

# China and the Global Supply Chain

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# Overview

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- ◆ The Chinese economy and the trade infrastructure
- ◆ Logistics challenges and developments
- ◆ Value chain evolution
- ◆ Industrial and logistics parks
- ◆ Outlook
- ◆ Teaching and research opportunities

# Overview

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- ◆ The Chinese economy and the trade infrastructure
  - ◆ A fast growing economy
  - ◆ Strong investments into the region
  - ◆ Positive outlook on reducing domestic trade frictions
- ◆ Logistics challenges and developments
- ◆ Value chain evolution
- ◆ Industrial and logistics parks
- ◆ Outlook
- ◆ Teaching and research opportunities

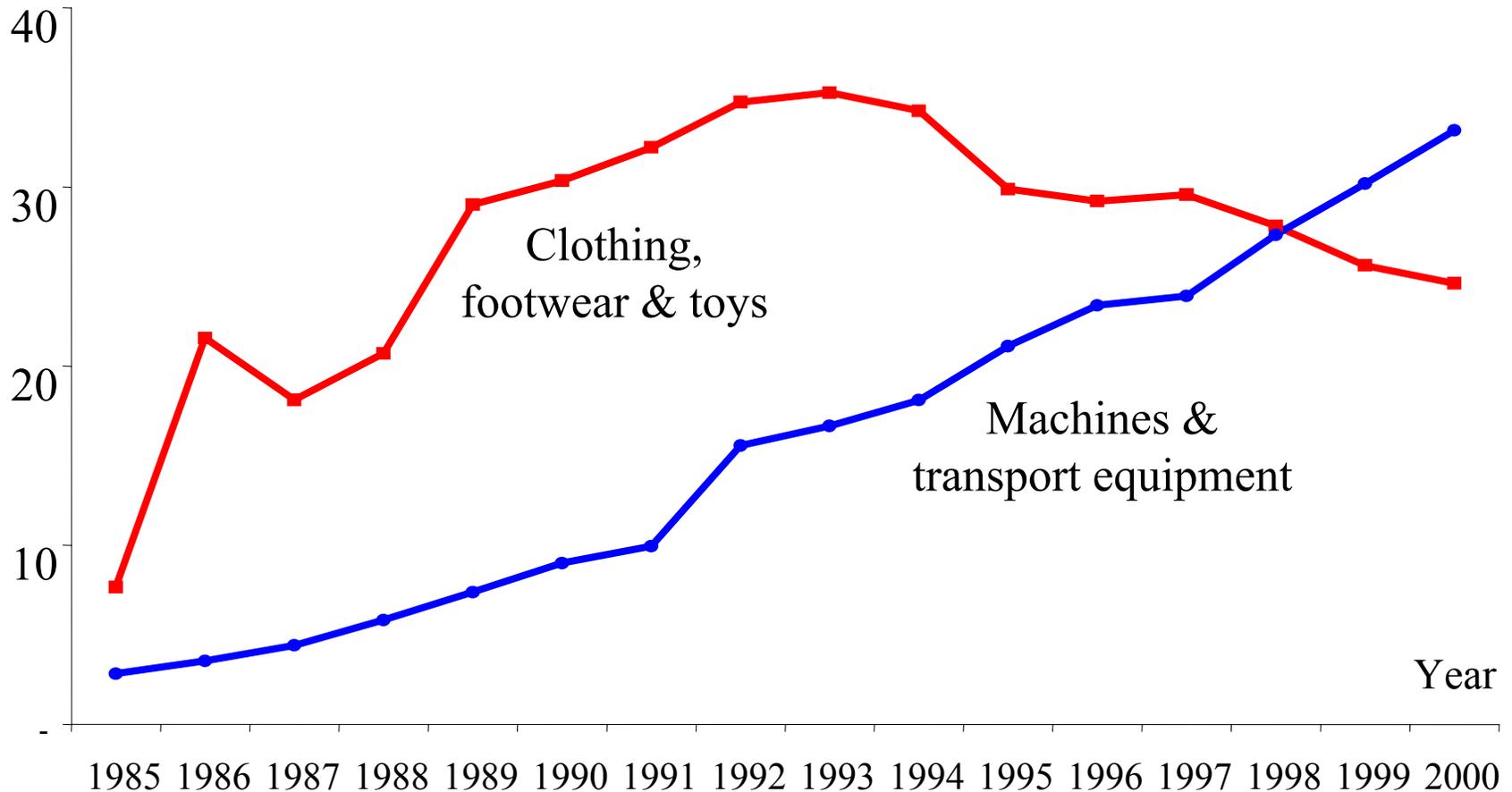
# The Chinese Economy Today

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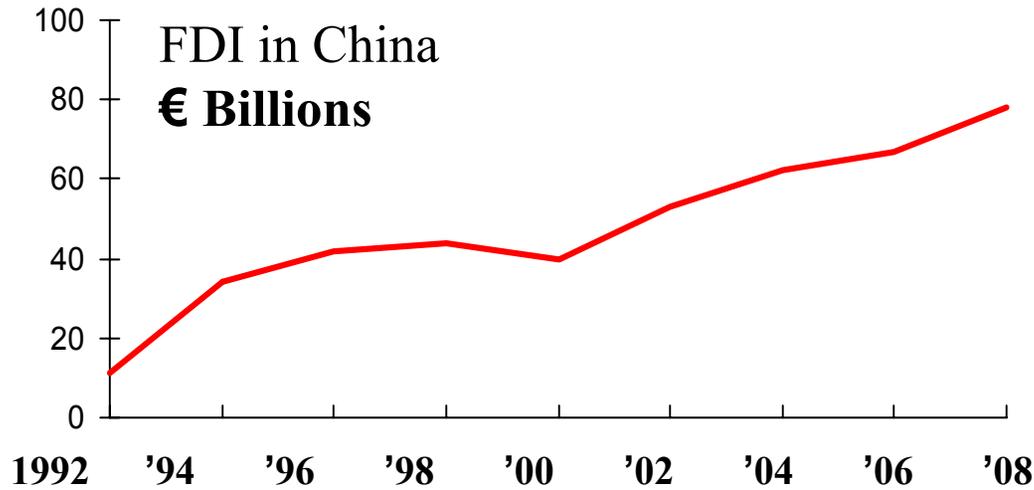
- ◆ Chinese real GDP in 2003 is the 6<sup>th</sup> largest in the world, having grown 9% a year since economic reform of 1979, and 7.9% over the past five years.
- ◆ China is the world's 4<sup>th</sup> largest exporting country (behind Germany, Japan and the U.S.) , at US\$438.4 billion in 2003, an increase of 34.6% over 2002.
- ◆ China is the world's 3<sup>rd</sup> largest importing country (behind U.S. and Germany), at US\$412.8 billion in 2003, an increase of 39.9% over 2002.
- ◆ The private (non-state) sector accounts for more than 65% of GDP and an even greater percentage of employment in 2002.

# Rise of Manufactured Exports

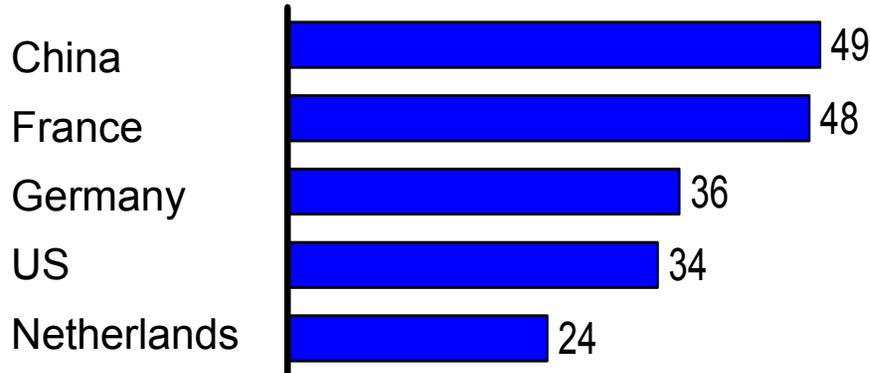
## Chinese Manufactured Exports as Percent of Total Exports



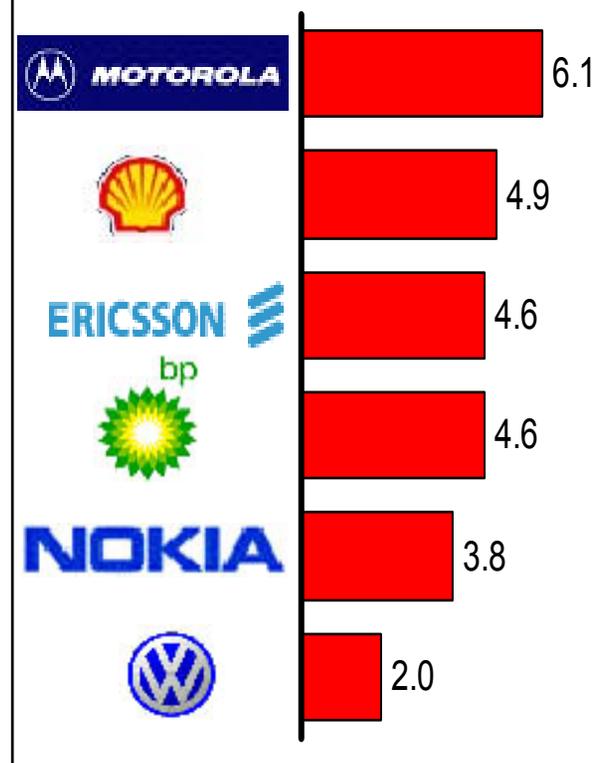
# High Foreign Direct Investment



FDI € Billions in 2002



Planned investment  
in next 5 years,  
in € Billions



# Changes in Trade Infrastructures

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- ◆ With rest of world:
  - ◆ WTO accession provides national treatment for all foreign companies.
- ◆ Within ASEAN Free Trade Area:
  - ◆ tariff rates for 90% of products lowered to 5% on 1/1/2002, and 0% by 2010.
- ◆ With Hong Kong:
  - ◆ Tariffs on 67% of Hong Kong-made exports to China exempted by 1/1/2004 and all will be completely exempted by 1/1/ 2006.
  - ◆ Hong Kong firms in key service sectors, including retailers, wholesalers, distributors, logistics companies and shipping lines, allowed to set up wholly owned subsidiaries in China with very little restrictions.
- ◆ Within China:
  - ◆ Abolition of provincial and local barriers to the flow of goods and services.
  - ◆ Promotion of government-supported and supervised standardization and certification.
  - ◆ Enhancement of the mobility of labor.

# Overview

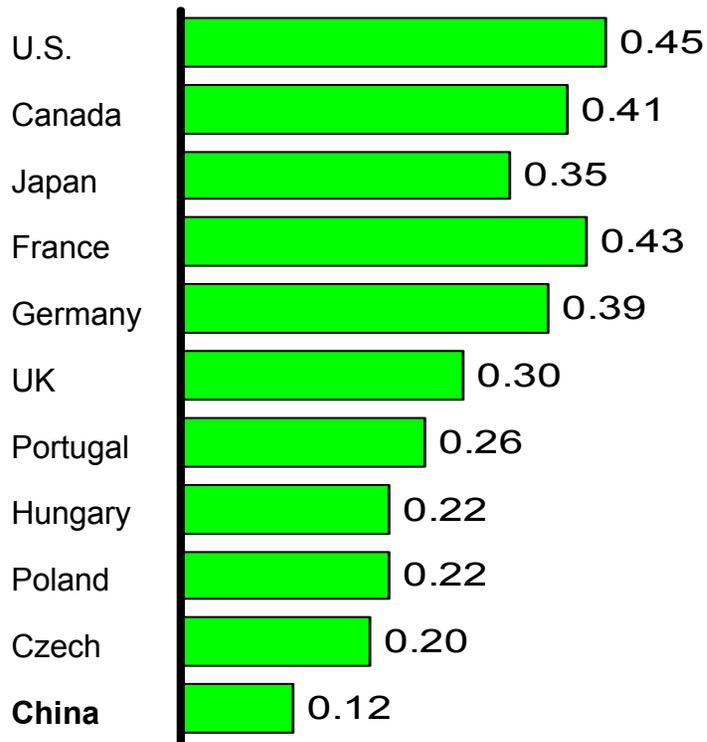
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- ◆ The Chinese economy and the trade infrastructure
- ◆ Logistics challenges and developments
  - ◆ Logistics a major impediment to supply chain efficiency
  - ◆ Increasing congestions at major logistics hubs
  - ◆ Positive steps taken
- ◆ Value chain evolution
- ◆ Industrial and logistics parks
- ◆ Outlook
- ◆ Teaching and research opportunities

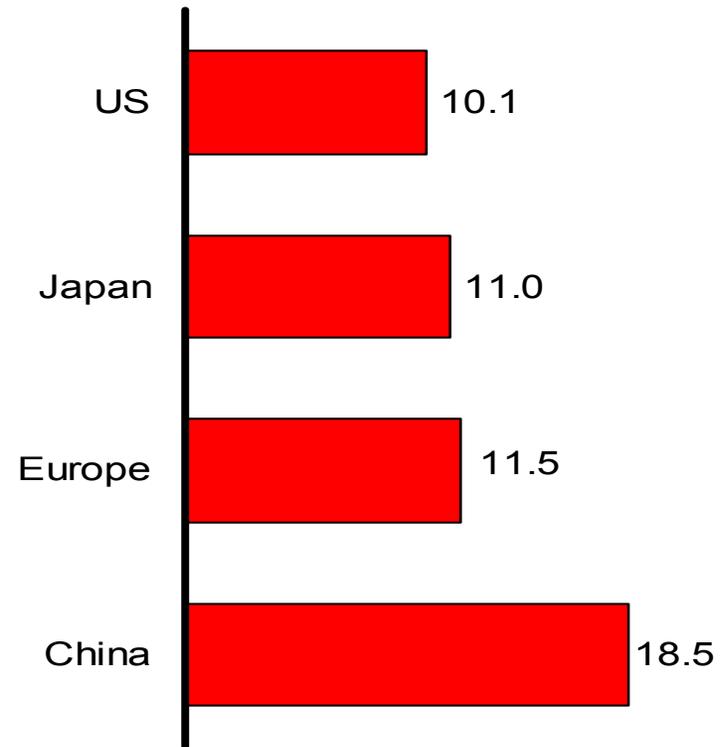
# Logistics a Big Challenge

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Percentage of total parcel & express market/GDP, 2002



Logistics costs as percentage of nominal GDP, 2002



# Supply Chain Problems

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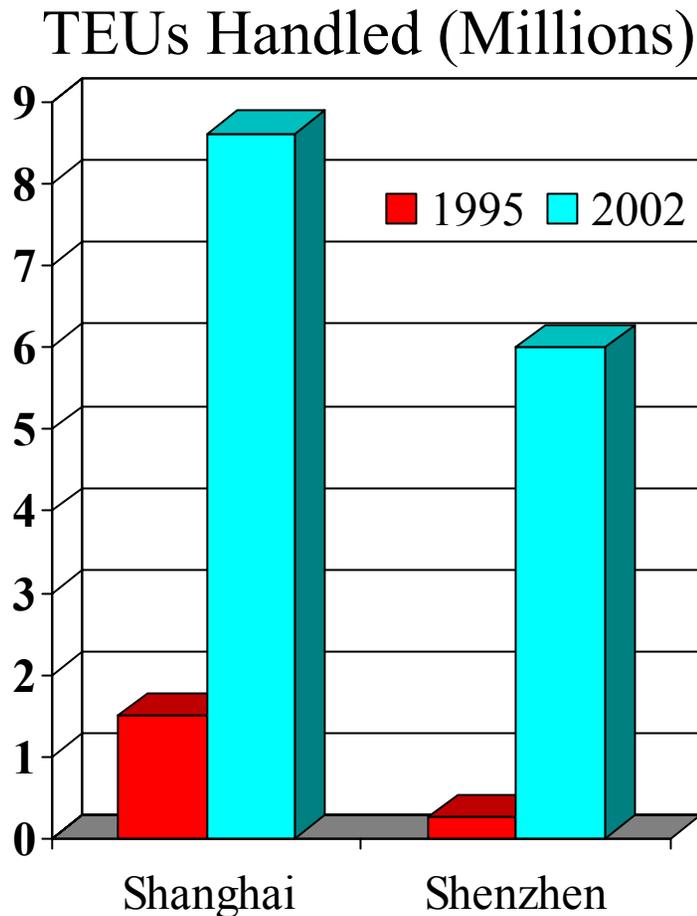
- ◆ Inefficient transportation logistics
  - ◆ Inadequate infrastructure
  - ◆ Fragmented market for providers
  - ◆ High cost and unreliable service
- ◆ Very high communication cost
  - ◆ 50% higher in China vs. Hong Kong for renting a data line
  - ◆ 10 times higher in China vs. Hong Kong for an IDD call to U.S.A.
- ◆ Extremely complex zones and customs structure
  - ◆ Technological Development Zone, National Free Trade Zone, National Hi-Tech Industrial Development Zone, Taiwanese Investment Zone, National Border and Economic Cooperation Zone, National Export Processing Zone
  - ◆ Complex customs clearance procedures
- ◆ Small 3PL market
  - ◆ 3% of total logistics market today, expected to grow to 6% in 2010
  - ◆ Vs 8-10% in developed countries

# Transportation status

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- ◆ Trucking industry is a fragmented, cottage industry
  - ◆ Only 20% of freight trucks are containerized
  - ◆ For long hauls, local protectionism results in reloading of goods and empty returns; broken inter-modal systems
  - ◆ Road tolls represents 15-20% of trucking cost – 9 times more than in Europe
- ◆ Service is a problem:
  - ◆ High handling costs and high damage rates
  - ◆ Transit times are long and service reliability poor
  - ◆ Non-existent information systems for visibility
- ◆ Domestic air cargo market underdeveloped
  - ◆ Fast growth due to needs of electronics and telecom equipment segments
  - ◆ Improvements coming from alliances with outside global cargo carriers such as China Airlines (Taiwan) and Dragonair (Hong Kong)

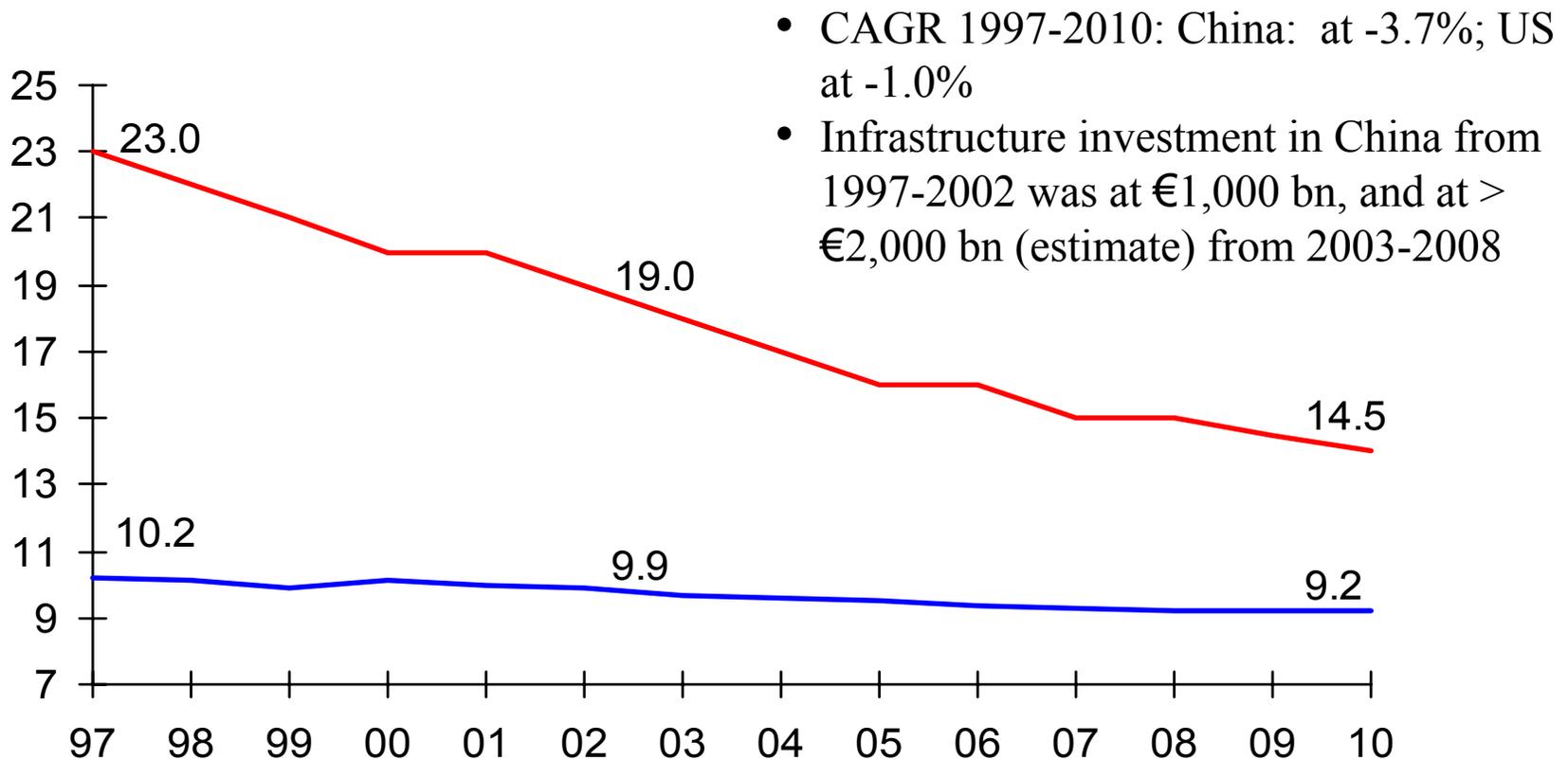
# Congestion in Logistics Hubs



- ◆ High congestion at Shanghai and Shenzhen's ports due to astounding growth
- ◆ Numerous new ports are under construction
- ◆ Shenzhen-HK border a major bottleneck
- ◆ Expressways are also being built in the Eastern region to address road congestion
- ◆ Inconsistent provincial regulations and repeated custom clearance requirement

# Future Logistics Cost Outlook

## Logistics Cost as Percentage of Nominal GDP



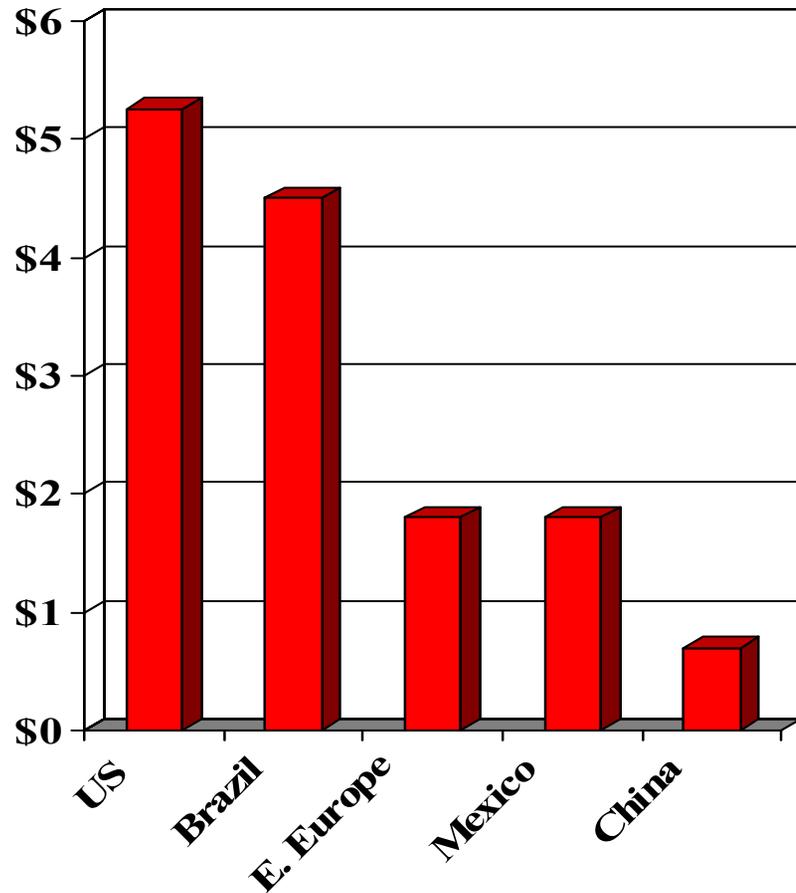
# Overview

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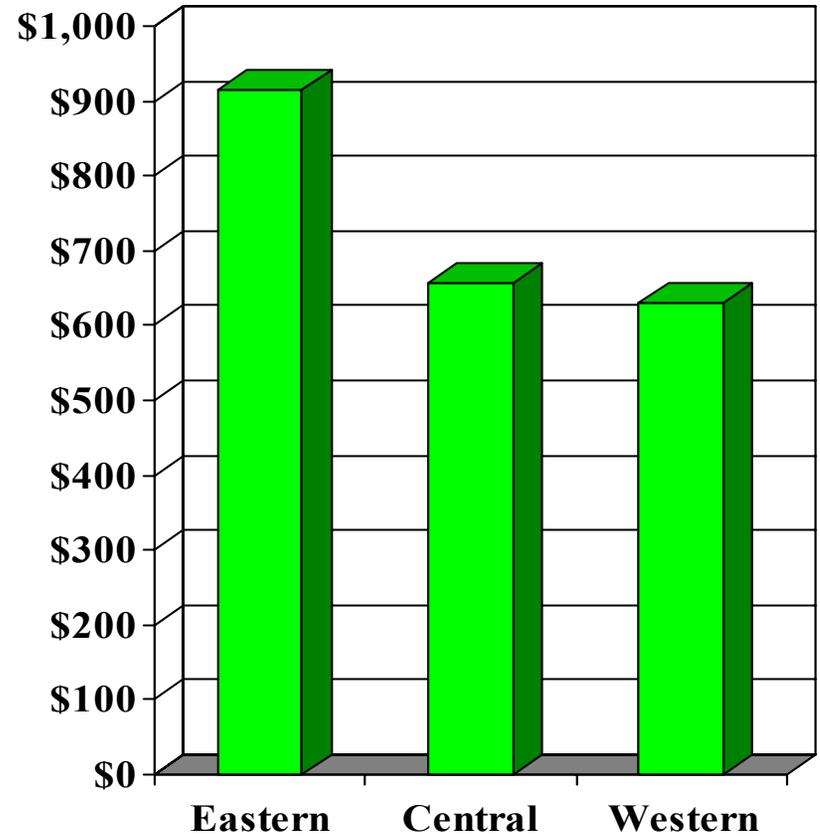
- ◆ The Chinese economy and the trade infrastructure
- ◆ Logistics challenges and developments
- ◆ Value chain evolution
  - ◆ Manufacturing sector still has lots of room to grow
  - ◆ Expanding the scope of the value chain
  - ◆ Is vertical integration out of fashion?
  - ◆ Emergence of design
- ◆ Industrial and logistics parks
- ◆ Outlook
- ◆ Teaching and research opportunities

# Labor Cost Advantage

Contract Electronics Labor costs (US\$)



Average Monthly Household Income (RMB) in China by Region

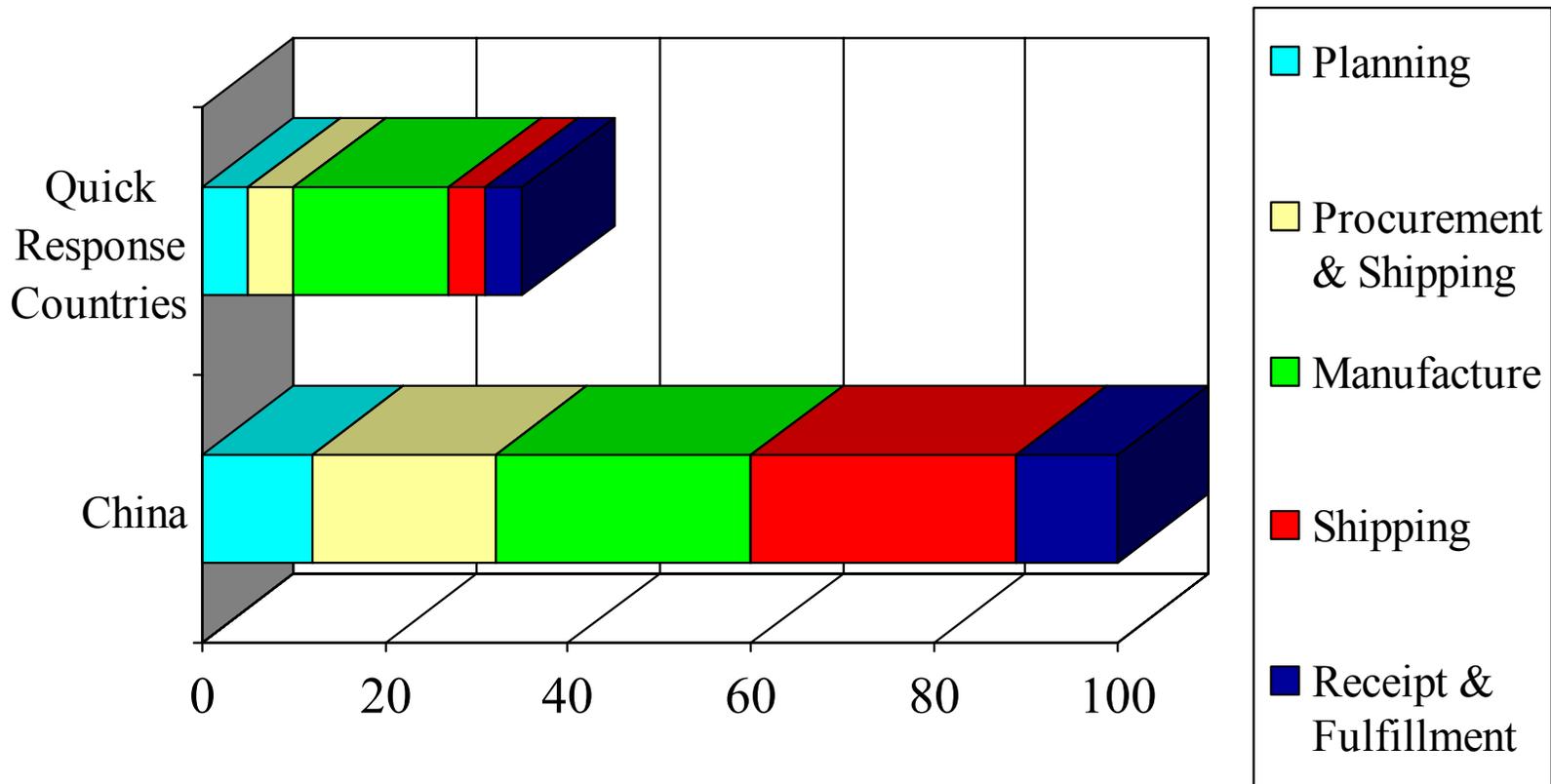


Note: Data as of Jan, 2003. Tibet excluded from Western region. Inner Mongolia & Heilongjiang included in Central China. Urban income.

Source: [www.stats.gov.cn](http://www.stats.gov.cn), Monthly China Statistics Data. NationsBanc Montgomery Securities 1999

# Lead Time Differences for Apparels

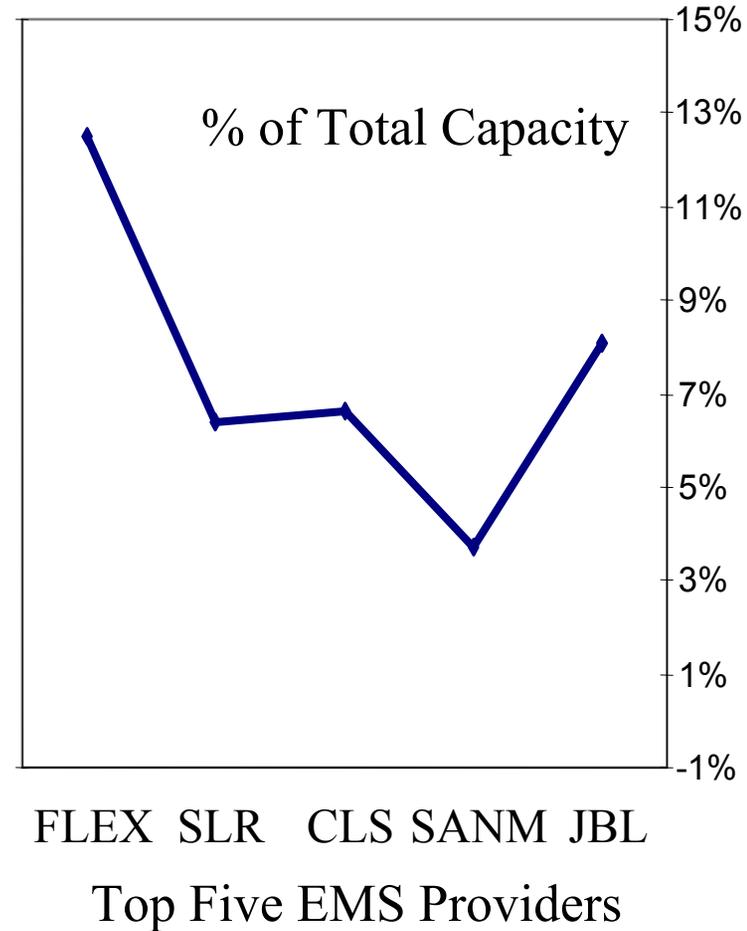
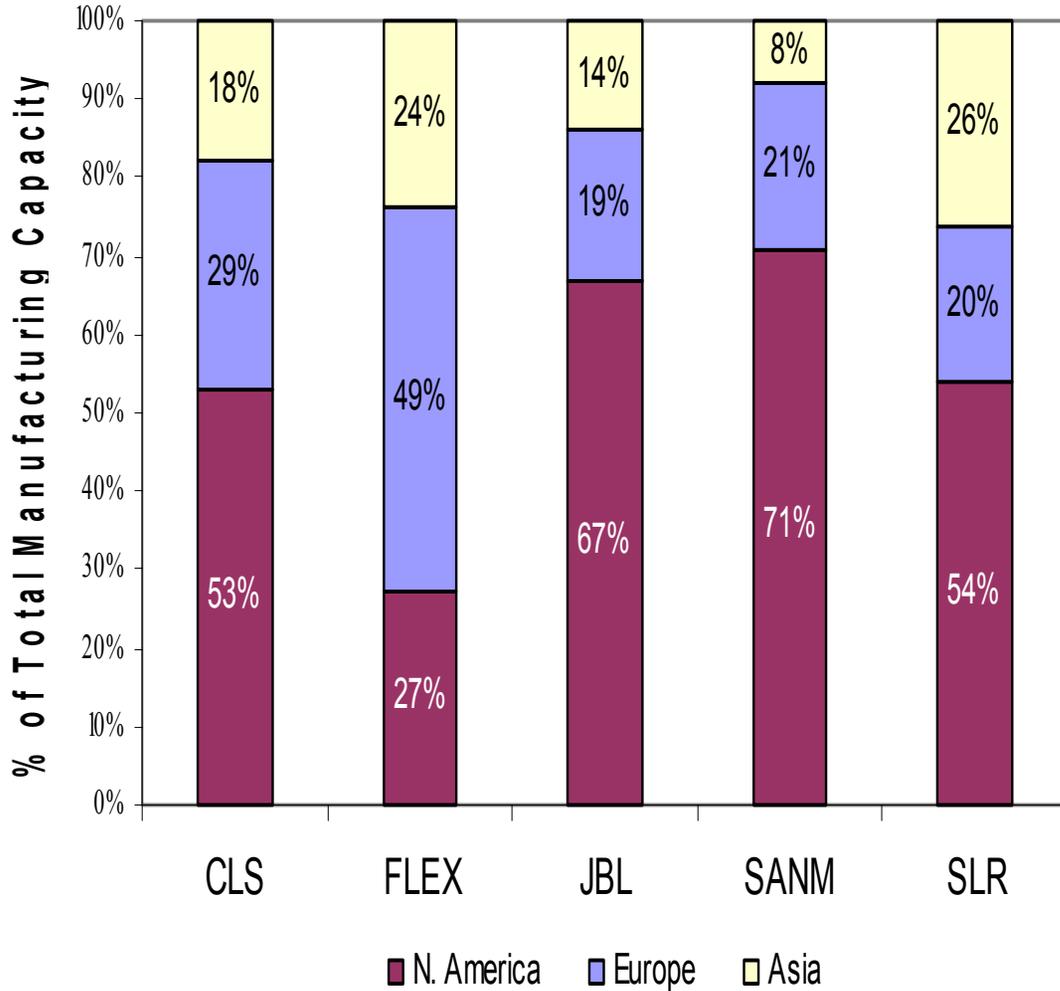
Average Lead Times (Days)



Note: Quick Response Companies refer to Turkey, Morocco, and Mexico

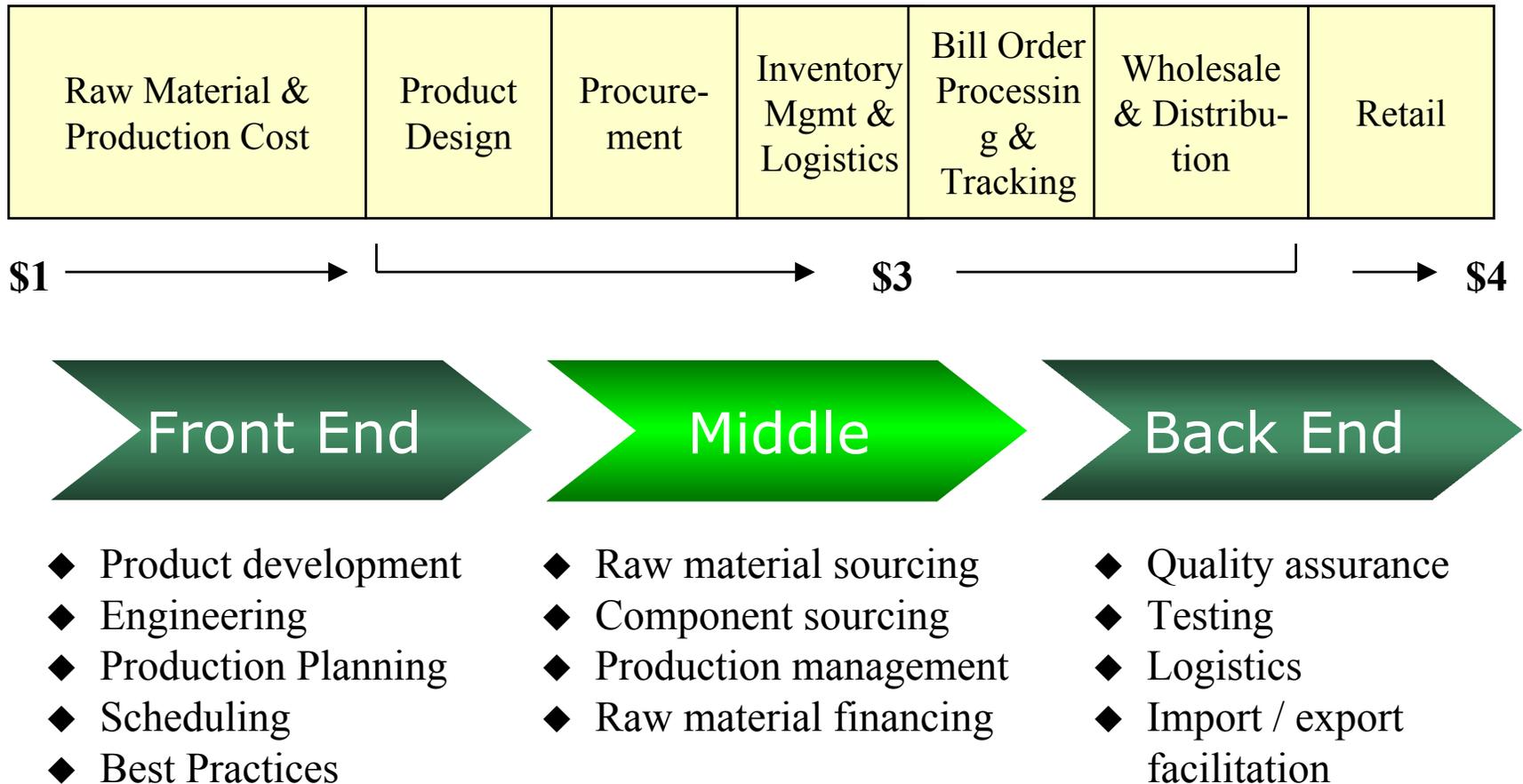
Source: Li & Fung May 2002, Lehman Brothers

# EMS still has Room to Grow in Asia



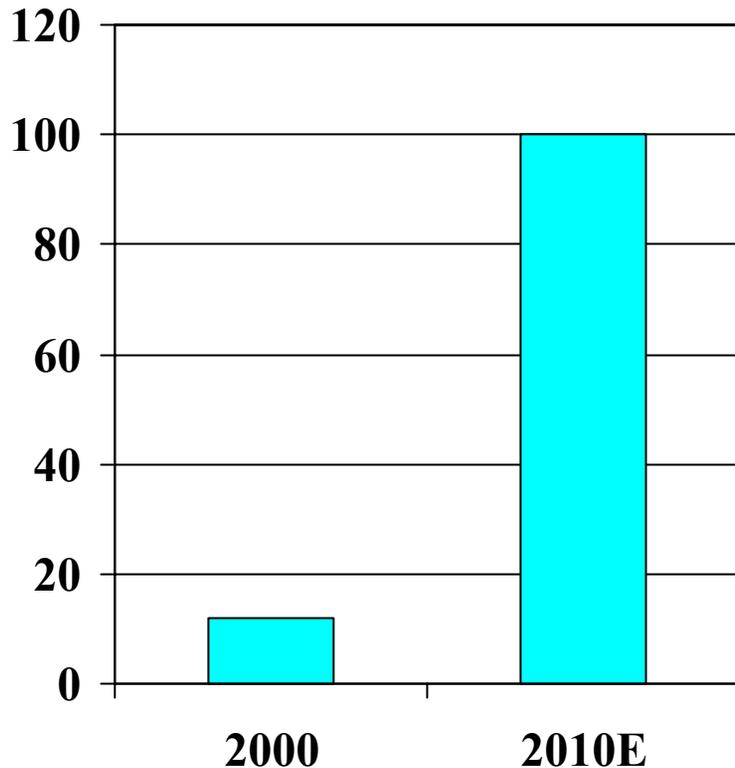
Source: Solectron Presentation by Tim Clark- Director Customer Supply Chain, North America Materials

# Getting More Value from the Value Chain



# Semiconductor/IC market in China

China Semiconductor Market  
(US\$B)



- ◆ Market share expected to grow from 5% in 2000 to 15% in 2010.
- ◆ Influx of Taiwanese semiconductor know-how into China.
- ◆ Tremendous growth in local IC demand
- ◆ Nascent ODM market
  - ◆ ~2% of China's market share
  - ◆ Expect to dominate low-end design chips by 2010

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- ◆ **Industrial and logistics parks**
  - ◆ Use of industrial and logistics parks
  - ◆ Solectron Suzhou example
  - ◆ Flextronics Domen example
- ◆ Outlook
- ◆ Teaching and research opportunities

# Three Major Economic Zones



## **Yangtze River Delta**

Population: 75.6 millions  
GDP % of CN, HK & MA: ~ 20%  
Export % of CN, HK & MA: ~ 20%

## **Greater Pearl River Delta**

Population: 30.6 millions  
GDP % of CN, HK & MA: ~ 3%  
Exports % of CN, HK & MA: ~ 61%

## **Bohai Bay Economic Zone**

Population: 40 millions  
GDP % of CN, HK & MA: ~ 6%  
Export % of CN, HK & MA: ~ 9%

# Solectron Suzhou

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## **“Customs Bonded Factory”—Awarded by China Customs**

- Bonded factory license allows importing and keeping material as bonded goods until the real domestic sales happen.

## **“AA Class Company”—Certified by China Customs**

- No import duty/VAT required when importing bonded material
- Lowest inspection rate: <1%

## **“Fast Customs Process Company”—Certified by China Customs**

- Pre-Customs clearance
- Critical shipment release process prior to formal Customs entry

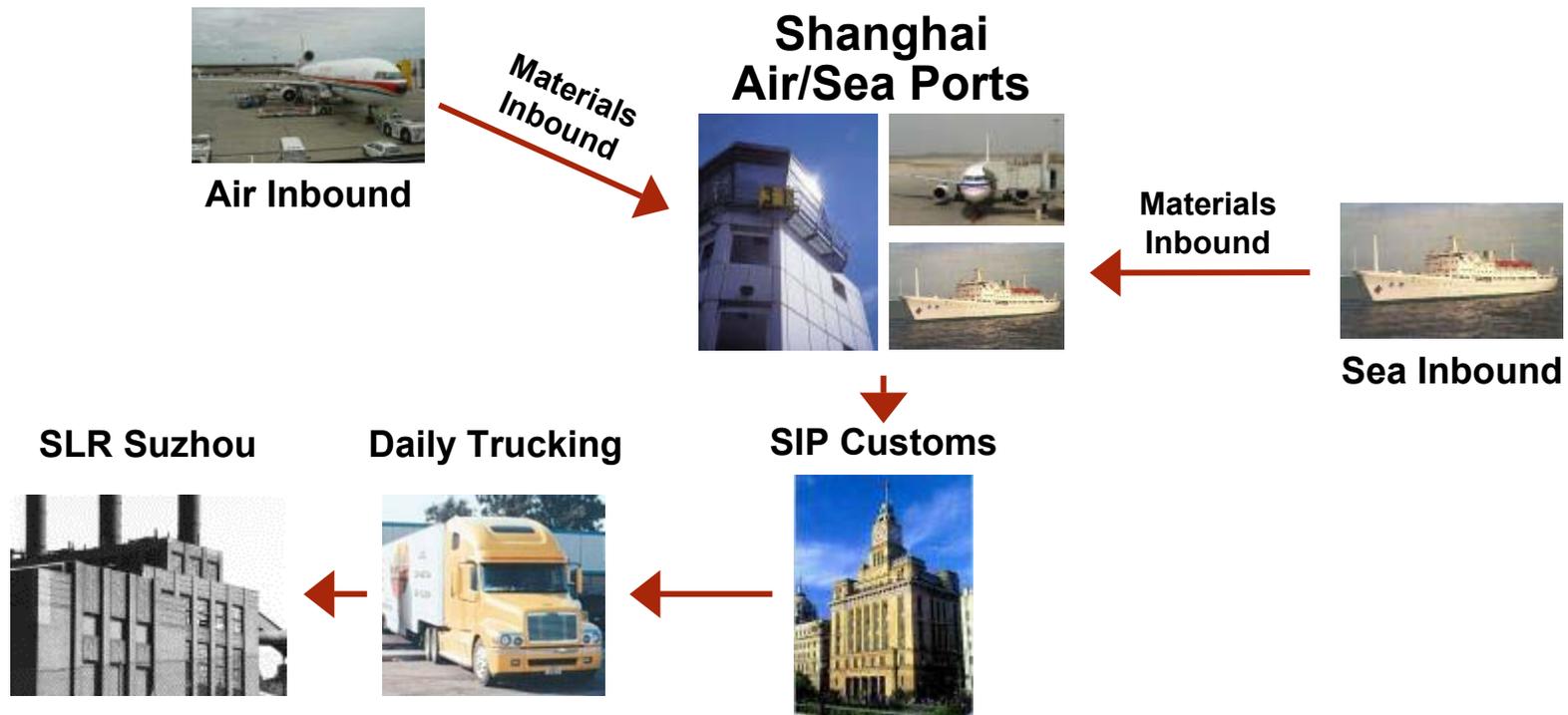
## **e-PTL (Electronic Process Trade Log)**

- e-PTL: Electronic tool to manage materials and clearance through Customs
- First company in China to deploy e-PTL Customs process (July 2000), which reduces Customs clearance from 7–8 days to 1.5 days

## **Logistic Hub in Suzhou Industrial Park (Virtual Hong Kong)**

- VMI model with full range of services from import/transportation/Customers clearance to distribution
- Specialized third-party logistics provider

# Inbound Flow at Solectron Suzhou



- Shipments are shipped through Shanghai air/sea port
- Bonded transfer to SIP Customs
- Customs clearance at SIP Customs
- All raw material can be imported through e-PTL as bonded material
- 1.5 working days from shipment-landed airport
- Shipments delivered to SLRSZ by trucks

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  - ◆ Risks
  - ◆ Exchange rate pressure
  - ◆ Environmental concerns
- ◆ Teaching and research opportunities

# Supply Chain Risks in China

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## Financial

- ◆ Local liquidity crisis
- ◆ Local NPL implosion
- ◆ Collapse of confidence in local markets, leading to bank runs
- ◆ Asset bubbles bursting resulting in dramatic worsening of NPLs

## Energy

- ◆ Input price shock
- ◆ Distribution shock
- ◆ Global crude oil price jumps
- ◆ Dramatic shift in demand distribution due to weather or partial shut down of generation factories

## Natural

- ◆ Grains shortage
- ◆ Destruction of major cities or transport hub
- ◆ Severe flooding or drought affecting large area
- ◆ Major earthquakes

## Public health

- ◆ Partial economic shut down due to extremely infectious disease
- ◆ Unknown/untreatable infectious disease (e.g., SARS)

# Exchange Rate and the Trade Surplus

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- ◆ Most of China's exports operations are “processing and assembly” using intermediate inputs produced elsewhere. Thus, as China's trade surplus with the US grows, the trade surpluses of Japan, Hong Kong, South Korea and Taiwan vis-à-vis the US have fallen.
- ◆ The low domestic value-added content, 20%, of Chinese exports to the U.S. implies a high import content, 80%. A 10% revaluation of the Renminbi will therefore increase the cost of Chinese exports to the U.S. by approximately 2% -- unlikely to have a significant effect in curbing imports.
- ◆ Postwar Japan experience showed revaluation did not impact trade surplus at all.
- ◆ A precipitous revaluation of the Renminbi may lead to a flight from the US\$ by Chinese nationals, possibly driving up the rate of interest in the US.

# WEEE and RoHS

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- ◆ Waste of Electrical and Electronic Equipment (WEEE) is a Global initiative aimed at environmental responsibility
- ◆ OEM manufacturers are now burdened to design products to meet the *Global* responsibility to recycle and dispose of electronics that contain hazardous substances.
  - ◆ Consumers can return WEEE to collection facilities free of charge;
  - ◆ Producers (manufacturers, sellers, distributors) will be responsible for financing the collection, treatment, recovery and disposal of WEEE.
  - ◆ Producers must meet set recycling and recovery targets by 2006.
- ◆ Directive to complement WEEE added to restrict use of specific substances: Restrictions of Hazardous Substances (RoHS).

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- ◆ Teaching and research opportunities
  - ◆ Need for more teaching cases
  - ◆ Global supply chain network design
  - ◆ Operations hedging and risk management
  - ◆ Role of industrial/logistics park in supply chain development
  - ◆ Design for supply chain management

# Teaching Possibilities

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- ◆ Current available supply chain cases:
  - ◆ Li and Fung
  - ◆ Lucent Technologies Global Supply Chain
  - ◆ Nike
  - ◆ ...
- ◆ New cases under development:
  - ◆ Esquel
    - ◆ Vertical integration vs outsourcing
    - ◆ Product development
    - ◆ Use of technologies
    - ◆ Integrated supply chain planning
    - ◆ Customer linkage
    - ◆ Environmental commitment
    - ◆ Corporate value for individuals and community

# Global Supply Chain Network Design

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- ◆ Important drivers:
  - ◆ Increasing pool of manufacturing and supply sources
  - ◆ Changing logistics economics and performances
  - ◆ Trade infrastructure changes (e.g., WTO)
- ◆ China as both supply and demand points
- ◆ Need to capture uncertainties
  - ◆ Logistics developments
  - ◆ Trade infrastructure changes
  - ◆ Demand
- ◆ Comprehensive total landed cost model

# Operational Hedging and Risks

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- ◆ Operational hedging in light of uncertainties in:
  - ◆ Logistics development
  - ◆ Trade infrastructural changes
  - ◆ Design capabilities
  - ◆ Exchange rates
- ◆ Risk management of major disruptions:
  - ◆ SARS
  - ◆ Bird's Flu
  - ◆ Earthquake and other natural disasters
  - ◆ Longshoremen strike
  - ◆ Border closing due to terrorists attack
  - ◆ Power outages

# Design for Supply Chain Management

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- ◆ Postponement opportunities
- ◆ Design for environment
- ◆ Design for efficient customs
- ◆ Reverse logistics management

# Role of Industrial/Logistics Parks

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- ◆ Comparative studies of industrial parks
  - ◆ Supply base consolidation
  - ◆ Input imports efficiency
  - ◆ Some degree of vertical integration
  - ◆ Power and utility reliability
  - ◆ R&D development
  - ◆ Knowledge worker investment
- ◆ Comparative studies of logistics hubs
  - ◆ Outbound logistics consolidation
  - ◆ Efficient warehousing
  - ◆ Efficient customs
  - ◆ Customization
  - ◆ Knowledge worker investment