

Measuring Costa Rica's participation in GVC's

Department of Macroeconomic Statistics

ICMTEG, Aguascalientes, México

Sep-Oct, 2014

- Costa Rica in GVC's
- Research goals based on international IOT
- Construction of international IOT
- Results for Costa Rica.

Rol of Costa Rica in GVC's

- What do we know?
- Where we are?

Strengthening Costa Rica's Knowledge

Base on GVCs



Integration of Costa Rica to TiVA Initiative and other initiatives (Dynemp, STI Outlook) to track upgrading towards knowledge based activities and productive transformation.



Technical Guidance to Costa Rica's participation in global value chains and TiVA Initiative.



Technical assistance to include Costa Rica's IO table in an international IO table and research to better understand the way in which Costa Rican firms interact with the main international players in GVCs.



Mapping Costa Rica's position and upgrading trajectories in electronics, medical devices, aeronautic/aerospace and offshoring services GVCs

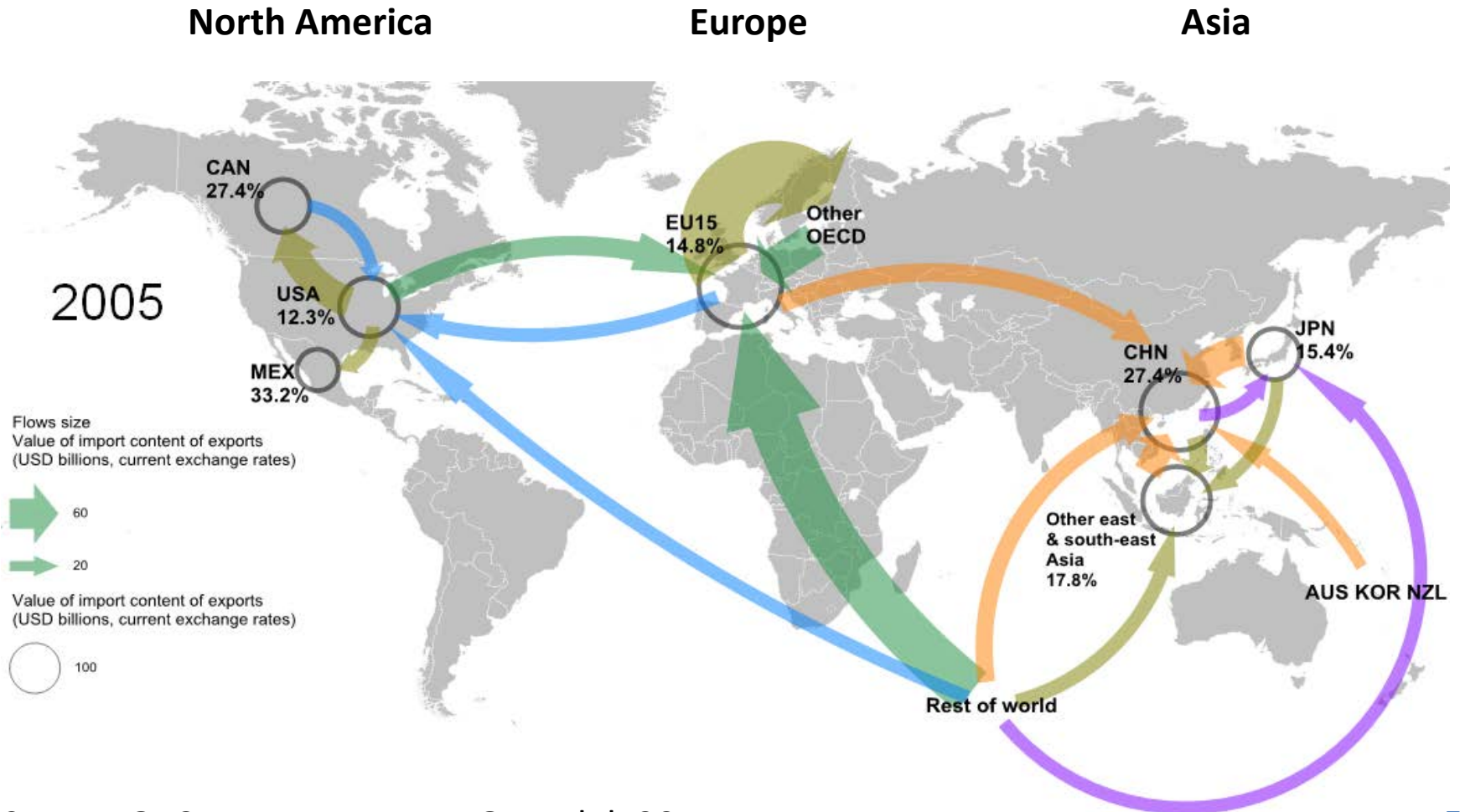


Technical assistance to build a firm level database that integrates trade statistics with other variables to analyze the performance of firms that integrate in GVCs



Strengthening the innovation ecosystem to drive the upgrading towards knowledge-based activities.

There are three major networks but Latin America participation is limited



Source: OECD Inter-country I-O model, 2011

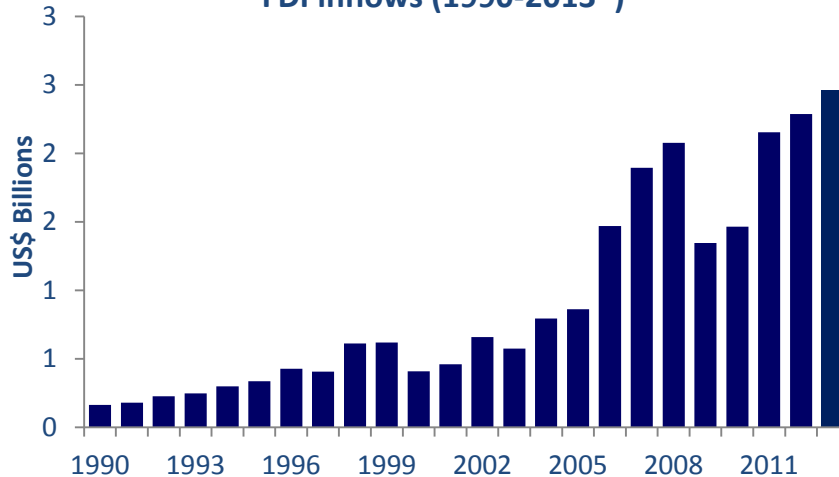
Trade and Investment

Composition of exports (1990-2013*)



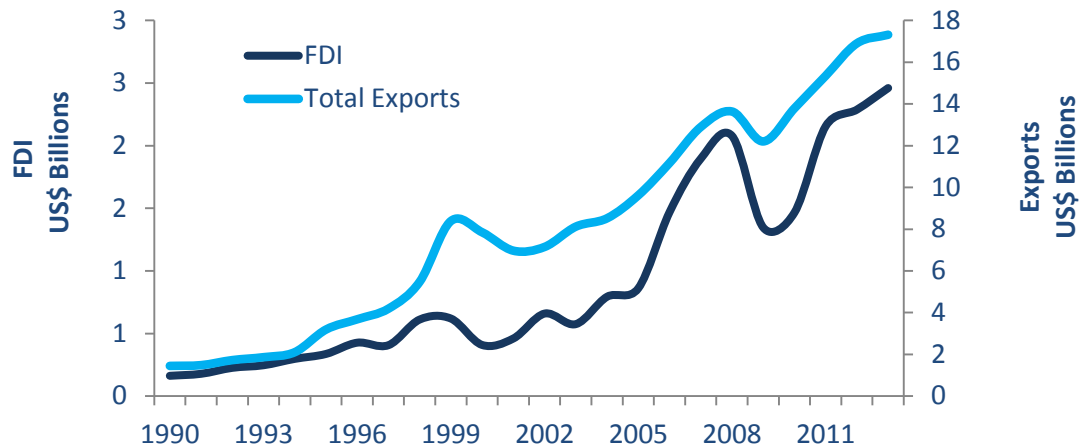
Source: COMEX based on Central Bank and PROCOMER data.

FDI inflows (1990-2013*)



Source: COMEX based on Central Bank data.

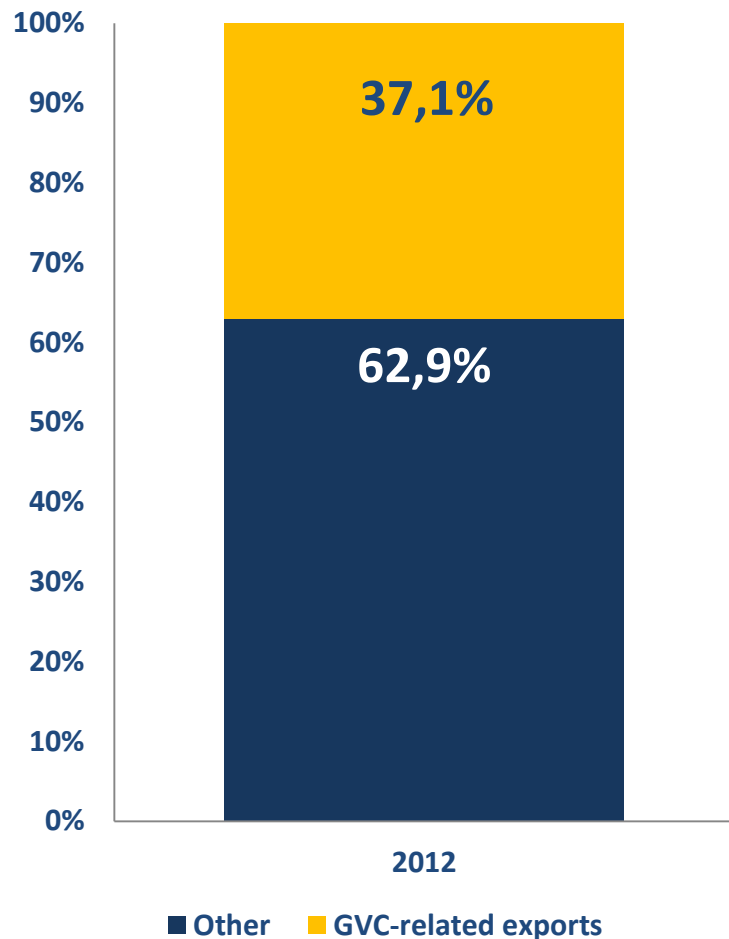
FDI inflows and exports (1990-2013*)



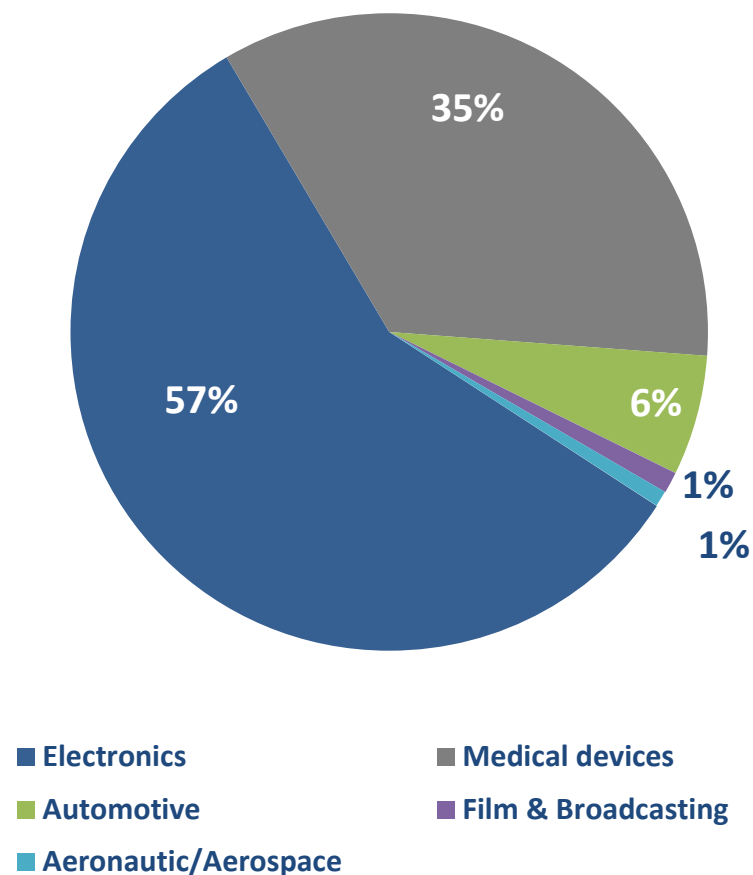
Source: COMEX, using PROCOMER data.

Costa Rica's Participation in GVCs

Costa Rica: Participation of GVC-related exports in total exports 2012

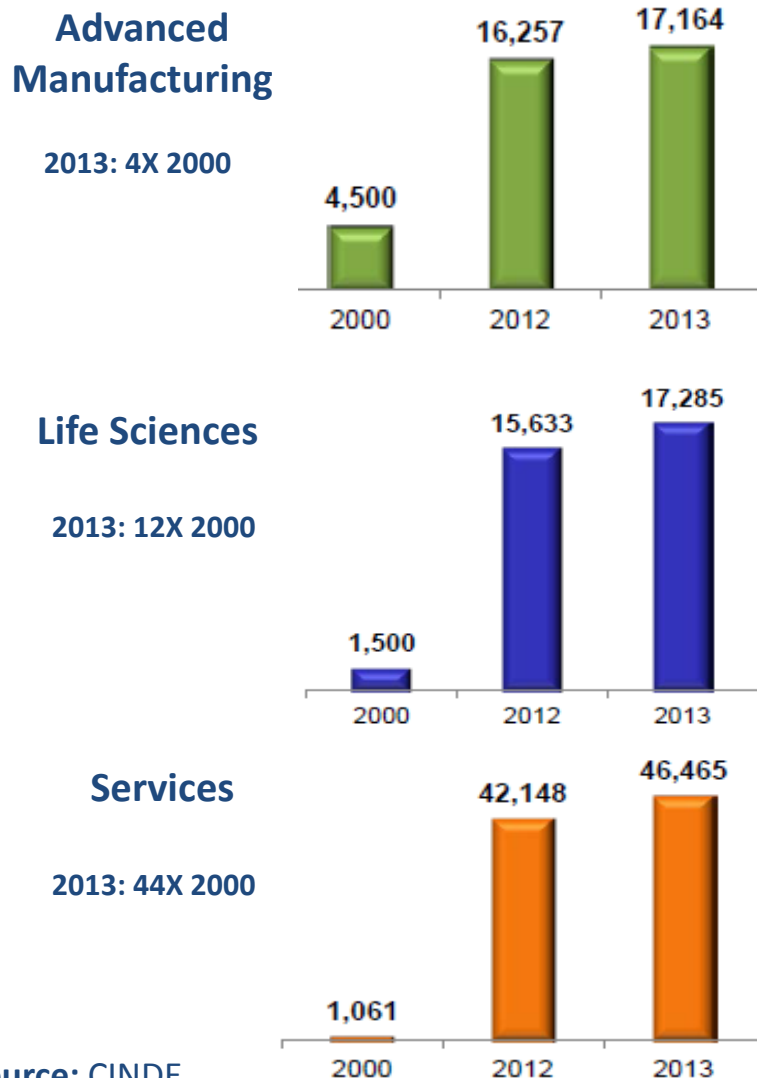


GVC-related exports by industry, 2012

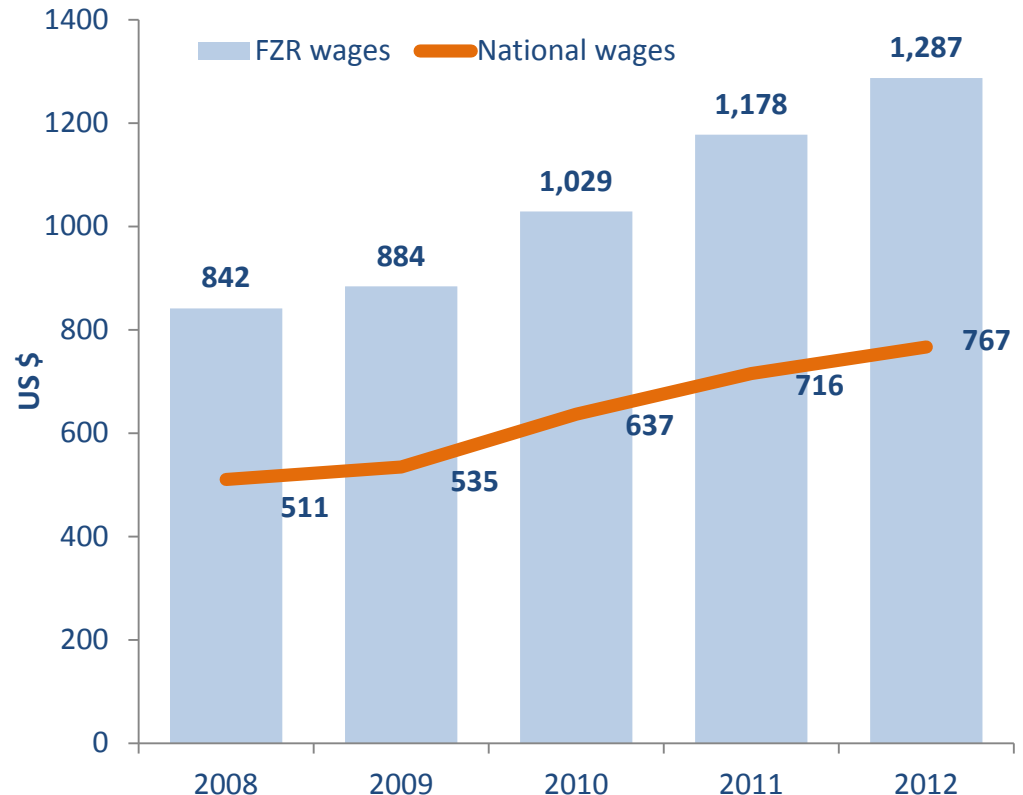


Employment

Costa Rica: Employment generated by FDI

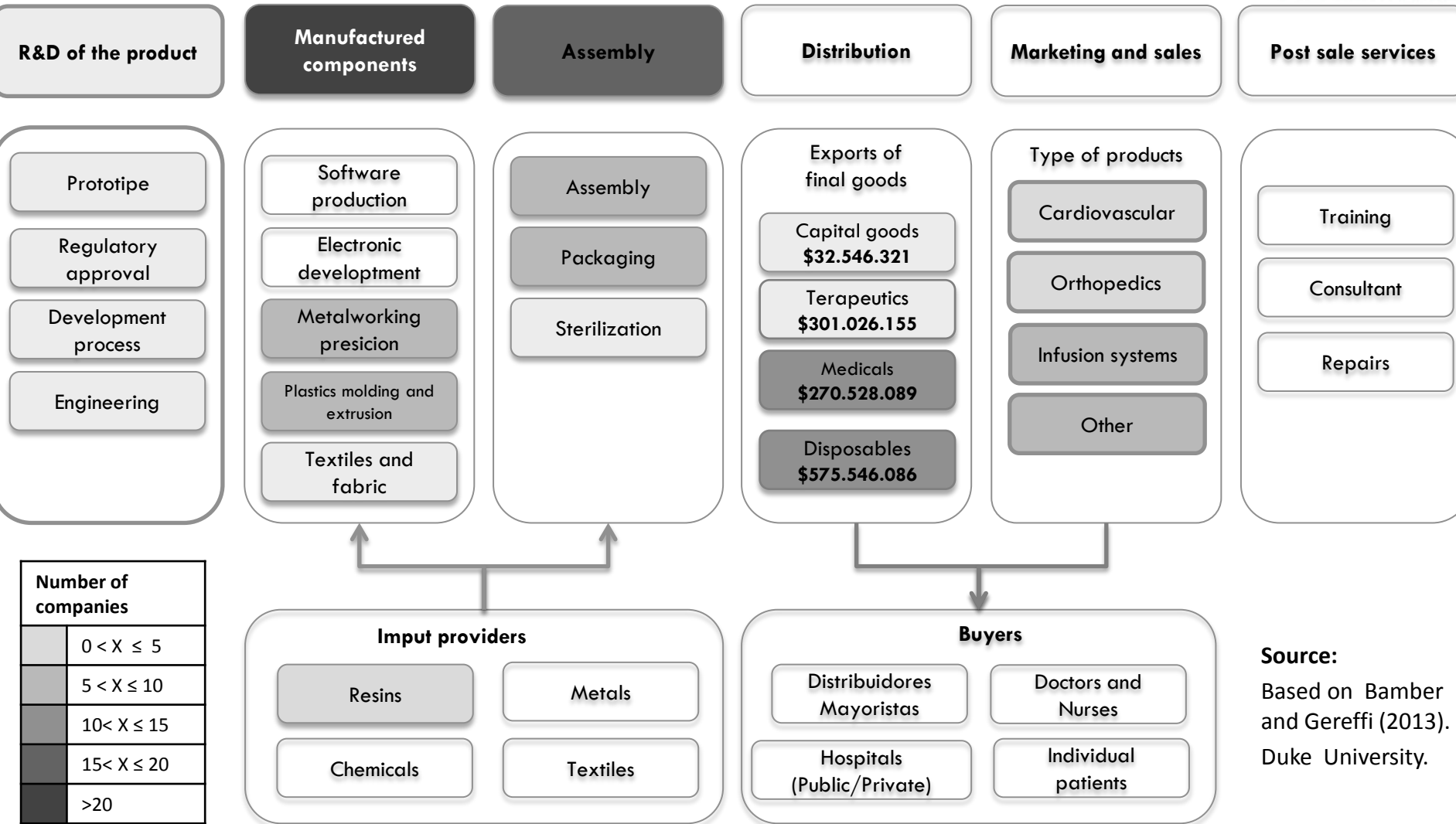


Costa Rica: Average monthly wages, FZR vs. the economy at large (2008-2012)



Source: PROCOMER

Participation of Costa Rica in the medical devices CGV



R&D of the product

- Prototype
- Regulatory approval
- Development process
- Engineering

Manufactured components

- Software production
- Electronic development
- Metalworking precision
- Plastics molding and extrusion
- Textiles and fabric

Assembly

- Assembly
- Packaging
- Sterilization

Distribution

- Exports of final goods
- Capital goods **\$32.546.321**
- Therapeutics **\$301.026.155**
- Medicals **\$270.528.089**
- Disposables **\$575.546.086**

Marketing and sales

- Type of products
- Cardiovascular
- Orthopedics
- Infusion systems
- Other

Post sale services

- Training
- Consultant
- Repairs

Input providers

- Resins
- Metals
- Chemicals
- Textiles

Buyers

- Distribuidores Mayoristas
- Hospitals (Public/Private)
- Doctors and Nurses
- Individual patients

1. Trade in Value Added

- Participation in GVC has been documented (gross trade).
- The “Made in the World” initiative of the WTO promoted the concept of Trade in Value Added (TiVA).
- Through TiVA there is a better understanding of the country contribution to GVC’s (more consistent with the management of the GDP)
- **Questions:**
- To what extent Costa Rica participate in the global economy in terms of trade in value added?
 - How does it change the relationship with our trade partners?
 - What are the implications of these changes for our trade policy?

2. Comparative advantages

- Based on the CGV's the "trade of tasks" is predominant which drives development countries to develop comparative advantages easily.
- Trade in value added statistics provide a new opportunity to measure the comparative advantages of the country.
- **Questions**
- How competitive are the Costarrican industries?
 - What are the comparative advantage characteristics of the industries in terms of TiVA?
 - What industries does Costa Rica have advantages on?
 - Which ones are developing advantages and what are the policies to strengthen those advantages?

3. Exports breakdown

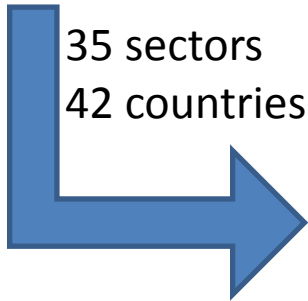
- The international IOT allows to breakdown the exports in its various components.
 - To understand the participation of Costa Rica in the global production it is crucial to measure the domestic component and to what extend it provides to the global production.
 - **Questions:**
- ¿How to breakdown the gross exports value in its various components?
 - What is the domestic component of the exports and how it compares to other countries?
 - How that domestic component fit in the global production?

- Main goal:
 - To integrate the domestic input-output table into the international input-output table (WIOD)

Construction of international IOT

Costa Rica's domestic
OIT

<i>Ad</i> (producer's price)	<i>Fd</i> (producer's price)	<i>Exports</i>
<i>Am</i> (CIF price)	<i>Fm</i> (CIF price)	
<i>V</i>		



International IOT (WIOD)

	code	Intermediate Demand (A)										Final Demand (F)										Export (L)					Discrepancy (QX)	Total Outputs (XX)
		Indonesia (AI)	Malaysia (AM)	Philippines (AP)	Singapore (AS)	Thailand (AT)	China (AC)	Taiwan (AN)	Korea (AK)	Japan (AJ)	U.S.A. (AU)	Indonesia (FI)	Malaysia (FM)	Philippines (FP)	Singapore (FS)	Thailand (FT)	China (FC)	Taiwan (FN)	Korea (FK)	Japan (FJ)	U.S.A. (FU)	Export to H.Kong (LH)	Export to India (LG)	Export to EU (LO)	Export to R.O.W. (LW)			
Indonesia	(AI)	<i>A^{II}</i>	<i>A^{IM}</i>	<i>A^{IP}</i>	<i>A^{IS}</i>	<i>A^{IT}</i>	<i>A^{IC}</i>	<i>A^{IN}</i>	<i>A^{IK}</i>	<i>A^{IJ}</i>	<i>A^{IU}</i>	<i>F^{II}</i>	<i>F^{IM}</i>	<i>F^{IP}</i>	<i>F^{IS}</i>	<i>F^{IT}</i>	<i>F^{IC}</i>	<i>F^{IN}</i>	<i>F^{IK}</i>	<i>F^{IJ}</i>	<i>F^{IU}</i>	<i>L^{IH}</i>	<i>L^{IG}</i>	<i>L^{IO}</i>	<i>L^{IW}</i>	<i>Q^I</i>	<i>X^I</i>	
Malaysia	(AM)	<i>A^{MI}</i>	<i>A^{MM}</i>	<i>A^{MP}</i>	<i>A^{MS}</i>	<i>A^{MT}</i>	<i>A^{MC}</i>	<i>A^{MN}</i>	<i>A^{MK}</i>	<i>A^{MJ}</i>	<i>A^{MU}</i>	<i>F^{MI}</i>	<i>F^{MM}</i>	<i>F^{MP}</i>	<i>F^{MS}</i>	<i>F^{MT}</i>	<i>F^{MC}</i>	<i>F^{MN}</i>	<i>F^{MK}</i>	<i>F^{MJ}</i>	<i>F^{MU}</i>	<i>L^{MH}</i>	<i>L^{MG}</i>	<i>L^{MO}</i>	<i>L^{MW}</i>	<i>Q^M</i>	<i>X^M</i>	
Philippines	(AP)	<i>A^{PI}</i>	<i>A^{PM}</i>	<i>A^{PP}</i>	<i>A^{PS}</i>	<i>A^{PT}</i>	<i>A^{PC}</i>	<i>A^{PN}</i>	<i>A^{PK}</i>	<i>A^{PJ}</i>	<i>A^{PU}</i>	<i>F^{PI}</i>	<i>F^{PM}</i>	<i>F^{PP}</i>	<i>F^{PS}</i>	<i>F^{PT}</i>	<i>F^{PC}</i>	<i>F^{PN}</i>	<i>F^{PK}</i>	<i>F^{PJ}</i>	<i>F^{PU}</i>	<i>L^{PH}</i>	<i>L^{PG}</i>	<i>L^{PO}</i>	<i>L^{PW}</i>	<i>Q^P</i>	<i>X^P</i>	
Singapore	(AS)	<i>A^{SI}</i>	<i>ASM</i>	<i>A^{SP}</i>	<i>A^{SS}</i>	<i>AST</i>	<i>A^{SC}</i>	<i>A^{SN}</i>	<i>A^{SK}</i>	<i>A^{SJ}</i>	<i>A^{SU}</i>	<i>F^{SI}</i>	<i>FSM</i>	<i>F^{SP}</i>	<i>F^{SS}</i>	<i>FST</i>	<i>F^{SC}</i>	<i>F^{SN}</i>	<i>F^{SK}</i>	<i>F^{SJ}</i>	<i>F^{SU}</i>	<i>L^{SH}</i>	<i>L^{SG}</i>	<i>L^{SO}</i>	<i>L^{SW}</i>	<i>Q^S</i>	<i>X^S</i>	
Thailand	(AT)	<i>A^{TI}</i>	<i>ATM</i>	<i>A^{TP}</i>	<i>A^{TS}</i>	<i>A^{TT}</i>	<i>A^{TC}</i>	<i>A^{TN}</i>	<i>A^{TK}</i>	<i>A^{TJ}</i>	<i>A^{TU}</i>	<i>F^{TI}</i>	<i>FTM</i>	<i>F^{TP}</i>	<i>F^{TS}</i>	<i>F^{TT}</i>	<i>F^{TC}</i>	<i>F^{TN}</i>	<i>F^{TK}</i>	<i>F^{TJ}</i>	<i>F^{TU}</i>	<i>LTH</i>	<i>L^{TG}</i>	<i>L^{TO}</i>	<i>L^{TW}</i>	<i>Q^T</i>	<i>X^T</i>	
China	(AC)	<i>A^{CI}</i>	<i>A^{CM}</i>	<i>A^{CP}</i>	<i>A^{CS}</i>	<i>A^{CT}</i>	<i>A^{CC}</i>	<i>A^{CN}</i>	<i>A^{CK}</i>	<i>A^{CJ}</i>	<i>A^{CU}</i>	<i>F^{CI}</i>	<i>F^{CM}</i>	<i>F^{CP}</i>	<i>F^{CS}</i>	<i>F^{CT}</i>	<i>F^{CC}</i>	<i>F^{CN}</i>	<i>F^{CK}</i>	<i>F^{CJ}</i>	<i>F^{CU}</i>	<i>L^{CH}</i>	<i>L^{CG}</i>	<i>L^{CO}</i>	<i>L^{CW}</i>	<i>Q^C</i>	<i>X^C</i>	
Taiwan	(AN)	<i>A^{NI}</i>	<i>A^{NM}</i>	<i>A^{NP}</i>	<i>A^{NS}</i>	<i>A^{NT}</i>	<i>A^{NC}</i>	<i>A^{NN}</i>	<i>A^{NK}</i>	<i>A^{NJ}</i>	<i>A^{NU}</i>	<i>F^{NI}</i>	<i>F^{NM}</i>	<i>F^{NP}</i>	<i>F^{NS}</i>	<i>F^{NT}</i>	<i>F^{NC}</i>	<i>F^{NN}</i>	<i>F^{NK}</i>	<i>F^{NJ}</i>	<i>F^{NU}</i>	<i>L^{NH}</i>	<i>L^{NG}</i>	<i>L^{NO}</i>	<i>L^{NW}</i>	<i>Q^N</i>	<i>X^N</i>	
Korea	(AK)	<i>A^{KI}</i>	<i>A^{KM}</i>	<i>A^{KP}</i>	<i>A^{KS}</i>	<i>A^{KT}</i>	<i>A^{KC}</i>	<i>A^{KN}</i>	<i>A^{KK}</i>	<i>A^{KJ}</i>	<i>A^{KU}</i>	<i>F^{KI}</i>	<i>F^{KM}</i>	<i>F^{KP}</i>	<i>F^{KS}</i>	<i>F^{KT}</i>	<i>F^{KC}</i>	<i>F^{KN}</i>	<i>F^{KK}</i>	<i>F^{KJ}</i>	<i>F^{KU}</i>	<i>L^{KH}</i>	<i>L^{KG}</i>	<i>L^{KO}</i>	<i>L^{KW}</i>	<i>Q^K</i>	<i>X^K</i>	
Japan	(AJ)	<i>A^{JI}</i>	<i>A^{JM}</i>	<i>A^{JP}</i>	<i>A^{JS}</i>	<i>A^{JT}</i>	<i>A^{JC}</i>	<i>A^{JN}</i>	<i>A^{JK}</i>	<i>A^{JJ}</i>	<i>A^{JU}</i>	<i>F^{JI}</i>	<i>F^{JM}</i>	<i>F^{JP}</i>	<i>F^{JS}</i>	<i>F^{JT}</i>	<i>F^{JC}</i>	<i>F^{JN}</i>	<i>F^{JK}</i>	<i>F^{JJ}</i>	<i>F^{JU}</i>	<i>L^{JH}</i>	<i>L^{JG}</i>	<i>L^{JO}</i>	<i>L^{JW}</i>	<i>Q^J</i>	<i>X^J</i>	
U.S.A.	(AU)	<i>A^{UI}</i>	<i>A^{UM}</i>	<i>A^{UP}</i>	<i>A^{US}</i>	<i>A^{UT}</i>	<i>A^{UC}</i>	<i>A^{UN}</i>	<i>A^{UK}</i>	<i>A^{UJ}</i>	<i>A^{UU}</i>	<i>F^{UI}</i>	<i>F^{UM}</i>	<i>F^{UP}</i>	<i>F^{US}</i>	<i>F^{UT}</i>	<i>F^{UC}</i>	<i>F^{UN}</i>	<i>F^{UK}</i>	<i>F^{UJ}</i>	<i>F^{UU}</i>	<i>L^{UH}</i>	<i>L^{UG}</i>	<i>L^{UO}</i>	<i>L^{UW}</i>	<i>Q^U</i>	<i>X^U</i>	
Freight and Insurance	(BF)	<i>BA^I</i>	<i>BA^M</i>	<i>BA^P</i>	<i>BA^S</i>	<i>BA^T</i>	<i>BA^C</i>	<i>BA^N</i>	<i>BA^K</i>	<i>BA^J</i>	<i>BA^U</i>	<i>BF^I</i>	<i>BF^M</i>	<i>BF^P</i>	<i>BF^S</i>	<i>BF^T</i>	<i>BF^C</i>	<i>BF^N</i>	<i>BF^K</i>	<i>BF^J</i>	<i>BF^U</i>							
Import from H. Kong	(CH)	<i>A^{HI}</i>	<i>A^{HM}</i>	<i>A^{HP}</i>	<i>A^{HS}</i>	<i>A^{HT}</i>	<i>A^{HC}</i>	<i>A^{HN}</i>	<i>A^{HK}</i>	<i>A^{HJ}</i>	<i>A^{HU}</i>	<i>F^{HI}</i>	<i>F^{HM}</i>	<i>F^{HP}</i>	<i>F^{HS}</i>	<i>F^{HT}</i>	<i>F^{HC}</i>	<i>F^{HN}</i>	<i>F^{HK}</i>	<i>F^{HJ}</i>	<i>F^{HU}</i>							
Import from India	(GH)	<i>A^{GI}</i>	<i>A^{GM}</i>	<i>A^{GP}</i>	<i>A^{GS}</i>	<i>A^{GT}</i>	<i>A^{GC}</i>	<i>A^{GN}</i>	<i>A^{GK}</i>	<i>A^{GJ}</i>	<i>A^{GU}</i>	<i>F^{GI}</i>	<i>F^{GM}</i>	<i>F^{GP}</i>	<i>F^{GS}</i>	<i>F^{GT}</i>	<i>F^{GC}</i>	<i>F^{GN}</i>	<i>F^{GK}</i>	<i>F^{GJ}</i>	<i>F^{GU}</i>							
Import from EU	(CO)	<i>A^{OI}</i>	<i>A^{OM}</i>	<i>A^{OP}</i>	<i>A^{OS}</i>	<i>A^{OT}</i>	<i>A^{OC}</i>	<i>A^{ON}</i>	<i>A^{OK}</i>	<i>A^{OJ}</i>	<i>A^{OU}</i>	<i>F^{OI}</i>	<i>F^{OM}</i>	<i>F^{OP}</i>	<i>F^{OS}</i>	<i>F^{OT}</i>	<i>F^{OC}</i>	<i>F^{ON}</i>	<i>F^{OK}</i>	<i>F^{OJ}</i>	<i>F^{OU}</i>							
Import from the R.O.W.	(CW)	<i>A^{WI}</i>	<i>A^{WM}</i>	<i>A^{WP}</i>	<i>A^{WS}</i>	<i>A^{WT}</i>	<i>A^{WC}</i>	<i>A^{WN}</i>	<i>A^{WK}</i>	<i>A^{WJ}</i>	<i>A^{WU}</i>	<i>F^{WI}</i>	<i>F^{WM}</i>	<i>F^{WP}</i>	<i>F^{WS}</i>	<i>F^{WT}</i>	<i>F^{WC}</i>	<i>F^{WN}</i>	<i>F^{WK}</i>	<i>F^{WJ}</i>	<i>F^{WU}</i>							
Duties & Import Taxes	(DT)	<i>DA^I</i>	<i>DA^M</i>	<i>DA^P</i>	<i>DA^S</i>	<i>DA^T</i>	<i>DA^C</i>	<i>DA^N</i>	<i>DA^K</i>	<i>DA^J</i>	<i>DA^U</i>	<i>DF^I</i>	<i>DF^M</i>	<i>DF^P</i>	<i>DF^S</i>	<i>DF^T</i>	<i>DF^C</i>	<i>DF^N</i>	<i>DF^K</i>	<i>DF^J</i>	<i>DF^U</i>							
Value Added	(VV)	<i>V^I</i>	<i>V^M</i>	<i>V^P</i>	<i>V^S</i>	<i>V^T</i>	<i>V^C</i>	<i>V^N</i>	<i>V^K</i>	<i>V^J</i>	<i>V^U</i>																	
Total Inputs	(XX)	<i>X^I</i>	<i>X^M</i>	<i>X^P</i>	<i>X^S</i>	<i>X^T</i>	<i>X^C</i>	<i>X^N</i>	<i>X^K</i>	<i>X^J</i>	<i>X^U</i>																	

Methodology to construct the international IOT

1. Domestic IOT

Preparing the structure:
1-period; 2-currency; 3-prices;
4-industries. 5-trade flows

Backdating:
RAS algorithm
2011 -> 2009

Assigned trade by country:
Imports table and exports vector

2. International IOT

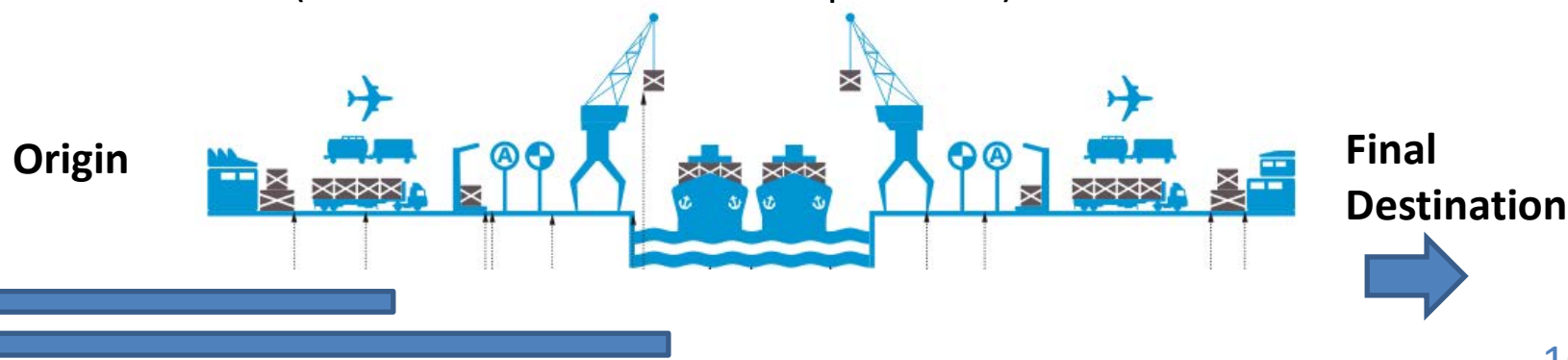
To fit into the international IOT:
Breakdown of Costa Rica separated
from the rest of the world (ROW)

Consistency testing:
Some negatives and some
readjustments
Consistency with national accounts

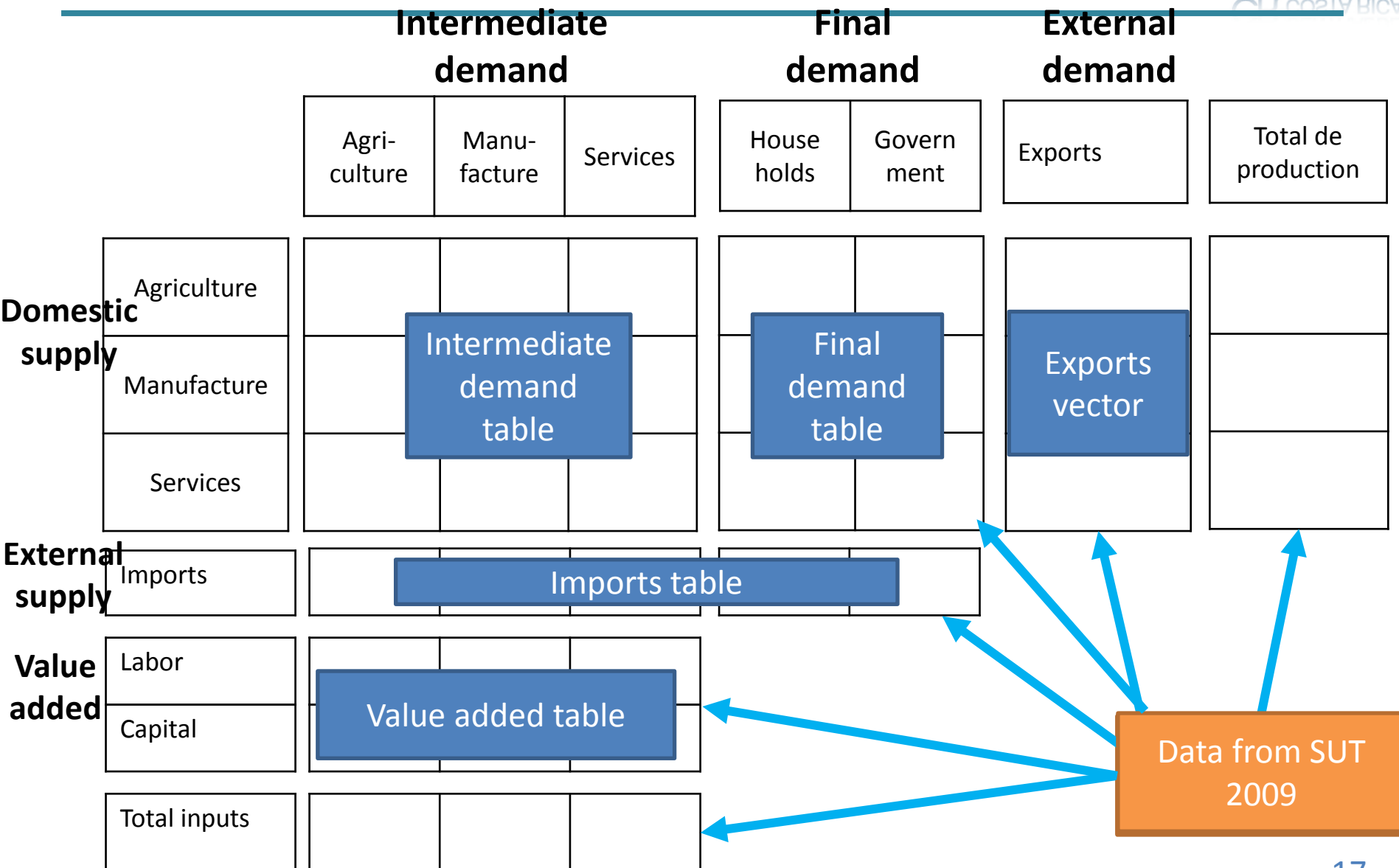
Analysis with CGV indicators:
TiVA, comparative advantages, Exports
breakdown

Preparing the domestic IOT

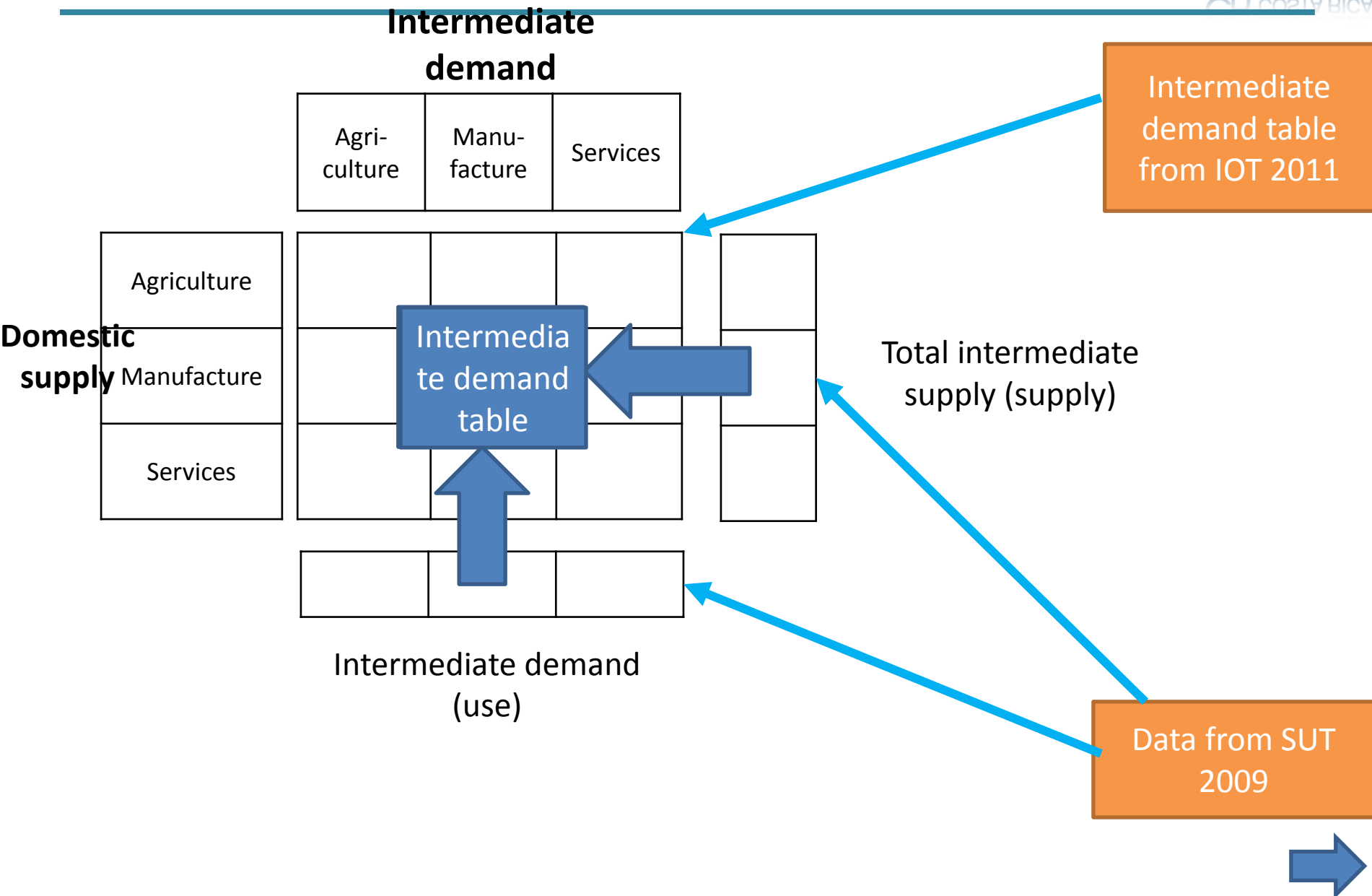
- 1 **Period:** Data from 2009 (last available year for the WIOD at that moment)
- 2 **Currency:** colones -> dollars (official exchange rate for the year 2009, BCCR)
- 3 **Price consistency :** basic prices in IOT and WIOD
- 4 **Concept consistency of industry /product:**
ISIC (SUT classification)
Breakdown: Intermediate consumption, final consumption, capital)
Classification of the WIOD
- 5 **Consistency of the trade flows:** CIF / FOB adjustment for the imports
WIOD is FOB (even when it is based on import data)



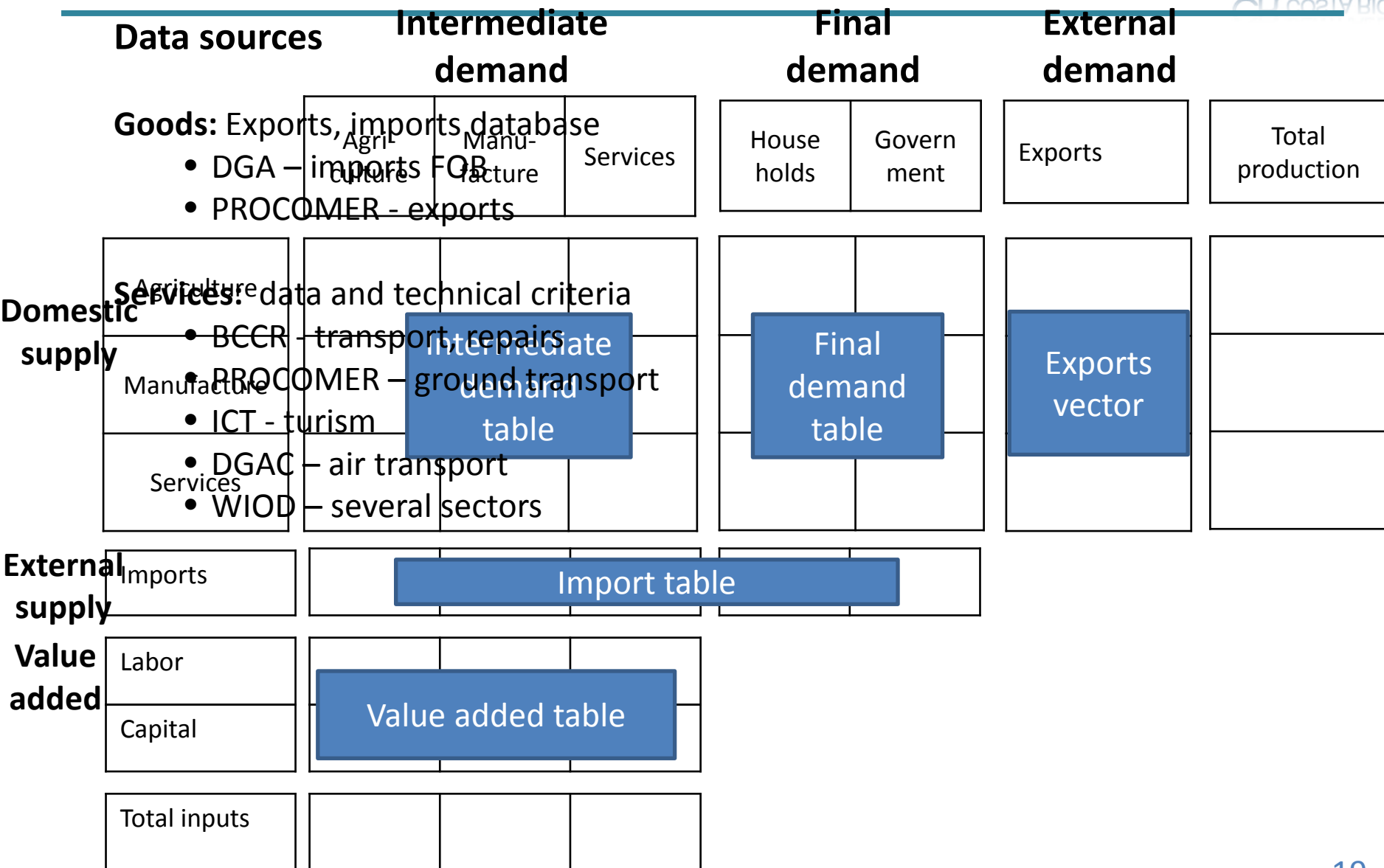
“Backdating”: to2009



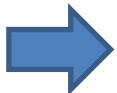
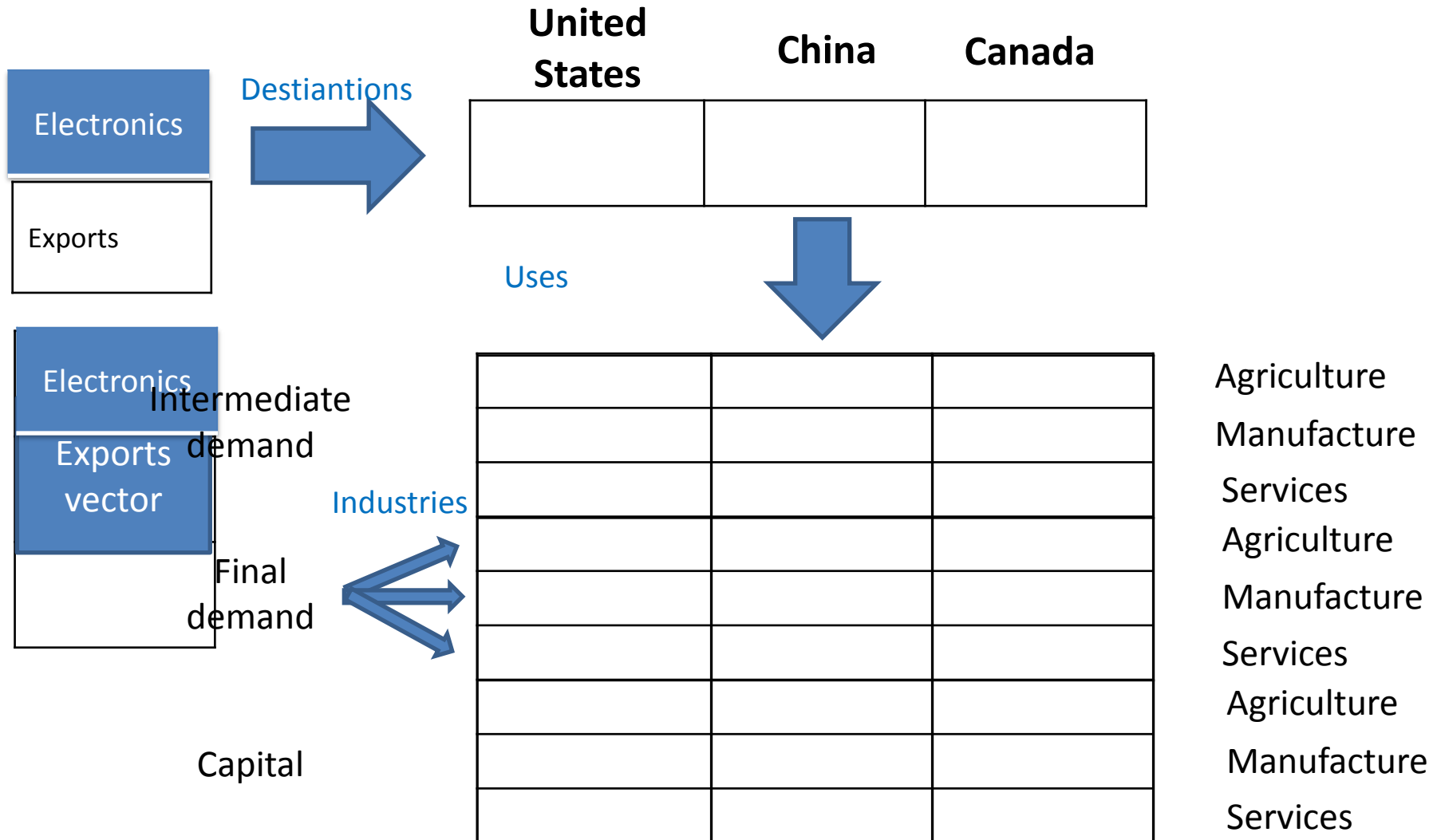
“Backdating”: to 2009



Assigning trade by country

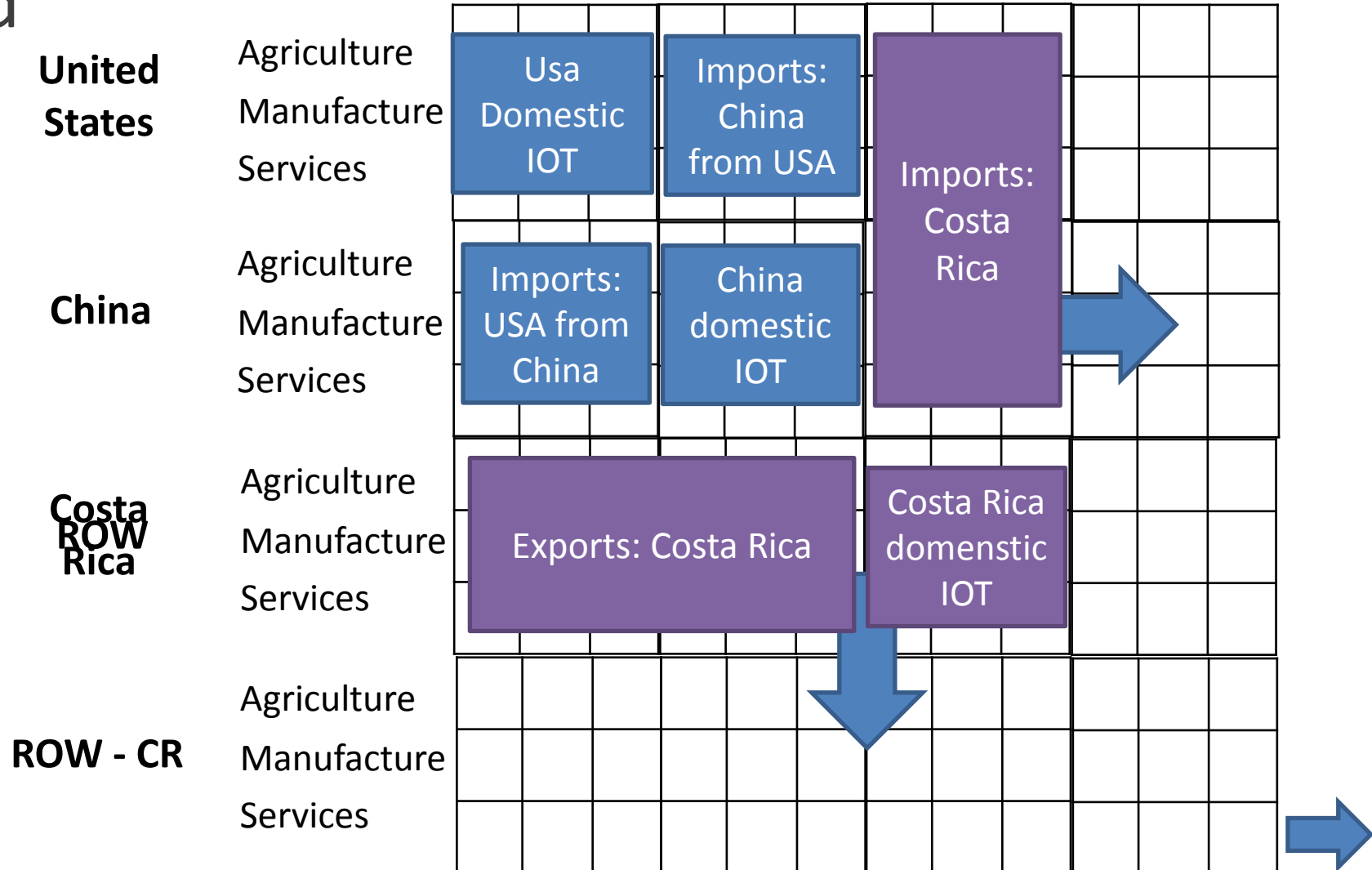


Vector of exports by country and by sector



Costa Rica dissagregation to the rest of the world

United States
 Agriculture
 Manufacture
 Services
China
 Agriculture
 Manufacture
 Services
Costa Rica
 Agriculture
 Manufacture
 Services
ROW - CR
 Agriculture
 Manufacture
 Services



Consistency testing

1

National accounts consistency: Export data from CR, (no mirror data) to ensure consistency with the national accounts.

2

Reduce negative number findings: Better assumptions and adjustments to minimize negative numbers.

3

Discrepancies vector: When Costa Rica data is more accurate than international data.

e.g.: Tourism -> Hotels & restaurants

Exports from CR to USA. National sources: \$418,2M

Imports of EE.UU. USA data: \$53,8M

Discrepancies ROW: -\$364,3 M

- Lessons learned from the international IOT

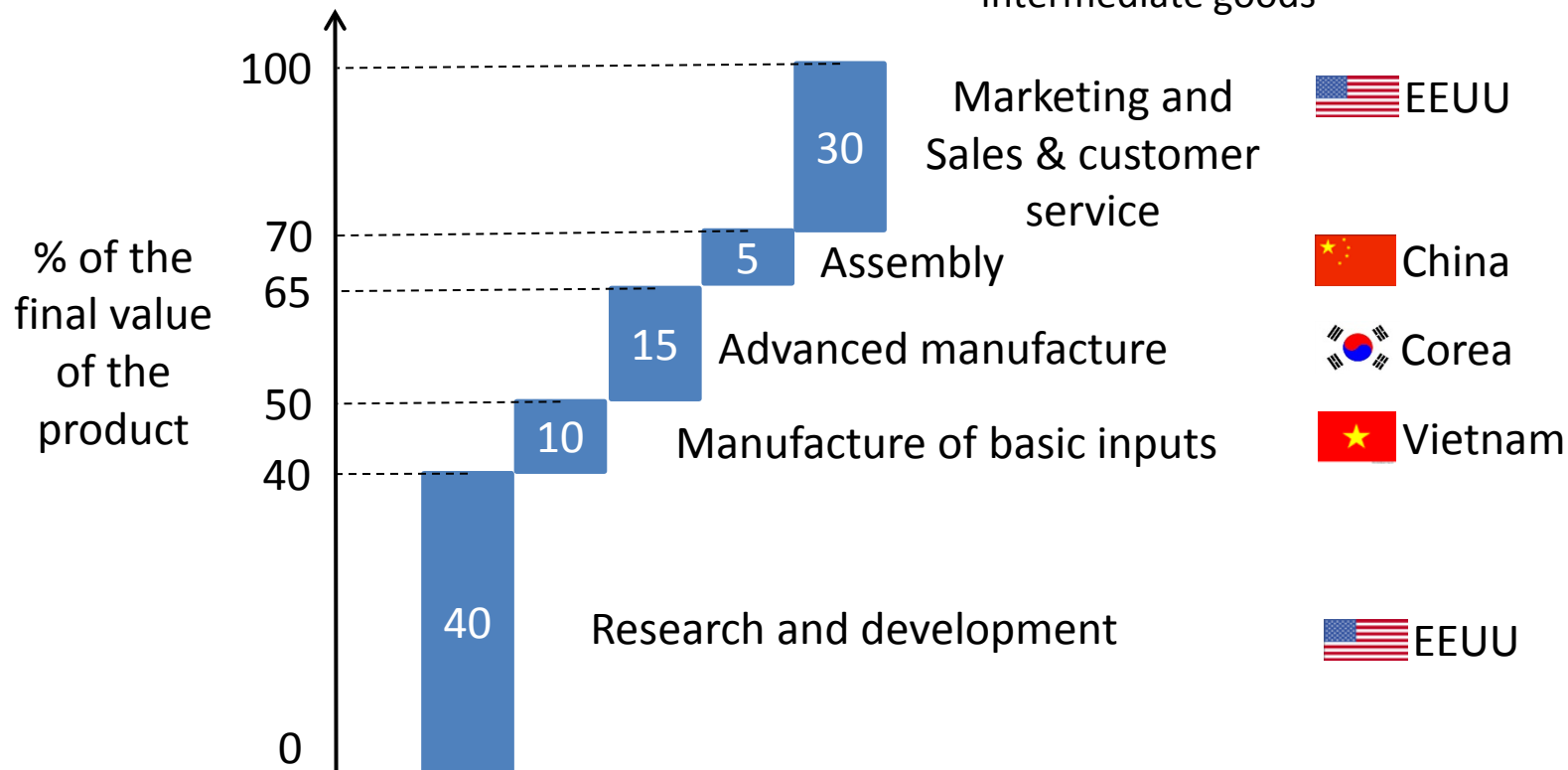
From gross value to value added

Gross value

- Cumulative value exported to another country
- E.g.: Korea – product to China: 65%
- Accurate to measure value if trade is focused on final goods

Value added

- Contribution in the exported value to the final destination
- E.g.: Korea – manufacture: 15% to USA
- Accurate to measure the value of the international trade if it is focused on intermediate goods



New methodology shows different magnitudes on exports according to GV vs. VA

Costa Rica: Structure of the export by country 2009

Exports detination	X gross value	X Added value	
Rest of the world	41,6%	38,5%	↓
USa	26,8%	28,2%	↑
Western Europe	15,8%	17,1%	↑
China	6,1%	5,4%	↓
Mexico	4,1%	3,1%	↓
Canada	2,3%	2,7%	↑
Rest of Europe	1,7%	2,5%	↑
Japan	0,9%	1,5%	↑
Brazil	0,9%	1,0%	↑
Total	100%	100%	

Also differences on imports GV vs. VA

Costa Rica: Structure of the imports by origin 2009

Origin of the imports	M gross value	M value added	
USA	39.3%	34.9%	↓
Rest of the world	29.6%	28.6%	↓
Western Europe	8.0%	10.6%	↑
China	7.0%	8.0%	↑
Mexico	8.2%	6.7%	↓
Japan	2.5%	4.0%	↑
Resto of Europe	1.9%	2.7%	↑
Brazil	2.5%	2.5%	→
Canada	1.1%	2.0%	↑
Total	100%	100%	

Implication por trade policy

1

Goals of diversification in terms of value added

- Real diversification according to final demand

2

Reduce trade barriers direct and indirect trade partners on CGVs

- Multilateral agreements to help create GVC's:
 - Alianza del Pacífico
- Agreements on the supply chains:
 - IT Agreement (ITA)
 - Anti-Counterfeiting Trade Agreement. (ACTA)

Encourage participation of CR in CGV

1

Diversification: companies, markets, activities

- High value FDI.
- Expand trade platform

2

Strengthen: Participation

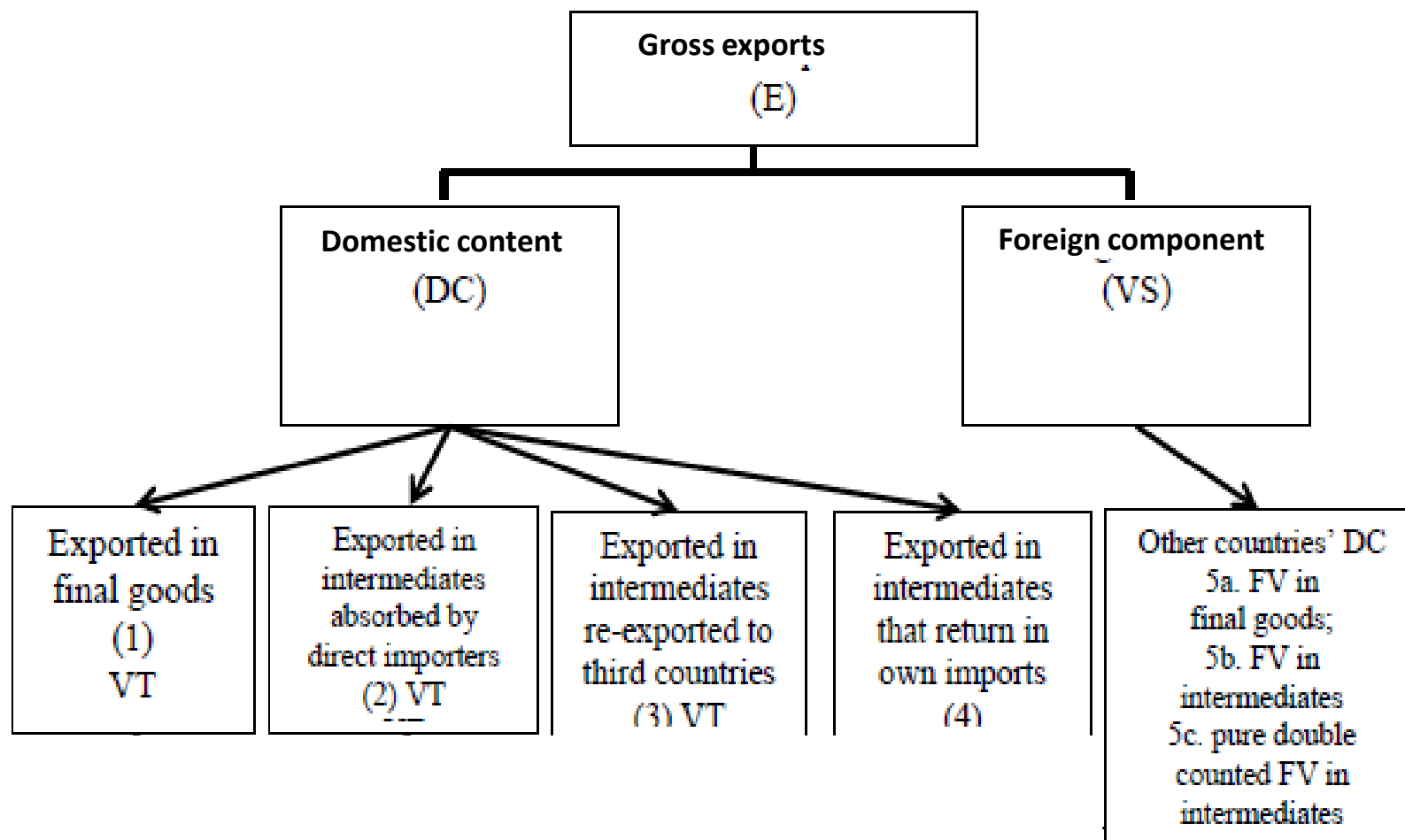
- Merging with local companies.
- Entrepreneurship.

3

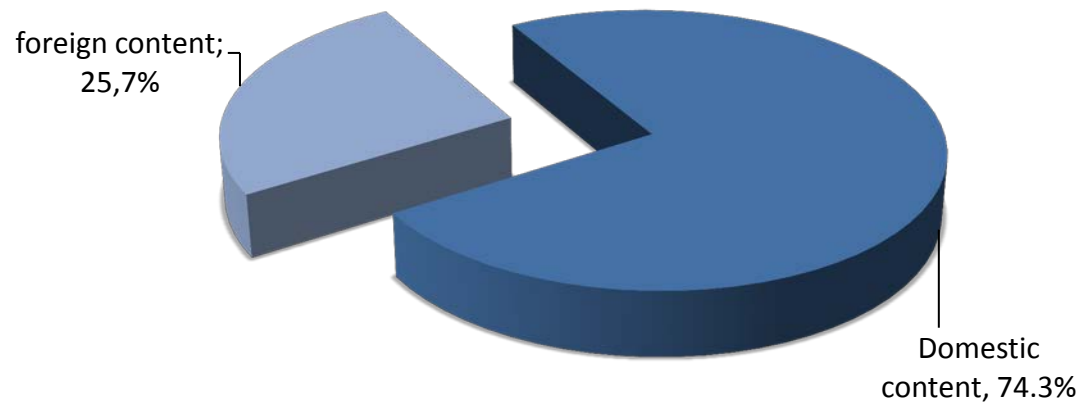
To higher value added activities

- Continuous investment and human capital.
- Promote innovation.

What are the components of the exports



Domestic content of the exports



- Intermediate and final product have the same weight.
- Exports indirectly to third parties.

1

Trade policy towards intermediate goods

- Imports contribute to the competitiveness of the companies.
- To reduce trade barriers on the supply chains.

2

Strategy to increase domestic content

- No restrictions for inputs with competitive prices.
- Strength the capacity building for companies to provide inputs with a clear competitive advantage.

Measuring Costa Rica's participation in GVC's

Department of Macroeconomic Statistics

ICMTEG, Aguascalientes, México

Sep-Oct, 2014