LITTLE VALUE CREATION, ARTICULATION AND PROPAGATING FORCES : A HYPOTHESIS FOR THE MEXICAN MANUFACTURING SECTOR

Authors: Santiago Roca
                Luis Simabuko

Escuela de Administración de Negocios para Graduados, ESAN. Lima-Perú

Objective

◆ The present article examines the impact of "open trade" and "specialization" in Mexican economic growth in the past 20 years

Open trade and growth

Theory

- Trade permits local companies to buy foreign goods, services, inputs, machinery and technology

- Also ideas management and organization

- Open trade eventually allows small countries to increase their exports and to gain access to broader markets

◆ Greater possibilities to benefit from economies of scale and from the international division of labor.

◆ Foreign markets leads to larger R&D spending, which accelerates technological change and economic growth.

◆ An open business environment creates more competition in the internal market, increasing the efficiency of local firms compared to when there are restrictions to international trade.

Empirical evidence

◆ Evidence of the positive relationship between open trade and economic growth (Dollar 1992, Sachs and Warner 1995, Edwards 1992)

◆ *Gravity models* (social, demographic, historical and institutional variables) try to isolate the net impact of open trade from other structural factors (Frankel and Romer, 1999; Dollar and Kraay, 2003).

◆ Dollar and Kraay 2001 estimate that an increase in the volume of business (as % of GDP) by 20 percent results in an increase in the annual growth rate between 0.5 and 1%.

Productive specialization and growth

Theory

◆ Graham

- if one country specializes in goods with increasing returns and the other country in goods with decreasing returns, the world will overall have increased income, but the level of the second country's income will be diminishing, while the first country's income will be increasing.

- **Prebish (term of trade), Myrdal** ("cumulative causations"), **Hirschman** (upstream and downstream links)

- **Matsuyama** ("induced learning"), **Sachs & Warner (institutions), Krugman (market imperfections)**

- **Reinert (high/low quality goods)**

Empirical evidence

◆ **IDB**: "countries where the exports with intermediate and high technological content represent 10% of GDP tend to grow between 0.1 and 0.2 percent more than others that -other factors being equal- do not export this type of goods"

◆ **Ros**: "for similar initial income and investment rate, the countries that specialize in manufacturing exports grew from 1960-1990 at a faster rate than exporters of primary products"

Roca y Simabuko: for each percentage point of primarization growth, per capita consumption fell by 2.6% and real wages and salaries fell by 5.4% and 7.4%, respectively. However, for each additional percentage point in manufacturing, per capita consumption rose by 4.2% and real wages and salaries increased by 10.6% and 15.5%, respectively.
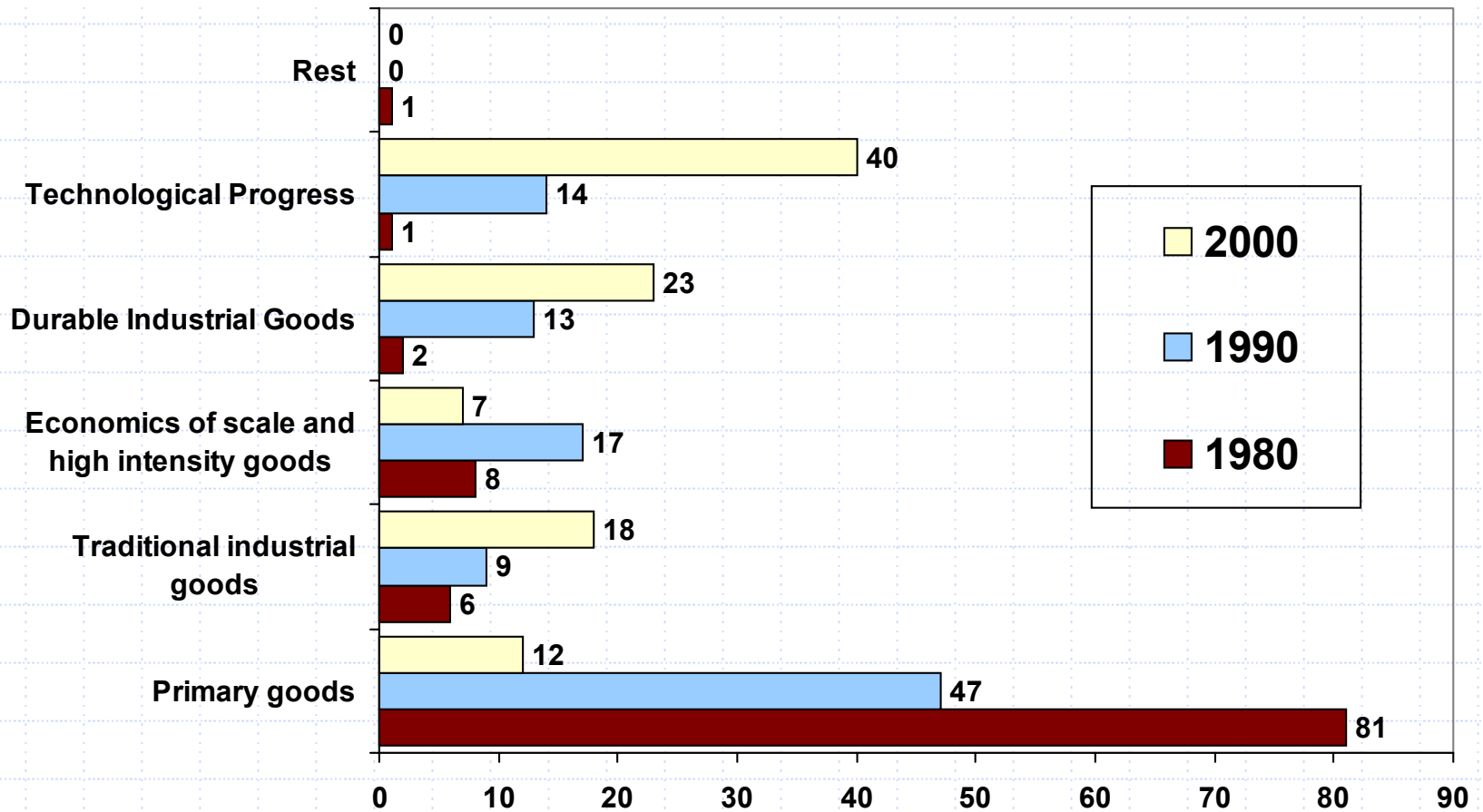
The Mexican case

Mexico's GDP per capita and trade opening, 1980-2001

GDP PER CAPITA (100=1980)

TRADE OPENING (% OF GDP)
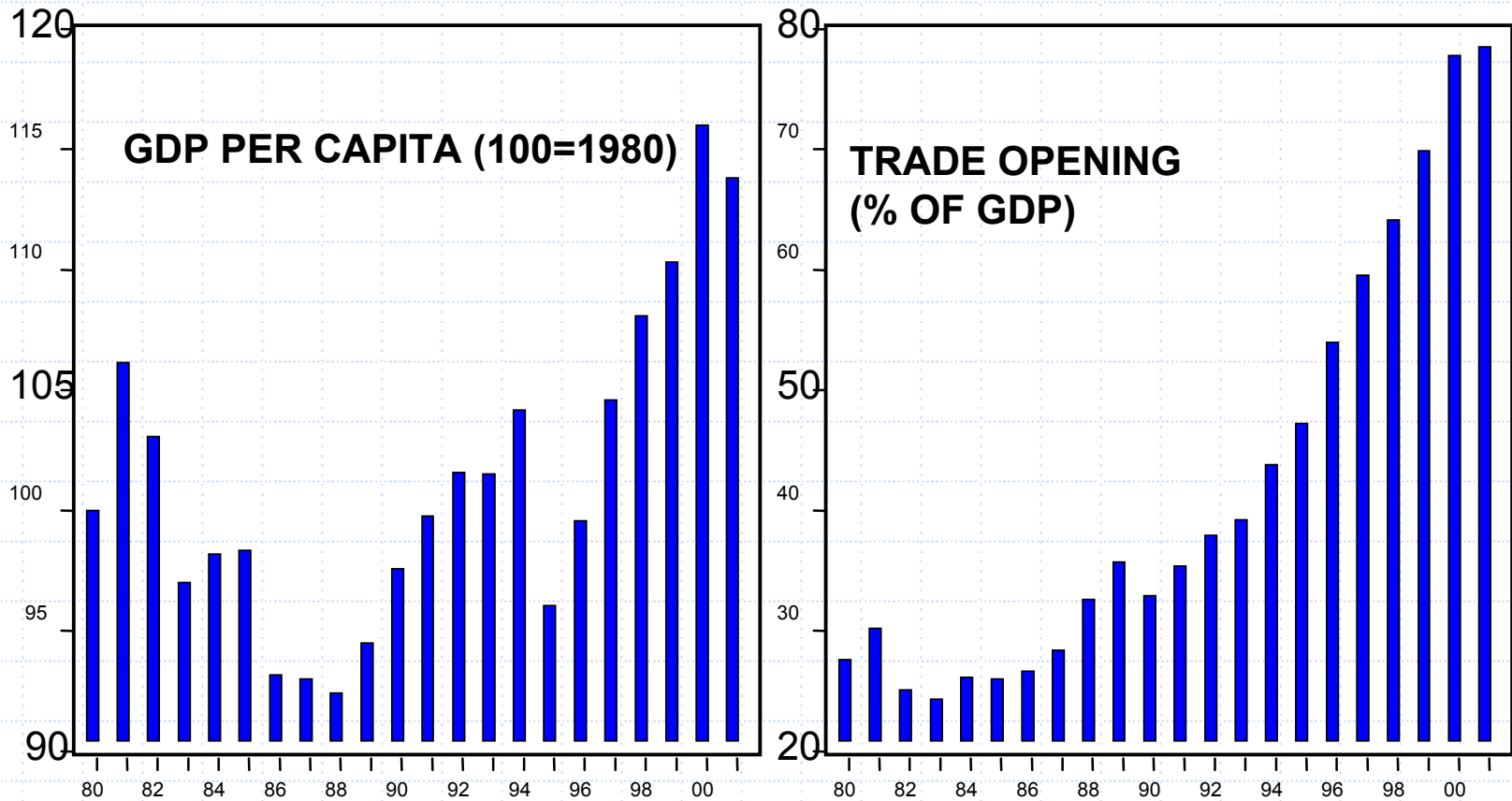
Source: CEPAL

Composition of Mexico's export goods (%)

Source: CEPAL

Model

◆ **ln GDPP = a0 + a1 ln OPEN**

   + a2 ln SPEC + e

◆ Where,

◆ GDPP   GDP per capita

◆ OPEN   Exports + imports (as % of GDP)

◆ SPEC   Productive Specialization: Exports of industrial products as % of total exports

◆ e   Other variables that affect GDP per capita.

Hypothesis
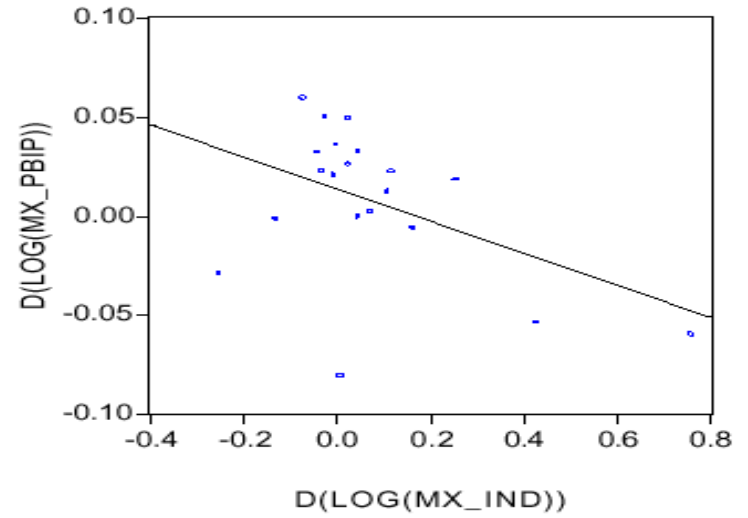
- **Hypothesis I:** a1 > 0. Trade opening positively affects economic growth.

- **Hypothesis II:** a2 > 0. Export specialization in industrial activities has a positive impact on economic growth.
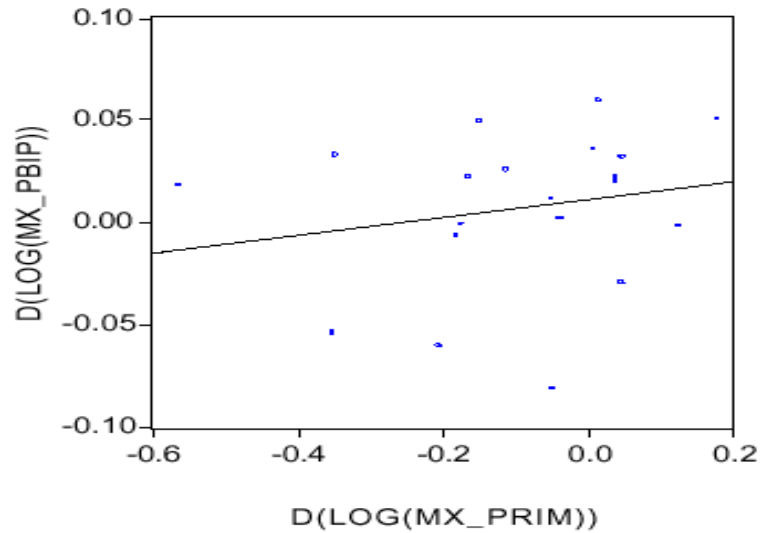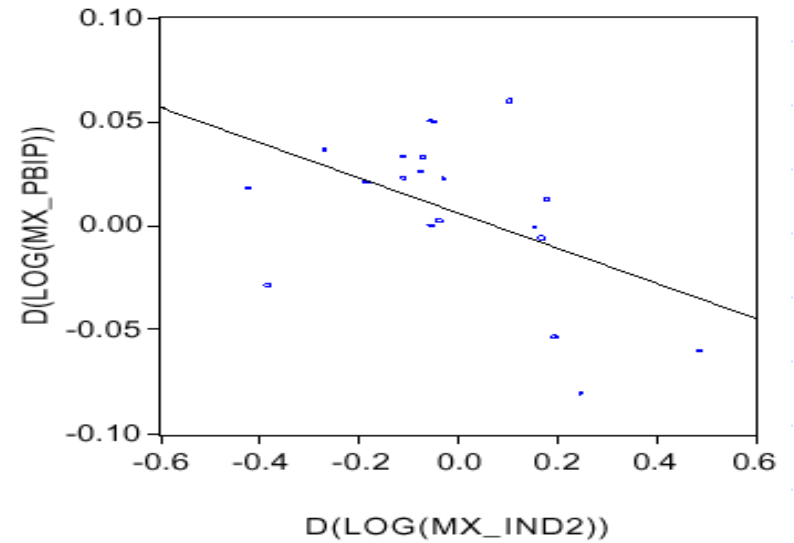
PBI PER CAPITA Y APERTURA
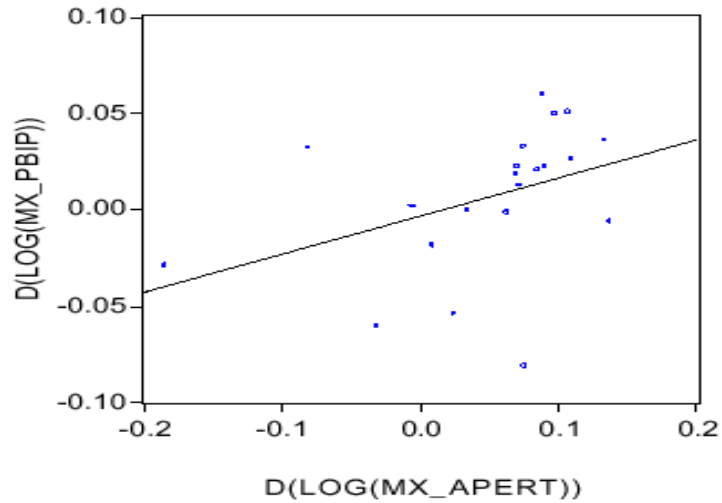
PBI PER CAPITA Y EXPORTACIONES INDUSTRIALES

PBI PER CAPITA Y EXPORTACIONES PRIMARIAS

PBI PER CAPITA Y EXPORTACIONES INDUSTRIALES CON ECONOMIAS A ESCALA

Mexico

Sample 1981-2000

$$D(LOG(MX\_GDPP)) = 0{,}008 + 0{,}217\ D(LOG(MX\_OPEN)) - 0{,}09\ D(LOG(MX\_IND)) - 0{,}105\ D95$$
$$\text{t:} \qquad\qquad (1.37) \qquad\qquad (3.45) \qquad\qquad\qquad (-.,96) \qquad\qquad (-4.81)$$

R2: 0.74
R2a: 0.69
F: 15.15 (0.00)
DW: 1.39

$$D(LOG(MX\_GDPP)) = 0.006 + 0.223\ D(LOG(MX\_OPEN)) + 0.06\ D(LOG(MX\_PRIM)) - 0.101\ D95$$
$$\text{t:} \qquad\qquad (0.43) \qquad\qquad (2.73) \qquad\qquad\qquad (1.67) \qquad\qquad (-3.59)$$

R2: 0.56
R2a: 0.48
F: 6.83 (0.00)
DW: 1.28

Variables in the Mexican Economy

MX_GDPP	GDP per capita (basis 1980=100)
MX_OPEN	Commercial opening (% del GDP)
MX_PRIM	Share of primary exports (%)
MX_IND	Share of industrial exports (%)
MX_IND1	Share of traditional industrial exports (%)
MX_IND2	Share of industrial exports with economies of scale (%)
MX_IND3	Share of exports of industrial durable goods (%)
MX_IND4	Share of exports of industrial technological progress diffusers (%)

Out of 16% increase of GDP per capita in period 1980-2000 the following explain:

- **Open trade**   **23%**
- **Specialization**   **-14%**
- **Other factors**   **7%**
- **Total**   **16%**

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How does trade opening increases GDP per capita ?

Table 2: Mexican imports by five-year periods (millions of dollars)

	1981-85	1986-90	1991-95	1996-00
Imports of technological progress goods (A)	5 925	6 677	23 059	54 885
Total imports (B)	16 234	19 881	63 364	131 576
A/B (%)	36,5%	33,6%	36,4%	41,7%

Source: INEGI (www.inegi.gob.mx)

Expenses in experimental R&D (Millions of pesos)
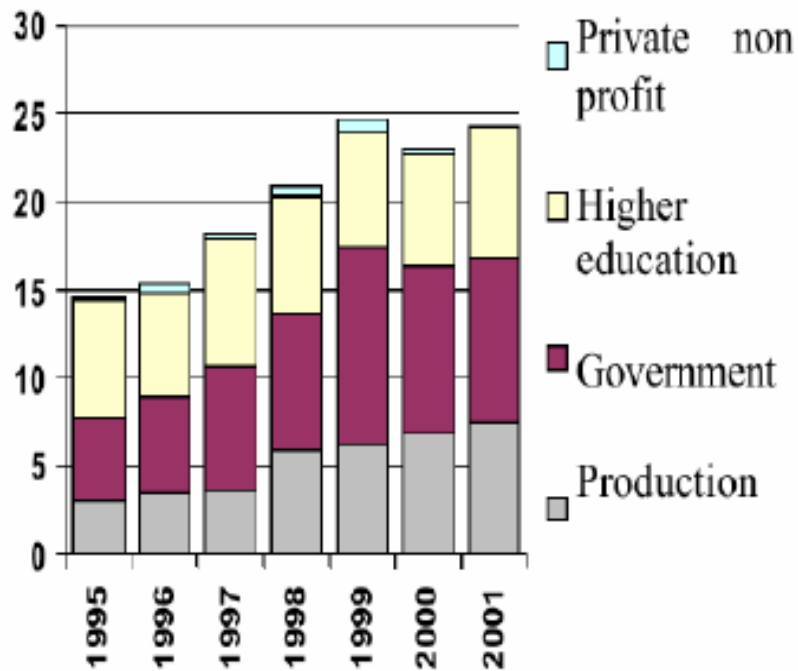
R&D personal (Thousand of equivalent full time persons)

Source: CONACYT

Source: CONACYT

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Table 3: Index of labor productivity in manufacturing (Basis 100=1993)

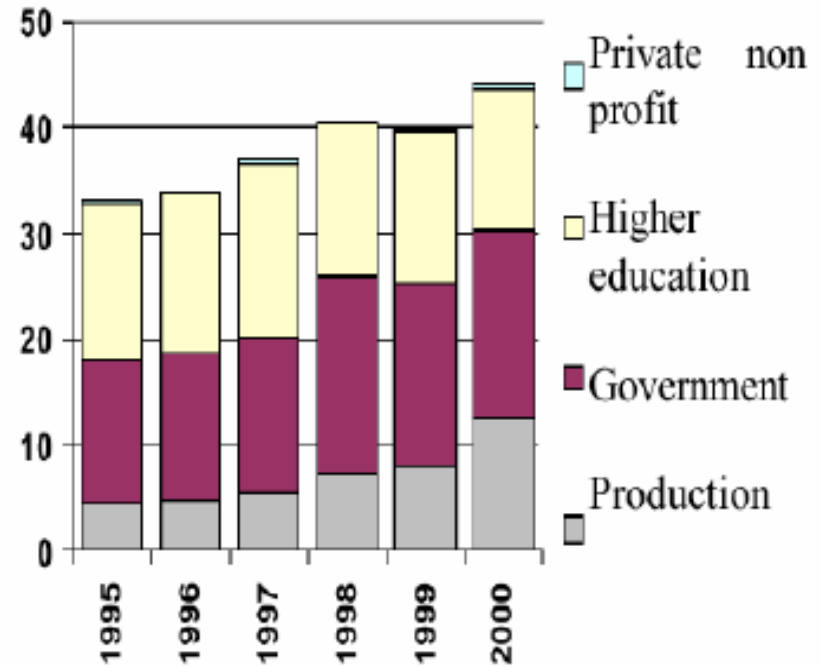|	Mexico */	United States	Canada	Japan	Germany	Korea	United Kingdom
1993	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1994	109,9	103,2	104,7	103,2	111,0	110,1	103,6
1995	115,3	108,3	109,1	107,8	113,6	122,2	102,5
1996	125,7	113,6	108,2	111,7	118,5	134,8	102,1
1997	130,9	120,5	108,6	117,5	127,3	147,0	103,1
1998	136,4	128,1	112,5	113,3	131,1	158,7	103,3
1999	139,0	136,4	117,6	117,0	133,9	192,3	107,3
2000	145,7	144,3	118,3	123,8	142,6	212,3	112,5
2001	146,8	148,2	113,2	119,8	143,0	213,6	114,2
2002 p/	153,6	158,0	114,5	123,8	145,3	232,8	114,9

* Excluding maquila . P = Preliminary

Source: INEGI (www.inegi.gob.mx)

Table 4: Typology of production organization models of the Mexican maquila

Functions Organization models	Operations management	Process Engineering	Product Engineering	Design	R&D
Assembly - traditional	*	-	-	-	-
Continuous manufacturing/ assembly - traditional	*	*/-	*/-	-	-
Manufacturing – traditional specifications	*	*	*/-	*/-	-
Continuous manufacturing - edge	*	*	*	*/-	-
Manufacturing - edge specifications	*	*	*	*	*

* = present

\- = absent

*/- = present only for greater product complexity

Source: Alonso, Carrillo and Contreras, 2000; p. 26.

Table 5: Structure of exports (%)

	World Trade 1/		Mexico 2/		Ireland 3/		Singapore 4/	
	1980	1998	1986	2000	1985	1998	1985	1998
Natural Resources	25,6	15,1	45,5	12,6	20,5	6,9	4,4	1,5
Manufacturing based on natural resources	18,7	11,6	12,5	6,0	24,1	33,4	38,2	14,5
Manufacturing not based on natural resources	55,8	73,4	41,7	81,0	53,5	57,7	54,0	80,2
Of low technology	14,2	16,8	8,7	15,2	15,2	11,5	8,7	4,6
Of medium technology	31,0	34,3	23,6	37,6	15,4	11,4	17,5	14,8
Of high technology	10,6	22,3	9,4	28,2	22,9	34,8	27,8	60,8
Others	--	--	0,3	0,3	1,9	2,0	3,3	3,9
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

1/ BID, 2001; p. 53

2/ CEPAL, 2003

3/ Mortimore, Vergara and Katz, 2001; p. 68

4/ Mortimore, Vergara and Katz, 2001; p. 67

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Why specializing in manufacturing exports does not increase GDP per capita ?

Limited links

Table 6: Inputs bought by Mexican maquila (as % of GVP)

	Imports	Domestic	Total
1980	69.3	1.2	70.5
1985	75.1	0.7	75.8
1990	74.8	1.3	76.1
1995	80.8	1.4	82.2
1996	81.4	1.7	83.1
1997	79.8	1.8	81.6
1998	78.4	2.2	80.6
1999	76.6	2.4	79.0
2000	75.6	2.4	78.0
2001	73.1	2.7	75.8

Source: CEPAL, 2003; p. 13

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Graph 5: Value Added. Maquila and other manufacturing industries (Billion of 1993 pesos)

Other (right)

Maquila (left)
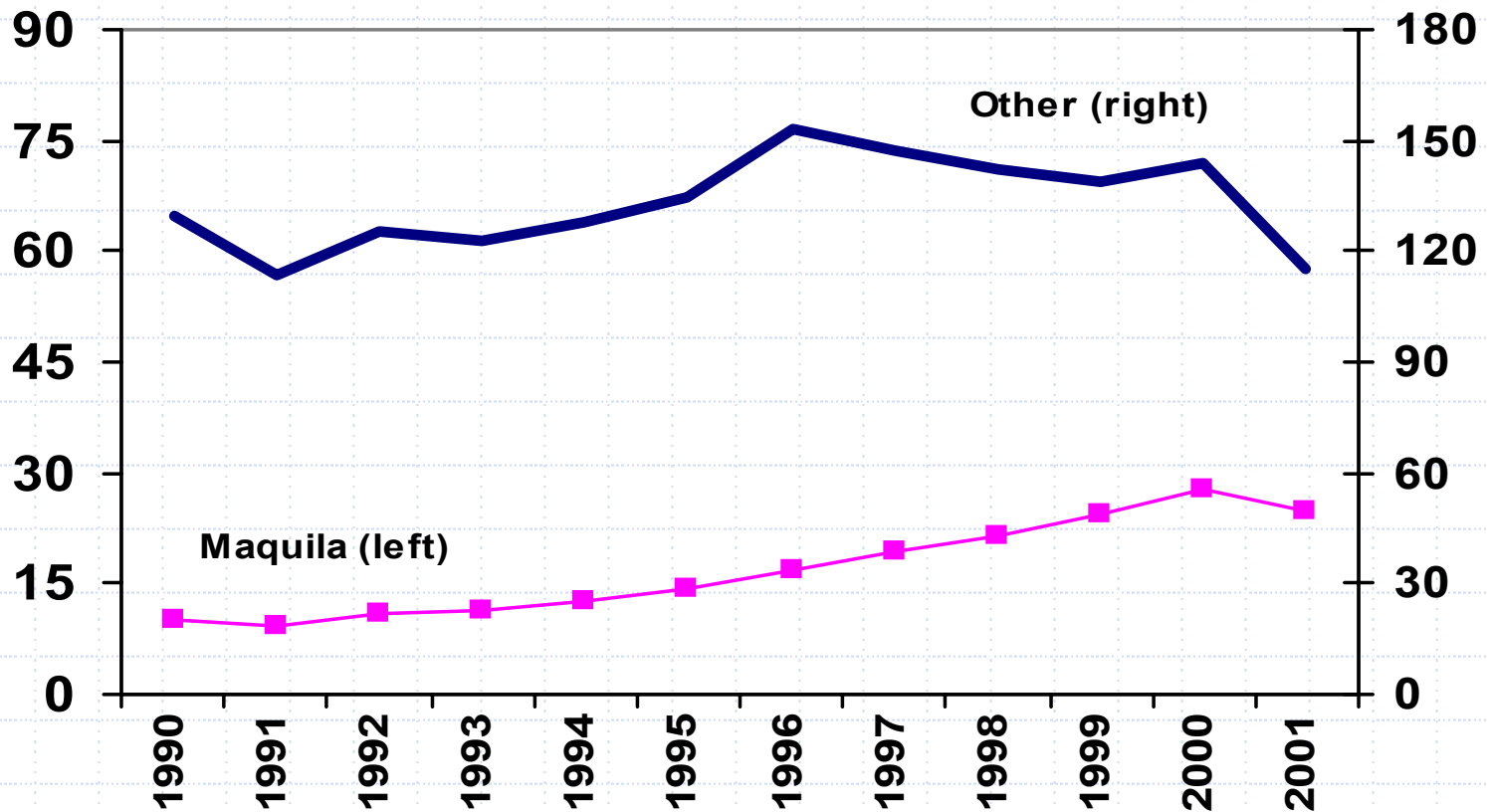
Source: INEGI (www.inegi.gob.mx)

Poor increase in value added

Table 7: Composition of VA in Mexican maquila (as % of GVP)

	Wages	Profits	Rest	Total
1980	18.2	5.1	7.4	30.7
1985	12.8	4.8	7.3	24.9
1990	13.0	4.1	8.1	25.2
1995	9.4	2.8	7.0	19.2
1996	9.0	2.4	7.2	18.6
1997	10.0	2.7	7.5	20.2
1998	10.5	3.0	8.1	21.6
1999	11.4	3.3	8.7	23.4
2000	12.4	2.7	9.3	24.4
2001	13.3	3.5	10.1	26.9

Source: CEPAL, 2003; p. 13

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Cheap labor

Maquila: Real remunerations and GDP (% change)

	Remunerations	GDP	Elasticity
1994/1990	4.8%	29.1%	0.81
1996/1994	-10.4%	32.9%	0.67
2001/1996	23.9%	47.1%	0.84

Source: INEGI (www.inegi.gob.mx)

Prepared by the authors

◆ % change in remunerations is lower than % change in GDP in all three periods.

◆ Labor is gaining less from their contribution to value added.

Other Explanations to Explore

World market saturated products and declining prices

Potentially low division of labor and low technological skill formation

Low potential to diffuse and disseminate knowledge in other sectors (slope learning curve close to zero)

Conclusions

- Trade opening is directly related to GDP per capita
- Manufacturing exports are inversely related to GDP per capita

◆ Mexico's export-led industrialization successfully adapted to the world market and transformed its productive, business, organizational and technological structure.

◆ It however did not translate into clear macro benefits due to the absence of strong links, little value and weak dissemination forces over the rest of the economy.

◈ Poor internal linkages in the maquila industry, high import propensity and limited generation of VA, among other elements, leads the maquila industry to operate as an export enclave.

◆ In those circumstances, manufacturing will generate weak positive externalities and articulations, nor strong disseminations that increase value in other sectors of industry and in economic activity at large.

Muchas gracias

sroca@esan.edu.pe
lsimabu@esan.edu.pe