

Measuring global value chains: new approaches

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Measuring Global Trade - Do we have the right numbers?

Global Forum on Trade Statistics

Organized jointly by UNSD and Eurostat in collaboration with WTO and UNCTAD

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Cross-cutting trends

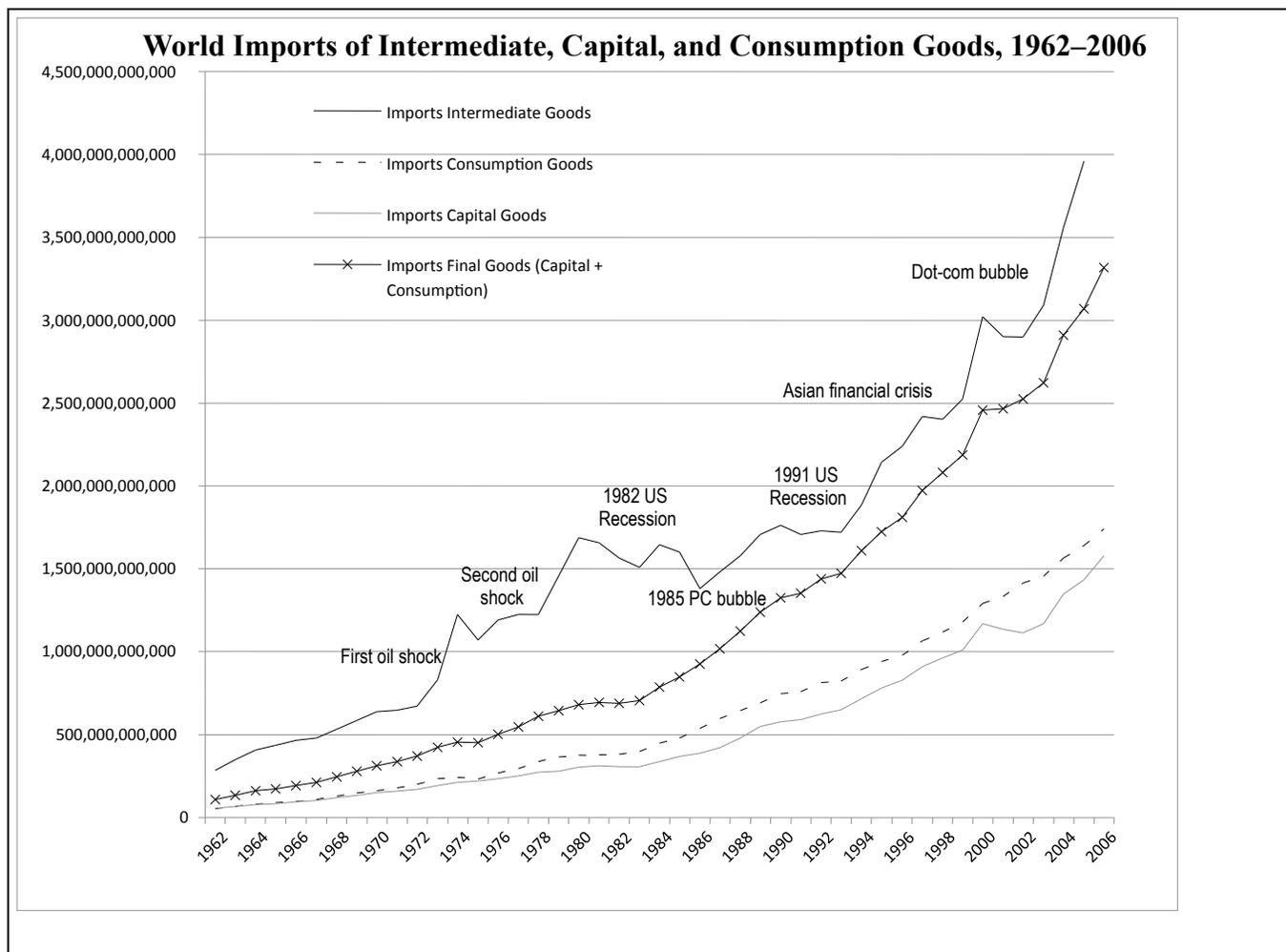
- Increased outsourcing
 - Increasing geographic scope of production systems: offshoring
 - Better integration of geographically dispersed production systems
 - Computerization of product design
 - Computerization of process technology
 - Formalization and segmentation of work tasks -> trade in tasks
 - Increasing services trade
 - The rise of a new, global-scale supply-base
 - Rising affiliated trade (but may be within global suppliers...)
- ✓ *The global value chains framework is an overarching rubric that can help to tie these trends together*
- ✓ *New features are global suppliers, global buyers, and value chain modularity, which eases coordination between the two.*

Evolution of global industries - the rise of GVCs

- Phase I (1960s): vertically integrated national firms and industries
- Phase II (1970s): global dispersion through offshoring by MNCs
 - FDI-led cross border integration
- Phase III (1980s): geographic and organizational fragmentation: outsourcing *and* offshoring
 - GVC-led cross border integration
- Phase IV (1990s): A new consolidation: global suppliers, the rise of China
- Phase V (2000s): Services offshoring, distributed R&D and design, global knowledge and innovation networks, the rise of India
- Phase VI (2010s?): Radical consolidation, supplier deaths, rising protectionism, or a new acceleration of GVC formation in the wake of the crisis?

The recent economic crisis: the end of GVCs?

- Permanent retraction of GVCs? Did this happen in 1986, 1992, 1997, or 2001?
- On the contrary, GVC expansion has tended to accelerate further after busts



Points to keep in mind

- Global integration is being driven by value chain fragmentation *and* better integration of the fragments -> **global value chains**
 - Nomenclature: “Manufacturing” and “production” chains emphasize goods; “supply chains” only look upstream from the buying firm.
 - “Value chains” cover **goods and services**, the **entire chain**, focus on **value** creation and capture, and **resonate** with stakeholders.
- 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.
 - So, *outsourcing and offshoring* are entwined
- New **opportunities and risks** are being created for national industries, firms, and workers.
 - Country and cluster **specialization** (modularity traps vs. high value/control functions)
 - **Interconnectedness** (contagions and vulnerability vs. interdependence)
 - **Compressed development**, especially in large developing countries and regions (BICs?)

Main issue for this week's Global Forum

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

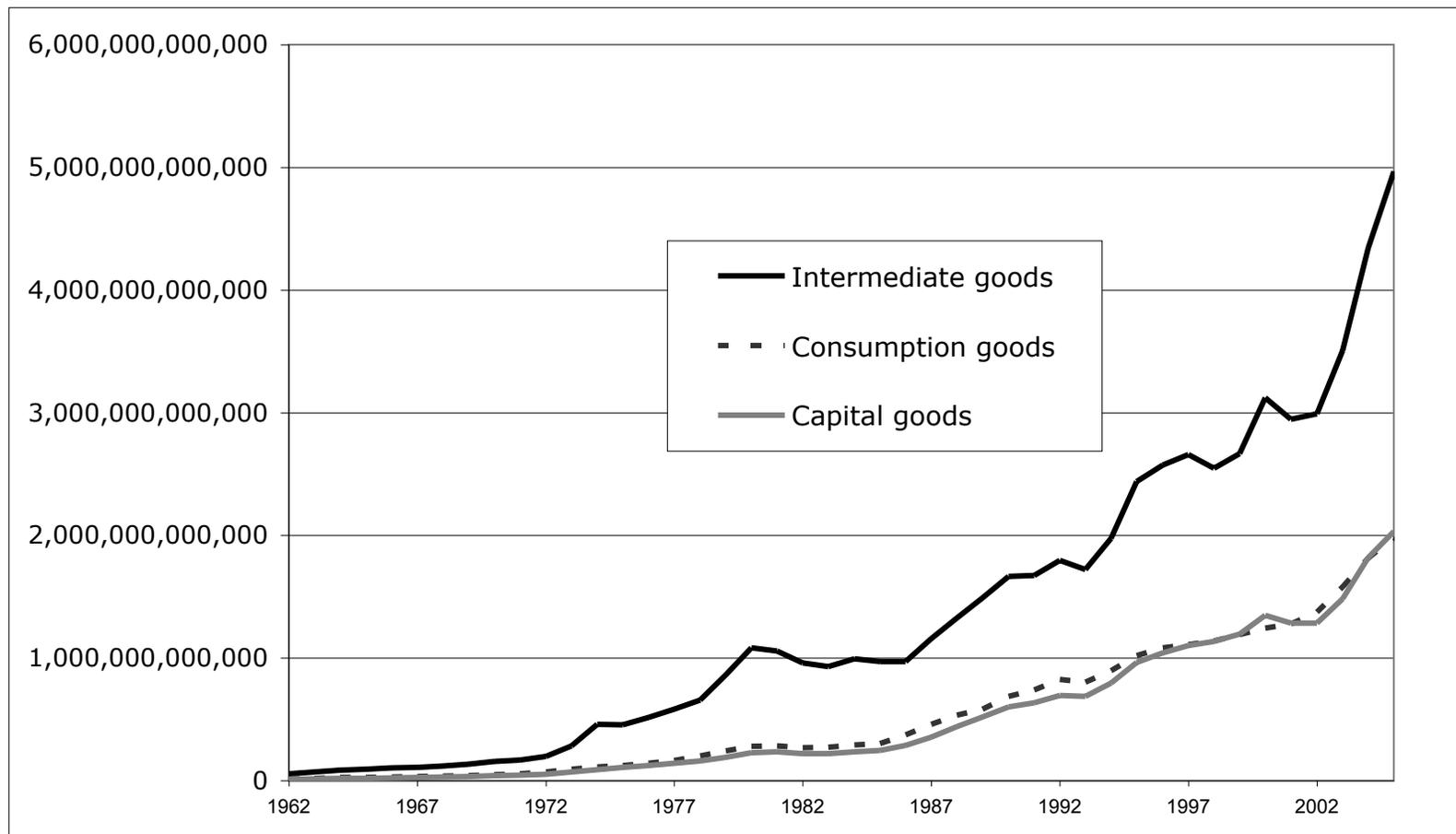
GVC Metrics - Sampling of Current Efforts

1. Repurposing existing statistics (aggregate and industry level)
 - COMTRADE:
 - Primary commodities and undifferentiated intermediates
 - Industry breakouts for final and “**true**” (**differentiated**) **intermediates**
 - Unit prices - for selected products
 - Linking Trade Statistics to National Production
 - Regional and Global Input-Output Tables
 - IDE-JETRO I/O database for East Asia, WIOD
2. Collecting more detail on services trade and prices
3. Estimating value added and value capture in GVCs
 - 2007 Linden, Dedrick, and Kramer iPod studies
 - 2010 Asian Development Bank Institute iPhone Study
4. Standardizing new enterprise-level data collection on GVCs
 - Offshoring and outsourcing by **business function**

Repurposing existing statistics for GVC analysis:

Intermediate Goods Trade - BEC classification

World imports of intermediate, capital and consumption goods 1962-2006

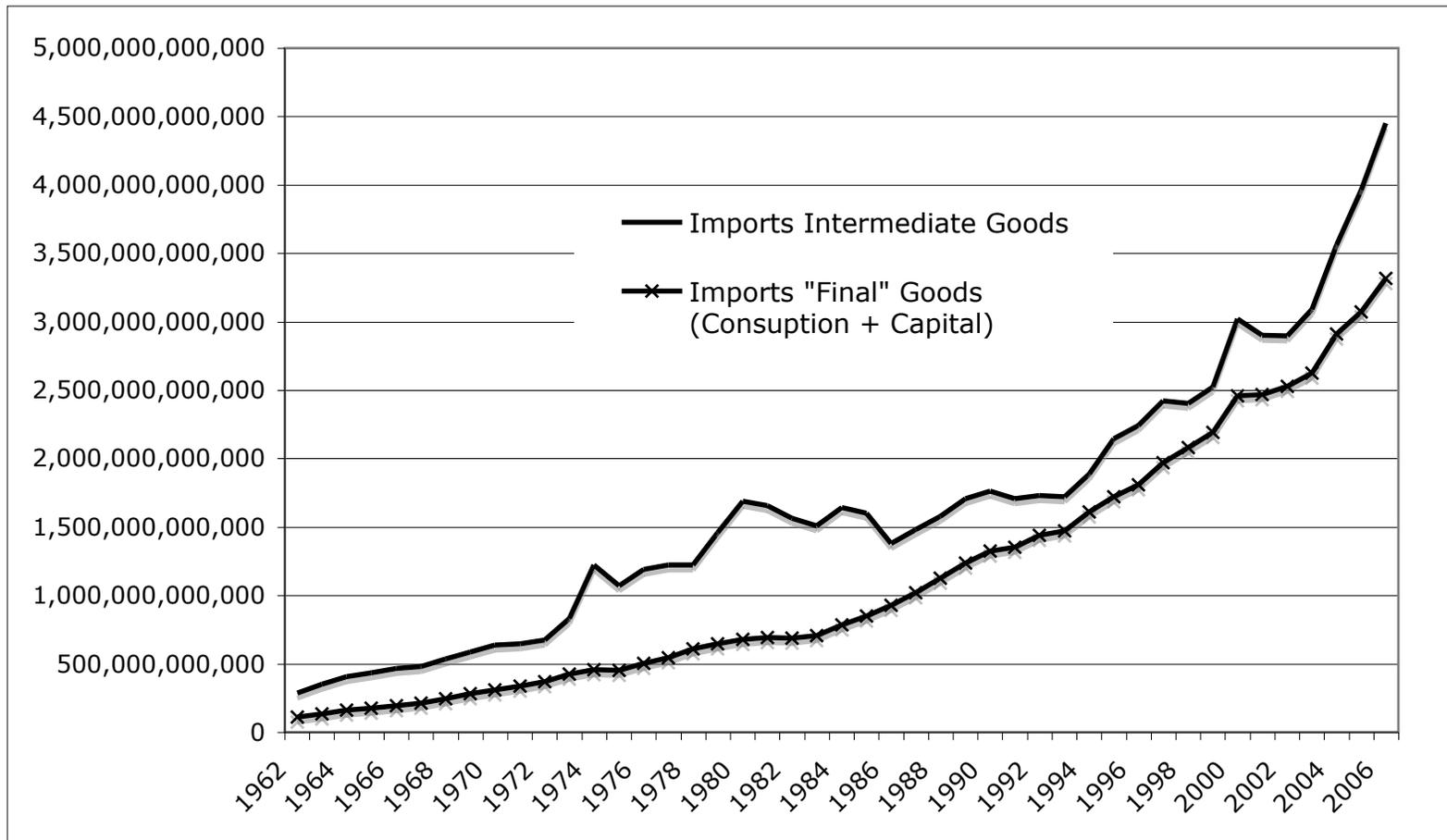


Source: Sturgeon and Memedovic, 2010, calculated from UN COMTRADE

Looking for Evidence of GVCs:

Intermediate Goods Trade - GVC classification

World imports of manufactured intermediate and "final" goods 1962-2006

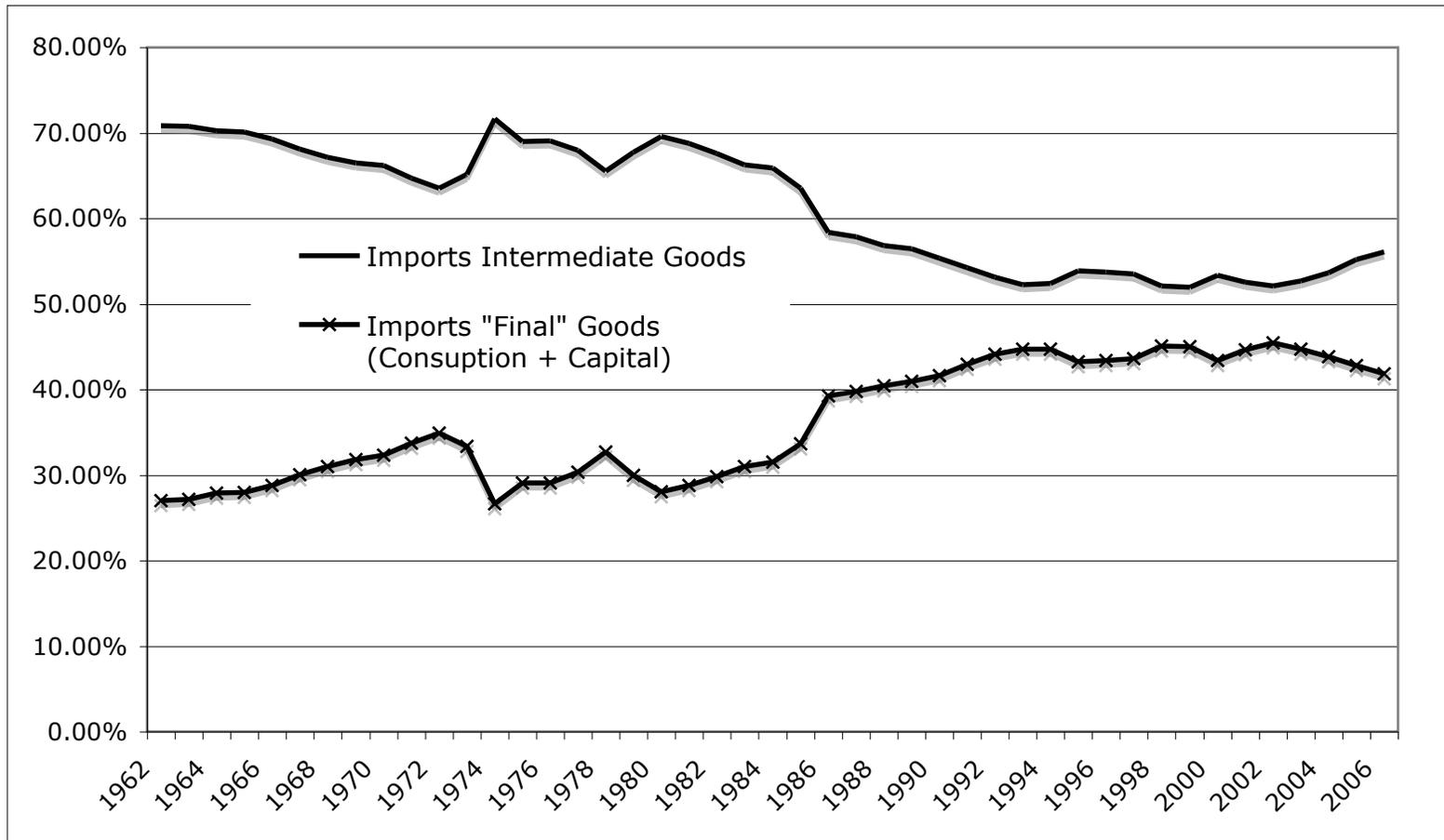


Source: Sturgeon and Memedovic, 2010, calculated from UN COMTRADE

GVC inflection point after 2001?

Intermediate Goods Trade - GVC classification

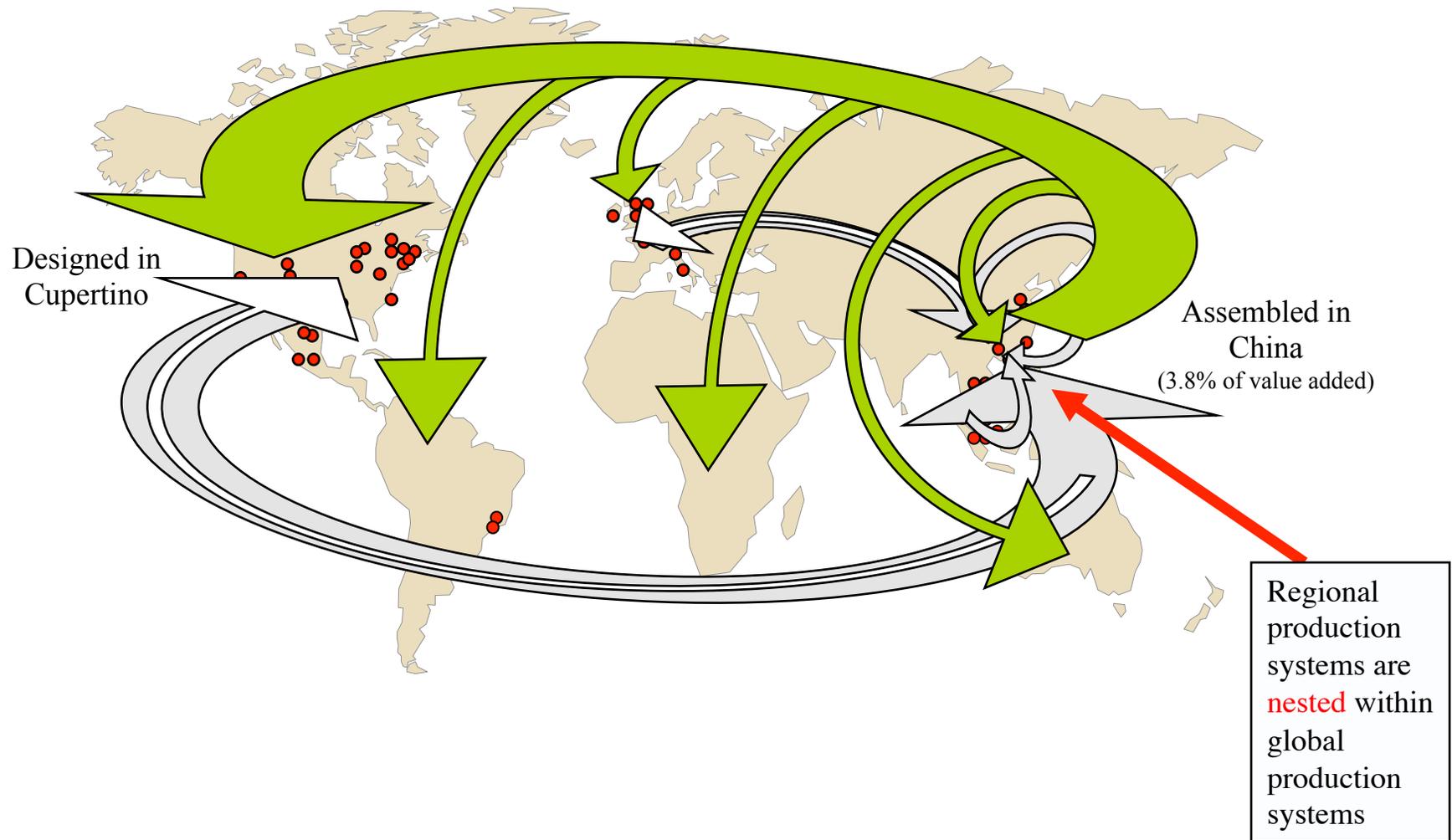
Import shares of intermediate and "final" goods 1962-2006



Source: Sturgeon and Memedovic, 2010, calculated from UN COMTRADE

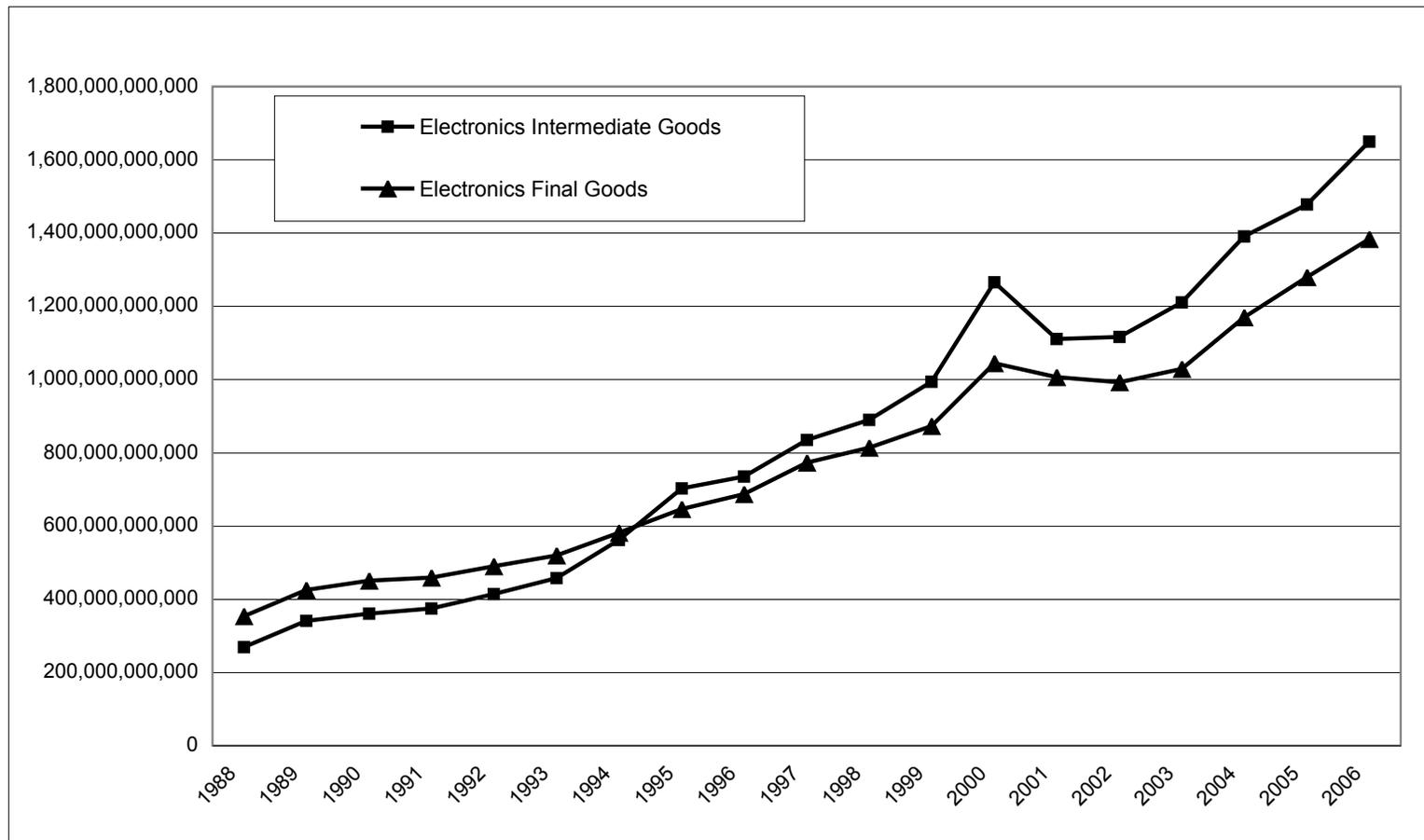
The Apple iPod

Emblematic Case: Low Cost Assembly and Global Sourcing. But can it be generalized?



Electronics: Industry-level GVC classifications

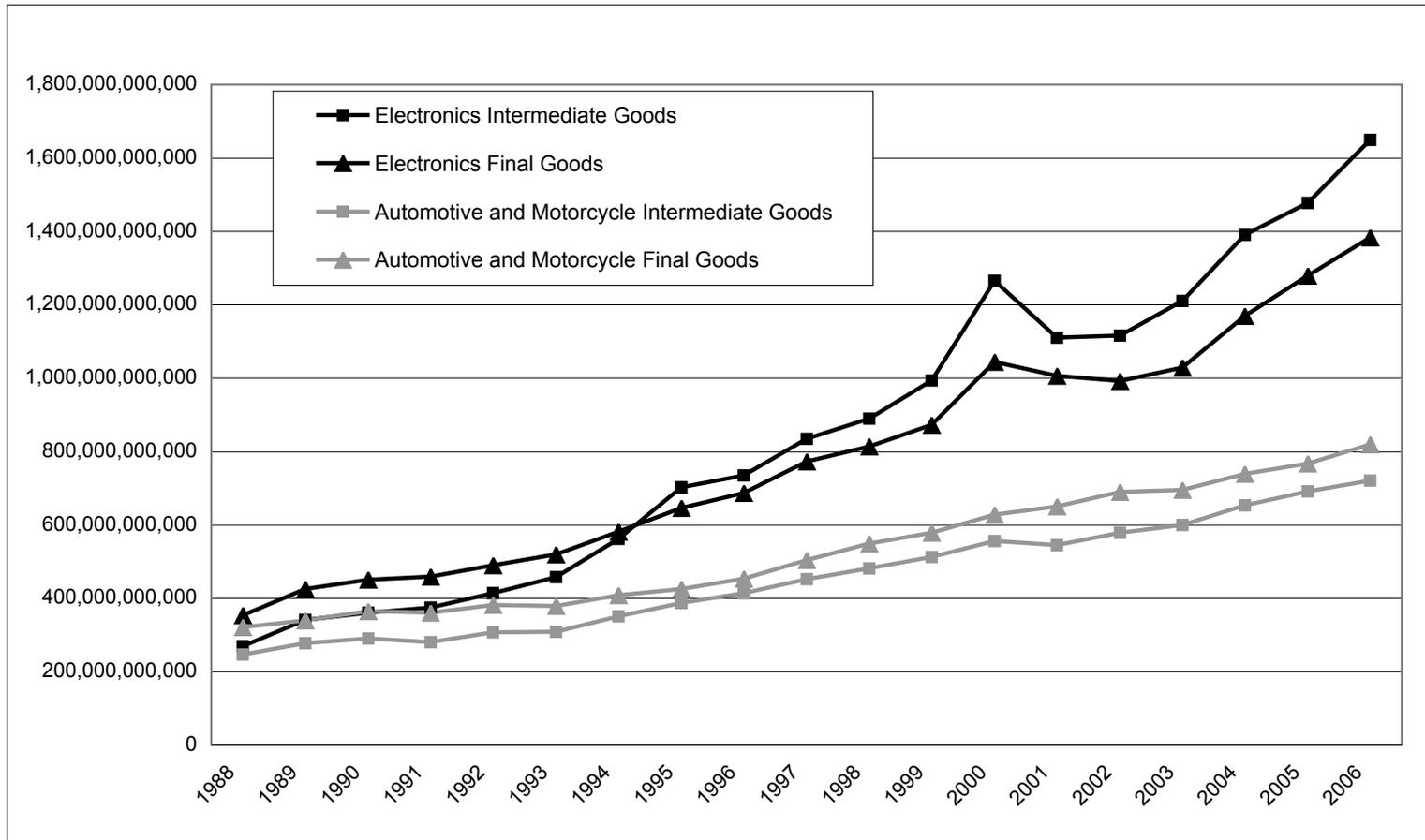
Total Trade, Intermediate and Final Goods, 1988–2006



Source: Sturgeon and Memedovic, 2010, calculated from UN COMTRADE

Autos and Electronics: Industry Differences

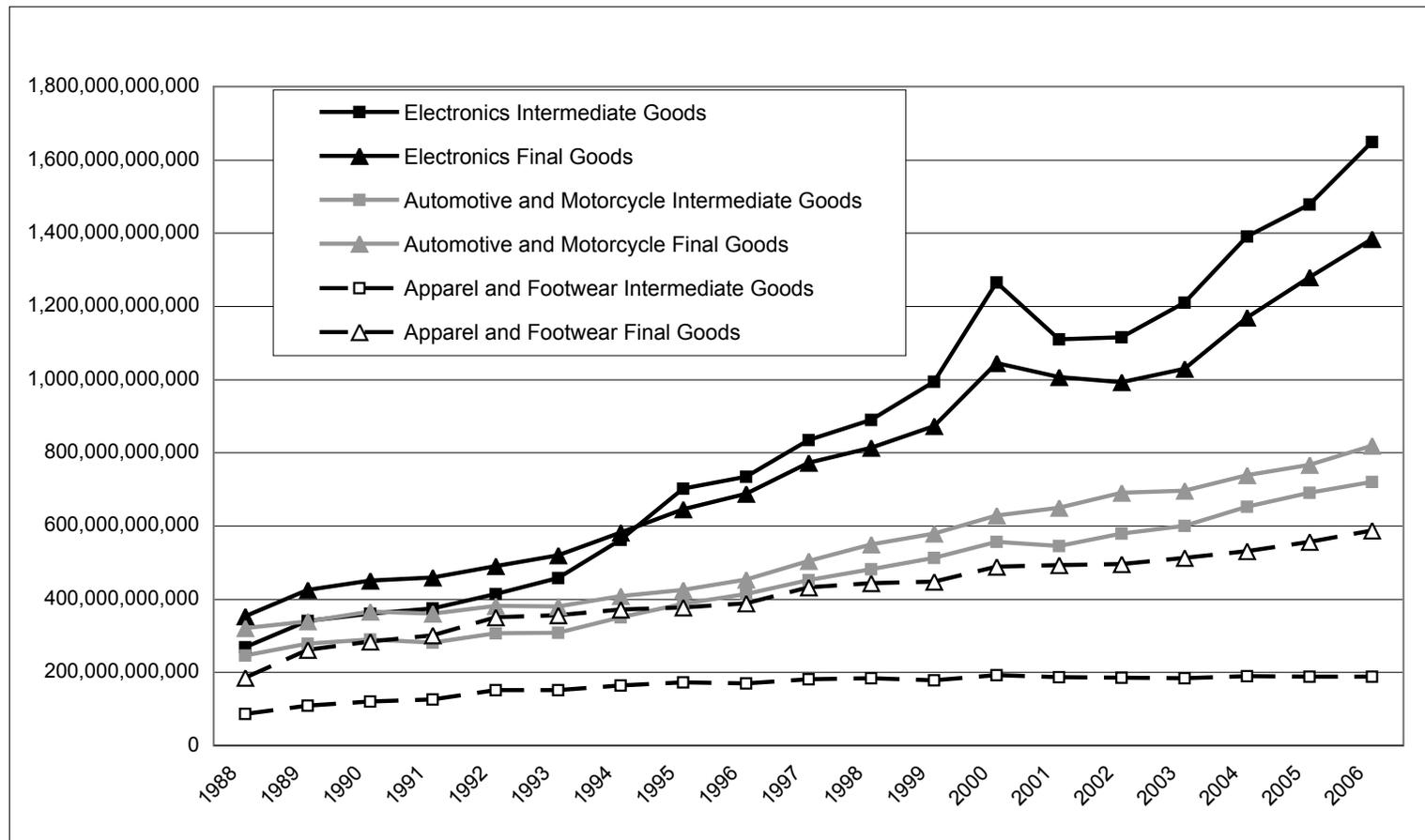
Total Trade, Intermediate and Final Goods, 1988–2006



Source: Sturgeon and Memedovic, 2010, calculated from UN COMTRADE

Apparel, Autos, and Electronics: Industry Differences

Total Trade, Intermediate and Final Goods, 1988–2006



Source: Sturgeon and Memedovic, 2010, calculated from UN COMTRADE

Collect more detail on services trade!!!!

...but not too much?

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**

But, should this detail be replicated for services (e.g., NAPCS)?

- Harmonization on Central Product Classification (CPC) scheme?
 - **586 5-digit services products, 34% of total**
 - (1,145 5-digit goods products, 66% of total)

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 commonly 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?

Using a business function framework to collect enterprise-level data on outsourcing and offshoring

The 2011 National Organizations Survey

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with:

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Funded by the National Science Foundation

Goals of the survey

- Examine the relationship between outsourcing and jobs (quality and quantity)
- Examine the relationship between offshoring and jobs (quality and quantity)
- Document the organizational structure of firms
- Compare organization and jobs by industry and firm size
- Provide employment benchmarks at the trough of the recession
- Create public use dataset

Measures used

- Jobs
 - Employment, by business function (inc. R&D)
- Outsourcing and offshoring practices
 - Costs of goods and services sold (COGS and COSS), by organization structure and by offshore location (3 categories), for each business function (inc. R&D)
- Job Quality
 - Wages, by business function (inc. R&D)
 - Benefits (health, retirement)
- Organization (firm) characteristics
 - Sales (domestic/international)
 - Industry
 - Number of domestic employees

Approach taken

Dual sample frames

1. Firms employing General Social Survey (GSS) respondents
 - Repeat of approach used in 1996, 1999, and 2002
 - Workplaces based on U.S. employment, 2008
2. Fortune 1000 (F1K)
 - Sample of large firm business segments
 - Over sample F1K firms with high R&D employment

Firms in Sample

Sample size: about 1,800

1. GSS: 883 (of 3,000 GSS respondents)
 - Private = 598
 - F1K in GSS = 81
 - Public sector = 180
 - Non-profit = 24
2. F1K: about 1000 business segments (355 firms)
 - GSS F1K = 81
 - Non-GSS F1K = 919

Survey Period

Time frame:

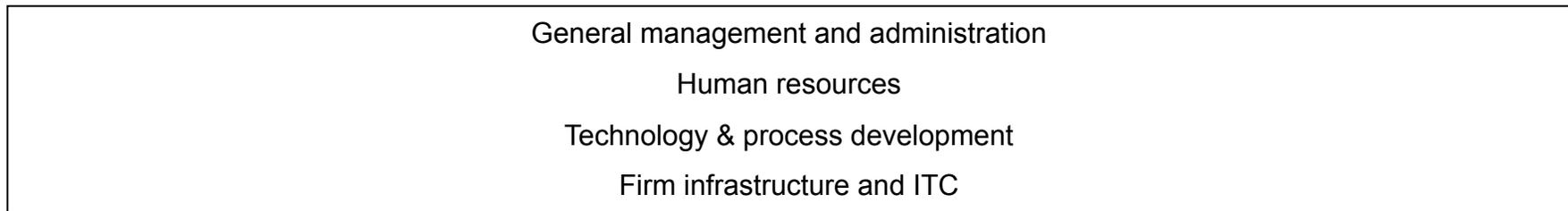
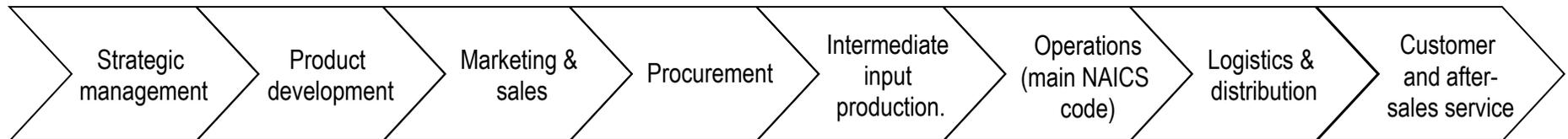
- Data: Calendar 2010/December 31, 2010
- Data collection: March-July 2011

What's innovative

- Use of business function framework
 - Employment by business function
 - Wages by business function
 - Outsourcing by business function (% of costs)
 - Offshoring by business function (% of costs)
- Use of business segment as unit of analysis in large firms (Fortune 1000)
 - Also known as: Line of business or Division
 - Potential for outsourcing offshoring will vary by line of business because of technological differences etc.

Vertical and horizontal business functions

Vertical business functions (the value-added chain)



Horizontal business functions

(support functions ala Porter)

Eight generic business functions

~ a mutually exclusive and exhaustive list ~

a.. The primary activity of your organization , such as the production of final goods or services intended for the market or for third parties for the purpose of sale, lease, or rental	<p>Primary activity maps to industry code (e.g. NAICS, CPC, etc.)</p>
b. Research and development , including designing, redesigning, or improving products or services, equipment, and processes	
c. Sales and marketing , including sales, advertising or potential buyers, advertising, market research, account management, managing	<p>Other functions can be mapped to other industry or product codes</p>
d. Transportation, logistics, and distribution , including storing, shipping or transporting in-process and finished products, or warehousing inventory	
e. Customer and after sales service , including call center services, maintaining and repairing products, technical support, customer service, warranty support	
f. Management, administration, and back office functions including management, administrative support, procurement, human resources, accounting	
g. Information technology systems , including developing, maintaining, or upgrading systems for internal use, writing software for internal use, processing or managing data	
h. Facilities maintenance and repair , including maintenance and repair of office space or buildings, or janitorial and cleaning services	
i. Some other function (please specify)	

Employees by business function

ITEM	% EMPLOYEES	DK	REF
a. [ACTIVITY FROM B3] [IF B3 BLANK] The primary activity of your organization, such as _____s or _____s or _____s intended for the market or for third parties _____ income.	_ _	d	r
b. Research and development of products, services, or technology	_ _	d	r
c. Marketing and sales	_ _	d	r
d. Transportation, logistics, and distribution	_ _	d	r
e. Customer and after sales service	_ _	d	r
f. Management, administration, and back office functions	_ _	d	r
g. Information technology systems	_ _	d	r
h. Facilities maintenance and repair	_ _	d	r
i. Other function	_ _	d	r

Quantifies internal business function structure for the first time

Earnings by business function (benefits also collected)

	C2. ANNUAL RANGE S	RANGE S
a. B3 ACTIVITY, IF B3=BLANK, The primary activity of your organization	Less than \$40,000 \$40,000 to \$60,000..... \$60,000 to \$90,000..... More than \$90,000 DK REF	00 00 00 DK REF
b. Research and development of products, services, or technology.....	Less than \$40,000 \$40,000 to \$60,000..... \$60,000 to \$90,000..... More than \$90,000 DK REF	Less than \$19.00 \$19.00 to \$29.00 \$29.00 to \$43.00 Over \$43.00 REF
c. Marketing and sales.....	Less than \$40,000 \$40,000 to \$60,000 \$60,000 to \$90,000 More than \$90,000 DK REF	Less than \$19.00 \$19.00 to \$29.00 \$29.00 to \$43.00 Over \$43.00 REF
d. Transportation, logistics, and distribution	Less than \$40,000 \$40,000 to \$60,000..... \$60,000 to \$90,000..... More than \$90,000 DK REF	Less than \$19.00 \$19.00 to \$29.00 \$29.00 to \$43.00 Over \$43.00 DK REF

Four salary ranges...

...or hourly pay ranges

....and so on

Outsourcing and offshoring business functions

Quantifies sourcing for the first time

Shared services

Domestic outsourcing

International sourcing

In-sourcing

	B4. within your organization/ part of the organization) ?	B5. within your organization, but at a central location like your headquarters ?	B6. by a supplier or suppliers within the U.S. ?	B7. by a supplier or suppliers outside the U.S. ?	Not Applicable
a. B3/Primary Activity [IF B3 BLANK] The primary activity of your organization, such as the production of final goods or services intended for the market or for third parties for the purpose of generating income.	_____	_____	_____	_____	<input type="checkbox"/>
b. Research and development of products, services, or technology , including designing, redesigning, or improving products or services, equipment, or procedures, or basic research and experimentation with new technology, systems, and processes.....	_____	_____	_____	_____	<input type="checkbox"/>
c. Sales and marketing , including pre-sale interactions with existing or potential buyers, advertising, market research, account management, managing brands or products	_____	_____	_____	_____	<input type="checkbox"/>
d. Transportation, logistics, and distribution , including packing, storing, shipping or transporting in-process and finished products, or warehousing inventory.....	_____	_____	_____	_____	<input type="checkbox"/>

....and so on

Offshored costs by type of location

	a. B3/Primary Activity	b. Research and development of products, services, or technology	c. Marketing and sales	d. Transportation, logistics, and distribution	e. Customer and after sales service
industrialized countries where costs are the same or higher than the US).....					
emerging countries where costs are moderately lower than the US.....					
developing countries where costs are much lower than the US.....					
	OWdr	DON'T KNOW.....d REFUSED.....r	DON'T KNOWd REFUSED.....r	DON'T KNOW.....d REFUSED.....r	DON'T KNOW.....d REFUSED.....r

High income countries

Middle income countries

Low income countries

....and so on

Business Functions - Benefits

- Generic: questions equally applicable at goods and services producing enterprises.
- Categories are intuitive and fit those used by management
 - Particularly important for comparing data across countries - bypasses the need to reconcile idiosyncratic national data collection methods.
 - Test interviews show that quantification of outsourcing, offshoring, employment, and earnings by business function is possible to collect
- Suited to globalization research because tasks are typically offshored in business function “bundles,” not moved one by one
- Suited to both international and domestic sourcing and/or outsourcing
- Related Efforts in European Union: Questionnaire on International Sourcing and GVCs (Eurostat, 2008 and in preparation)

Thank you!