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# **The Domestic Content of Mexico's Maquiladora Exports: 1988-2006**

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# Outline

1. Introduction
2. Methodology.
3. Data.
4. Results.
5. Conclusion.

# Introduction

## Maquiladora

Industry that imports intermediate goods to process them in Mexico and to export them as final goods.



**Industrial Upgrading, key to succeed in Global Value Chains (Humphrey and Schmitz, 2002):**

- ▲ Domestic Value Added (DVA) and ▲ Productive Linkages.

**Research questions:**

- *What has been the evolution of DVA in the manufacturing sectors of Maquiladora industry?*
- *Are there any productive linkages that foster increasing levels of DVA?*

## Methodology (1): How to measure DVA and productive linkages?

- Index of Vertical Specialization (VS): A measure for foreign value added (Hummels et al.,2001)

$$VS = \frac{\text{Intermediate inputs (*imported*)}}{\text{Manufacturing goods (*to be exported*)}}$$

- **Direct effect (DVS):** Imported inputs that are no longer modified.

Microchips (imported) → Ipod (exported).

- **Indirect effect (IVS):** Imported inputs that require further processing

Thread (imported) → Fabric (domestically modified) → T-shirt (exported)

- **Total effect (TVS):** DVS + IVS

- Nevertheless, this index of VS proposed by Hummels et al. (2001) must be modified in order to study the specific case of countries highly engaged in EPZ.
- Therefore, we followed a methodology proposed by Yang et al. (2010) that mathematically modifies VS to consider countries highly engaged in EPZ.

## Methodology (2): So how to measure DVA and productive linkages?

**Direct level of domestic value added in the maquiladora** ( $DDVA^{maq}$ ),

$$DDVA^{maq} = 1 - DVS^{maq} \quad (6)$$

It indicates the level of domestic intermediate inputs that are totally produced in Mexico and that are embodied in the exports of the maquiladora.

**Indirect level of domestic value-added** ( $IDVA^{maq}$ ):

$$IDVA^{maq} = 1 - IDVS^{maq} \quad (7)$$

It studies the level of domestic intermediate inputs that have been used in the production of other domestic intermediate inputs used by the maquiladora and that are embodied in the exports of this industry

**Total level of domestic value-added** ( $TDVA^{maq}$ )


$$TDVA^{maq} = 1 - TVS^{maq} \quad (8).$$

**Productive linkages** =  $IDVA^{maq}$  \* Total level of domestic inputs used by the maquiladora

## Data

- **Constructing maquiladora IOT with G-RAS (Junius & Oosterhaven, 2003).**

- Old matrix: Maquiladora IOT for 2003 developed by Statistical Office (INEGI)
- Gross production of maquiladora at a subsector level
- Intermediate consumption of maquiladora,
- Gross value added of maquiladora,
- Maquiladora's total level of exports and imports.



Information available  
from 1988-2006 (INEGI)

- **Classification of manufacturing sectors (Giuliani et al., 2005).**

***Traditional manufacturing sectors***

Food and tobacco manufacturing  
Furniture assembly  
Mineral products

Textile, leather and footwear  
Paper and printing industry  
Basic metal industries

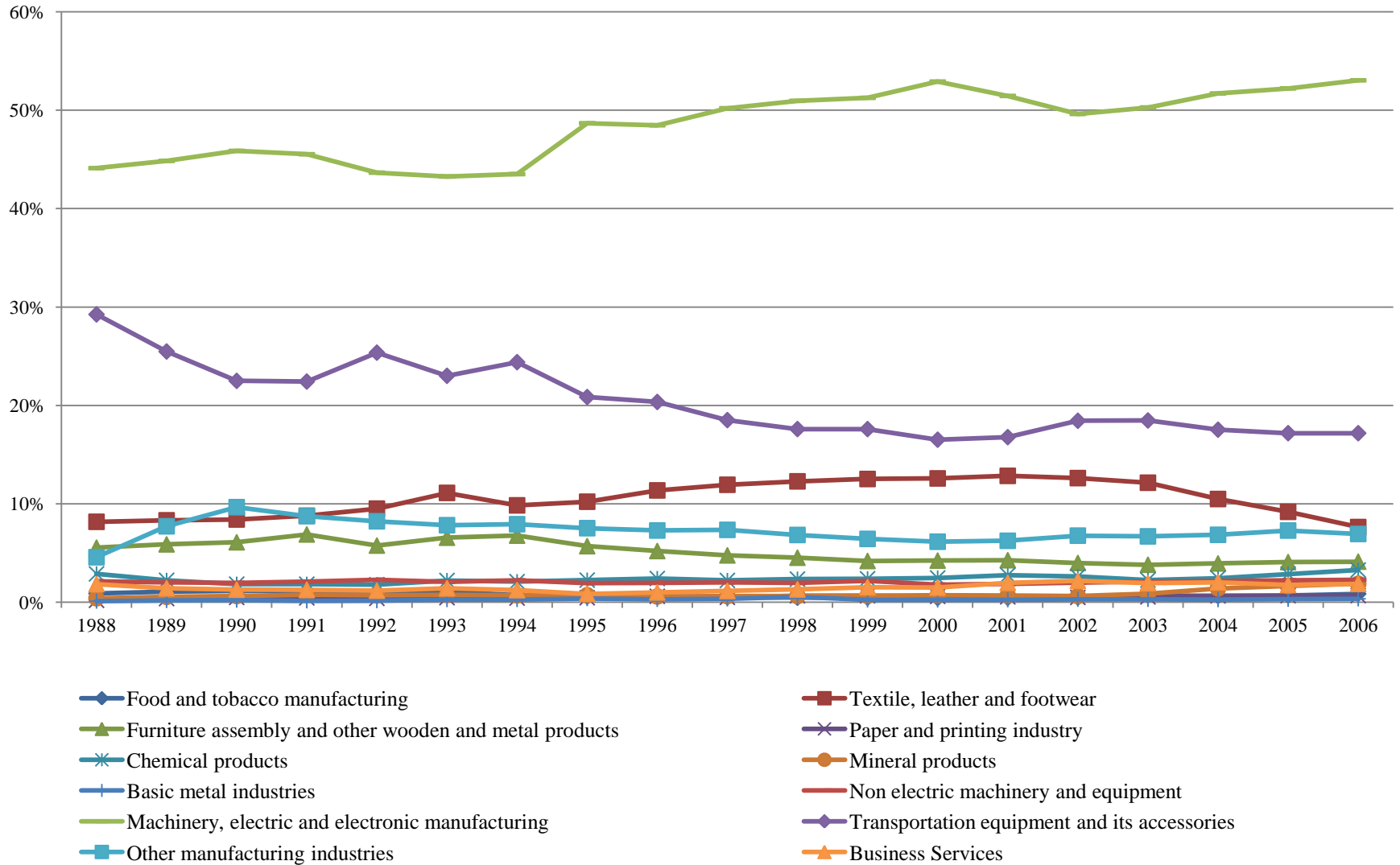
**More complex manufacturing sectors**

Chemical products  
Machinery, electric and electronic  
Other manufacturing industries

Non electric machinery and equipment  
Transportation equipment  
Business Services

# Data: A closer look to the data.

Figure (2): Participation of manufacturing sectors in the total gross production of maquiladora industry per year



Source: Authors' calculation.

## Results

### Traditional and Complex manufacturing sectors have low DVA

Average levels of domestic and foreign value added in constant Mexican pesos of 1993 (1988-2006). Data reported in millions.

	Domestic value added	Foreign value added
<i>Traditional manufacturing sectors</i>		
Food and tobacco manufacturing	1,46	1,29
Textile, leather and footwear	13,63	35,80
Furniture assembly and other wooden and metal products	6,32	13,03
Paper and printing industry	0,75	1,90
Mineral products	1,58	3,13
Basic metal industries	0,38	0,93
<i>More complex manufacturing sectors</i>		
Chemical products	5,21	6,48
Non electric machinery and equipment	2,27	7,07
Machinery, electric and electronic manufacturing	36,54	194,27
Transportation equipment and its accessories	18,04	63,02
Other manufacturing industries	7,39	23,52
Business services	3,28	4,44
<i>Whole maquiladora industry</i>	94,79	356,93

### Traditional and complex manufacturing sectors have low Productive linkages.

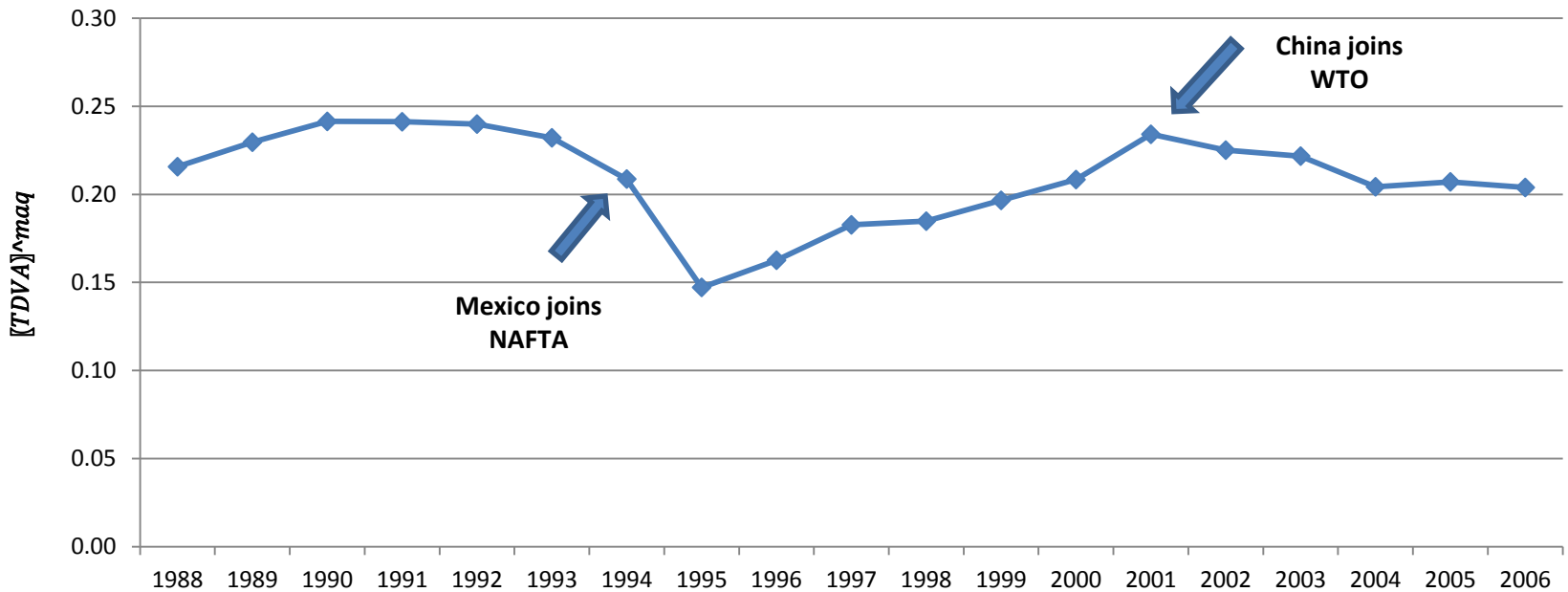
Average levels of productive linkages in constant Mexican pesos of 1993 (1988-2006). Data reported in millions.

	Domestic inputs used by domestic suppliers	Imported inputs used by domestic suppliers
<i>Traditional manufacturing sectors</i>		
Food and tobacco manufacturing	0,89	0,08
Textile, leather and footwear	5,81	0,15
Furniture assembly and other wooden products	2,78	0,07
Paper and printing industry	0,29	0,01
Mineral products	0,56	0,02
Basic metal industries	0,31	0,01
<i>More complex manufacturing sectors</i>		
Chemical products	1,99	0,14
Non electric machinery and equipment	1,08	0,02
Machinery, electric and electronic manufacturing	14,42	0,15
Transportation equipment and its accessories	6,92	0,08
Other manufacturing industries	2,49	0,04
Services	1,39	0,03
<i>Whole maquiladora industry</i>	39,13	0,59



# Results

Evolution of DVA in the maquiladora industry as a whole.



## Results per manufacturing sector over time

Period of time	Outcome
	<b>Late 1980s</b>
<b>1990s</b>	<p>Low levels in early 1990s and decline in DVA after NAFTA.</p> <p>Small increases in productive linkages</p>
<b>Early 2000s</b>	<p>Few sectors with high DVA</p> <p>Large amount of sectors with low levels (traditional and complex)</p>

## Conclusion (1).

- ***What has been the evolution of DVA in the manufacturing sectors of Maquiladora industry?***

Cyclical. Two external shocks (NAFTA, China) have deterred the existence of a continuous upward trend in DVA.

Cyclical behavior explained by the tendency of manufacturing sectors.

- ***Are there any productive linkages that foster increasing levels of DVA?***

Few signs of productive linkages between domestic suppliers and manufacturing producers. Excessive use of imported inputs not only due to tariff exemption. It is also related to the low quality of the domestic inputs.

### ***Overall Conclusion.***

- The maquiladora has achieved few signs of Industrial Upgrading. They have been discouraged by external shocks.
- Further support to the domestic supplier (not only to the maquiladora producers) is required.

# Thank you so much for your attention!

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