Measuring Success in the Global Economy:
International Trade, Industrial Upgrading,
and Business Function Outsourcing in Global Value Chains

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Measurement Issues Arising from the Growth of Globalization
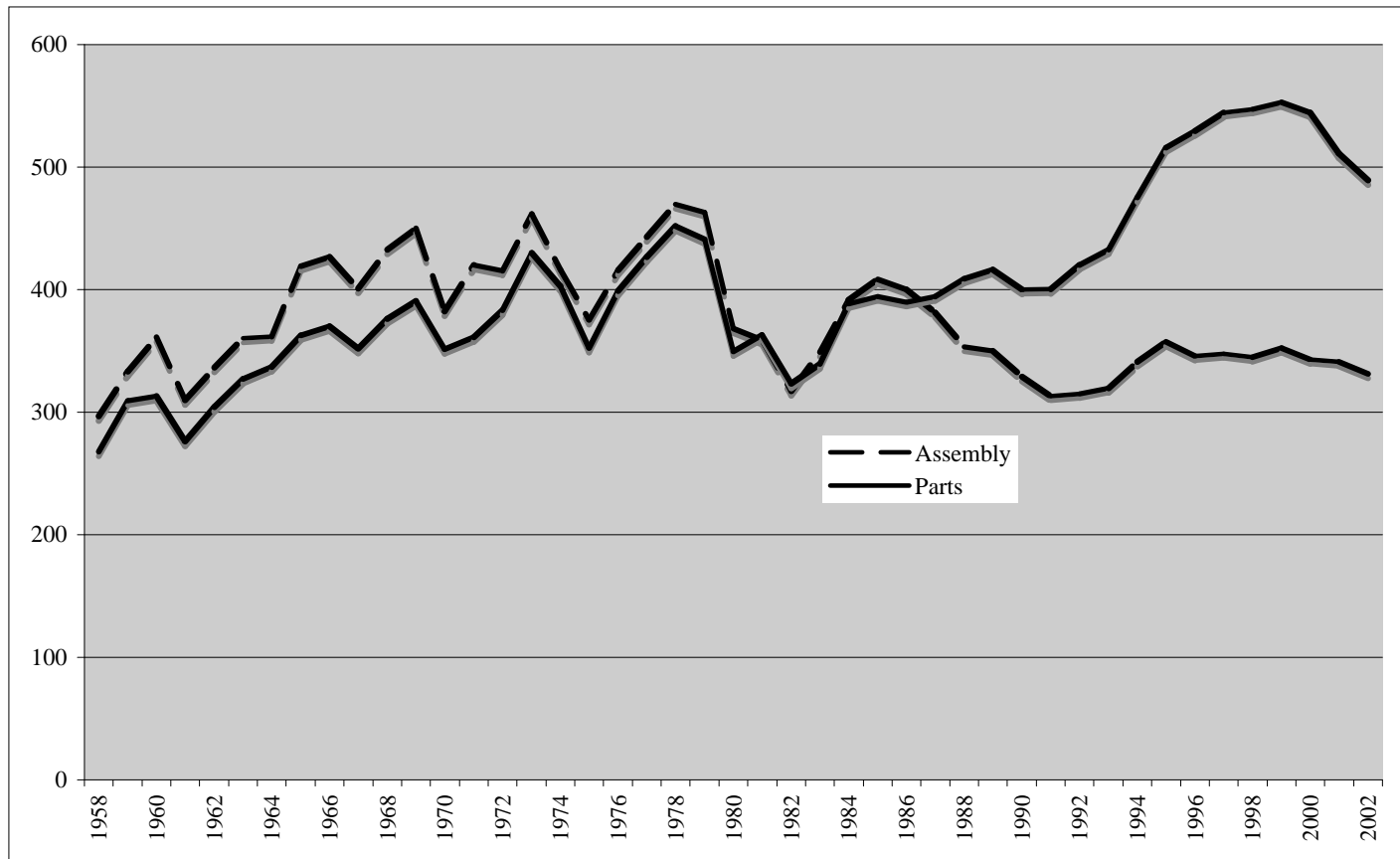November 6-7, 2009, Washington, DC

W.E. Upjohn Institute for Employment Research
and
National Academy of Public Administration

One reason we are here:
The evolution of global industries and the rise of Global Value Chains (GVCs)

- Phase I (1960s): vertically integrated national firms and industries

- Phase II (1970s): global dispersion through offshoring by MNCs

- Phase III (1980s): geographic and organizational fragmentation: outsourcing *and* offshoring

- Phase IV (1990s): A new consolidation, global suppliers, the rise of China

- **Phase V (2000): Services offshoring, distributed R&D and design, global knowledge and innovation networks, the rise of India**

- Phase VI?: Radical consolidation, supplier deaths, rising protectionism?

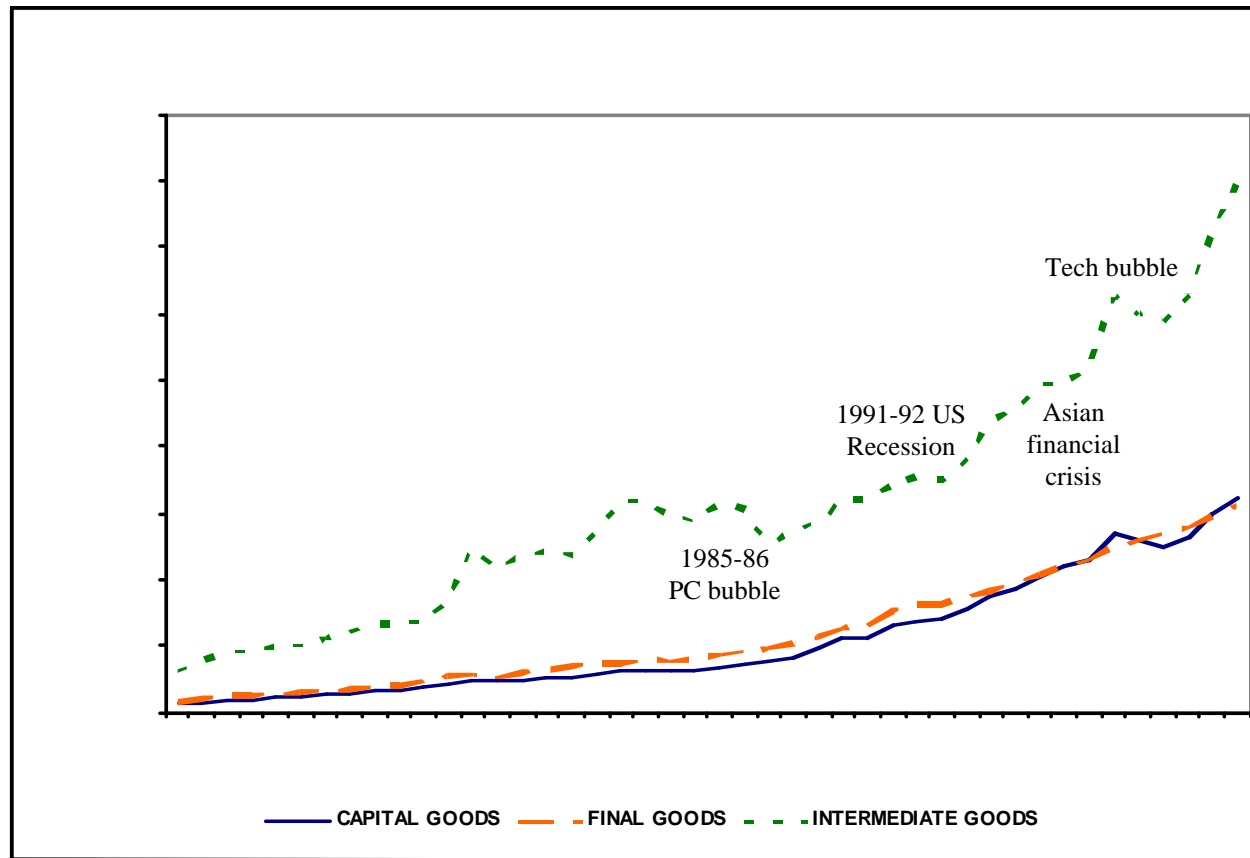# A structural shift toward outsourcing (and offshoring)
Outsourcing in the US Automotive Industry,
Assembly and Parts Employment, 1958-2002

Note: Assembly includes SIC 3711 (Motor Vehicles and Car Bodies) and Parts includes SIC 3714 (Motor Vehicle Parts and Accessories).
Source: Employment, Hours, and Earnings from the *Current Employment Statistics Survey*, SIC basis (US Bureau of Labor Statistics).

Intermediate goods trade - the rise of GVCs
World imports of intermediate, capital and consumption goods, 1962-2006

Tech bubble

1991-92 US
Recession

Asian
financial
crisis

1985-86
PC bubble

CAPITAL GOODS   FINAL GOODS   INTERMEDIATE GOODS

Source: Sturgeon and Memedovic, forthcoming, using UN Comtrade statistics, BEC classification

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CAPITAL GOODS ——— FINAL GOODS ― ― INTERMEDIATE GOODS - - - -

Source: Sturgeon and Memedovic, forthcoming, using UN Comtrade statistics, BEC classification

GVC expansion has tended to accelerate further after busts

Developing countries - the rise of GVCs

Billions of US dollars

Intermediate Goods Exports						
	1988	1990	1995	2000	2005	2006
Industrialized	703.7	1,097.6	1,967.0	2,338.3	3,542.4	4,034.7
Developing	28.7	172.8	530.7	882.3	1,606.5	1,872.5
World	732.4	1,270.3	2,497.7	3,220.6	5,148.9	5,907.2
Industrialized	96.08%	86.40%	78.75%	72.61%	68.80%	68.30%
Developing	**3.92%**	**13.60%**	**21.25%**	**27.39%**	**31.20%**	**31.70%**
World	100%	100%	100%	100%	100%	100%
Intermediate Goods Imports						
	1988	1990	1995	2000	2005	2006
Industrialized	780.4	1,266.7	2,010.6	2,486.3	3,850.4	4,451.1
Developing	42.9	184.0	644.8	892.4	1,658.9	1,872.7
World	823.3	1,450.6	2,655.5	3,378.6	5,509.3	6,323.8
Industrialized	94.79%	87.32%	75.72%	73.59%	69.89%	70.39%
Developing	**5.21%**	**12.68%**	**24.28%**	**26.41%**	**30.11%**	**29.61%**
World	100%	100%	100%	100%	100%	100%

Source: Sturgeon and Memedovic, forthcoming, using UN Comtrade statistics, BEC classification

Main issues

- Global integration is being driven by value chain fragmentation *and* better integration of the fragments -> **global value chains**

- Very likely that global integration will **continue to accelerate**

- Any value chain activity (**business functions**) can become a core competence, or be outsourced - some can be offshored.

- New **opportunities and risks** are being created for national industries, firms, and workers.

- Existing **data resources are inadequate to support policy** responses to global integration.

Main Recommendations

1. Collect more detail on services trade, using NAPCS product descriptions as a starting point.

2. Collect a range of establishment-level economic data according to business function.

The seventeen product categories collected by the Bureau of Economic Analysis for traded private services

Travel, passenger fares, and other transportation (1)	Royalties and license fees (2)	Education (3)
Financial services (4)	Insurance services (5)	Telecommunications (6)
Business, professional, and technical services		
Computer and information services Computer and data processing services (7) Database and other information services (8)	Management and consulting services (9)	Research, development and testing (10)
Construction, architectural, engineering (11)	Industrial engineering services (12)	Operational leasing (13)
Installation, maintenance, and equipment repair (14)	Advertising (15)	Legal services (16)
Other business, professional, and technical services (17)		

UN HTC (Comtrade) product codes for traded goods = 8,000

US Department of Commerce product codes for traded goods = 16,000

Examples of critical policy questions we can't ask from existing data on services trade…

- What's going on in the service product categories that have been mentioned as moving offshore, such as the wide variety of back-office functions like accounting, customer support, and software programming?

- Is trade increasing quickly in higher end services such as radiology image interpretation, market and legal research, and research to supports financial services?

- Are customized software services staying onshore while only basic software coding is moving offshore, or is higher-skilled work and work related to innovation and new product creation also being imported?

Collect more detail on services trade!!!!!

Important aspects of GVCs are
invisible or hard to see in trade statistics

- Power in the chain (Locating strategic management)

- Value capture in GVCs can be spatially separated from production and exports (iPod case)

- Long term segmentation of knowledge in GVCs - is it possible? (more detail on services trade will help, but not solve this problem)

- Co-evolution and the durability of GVCs; agglomeration, clusters, infrastructure (National, regional, and local specialization in business functions)

We need to collect new data that measure GVCs more directly!

Conclusion #2: there is a need to collect establishment-level economic data according to a set of generic business functions
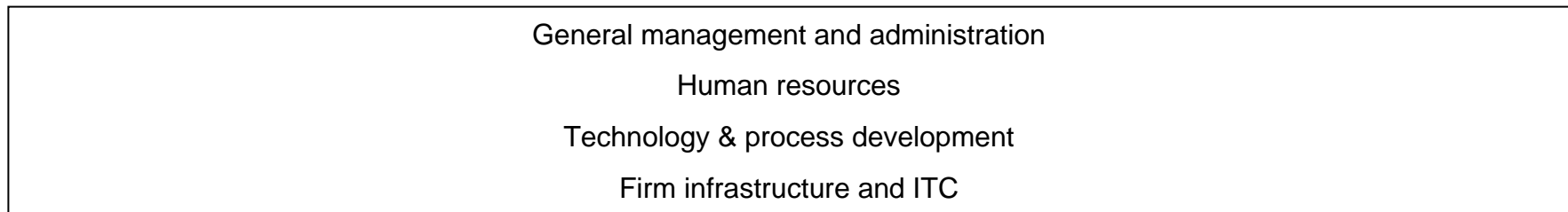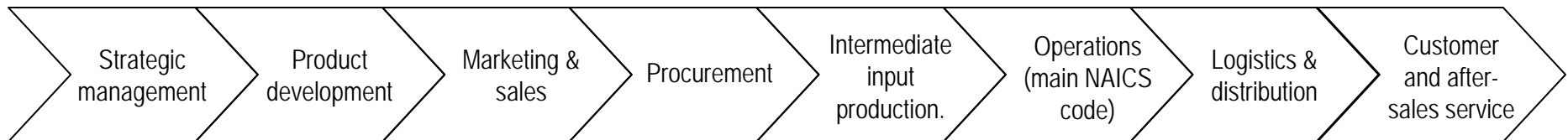
- Generic definitions to allow comparison and aggregation across industries and places

- Establishment-level data to allow detailed geographic analysis; firms can be derived

- Specify ownership of business function sources (outsourcing)

- Specify location of business function sources (offshoring)

Key questions raised by global value chains

1) What business functions are establishments doing internally and externally (**outsourcing**)?
2) What business functions are establishments doing domestically and abroad (**offshoring**)?
3) What types of **jobs** go with various business functions, including employment by occupation, wages, tenure, and number and type of new hires?
4) What **educational and training** requirements are associated with various business functions?
5) How do the business functions that an establishment engages in relate to the goods and services bought and sold (**inputs and outputs**)?
6) How do the business functions that an establishment engages in relate to its **economic performance** (market share, profitability, employment, share of value added, market share)
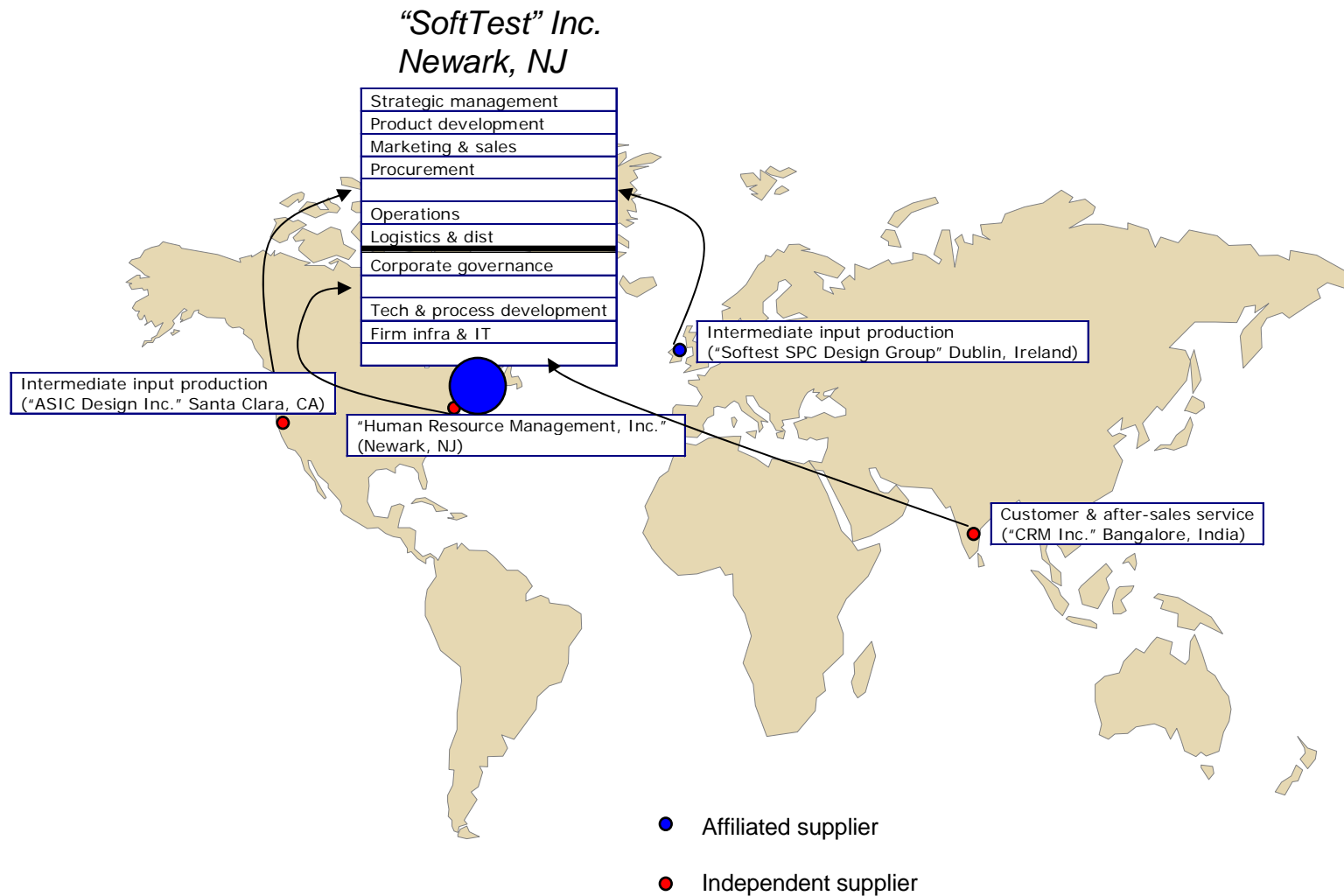7) How do the mix of business functions in establishments compare across **countries**?

Vertical and support business functions

Vertical business functions (the value-added chain)

Strategic management	Product development	Marketing & sales	Procurement	Intermediate input production.	Operations (main NAICS code)	Logistics & distribution	Customer and after-sales service

General management and administration

Human resources

Technology & process development

Firm infrastructure and ITC

Horizontal business functions (support functions)

Business function outsourcing and offshoring

"SoftTest" Inc.
Newark, NJ

Strategic management
Product development
Marketing & sales
Procurement
Operations
Logistics & dist
Corporate governance
Tech & process development
Firm infra & IT

Intermediate input production
("ASIC Design Inc." Santa Clara, CA)

"Human Resource Management, Inc."
(Newark, NJ)

Intermediate input production
("Softest SPC Design Group" Dublin, Ireland)

Customer & after-sales service
("CRM Inc." Bangalore, India)

🔵 Affiliated supplier

🔴 Independent supplier

Core Business Functions, Definitions (revised, April 17, 2008)

Business function	Definitions
Core business functions	
Strategic management	Activities that support the setting of product strategy (i.e., deciding what "new product development" works on), choosing when and where to make new investments and acquisitions, or sales of parts of the business, and choosing key business partners (e.g., suppliers and service providers).
Product development	Activities associated with bringing a new product or service to market, including research, marketing analysis, design, and engineering.
Marketing, sales and account management	Activities to inform buyers including promotion, advertising, telemarketing, selling, retail management.
Intermediate input and materials production	The fabrication or transformation of materials and codification of information to render them suitable for use in operations
Procurement and purchasing	Activities associated with choosing and acquiring purchased inputs
Operations (NAICS code:_____)	Activities that transform inputs into final outputs, either goods or services. This includes the detailed management of such operations. (In most cases, operations will equate with the industry code of the establishment or the activity most directly associated with the industry code.)
Transportation, logistics, and distribution	Activities associated with transporting and storing inputs, and storing and transporting finished products to customers.

Source: Adapted from U.S. Bureau of Labor Statistics, Mass Layoff Survey Program.

Support Business Functions, Definitions (revised, April 17, 2008)

Business function	Definitions
Support business functions	
Corporate governance	Activities associated with the administration of the organization, including legal, finance, public affairs, government relations, accounting, and general management.
Human resource management	Activities associated with the recruiting, hiring, training, compensating, and dismissing personnel.
Technology and process development	Activities related to maintenance, automation, design/redesign of equipment, hardware, software, procedures and technical knowledge.
Firm infrastructure (e.g., building maintenance. and IT systems)	Activities related to building maintenance, and ITC systems
Customer and after-sales service	Support services to customers after purchase of good or service, including training, help desks, customer support for guarantees and warranties.

Source: Adapted from U.S. Bureau of Labor Statistics, Mass Layoff Survey Program.

Possible survey format for collecting data on the outsourcing and offshoring of business functions (inputs)

	Your establish-ment	Another establish-ment owned by my company	Write in city and country of primary source	Another company	Write in city and country of primary source
1) Strategic management	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
2) Product development	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
3) Marketing, sales and account management	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
4) Intermediate input and materials production	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
5) Procurement and purchasing	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
6) Operations (Main* NAICS code:_____)	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
7) Transportation, logistics, & distribution	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
8) Corporate governance (legal, accounting, etc.)	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
9) Human resource management	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
10) Technology and process development	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
11) Firm infrastructure (e.g., building maint. and IT sys.)	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5
12) Customer and after-sales service	$\bigcirc_1$	$\bigcirc_2$	3	$\bigcirc_4$	5

Possible survey format for collecting employment and wage data by business functions

	Approximate number of employees (currently)	Approximate number of employees in two years	Approximate average wage (currently)
Strategic management			
Product development			
Marketing, sales and account management			
Intermediate input and materials production			
Procurement and purchasing			
Operations (Main NAICS code:_____)			
Transportation, logistics, & distribution			
Corporate governance (legal, accounting, etc.)			
Human resource management			
Technology and process development			
Firm infrastructure (e.g., building maintenance and IT sys.)			
Customer and after-sales service			
Others, please specify: _____			

Recent and ongoing efforts to collect business function data

- USA: International Offshoring Research Network (ORN)

  – Survey of 253 US companies reporting 880 offshoring implementations initiated between 2000 and 2006.

  – Data collected by business function.

  – 14% response rate.

  – Non-exhaustive business function list used.

  – Papers available.

Recent and ongoing efforts to collect business function data

- Canada: Survey of Changing Business Practices in the Global Economy

  - Pilot tested at Canadian MNEs

  - Survey developed by the Canadian Department of Foreign Affairs and International Trade (DFAIT) in partnership with Statistics Canada and Industry Canada

  - Questions about international sourcing by business function will be incorporated in next economic census.

Recent and ongoing efforts to collect business function data

- USA: Bureau of Labor Statistics Mass Layoff Statistics Program (BLS MLS)

  – Ongoing national data collection on the business functions performed by separated workers.

  – For the first two quarters of 2007 BLS reported on 2,135 layoff events where business functions were identified, involving 464,765 workers.

  – New data for 2007-2008 will be released soon, with additional detail.

Recent and ongoing efforts to collect business function data

- European Union: Questionnaire on International Sourcing (Eurostat Survey)

    - Administered in 14 out of 27 EU member states with 60,000 responses by national statistical agencies
    - Included mandatory questions in most countries
    - Summary reports available now for certain countries
    - Data linking projects are underway
    - Germany: very large sample with 60% response rate
    - Subsequent rounds planned in some countries
    - Planned collection of "normal" economic data - employment, wage - according to business function for some countries (Finland, Denmark)

Recent and ongoing efforts to collect business function data

- USA: National Organizational Survey (NOS)
  - Funded by the National Science Foundation ($1M+)
  - Will be deployed in the US in the first quarter of 2010
  - Two sample frames:
    - Representative sample of organizations based on employment derived from survey of 3,000 individuals in 2008 General Social Survey (module on globalization, technological change, and economic insecurity) - about 1,250 cases.
    - Sample of US Fortune 1000 business line divisions - about 1,000 cases.
  - Third sample of US venture-backed start-ups has not been funded (cost = $300k).

Descriptive analysis

- <u>Employment by business function</u>. What is the employment by business function? This can provide an important benchmark for future research on business functions.

- The <u>organizational patterns of off-shoring and outsourcing</u>. What business function are organizations sourcing abroad, what functions are they sourcing domestically, and what functions are they keeping within their own organizations at home and abroad? Are strategic and innovative functions being sourced at home while mundane functions are sourced abroad? How are organizations mixing in- and out-of-house business functions and on- and offshore locations? Are firms that source business functions internationally more or less likely to sell internationally?

- <u>The geographic patterns of offshoring and outsourcing.</u> Are specific outsourced business functions likely to be located in specific cities, regions, and countries? Are specific business functions likely to be co-located? Are some business functions, when they are outsourced, likely to be located nearby the respondent's establishment?

- <u>The types of innovation and innovation adoption occurring at the organization level</u>. How many organizations are innovative? How many organizations generate new products and processes, how many organizations are adopting these innovations, and how many organizations are "moribund" in regard to innovation?

- <u>The characteristics of domestic jobs and the characteristics of the global value chain</u>. How does the organization's position in its larger domestic and global value chains relate to the technology it uses and the stickiness of its domestic jobs? Which business functions create jobs that resist automation and relocation? Which business functions appear to be at risk for offshoring?
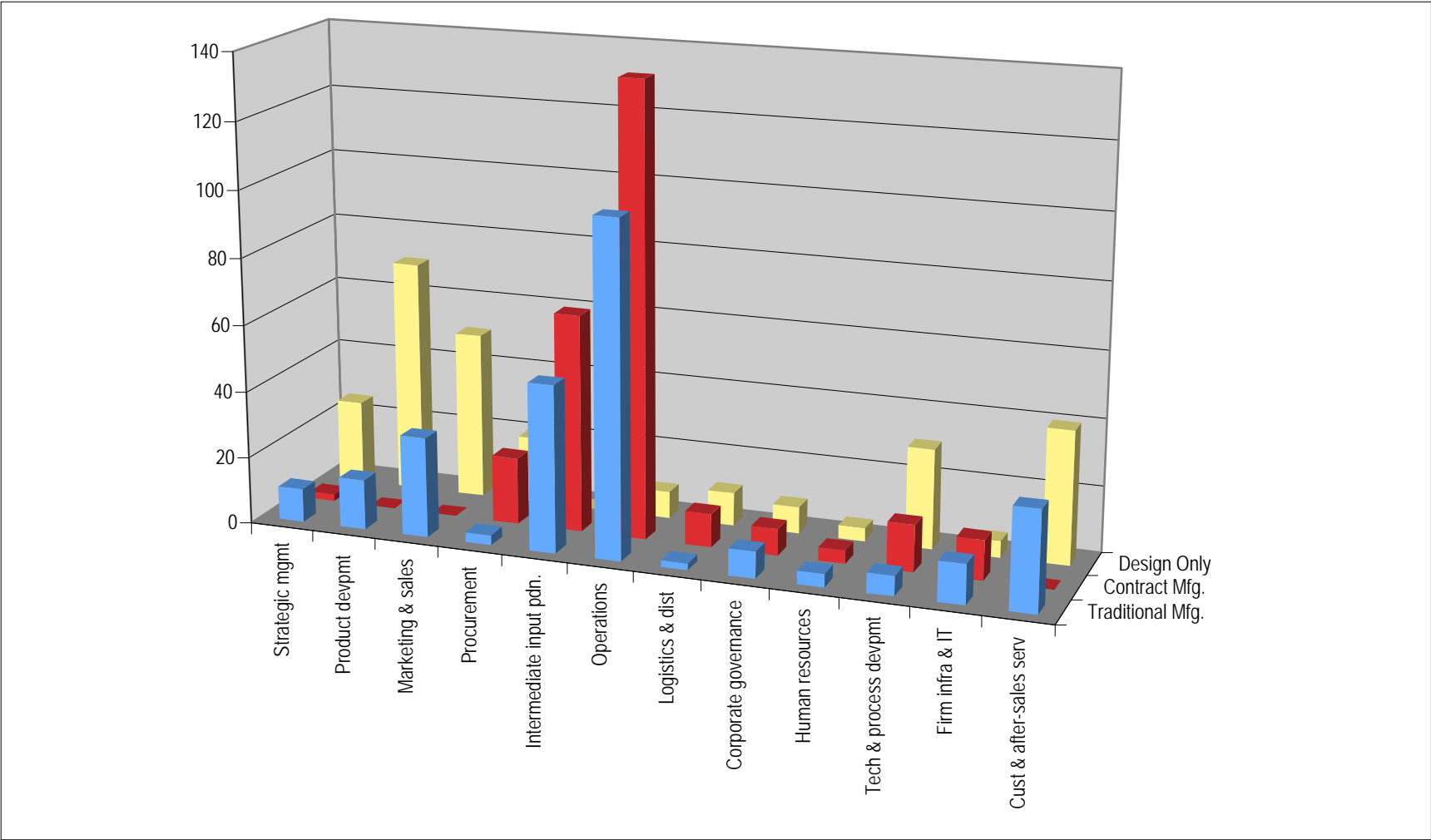
Business functions - unique benefits

- Questions equally applicable at at goods and services producing enterprises.
- Categories are intuitive and fit those used by management - highly collectable.
  - Particularly important for cross-border data collection - bypasses the need to reconcile idiosyncratic national data collection methods.
  - Firms in developing countries may have little experience with completing surveys
  - BLS had fewer than 5% DKN responses to the business function question; Eurostat had a great deal of success.
- Suited to globalization research because work is typically offshored in business function "bundles"
- Suited to both international and domestic sourcing and/or outsourcing

Hypothetical employment and wage data according to business function for three types of firms
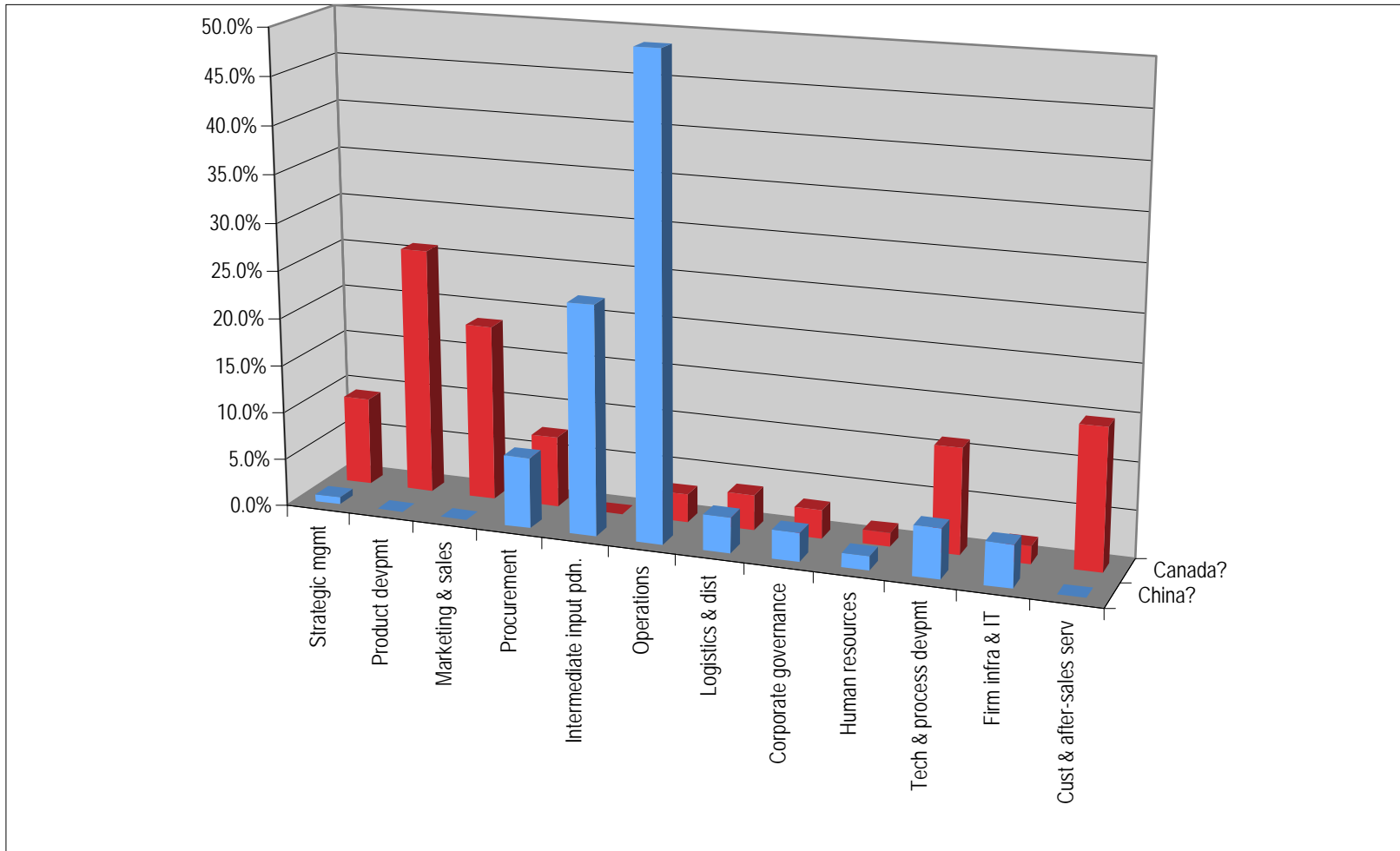
	Number of employees*			Annual wage
	Traditional Mfg.	Contract Mfg.	Design Only	
Strategic management	10	2	25	$200,000
Product development	15	0	70	$100,000
Marketing & sales	30	0	50	$100,000
Procurement	3	20	20	$75,000
Intermediate input production	50	65	0	$50,000
Operations	100	135	8	$50,000
Logistics & dist	2	10	10	$75,000
Corporate governance	8	8	8	$120,000
Human resources	4	4	4	$75,000
Tech & process development	6	14	30	$100,000
Firm infra & IT	12	12	5	$75,000
Customer & after-sales service	30	0	40	$50,000
Total Wages (millions)	$19	$16	$26	

* hypothetical 270 person establishment

Hypothetical employment according to business function for three types of firms

Vertical axis: 0, 20, 40, 60, 80, 100, 120, 140

Categories: Strategic mgmt, Product devpmt, Marketing & sales, Procurement, Intermediate input pdn., Operations, Logistics & dist, Corporate governance, Human resources, Tech & process devpmt, Firm infra & IT, Cust & after-sales serv

Series: Design Only, Contract Mfg., Traditional Mfg.

**The vision: roll out business function metrics internationally —
Hypothetical business function employment shares for Canada and China**

Chart axis labels:

50.0%
45.0%
40.0%
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%

Strategic mgmt
Product devpmt
Marketing & sales
Procurement
Intermediate input pdn.
Operations
Logistics & dist
Corporate governance
Human resources
Tech & process devpmt
Firm infra & IT
Cust & after-sales serv

Canada?
China?

Open questions

- Can and should the business function framework be broadly deployed?
  - Resources are constrained!
  - What programs can we scale back or eliminate?
  - Build on international efforts to improve data resources, especially related to services (European Union, WTO, IDE-JETRO)
- If and how to develop more detail?
  - Can occupations be used for additional detail: as in, Function A - occupation A; Function B, occupation A, etc.
  - How much detail is enough; too much?

THANK YOU!