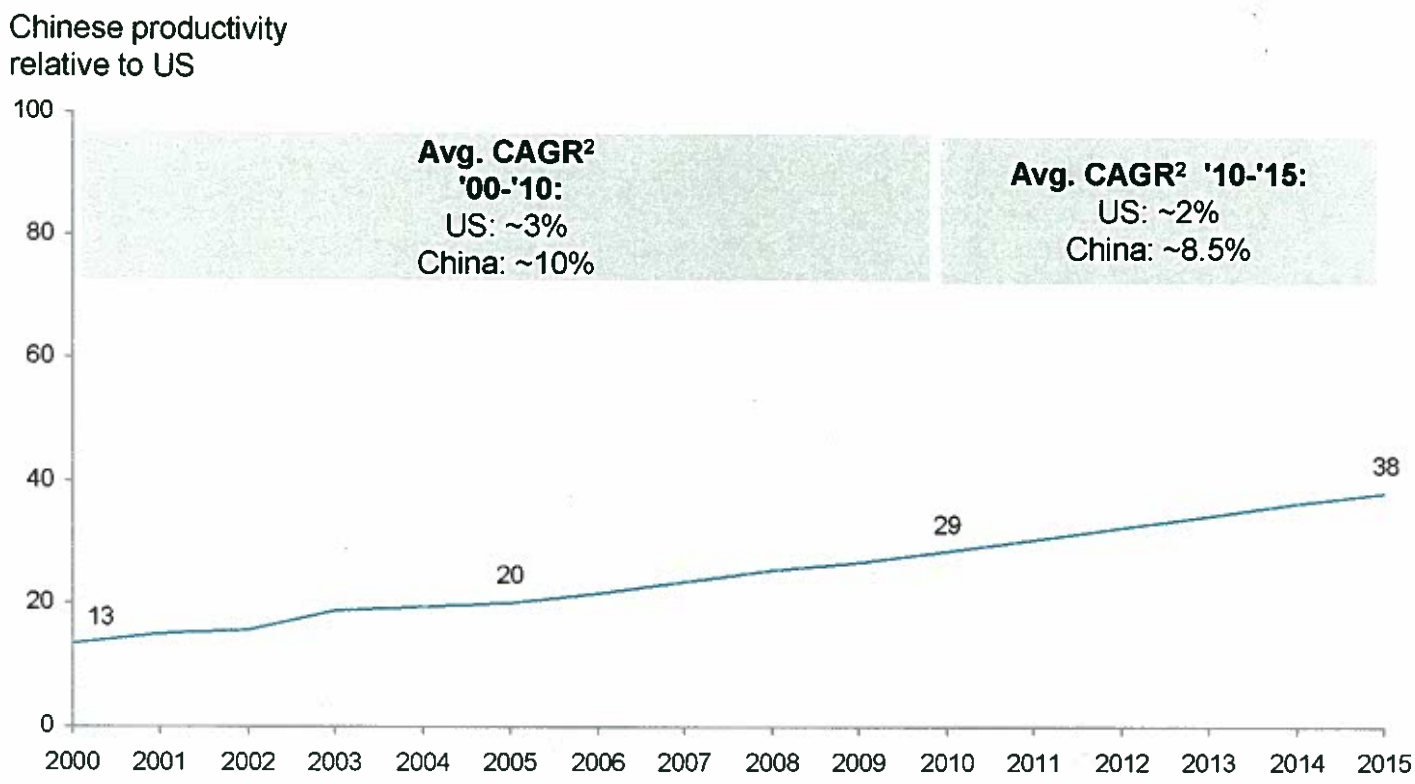
China's productivity gains will lag wage increases

Growing at nearly 10%, all else equal, will likely reach ~40% of US productivity by 2015



Productivity can't keep up with rising wages, especially as the yuan continues to appreciate

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Productivity-adjusted wage rates will near US rates by 2015

Assuming current capital-labor tradeoffs and low-cost US location

		2000	2005	2010	2015F	Δ '00 - 15
Average wages	China nominal rate ($/hr)	0.52	0.83	1.99	4.41	3.90
	China relative productivity (%)	13%	20%	29%	38%	+25 pts
	China adjusted wage rate ($/hr)	3.84	4.12	6.94	11.57	7.73
	US wage rate ($/hr)	16.61	18.77	22.32	26.06	9.45
	China as a % of US wage rate	**23%**	**22%**	**31%**	**44%**	**+21 pts**
YRD[1] region vs. Mississippi	China nominal rate ($/hr)	0.72	1.16	2.79	6.18	5.45
	China relative productivity (%)	13%	20%	29%	38%	+25 pts
	China adjusted wage rate ($/hr)	5.38	5.77	9.73	16.21	10.83
	US wage rate ($/hr)	14.94	16.89	20.08	23.44	8.50
	China as a % of US wage rate	**36%**	**34%**	**48%**	**69%**	**+33 pts**

1. Yangtze River Delta region; includes the provinces of Shanghai, Jiangsu, and Zhejiang; For 2009 the region had a relative wage index of 133 against the median; a 5% MNC wage premium has been added

Source: EIU, BLS, NBSC, BCG analysis

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Economics will drive reinvestment in US

Near shore locations will also benefit, especially when manufacturing for US market

Imagine a company...

- US-based auto parts supplier
- Most customers are US OEMs that manufacture in the US
- Parts take 8 minutes of labor on average in the US
- Labor represents 1/3 of the total cost of the part

...with the following location choices...

US – Mississippi

- Flexible unions/workers
- Minimal wage growth
- High worker productivity

China – YRD region

- Scarce labor
- Rapidly rising wages
- Low productivity relative to the US

	2000	2015F
Wage rate ($/hr)	14.94	23.44
Productivity (%)	100%	100%
Labor cost/part ($)	1.99	3.13
Wage rate ($/hr)	0.72	6.18
Productivity (%)[1]	13%	38%
Labor cost/part ($)	0.74	2.17
Labor cost savings (%)	**63%**	**31%**
Total cost savings (before transportation, duties and other costs)	**21%**	**10%**

1. Average productivity difference between US and China
Source: BCG analysis, BLS, EIU,

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Increased automation in China unlikely to change equation

Savings still likely lower than the past, even if automation drives productivity to parity with US

Key inputs

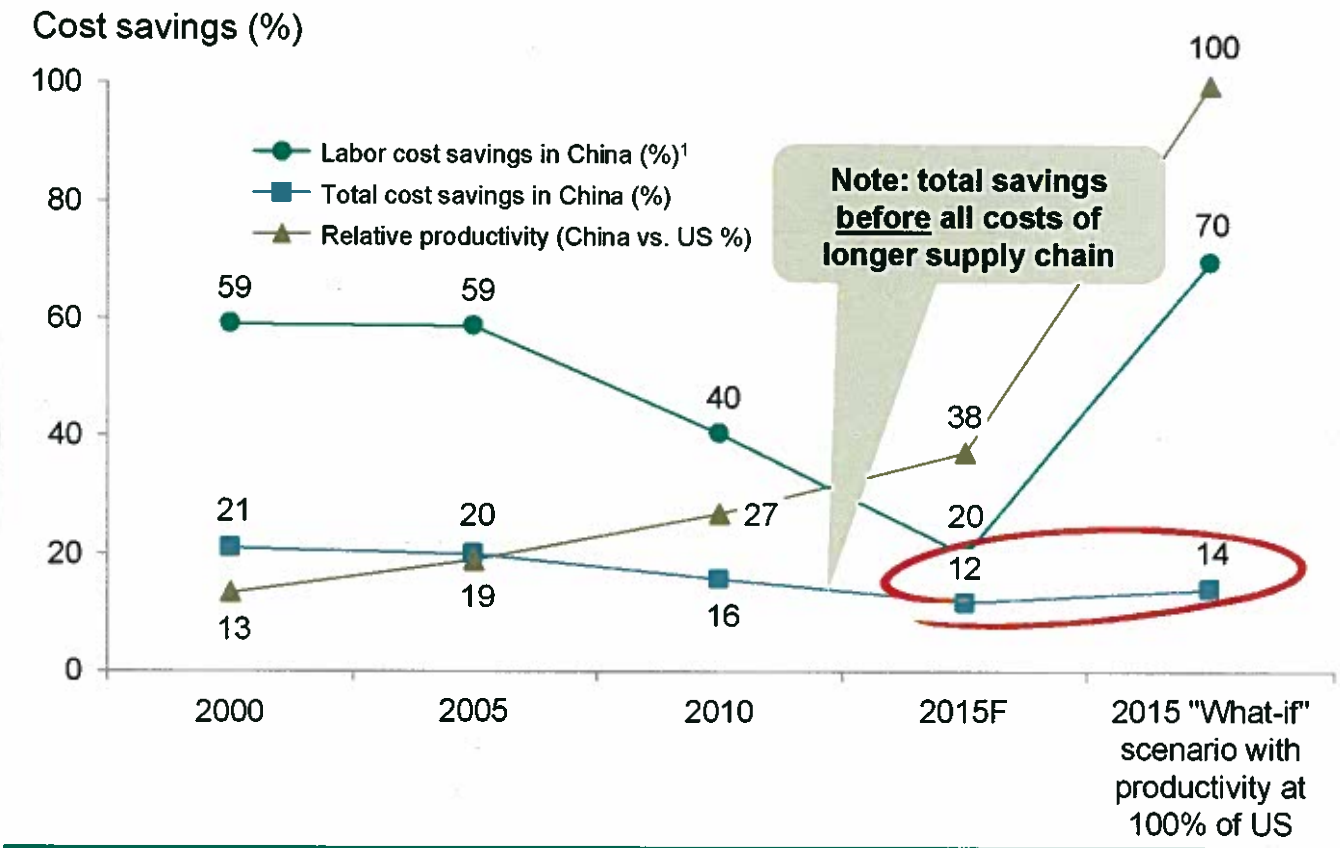
Product with 20% labor US$-denominated labor content in year 2000

Constant materials cost in the US throughout time period

- 5% discount in cost of total materials in China in 2000, decreasing to 1% in 2010 and 0% in 2015

Depreciation, rental, maintenance and other expenses ~3.5 times higher in the US in 2000

- Assumed capital-for-labor substitution rate of 75¢ incremental capital cost[1] for 1 US$ labor savings in China (for 2015)



Lower labor content offsets labor cost savings from increased capital investment

1. Depreciation, opportunity cost etc. 2. 100% - (total labor cost in China divided by total labor cost in US)
Source: BCG analysis

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Many US companies already rethinking their supply chains and production locations

Company	Manufacturing move	Company	Manufacturing move
Caterpillar	In 2010 announced a new excavator-making facility to be built in Texas. Is expected to employ over 500 people and triple CAT's U.S.-based excavator capacity	NCR	Brought back production of its ATMs to Columbus, Georgia, with approximately 870 jobs being created
Ford	Bringing back up to 2K jobs due to a favorable agreement with UAW, allowing the company to hire workers at $14/hr	Sauder	Moved back production to local manufacturers from foreign low-cost sources, based on a supply chain assessment analysis
Flextronics	Flextronics is building more product categories in Mexico	Wham-O	Toy manufacturer Wham-O has returned 50% of its Frisbee production and its Hula Hoop production from China and Mexico to the US

Source: Press search; company websites

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Additional support from state and local governments can tip the balance

Company	Incentives received	Company	Incentives received
Caterpillar	Winston-Salem's $14.35m incentive package encouraged the company to build a manufacturing plant in the eastern part of the city	Nissan	A $1.4bn federal loan under the Advanced Technology Vehicles Program covered most of the $1.7bn investment in a new TN plant
Ford	After receiving $240m in state funding to support expansion of its Louisville Assembly Plant (LAP), the company injected another $600M	Bosch	Hiring several hundred workers at its Charleston plant after equipment investments of $125m, $1m state grant and employee tax incentives
Beckmann Volmer	Getting 7 different state incentives for building a 300-person facility, including no state corporate tax for 15 years, plus $4m in other grants for infrastructure	Blade Dynamics	Located in Michoud, LA after Louisiana Economic Development provided a $30m state incentive package
GlobalFoundries	Will receive +$1.3bn dollar in state incentives over the next 15 years for providing thousands of manufacturing and construction jobs in Malta, NY		

Source: Press search

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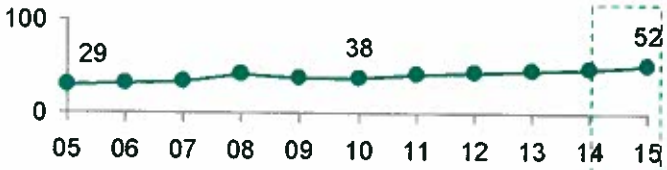
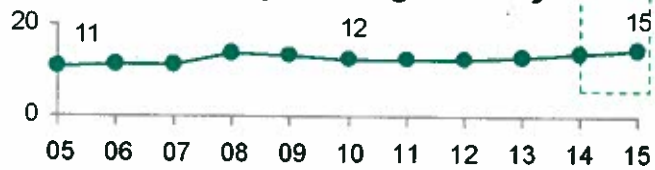
Mexico's lower-cost components should further shift the economic balance

Mexico's fundamentals are positive

MXP/hour ***Limited nominal wage growth ...***



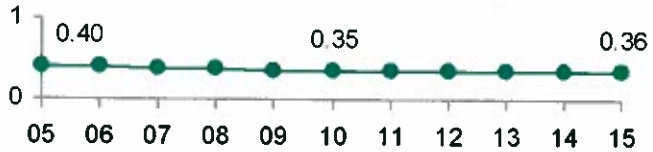
MXP/US$ ***... a depreciating currency ...***



$-denominated wages competitive against Chinese wages by 2015

... fairly constant relative productivity ...

Relative Productivity vs. US[1] (x)



...as well as a trade advantage with the US based on the NAFTA and geographical proximity

1. Adjusted for manufacturing/industry
Source: BLS, EIU, BEA, BCG analysis

And results are already evident

"For the first time since China entered the World Trade Organization in 2001 and became an exporting superpower, **Mexico posted a bigger gain in U.S. market share than its Asian rival during the first 11 months of 2010**....The **closing wage gap means Mexico will likely win even more U.S. market share** in coming years" ***Financial Post, 26 Jan '11***

"U.S. manufacturers like the proximity of **Mexico** and the fact that the country **has few labor strikes, shares time zones with the U.S. and has cultural similarities** with the rest of North America, with most Mexican executives and middle managers able to speak English..."

" 'Every year that goes by, we're going to see **Mexico becoming more and more attractive as an alternative to China**,' Flextronics's CEO McNamara said..."

" 'You're buying a relatively **cheap currency in a country that's growing reasonably well and without any significant short-term problems**,' " Ed Sternberg from Loomis Sayles & Co said... ***Bloomberg, 8 Sept '10***

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Other LCCs will benefit from new US demand in Asia

Size and infrastructure will affect ability to capitalize on improving economics

Country	GDP/head (PPP US$)	Manufacturing wage rate (US$/hour)	Working age population (m/% total)	Corruption index[5] (Score/ ranking)	Km road/ sq.km[6]	Electricity production (1000 kWh/head)[8]	Overall business env. rating[10] (10=high)
Vietnam	3,140	0.49	61.4 (70%)	2.7/116	0.5	0.80	5.5
Thailand	8,600	1.80	47.8 (71%)	3.5/78	0.4	2.06	6.6
Cambodia	1,940	0.35 [2]	10 (69%[4])	2.1/154	0.2	0.09	N/A
Indonesia	4,210	0.38	161 (66.2%)	2.8/110	0.2	0.58	5.7
Average/sum	4,473[1]	0.76[1]	281	2.8[1]	0.33[1]	1.15[1,9]	5.9
India	3,480	3.00	756 (64%)	3.3/87	1.0	0.70	5.7
Brazil	11,210	8.24	129 (67%)	3.7/69	0.4[7]	2.40	6.6
China	7,740	1.99[3]	947 (72%)	3.5/78	0.4	2.63	6.3

1. Simple arithmetic average for the four countries 2. Extrapolated based on Cambodian Government data 3. Adjusted figure based on in-depth fully loaded wage rate analysis 4. Average of other Asian LCCs; working age population figure extrapolated 5. Based on transparency International 6. Based on CIA Factbook, latest available country data (2006-2009), no distinction in data between paved and non-paved roads for most countries 7. Adjusted for Amazon basin area, 10% premium added for other inhabitable rain forest areas 8. Based on EIA International data 9. Excluding Cambodia 10. EIU ranking
Note: 2010 data applied when possible
Source: EIU, CIA World Factbook, IMF, Government Statistics, EIA

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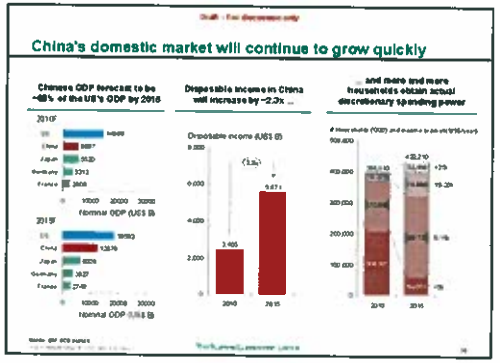
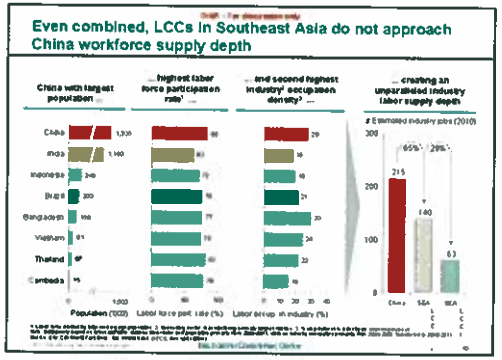
Despite trends, China will continue to be a major global player

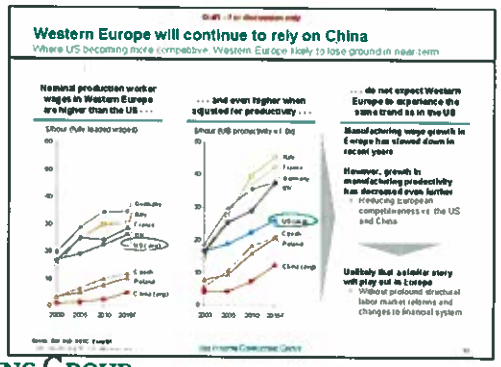
China's domestic market is huge – GDP and consumer discretionary spending are increasing



Other low-cost countries relatively attractive and will capture some growth, but too small to capture all investment



Western Europe becoming less competitive, will continue to invest in China as low-cost supply base



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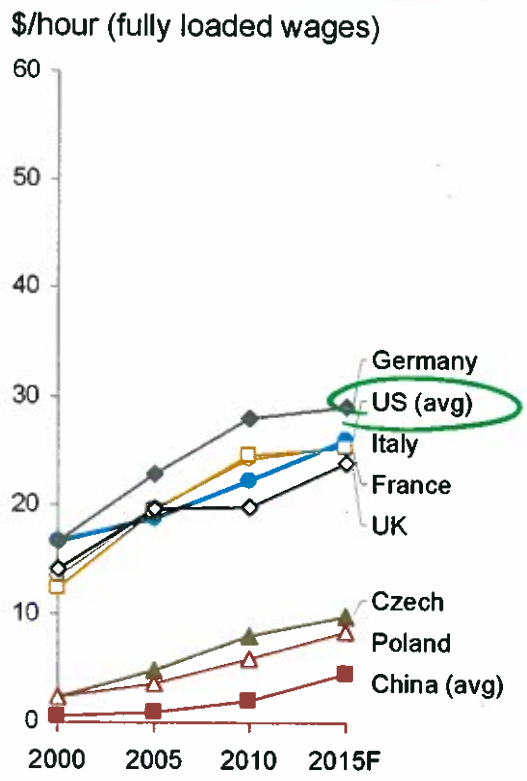
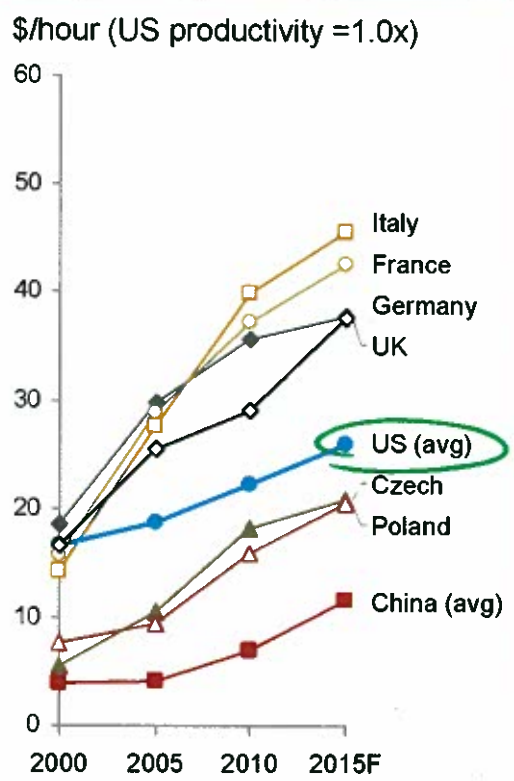
Western Europe will continue to rely on China

As US becomes more competitive, Western Europe likely to lose ground in the near term

Nominal production worker wages in Western Europe are similar to the US . . .



. . . but become higher when adjusted for productivity . . .



. . . Unlikely Western Europe will experience the same trends as the US

Manufacturing wage growth in Europe has slowed down in recent years

But growth in productivity has decreased even further

- Work rules restrict flexibility, decrease ability to maximize individual worker productivity

Europe's situation unlikely to change soon

- Without profound structural labor market reforms and changes to financial system

Source: EIU, BLS, NBSC, Eurostat

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Key takeaways for manufacturers

China will no longer be the default low-cost mfg location for supplying the US market

- Economics are becoming marginal for many products

US far more attractive as a "cheap" option for supplying the developed world

- Low-cost regions in US growing more competitive as wage gap with China shrinks
- Investments in US manufacturing will likely increase

Mexico also poised to benefit as a low-cost alternative

- Relatively low-cost components will further shift the economic balance

China will continue to be a major global player, even as investments for US exports decline

- Investments in manufacturing to supply China will continue, but with different capital/labor tradeoffs
- Other low-cost countries will benefit from companies seeking "cheaper" wages, but will be too small to absorb all demand

Western Europe lacks the labor market agility and productivity advantages of the US

- Will likely continue to rely on China's relatively lower labor rates

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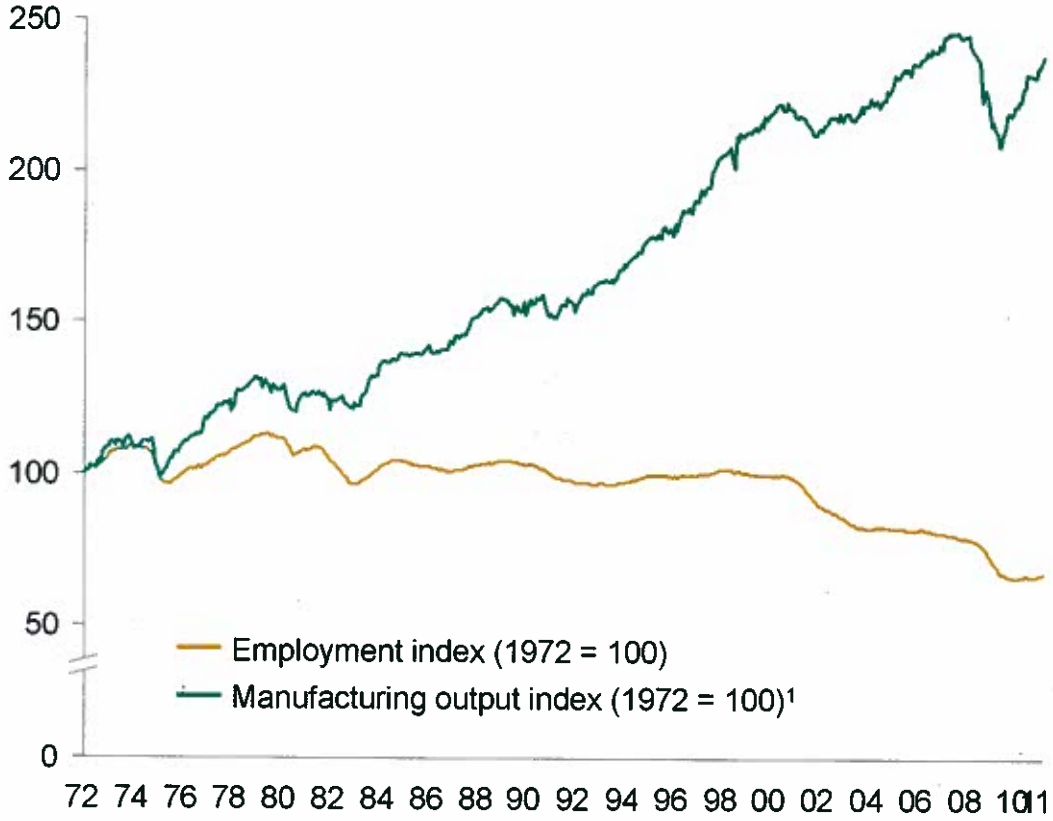
Appendix

US manufacturing output is almost 2.5 times greater than in 1972 while employment is down more than 30%

US manufacturing output vs. US manufacturing employment



	Compounded annual growth rates (CAGRs)	
	Empl.	Output
'72-'80	0.7%	2.3%
'81-'90	-0.6%	2.4%
'91-'00	0.1%	4.1%
'01-'10	-3.9%	0.6%

1. Gross value of Final Products, measured in 2005 US$ prices, Fed data
Source: Federal Reserve, US Bureau of Labor Statistics

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Author contacts

Harold L. Sirkin
Senior Partner and author of *GLOBALITY: Competing with Everyone from Everywhere for Everything*
Chicago
hal.ops@bcg.com

Michael Zinser
Partner and leader of manufacturing in the Americas
Chicago
zinser.michael@bcg.com

Douglas Hohner
Partner
Chicago
hohner.douglas@bcg.com

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