

Handbook on Accounting for Global Value Chains

Chapter 9: Global Value Chain Satellite Accounts

UN Expert Group on International Trade and Economic
Globalization Statistics

André Loranger
Assistant Chief Statistician, Economic Statistics
Statistics Canada

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Outline



- The GVC model
- Satellite accounting
- Proposed approaches for compiling GVC satellite accounts
- Chapter 9 summary
- Work plan for North American Automotive GVC case study

Initial comments

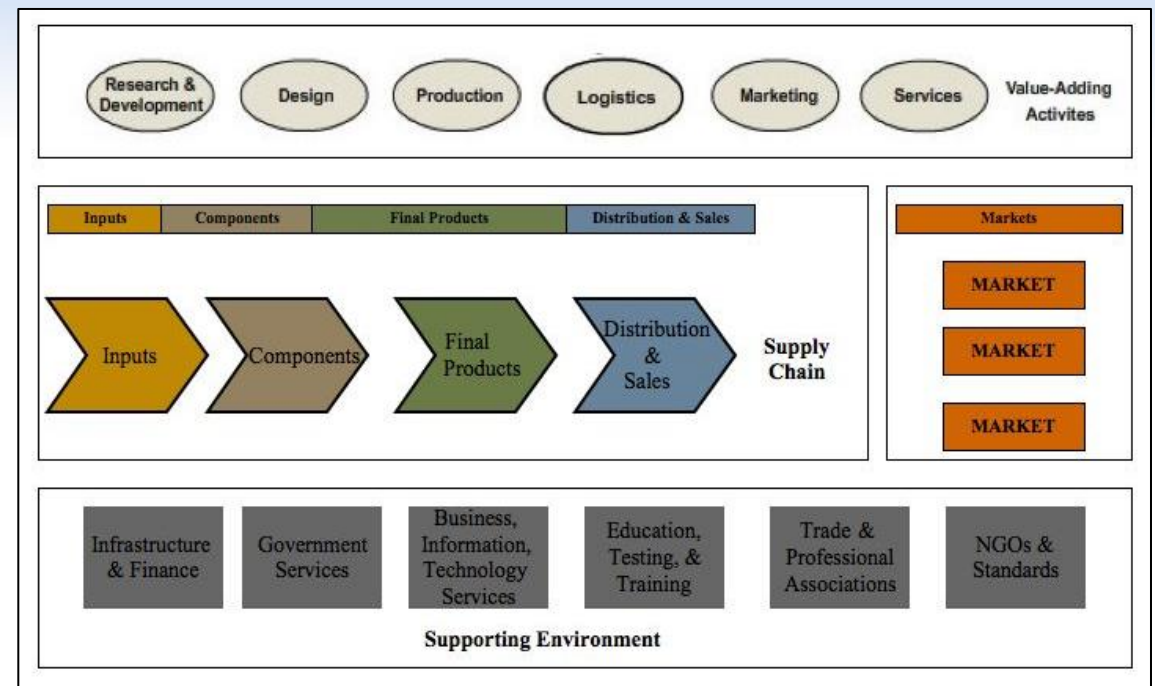
- Chapter proposes a micro-data linking approach (bottom-up)
 - Approach may not be feasible for some NSOs (availability of data, confidentiality)
 - May be useful to articulate aggregate approach in chapter
- Satellite accounts are not the same as Extended SUTs, they are complementary products ... there is some overlap
 - Extended SUTs provide a national picture (data) that provides insights on impact of GVCs...within a established framework
 - A GVC satellite account:
 - Is a set of data tables that highlight particular elements of the GVC (flexibility)
 - Focusses on specific GVCs with a multi-country perspective (regional)
 - Can go beyond production accounts and primary distributions of income and capital
- Build a repeatable statistical product rather than a one-time case study



The GVC model

- The GVC framework describes the structure, dynamics and relationships among stakeholders in GVCs
- Four dimensions:
 - Business functions
 - Geography
 - Governance
 - Institutional context

Value Chain Reference Model



Source: Frederick (2010)

What is Satellite Accounting?

- Extension of core SNA
- Two types:
 1. Re-arrangement of existing classifications (more detail, alternative classifications)
 2. Changing or extending underlying SNA concepts
- Examples: Tourism, Culture, Natural Resources, Non-profit and Volunteering
- The GVC Satellite Account is of the first type
 - Concepts and boundaries are consistent with the core SNA
 - Additional detail, classifications and presentational changes
 - A key expansion is the multi-country feature

GVC Satellite Account

- *Provides standard data product that articulates how the GVC operates and the role the GVC plays within a specific economic territory*
- *Is consistent across economic territories, through time and with the greater system of national accounts.*
- *Focus on specific GVCs (motor vehicles, textile, pharmaceuticals)*
- *Create tables to highlight particular issues of interest (production, governance, use of capital)*

Chapter 9 summary

Link to SUTs and Extended SUTs

GVC Satellite Account and Extended SUTs are complementary products.

Question of granularity – beyond production accounts

- Standard supply and use tables (SUTs) and Extended SUTs
 - National perspective, entire economy
 - SUTs provide an estimate of the use of goods and services by the producing industry. Assume that the outputs of downstream industries are inputs of lead firm and represent the participation rate of the into the GVC.
 - Can provide the overall shares but do not provide an estimate of the GVC destined output

		INDUSTRIES										FINAL USE					Total use		
		Agriculture	Manufacturing				...	Trade, transport and communication	Finance and business services	Other services	Total	Final consumption expenditure	Gross capital formation	Exports				Total	
			total	ISIC 291 - Manufacture of motor vehicles		other								Total	to Country A	to Country B			Other
		(1)	(2)	foreign owned (3)	nationally owned (4)	(5)	(6)	Business functions - ISIC (7)	Business functions - ISIC (8)	Business functions - ISIC (9)	(10)	(11)	(12)	(15)	(16)	(17)	(18)	(19)	(20)
PRODUCTS	...	(1)																	
	Input products - CPC-BEC codes	(2)																	
	Components - CPC-BEC codes	(3)																	
	Final products - CPC code	(4)																	
	Services of R&D - CPC code	(5)																	
	Services of Design - CPC code	(6)																	
	...	(7)																	
Adjustments	CIF/FOB adjustments on exports	(8)																	
	Total at purchasers' prices	(9)																	
GVA	Compensation of employees	(10)																	
	Other taxes less subsidies on production	(11)																	
	Consumption of fixed capital	(12)																	
	Net operating surplus/net mixed income	(13)																	
	Gross operating surplus/gross mixed income	(14)																	
	GVA	(15)																	
	Total input at basic prices	(16)																	

Can use the information from the GVC satellite account to articulate dimension of an Extended SUTs (for example, business function dimension or governance classification) and vice-versa. Extended SUTs can inform GVC satellite account.

Proposed approaches for compiling GVC satellite accounts

	Microdata linkage approach	Aggregate approach
Data	Microdata linking to get complete domestic picture at the firm-product level	Extracting data from existing databases
	Questionnaire sent to NSO to identify GVC participation and international transactions	GVC mapping - by product (HS, ISIC)
	GVC mapping – by products (HS, ISIC) and firm	
Process	Re-aggregation of the micro data into full set of GVC Satellite Accounts	Full set of GVC satellite accounts produced from aggregate information
	Country by country IOT and Extended SUT are informed by GVC satellite account	Leverage SUT, Extended SUT and country-by country IOT
Pros & Cons	Data intensive (precise mapping of GVC players is required)	Simplicity of approach (vs. micro-linkage approach)
	Precision and accuracy	Assumptions may be problematic. Assumes all firms in an industry are part of the chain. Assumes all products are produced in the GVC
	Access to micro-data required	

Basic assumptions:

1. *There are a limited number of large firms involved in a GVC or at the very least there are a limited number of firms that contribute to a large share of the total activity of the GVC.*
2. *The majority of the information required to construct a GVC satellite account already exists within the NSO.*

Chapter 9 summary

Defining GVCs

- A GVC includes:
 - At least two (international) economic territories.
 - All activities to get product to market including support activities (end to end) are in scope
 - A 'lead firm' and a 'supplier firm(s)'
- And is:
 - Product centric
 - Final use oriented

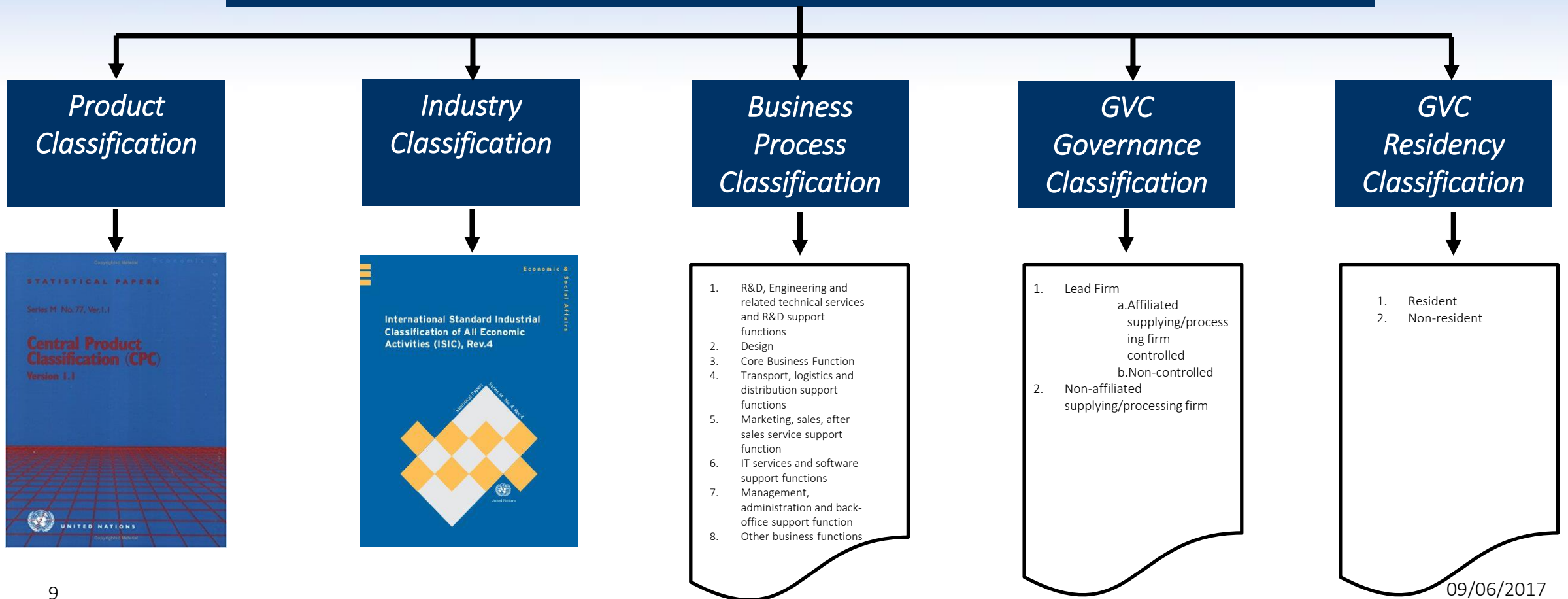
Definition

A Global Value Chain is a set of end to end interrelated activities that cross economic territories which are coordinated by a lead firm that result in the production of a product (good or service), delivers it to market and supports its use.

Chapter 9 summary

Articulating GVCs, classifications

Dimensions (classifications) of the GVC satellite account



Chapter 9 summary

Constructing the GVC satellite account

- 7 basic steps
 - Selection of the Product(s)
 - Establishing the GVC boundary
 - Product mapping
 - Identification and development of the frame of GVC participating firms
 - Application of the GVC classification, concepts and methods to the participating firms
 - Data collection
 - Compilation of the GVC accounts

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Selection of the product(s) around which the GVC is constructed (cellular phones, personal computers, motor vehicles)

The product tends to be final use oriented and primarily directed at consumers.

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Constructing the GVC satellite account

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 - Compilation of the GVC accounts
- *Practical use of activity thresholds*
- *Collaboration with “compilation partners” is key*
- *Necessary conditions for success include:*
 - *A clearly identified net benefit*
 - *A willingness to harmonize concepts and data requirements.*
 - *A willingness to coordinate statistical programs.*
 - *A willingness for each partner to adapt.*
 - *A willingness to consult*
 - *A willingness to implement quality control measures*
 - *A willingness to incur costs*

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VC Stage/ Subassembly	HS Codes (2002)	HS Code Descriptions	VC Sector
Final Products			
Passenger vehicles	870321	870321, 870322, 870323, 870324: Other vehicles, with spark-ignition internal combustion reciprocating piston engine <1000cc, 1000 - 1500cc, 1500 - 2000cc, > 2000cc	--
	870322		
	870323		
	870324		
	870333		
Inputs	870600	8706: Chassis fitted with engines, for the motor vehicles of headings 87.01-87.05	Chassis
	840733	Reciprocating piston engines used for the propulsion of vehicles of Chapter 87, of a cylinder capacity: > 250 cc ≤ 1,000 cc	Engine
	840810		
Components/Parts			
Body system (suspension)	401110	401110: New pneumatic tires, of rubber, of a kind used on motor cars 401211: Retreaded tires, of a kind used on motor cars (including station wagons and racing cars) 870331: Brakes and servo-brakes and parts thereof; 870332: Mounted brake linings 870333: Other 870370: Road wheels and parts and accessories thereof 870380: Suspension systems and parts (incl. shock absorbers) 870394: Steering wheels, columns and boxes	Tires
	401211		Brakes ^a
	870331-		Wheels
	870332-		Suspension systems and parts (incl. shock absorbers)
	870370		Steering wheel
	870380		
Body system (panels)	870710	870710: Bodies (incl. cabs), for motor vehicles of headings 87.01-.05, for the vehicles of heading 87.03 700711: Toughened (tempered) safety glass, of size and shape suitable for use in vehicles, aircraft, spacecraft or vessels 700721: Laminated safety glass... 830230: Other mountings, fittings and similar articles suitable for motor vehicles	Body Panels
	700711		Windows/
	700721		Windshield
	830230		Metal mountings
Body system (front & rear end modules)	870810	Parts and accessories of the motor vehicles of headings 87.01-87.05; 870810: Bumpers and parts thereof 870891: Radiators 870892: Silencers and exhaust pipes 842139: Filtering or purifying machinery and apparatus for gases; Intake air filters for internal combustion engines; other 853910: Electric filament or discharge lamps, including sealed beam lamp units and ultra-violet or infra-red lamps, arc-lamps; Sealed beam lamp units	Bumpers
	870891		Radiators
	870892		Silencers
	842139		(mufflers) exhaust
	853910		Filters
Body system (interior)	940110	940110: Seats of a kind used for motor vehicles 870821: Safety seat belts	Seats
	870821		Seatbelts ^a

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- *Identify GVC firms (GVC frame)*
- *Classify according role*
 - *Lead Firm*
 - *Affiliated Supplying firm*
 - *Controlled*
 - *Non-controlled*
 - *Non-affiliated supplying firm*

Role	Enterprise 1	Enterprise 2	Enterprise 3	Enterprise 4	Enterprise 5
Lead Firm	X				X
Affiliated Supplier – Controlled		X			
Affiliated supplier – not controlled			X		
Non-affiliated supplier				X	

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Fictitious example for a Motor Vehicle GVC

GVC (Classification)	GVC (Honda) Participating Enterprise 1	GVC (Ford) Participating Enterprise 2	GVC (General Motors) Participating Enterprise 3	GVC (Hyundai) participating Enterprise 4	GVC (Toyota) participating Enterprise 5
Governance	Lead	Affiliated Supplier - controlled	Affiliated Supplier – not controlled	Non-affiliated Supplier	Lead
Business Function	Management	Research and development	Assembly		Management
Industry	Head Office	Research and Development	Motor Vehicle Manufacturing	Motor Vehicle Parts Manufacturing	
Product	Management Services	Research and Development Services	Automobiles	Component parts	
Trade Characteristic	Exporter	Exporter	Exporter	Non-exporter	
Residency	US	US	US	Canadian	

Chapter 9 summary

Constructing the GVC satellite account

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- *Supply and use tables*
- *International merchandise trade statistics*
- *International trade in services statistics*
- *Administrative data*
- *Annual Business Surveys*
- *Trade by Enterprise Characteristic*
- *Foreign Affiliate Statistics*
- *Statistics on Domestic FDI parent enterprises*
- *Other sources*

Chapter 9 summary

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Chapter 9 summary

The GVC Satellite Account, selected tables

- Selected tables
 - GVC Production Account by business function
 - GVC Production Account by business function and governance
 - GVC Generation of Income / Primary Income Account by Economic Territory
 - GVC Capital Account by Economic Territory
 - GVC Labour Account

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Business Function	Canada	United States	Mexico	Rest of World	Total
Output					
Research and Development					
Design					
Extraction of primary inputs					
Provision of intermediate inputs					
Assembly					
Logistics					
Marketing					
IT Services					
Management, administration and back-office support function					
Other business functions					
Intermediate Consumption					
Gross Value Added					

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Business Function	Governance			
	Lead Firm	Affiliated Supplier (controlled)	Affiliated Supplier (not-controlled)	Non-Affiliated Supplier
Output				
Research and Development				
Design				
Extraction of primary inputs				
Provision of intermediate inputs				
Assembly				
Logistics				
Marketing				
IT Services				
Management, administration and back-office support function				
Other business functions				
Intermediate Consumption				
Gross Value Added				

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- GVC Labour Account

	Canada	United States	Mexico	Rest of the World	Total
Gross Value Added					
Compensation of Income					
Operating Surplus					
Consumption of Fixed Capital					
Taxes less subsidies					
Gross Domestic Income					
Primary Incomes Paid					
Primary Incomes Received					
Gross National Income					
Current Transfers Paid					
Current Transfers Received					
Gross Disposable Income					

Chapter 9 summary

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- GVC Labour Account

	Canada	United States	Mexico	Rest of the World	Total
Gross Saving					
Capital Transfers Received					
Investment					
Asset 1					
Asset 2					
Asset 3					
.....					
Capital Transfers Paid					
Net Lending/Borrowing					

Chapter 9 summary

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- GVC Capital Account by Economic Territory
- **GVC Labour Account**

	Canada	United States	Mexico	Rest of the World	Total
Gross Value Added					
Compensation of Income					
Number of Jobs					
Occupational Group 1					
Occupational Group 2					
Occupational Group 3					
....					

Chapter 9 summary

Acquiring data sources, Data sources residing in NSOs

- Supply and use tables
- International merchandise trade statistics
- International trade in services statistics
- Administrative data
- Annual Business Surveys
- Trade by Enterprise Characteristic
- Foreign Affiliate Statistics
- Statistics on Domestic FDI parent enterprises

- *Data sources available in most NSOs*
- *For centralized statistics offices such as Statistics Canada, it is possible to link all these data sets at the firm level*

Chapter 9 summary

Acquiring data sources, self-administered questionnaire

- Common self-administered questionnaire across jurisdictions
 - Firm-level questionnaire
 - Unique questionnaire for each GVC
 - Will facilitate the compilation and aggregation process
 - Will facilitate data exchange and reconciliation
 - Address some confidentiality issues
- Imputations from SUTs when firm level data not available
 - Use GVC shares from SUTs to estimate the GVC activity. The GVC shares can be based on auxiliary information obtained from a variety of sources.



Sample questionnaire for GVC firms

Variable	Response	Data Source	Methods / Notes
Coverage			
Statistical Unit			
Name			
Economic Territory			
Lead Firm			
Relationship to lead firm			
Business Function			
Industry			
Output – Product 1			
Output – Product 2			
Output – Product			
Intermediate Consumption – Product 1			
....			
Intermediate Consumption – Product 2			
Intermediate Consumption – Product			
....			
Exports to Affiliated firms (by economic territory)			
Exports to Non-affiliated firms (by economic territory)			
Imports from affiliated firms			
Imports from non-affiliated firms			
Gross Fixed Capital Formation			
Market Value of the stock of produced assets			
.....			

Chapter 9 summary

Appendix, Statistics Canada's micro-macro linkage approach

- Large integrated globalization micro-macro database
- Leverages the Linked File Environment (LFE) where business data (tax, survey) can be linked at the establishment/enterprise level
- Captures organizational structure (columns) and firm characteristics (rows). Time is third dimension
- Can be used to analyze/estimate
 - Outwardly engaged firms
 - Processing and merchanting estimates
 - Global value chains
 - Financial stability measures

BUSINESS ENTITIES /VARIABLES	All domestic firms (enterprise - LE - establishments), by industry (control totals) Of which: Not outwardly engaged domestic firms (residual)	Of which: Outwardly-engaged domestic firms - TRADE	Of which: Outwardly-engaged domestic firms - TRADE+FDI	Of which: All domestic MNEs, split between Canadian-owned and foreign-owned. These are sub-stratified into majority-owned FDI firms (related to inward FATS)	Majority-owned Canadian affiliates abroad (outward FATS)
Characteristics					
Employment, wages					
Sales					
Assets - Liabilities					
Income					
Exports of G and S					
Imports of G and S					
Value added					
Etc.					

Case study: Automotive GVC for North America

Project plan

- Partners (Chapter 9 contributors)
 - Statistics Canada, US Census Bureau, US Bureau of Economic Analysis, US International Trade Commission, UNSD, Academics (Tim Sturgeon, Gary Gereffi, Stacey Frederick)
 - Leverage Canada-US-Mexico TiVA working group
- Objective
 - Test the methods outlined in Chapter 9
 - Produce an Automotive GVC satellite account for North America for RY 2015
 - Identify the economic contribution (relative size) and characteristics of the automotive GVC within the context of the North American economy

Task	Responsibility	Timeline
Determination of the product(s)	Academic Community	
Identification of the enterprises involved in the GVC	Academic Community	
Identification the economic territory of the enterprises involved in the GVC	Academic Community / NSOs	
Identification of the primary function of the enterprises involved in the GVC	Academic Community / NSOs	
Identification of the role of the enterprises involved in the GVC.	Academic Community / NSOs	
Development of the GVC questionnaire that will be administered to Canada, US and Mexico	Academic Community / NSOs	
Collection of enterprise / industry level data (mainly from existing data holdings within the NSO)	NSOs	
Integration of the collected data in the Automotive GVC and reconciliation of cross country flows	NSO	
Analysis of the results	Academic Community / NSOs	
Development of an research paper and public dissemination	Academic Community / NSOs	



André Loranger
Assistant Chief Statistician
Economic Statistics
Statistics Canada
andre.loranger@canada.ca

