

***MAQUILADORAS:  
PRODUCTIVE EVOLUTION  
AND COMPETITIVENESS***

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Conference on

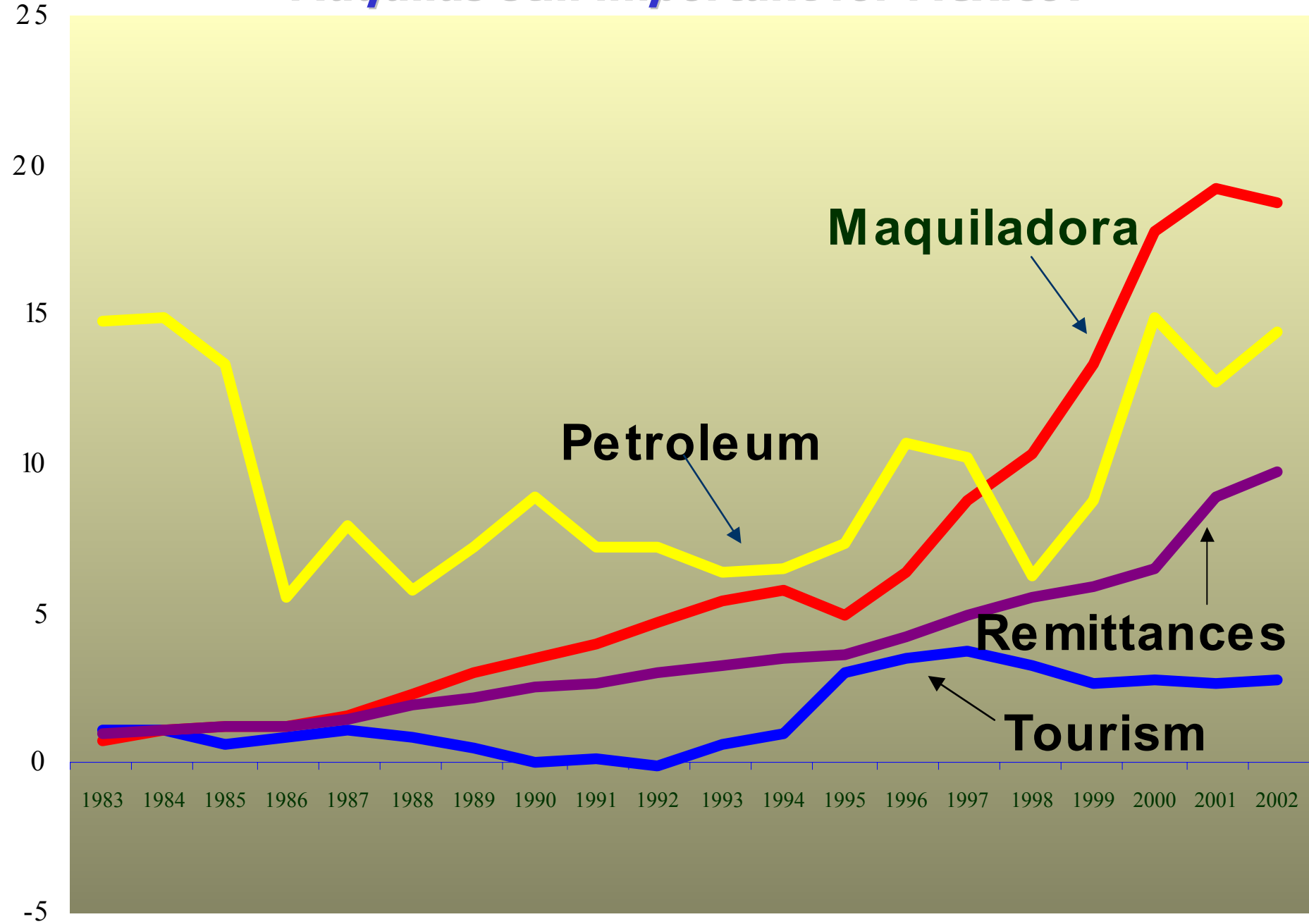
Maquiladora downturn: Structural change or cyclical factors?

Federal Reserve Bank of Dallas

Isla del Padre, Texas Nov. 10. , 2003

Billions of dollars

# *Maquilas still important for Mexico?*



## *Maquilas still global competitive?*

**THIS FIRMS ARE WELL POSITIONED TO  
COMPITE GLOBALLY**

592 average of employees per plant; 11 years average per plant  
Productive, organizational & technological complex

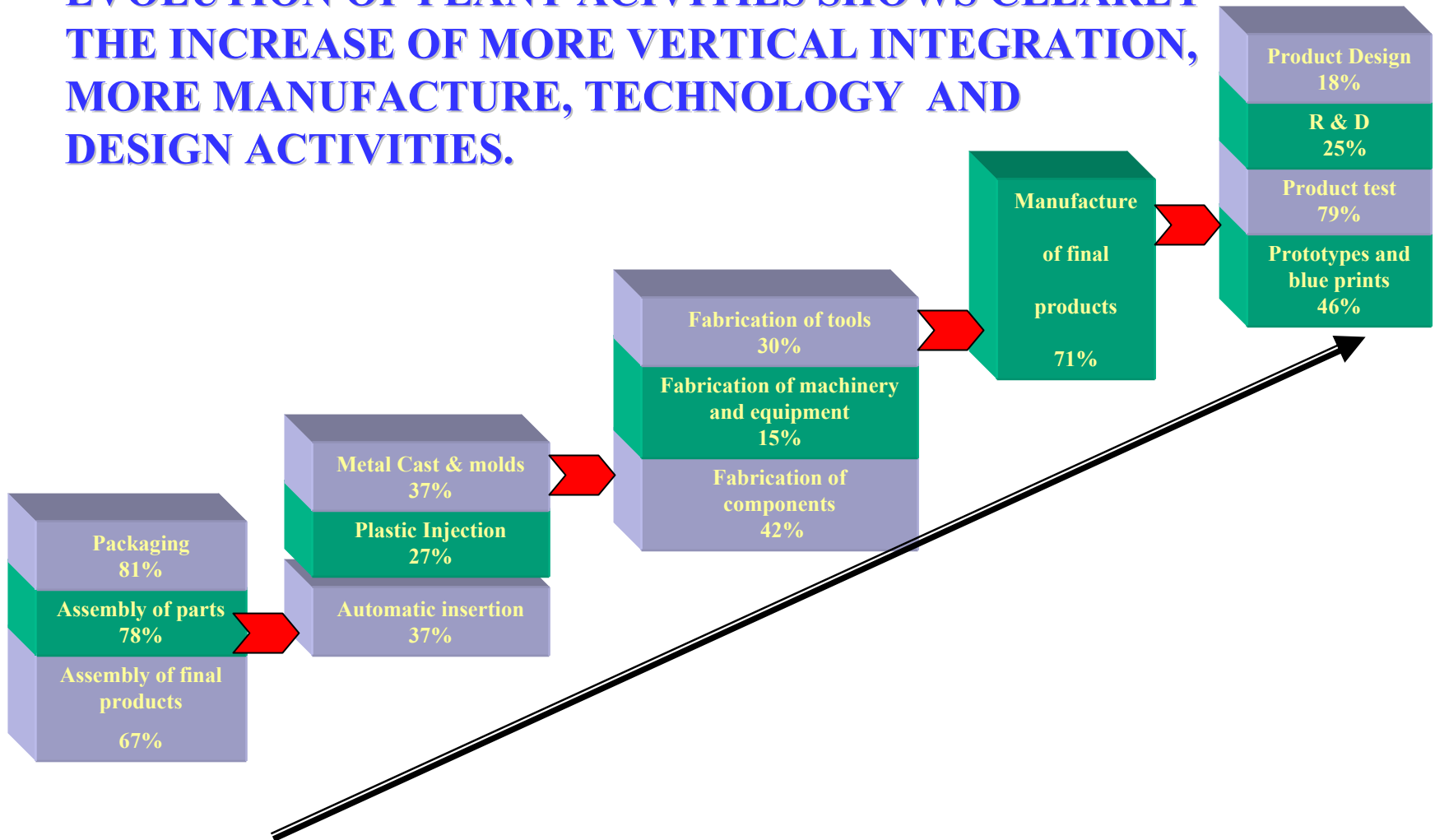
**THIS FIRMS ARE MUCH BETTER  
INTEGRATED IN THE REGION AND THERE IS  
AN IMPORTANT TRADE BETWEEN THEM**

54% of sales (n=97) and 33% of purchases (n=110) are local

High percentage of inter-maquila trade(OEMs)

Relations with local suppliers have increase quantitative and qualitative

**EVOLUTION OF PLANT ACTIVITIES SHOWS CLEARLY THE INCREASE OF MORE VERTICAL INTEGRATION, MORE MANUFACTURE, TECHNOLOGY AND DESIGN ACTIVITIES.**



# **MOST OF THE PLANTS USE THE BEST TECHNOLOGY AVAILABLE**

**45%**     **Comparable to the best**  
**2.3**     **years behind (average)**

## **THIS PLANTS ARE INCREASING THEIR AUTONOMY**

**The level of participation of the people involve in  
the plant is very high in the following aspects:**

**82% TRAINNING**

**59% MACHINERY UTILIZED**

**47% PURCHASES OF COMPONENTS**

**69% MODEL OF ORGANIZATION**

**50% MANUFACTURE OF PRODUCTS**

**40% INFORMATION TECHNOLOGY**

# THE PLANTS ARE USING MORE EDUCATED PEOPLE & INCREASING THE SKILLS

- Skill people represent 25% of the total employment
- Best practices are using for unskilled and medium skill people, for example:  
Kaizen 85%    Team Works 81%    Six Sigma 35%
- 46% increase the number of training hours  
59% increase the level of the training

*Main source of innovation are technicians and engineers with labor experiences (26.5%) and technology suppliers (23.2%)*

# THE PLANTS HAVE MORE INNOVATION AND USING MORE ITs

*67% consider that exists important technology' innovations and 22% frequent innovations*

**DESIGN** 26% with center or desing or engineer department  
**CERTIFICATION** 60.2%  
**PERFORMANCE** Inmprovment in last 3 years in 9 out of 10 plants. 96% decrease quality rejects, 93% products 're-work' and 91% of 'scrap" (desperdicios)

Web	46.3%
Orders by internet	41.6%
Purchases by internet	54.9%
Programers	50.9%

# GLOBAL INDEX OF COMPETITIVENESS

COMPETITIVENESS IS ASSOCIATED WITH SEVERAL FACTORS. THE MOST IMPORTANT ARE:

1<sup>st</sup>. Relation with Parent Company

2<sup>nd</sup>. U.S. market

3<sup>d</sup>. AGLOMERATION FACTORS

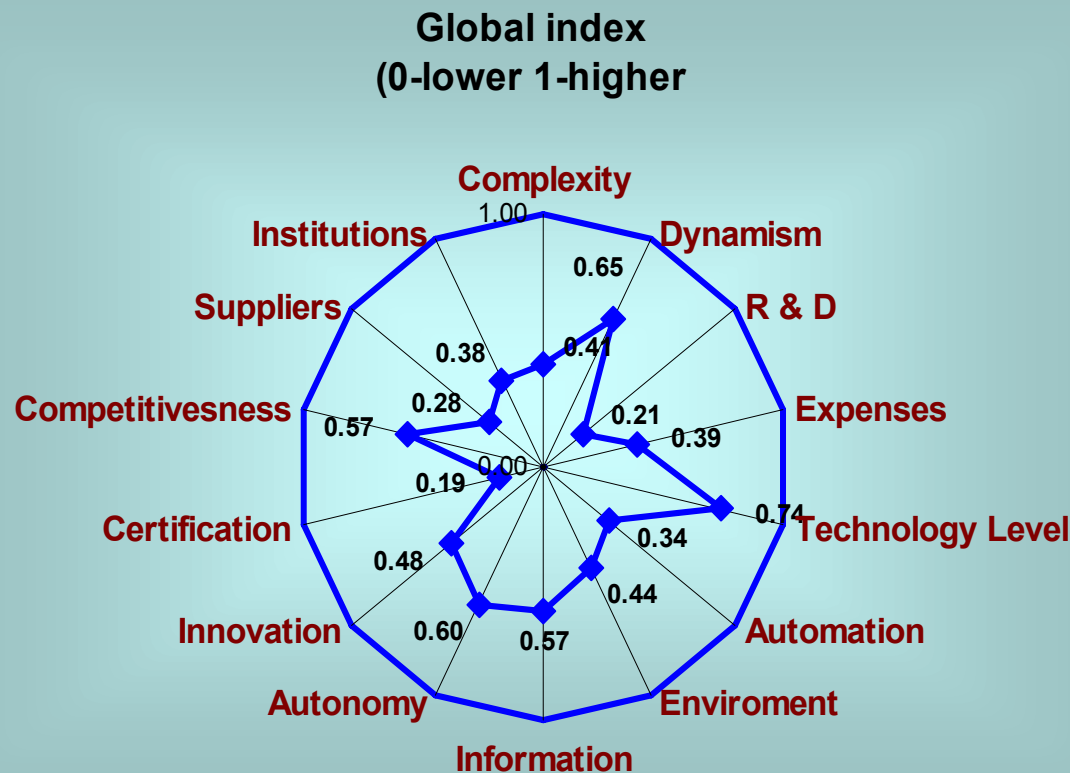
-TRADE WITH OTHER MAQUILAS

- ECONOMIES OF SCALE

SUPLIERS' DEVELOPMENT

NOT ASSOCIATED

-Business associations and educational insitutions

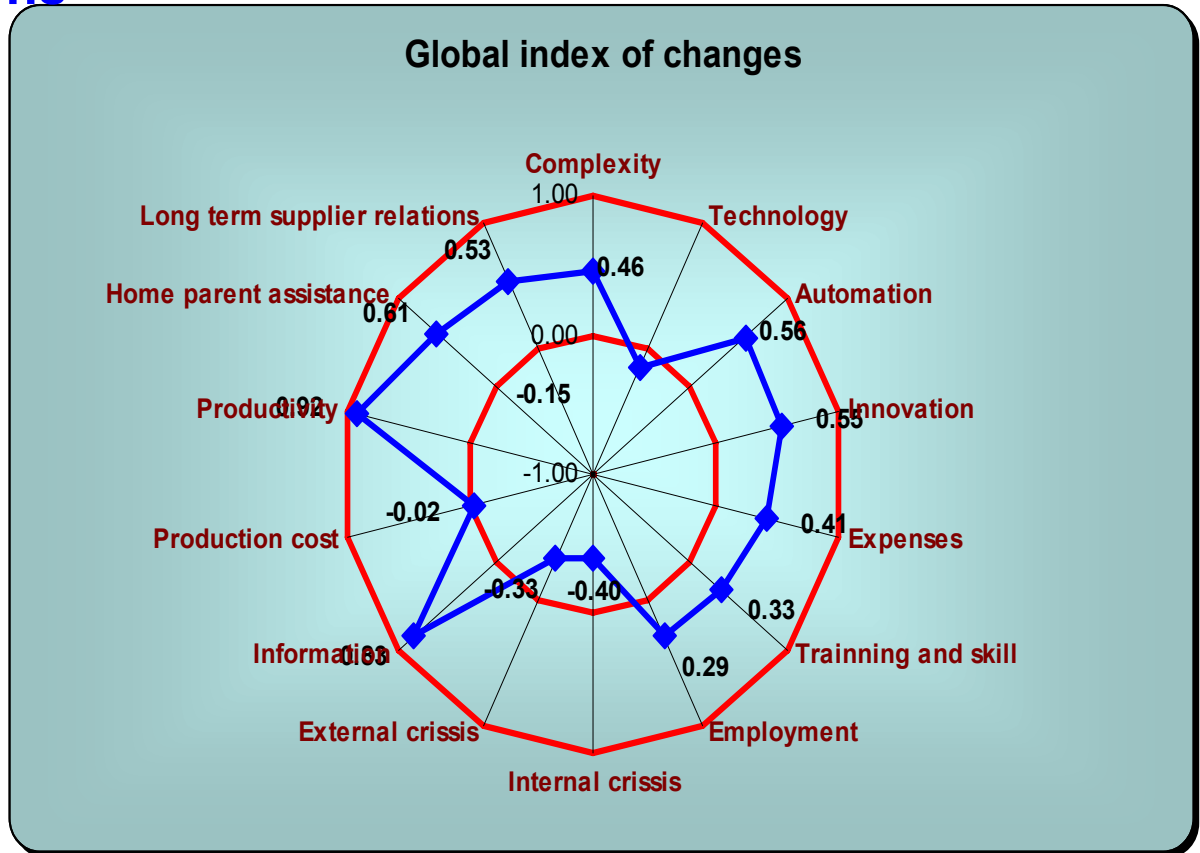


# MAIN CHANGES

**POSITIVE: IN LAST 3 YEARS HAVE BEEN VERY IMPORTANT IN SEVERAL AREAS:**

**Productivity  
Information Technology  
Parent Company Assistance  
Supplier Relations  
Innovation  
Automation.**

**NEGATIVE:  
COST OPERATIONS,  
DEMAND, AND  
MEXICAN  
GOVERNMENT  
PERFORMANCE**



## ***Is there a fourth generation?***

**First: manual assembly (assembly in M)**

**Second: manufacture w/lean production (made in M)**

**Third: design (knowledge intensive) (created in M)**

### **A fourth?: Coordination**

*(network is the key = logistics intensive, ITs)*

*Supply chain management*

*Consortium (several plants and functions)*

*Condominium (several companies inside the company)*

***'Regional head quarters' (coordinated in Mexico)***

# ***Maquilas in the north: Any diffusion of upgrading?***

**1980**

**100% “First” (n=80)**

**1990**

**82% “First” 18% “Second”  
(n=357)**

**2002**

**18% “First” 55% “Second” 27% “Third” (n=298)**

**COLEF survey (298 plants= electronics and autoparts in Tijuana, Mexicali and Juarez)**

**1o.: Index** (several variables/questions):

*vertical integración level / tech level / innovation level / authonomy level / certification level*

**2o. : Factor Analysis** *factor 1: innovation level, certification level and tech level /*

*factor 2: authonomy level / factor 3: vertioicla integración level*

**3rd. Cluster Analysis**

**RESULTS: SIX TYPES OF PLANTS**

# PLANTS TYPES

**Plants Type I.** Low technology level, Some autonomy and average level of vertical integration. Manual intensive, Inadequate environment for innovation. Low quality standards.. (13%)

**Plants Type II.** High level of technology. Low vertical integration and low autonomy. (5%) “In transit”

**Plants Type III.** High autonomy. Low level of vertical integration. High productive complexity related with technology and autonomy, But simple organization and poor diversified. (12%)

**Plants Type IV.** Low level of autonomy. Average technology. High level of vertical integration. (16%)

**Plants Type V.** The highest level of technology. But average level of autonomy and low integration level. (27%) “In transition”

**Plants Type VI.** High in all the factors. The most representative group (27.6%)

# **The future, depends on what?**

**Behavior of the U.S. economy (consumption and industry)**

**Vision and commitment of the government (change direction or capabilities accumulation model?)**

**The strategy of the TNCs and their policies. And the vision of the maquila's managers on the government (trust)**

**Transformation to profit center (risk capital, technological investments)**

**Local & sub-national embedded ness inter-maquila trade, participation in networks, lobbies, etc.)**

**Is it possible the diffusion of an intensive knowledge maquila?**

**Is convenient a policy for a 27% of maquilas?**

***GRACIAS / THANK YOU***

***Visit our WEBSITE:***

***[www.maquiladoras.info](http://www.maquiladoras.info)***

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