


Causes of Recession in Maquiladora Industry

Ernesto Acevedo

November, 2003

Content

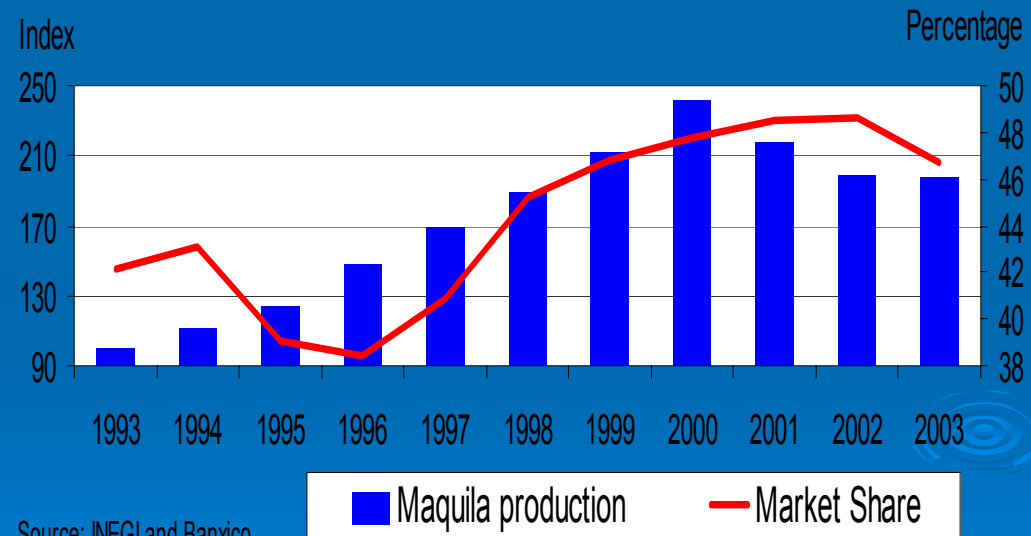
- Outstanding performance in the 90's
 - What are the causes of the crisis in the sector?
 - External demand
 - Labor and services costs in Mexico
 - Regulation
 - International competition
 - Concluding
 - Is the maquiladora industry ready to face increasing global competition?
- 

During the 90's economic performance of maquiladoras was booming...

- Between 1994 and 2000 its production grew 13.8 per cent on average every year.
- Its exports were almost \$80 billions and they represented 47.7 per cent of total Mexican exports.

MAQUILA PRODUCTION AND MAQUILA MARKET -SHARE

(1993=100)

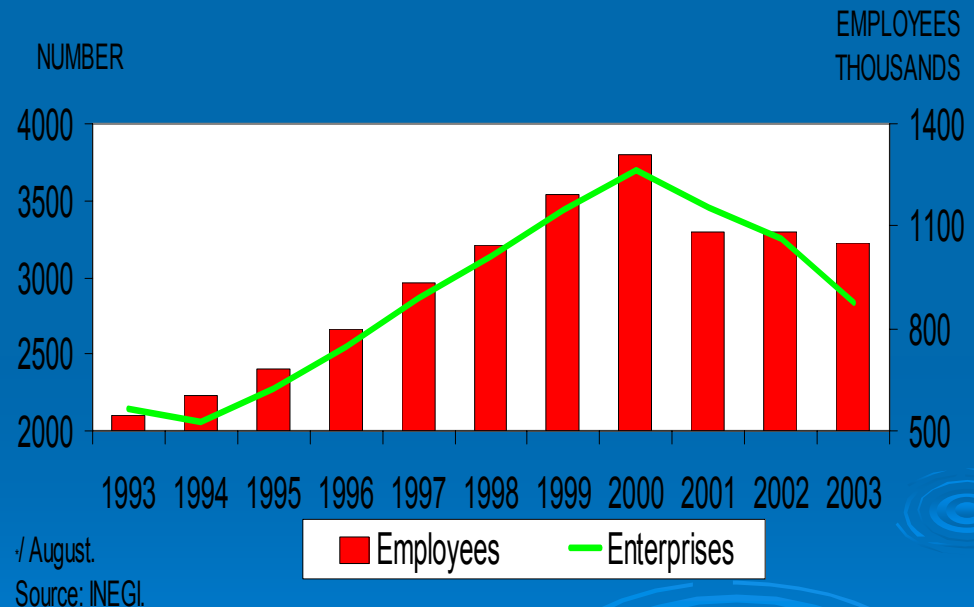


Source: INEGI and Banxico.

This industry was the main generator of employment in the Mexican economy.

- Total employment in the sector went up from 268 thousand to 1.3 million workers between 1986 and 2000.
- In 2000 there were almost 4 thousand maquiladoras in the country, 72 per cent more than in 1994.

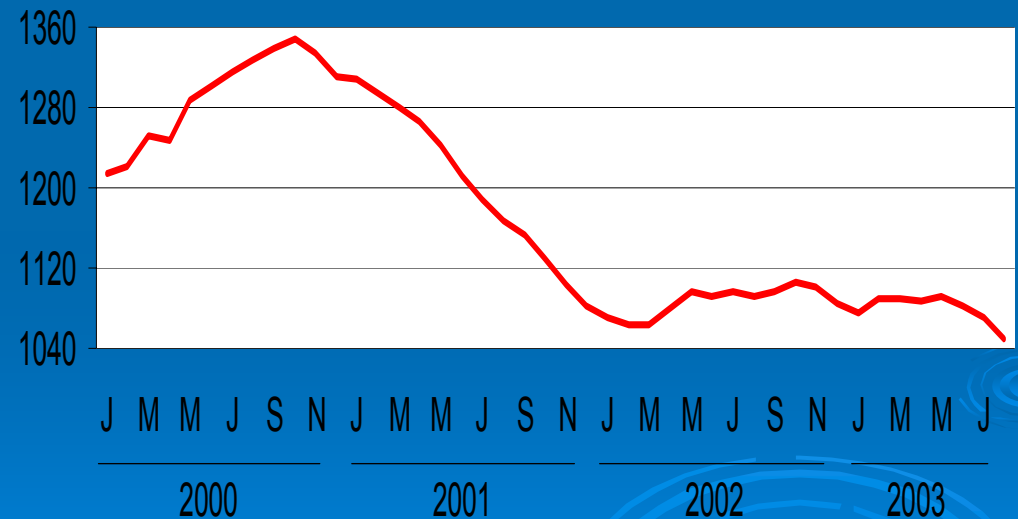
MAQUILADORAS AND EMPLOYMENT IN MAQUILAS



Employment in the sector contracted dramatically.

- Almost 300,000 jobs were lost between October 2000 and August 2003.

EMPLOYMENT IN THE MAQUILA SECTOR
(Thousands)




Source: INEGI.

What are the causes of this crisis?



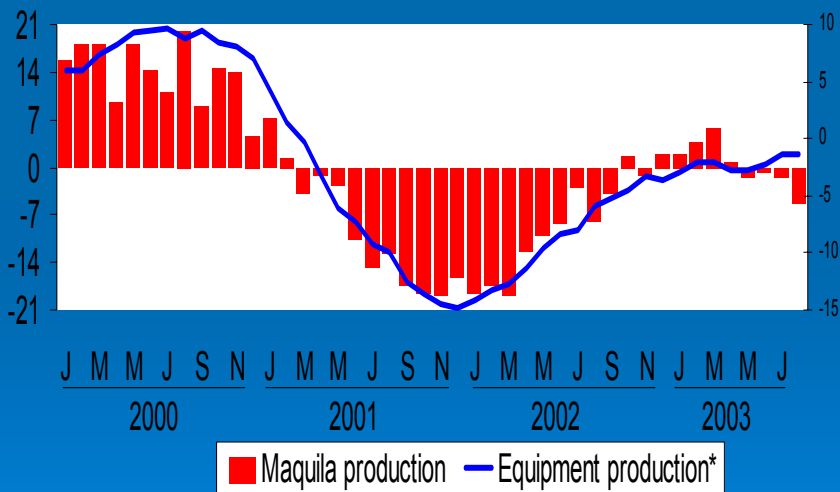
Four factors may explain the recession of maquiladora sector...

- Contraction of external demand, U.S. economic recession
 - Higher cost of labor and services in Mexico
 - Shift in commercial and fiscal regulations
 - International competition
- 

Contraction of external demand... Industrial production (equipment and business supplies)

- Correlation between the U.S. industrial production and the Maquiladora activity is very high : 0.94.

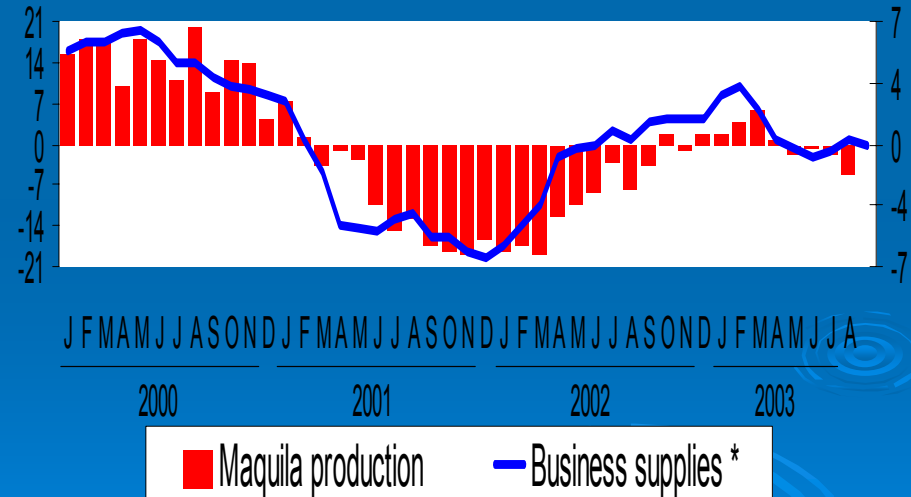
U.S. INDUSTRIAL ACTIVITY AND MAQUILA PRODUCTION
(Annual growth rate)



* / Second axis.

Source: INEGI and Federal Reserve.

U.S. INDUSTRIAL ACTIVITY AND MAQUILA PRODUCTION
(Annual pgrowth rate)

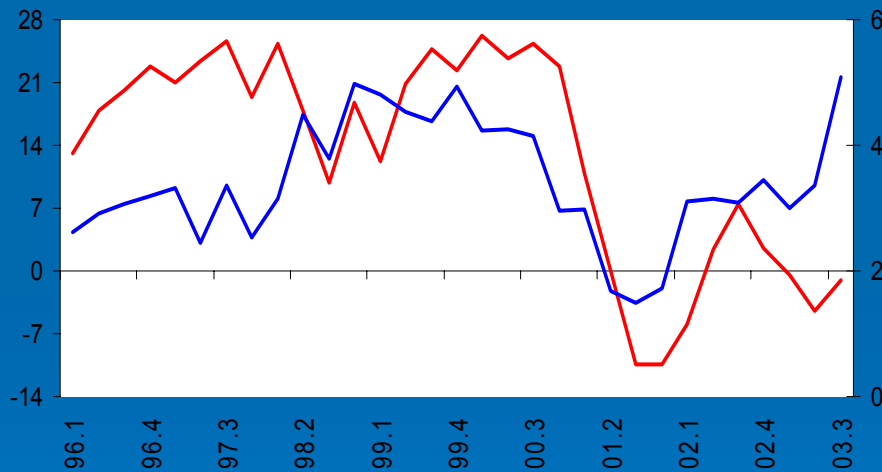


* / Second axis.

Source: INEGI and Federal Reserve.

Contraction of external demand... Consumption and investment in the U.S.

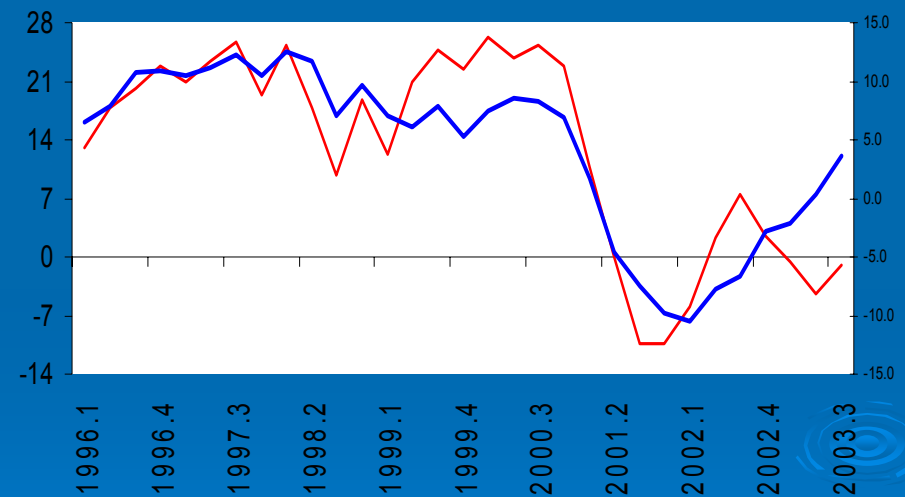
MAQUILA EXPORTS AND CONSUMPTION
(Annual percent change)



Source: BEA and Ministry of Economy.

— Maquila exports
— Non Durable goods consumption

MAQUILA EXPORTS AND INVESTMENT
(Annual growth rate)



Source: BEA.

— Maquila exports
— Non residential investment

Sensitivity of maquila exports...

- The elasticity of maquila exports to the U.S. industrial production is 1.98.

$$\eta_{X,IP} = \frac{\delta \ln X_{MEX}}{\delta \ln IP_{US}} = 1.98$$

- Meanwhile, the elasticity of maquila exports to the U.S. aggregate demand is 1.66.

$$\eta_{X,D} = \frac{\delta \ln X_{MEX}}{\delta \ln D_{US}} = 1.66$$

X_{MEX} = Mexican maquila exports

IP_{US} = U.S. industrial production

D_{US} = U.S. aggregate demand

However, external demand explains only 80 per cent of changes in maquiladora's exports... What can explain the other 20 per cent? Maybe the cost of labor and services.

- Wages in maquila sector increased 17.3 per cent in USD terms between 2000 and 2003.
- Core inflation of services increased at an annual average rate of 7.8 per cent.

EARNINGS IN THE MAQUILA INDUSTRY AND CORE INFLATION

	Monthly Average Earnings Dollars	Annual average percent growth	
		Goods	Services
1994	488	6.1	8.2
1995	324	41.0	27.5
1996	349	39.4	27.9
1997	411	20.3	21.1
1998	430	15.9	16.0
1999	489	16.7	16.4
2000	565	8.8	10.5
2001	663	5.2	7.5
2002	710	2.3	6.7
2003*	663	2.1	5.4

* During the period January-August.

Source: INEGI and BANXICO

The costs of labor and services do impact in a negative way the growth rate of exports, but only slightly.

- The sensitivity of maquila exports to labor cost is -0.005.

$$\eta_{X,CI} = \frac{\delta \ln X_{MEX}}{\delta \ln CI_{MEX}} = -0.005$$

- While the elasticity of maquila exports to services cost is -0.007.

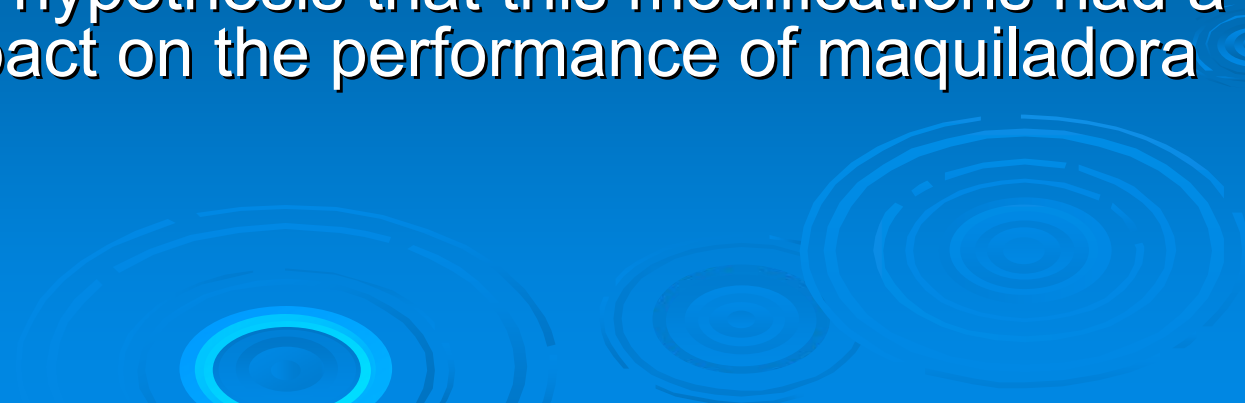
$$\eta_{X,W} = \frac{\delta \ln X_{MEX}}{\delta \ln W_{MEX}} = -0.007$$

X_{MEX} = Mexican maquila exports

W_{MEX} = Mexican real wage in USD in the maquila sector

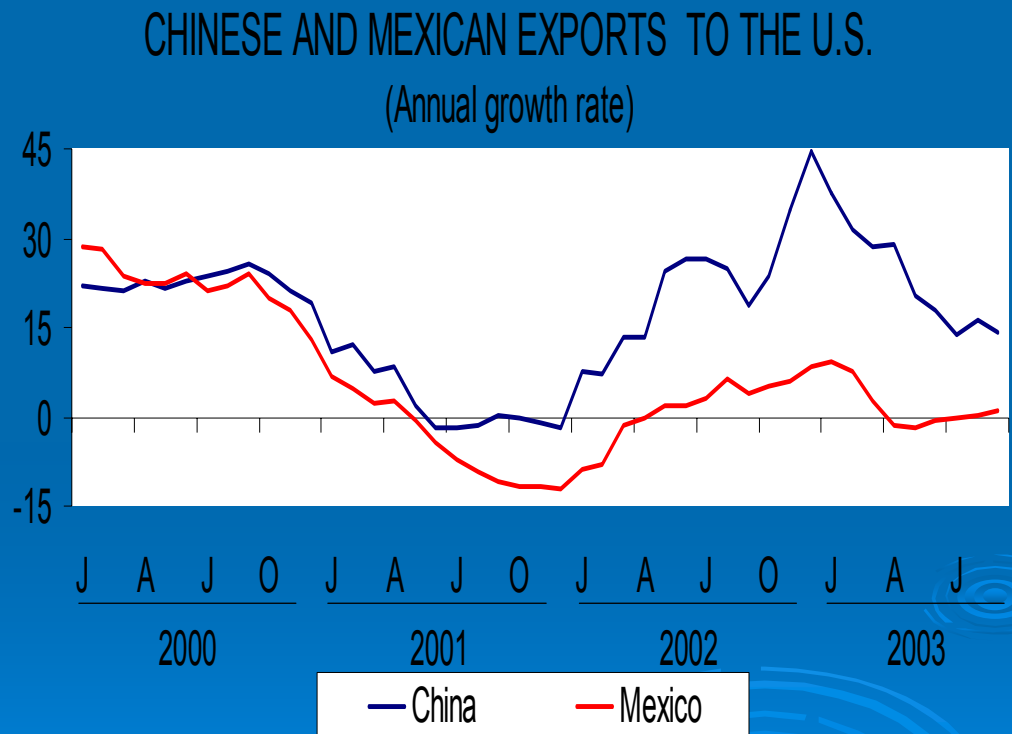
CI_{MEX} = Core inflation of services

Changes in regulation do not seem to have played a significant role either.

- In 2001 commercial regulations changed, eliminating exemptions to some inputs imported by maquiladoras.
 - Uncertainty regarding fiscal regime.
 - However, there is no statistical evidence that supports the hypothesis that this modifications had a negative impact on the performance of maquiladora sector.
- 

What about international competition? It may explain part of the story...

- Certainly Chinese exports to the U.S. have recovered the rhythm they had before the recession.
- While Mexican exports are lagging behind.

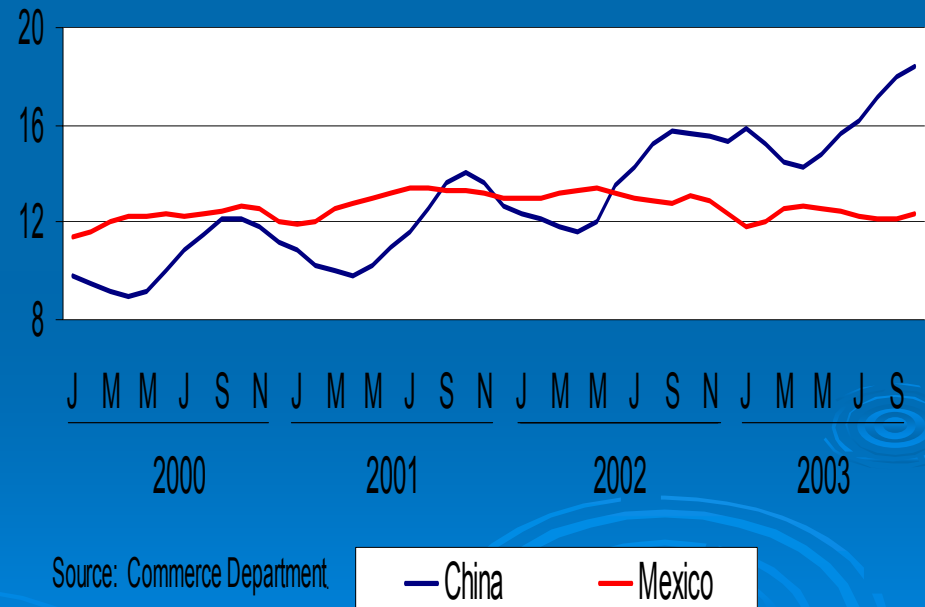


Source: Departament de Comerce.

This situation has led to changes in market share

- China's market share has kept increasing, becoming China the second most important supplier of the U.S. economy.
- Meanwhile, Mexican exports to the U.S. have remained almost constant, around 11 per cent.
- Even though that, it comes to mind the hypothesis of substitution between Mexican and Chinese exports to the U.S.

**U.S. MARKET SHARE OF CHINESE AND MEXICAN EXPORTS
MANUFACTURING GOODS**
(Market-Share)



A Granger causality analysis gives us very interesting results.

- They suggest three kind of relations between the Mexican and Chinese exports.
- For the main Mexican exports it was found:
 - Substitutes: 5 categories
 - Complements: 8 categories
 - With no evidence: 2 categories

	Share of total Mexican exports*
Substitutes	6.4
Complements	12.8
With no evidence	4.5

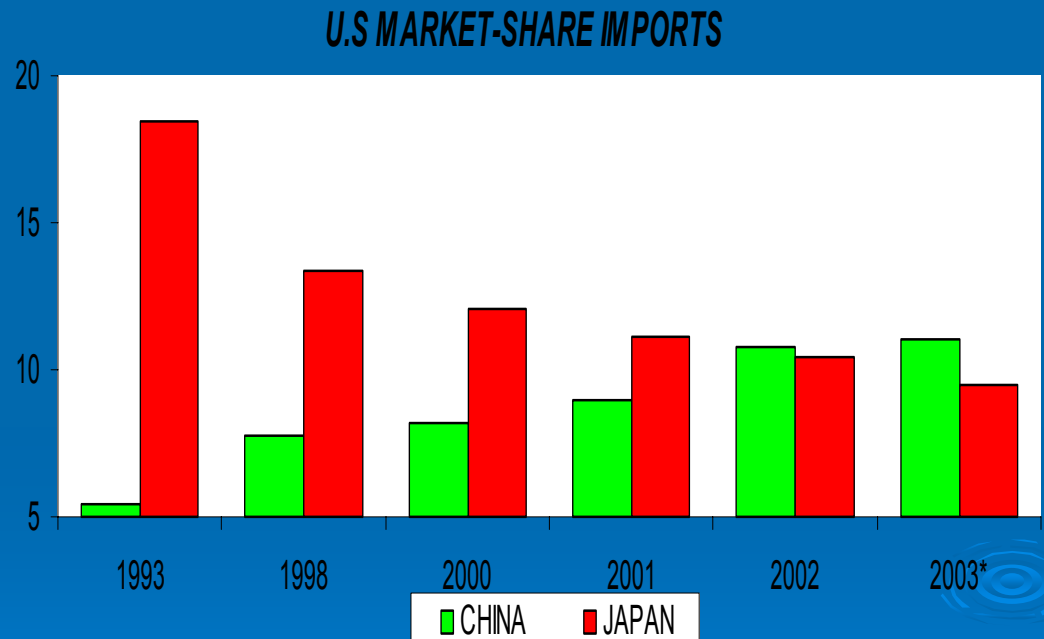
*/ Between March 2002 and February 2003.

Products	Change in Market Share */	
	Mexico	China
Substitutes		
Parts and accessories of automatic data processing machines and units thereof.	-2.6	4.8
Input and output units for computers and other data processing machines.	-1.9	8.2
Transmission apparatus for fax, television and radio transmitters.	-3.6	2.2
Women's /girls trousers, overalls and shorts woven cotton.	-3.1	0.8
Transmission/reception apparatus for CB/amateur radios, fax and cellular phones.	-6	7.2
Complements		
Parts for seats.	2.7	0.8
Boards and panels for voltage not exceeding for 1,000 Volts.	4.5	0.5
Digital processing units.	29.8	2.3
Modems for digital line systems.	18.7	1.6
Automatic regulating or controlling instruments.	1.7	0.7
Ignition wiring sets for vehicles, aircraft and ships.	0.8	0.0
Other motor parts for vehicles.	1.2	0.3
Parts solely for spark ignition-internal combustion types engines	2.1	0.3
No evidence		
Television receivers.	-11.9	5.1
Radio receivers for motor vehicles.	-6.6	2.1

*/ Between March 2002 and February 2003.

Then, where does China's market share come from?

- Japan's market share in the U.S. has "decreased" 9.0 percentage points in the last 10 years.
- Japanese are moving their manufacturing sector to China to get in the U.S. market again.



Source: U.S Department of Commerce.

* Data to August 2003

A Granger analysis between Chinese and Japanese exports to the U.S. shows:

- A substitution relationship between the following categories of items:
 - Video recording or reproducing apparatus
 - Computers and computer peripherals
 - Parts and accessories for computers and other office machinery
 - Electric domestic heating apparatus
 - Electrical apparatus for telephonic line (incl. telephones and modems)
 - Microphones, sound speakers, headphones and other electro acoustic apparatus
 - Radio receivers (incl. combined with cassette recorders); pagers
 - Electrical transformers and static converters.

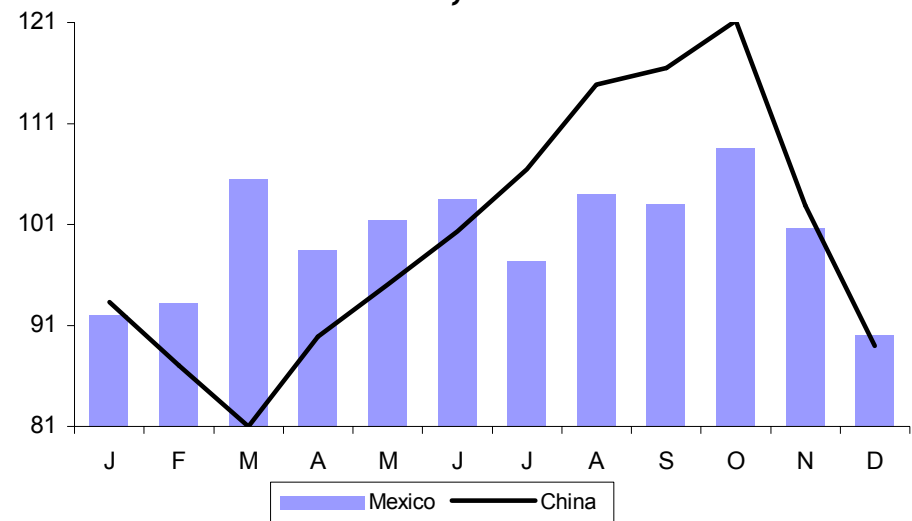
Concluding



Is the maquiladora industry ready to face increasing global competition?

- Even though transportation cost is declining, geographic proximity to markets is a strategic element.
- It makes production processes more flexible and able to adjust more quickly to demand shocks. Reducing seasonality of exports.
- It may reduce cost of storing and warehousing, all the benefits of a “just in time” philosophy.

AVERAGE SEASONALITY OF MEXICAN AND CHINESE EXPORTS TO THE U.S., 1999-2003 */



*/Data to september 2003.

Source: Department of Commerce.

However, location is not enough to succeed...

Further improvement is required in:

- Physical infrastructure in road, ports and cross borders.
- Modernizing transport systems to reduce time of delivering.
- Simplifying customs and fiscal procedures.
- Training programs to labor force, productivity and higher value added processes.