

Clustering SME with maquilas in a local context: benefiting from knowledge spillover

Globelics

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Growth

1st Generation

2nd Generation

3rd Generation

Productive activities

Technological activities

Local Decision making

Domestic suppliers

1965-

1980-

1995-

Time

Objetive of the paper

- 1. To analyze a number of knowledge spillovers of the maquila industry in Mexico:**
 - Towards SMEs**
 - Towards institutions**
- 2. To discuss the role of the local production system when benefiting from these spillovers**

We focus on

**⇒ a sector: machine shop industry
(design & fabrication of precision
pieces**

**⇒ in a locality: Ciudad Juárez (300
maquila plants)**

Theoretical framework

- 1. Technological spillovers of foreign direct investment**
- 2. Technological learning and capability accumulation processes**
- 3. Local, regional and national systems of innovation**

Methodology

Census

- Managerial and technological capabilities

Case studies

- Maquilas
- Machine shops

Workshops

- Entrepreneurs
- Institutions

Knowledge spillovers towards SMEs

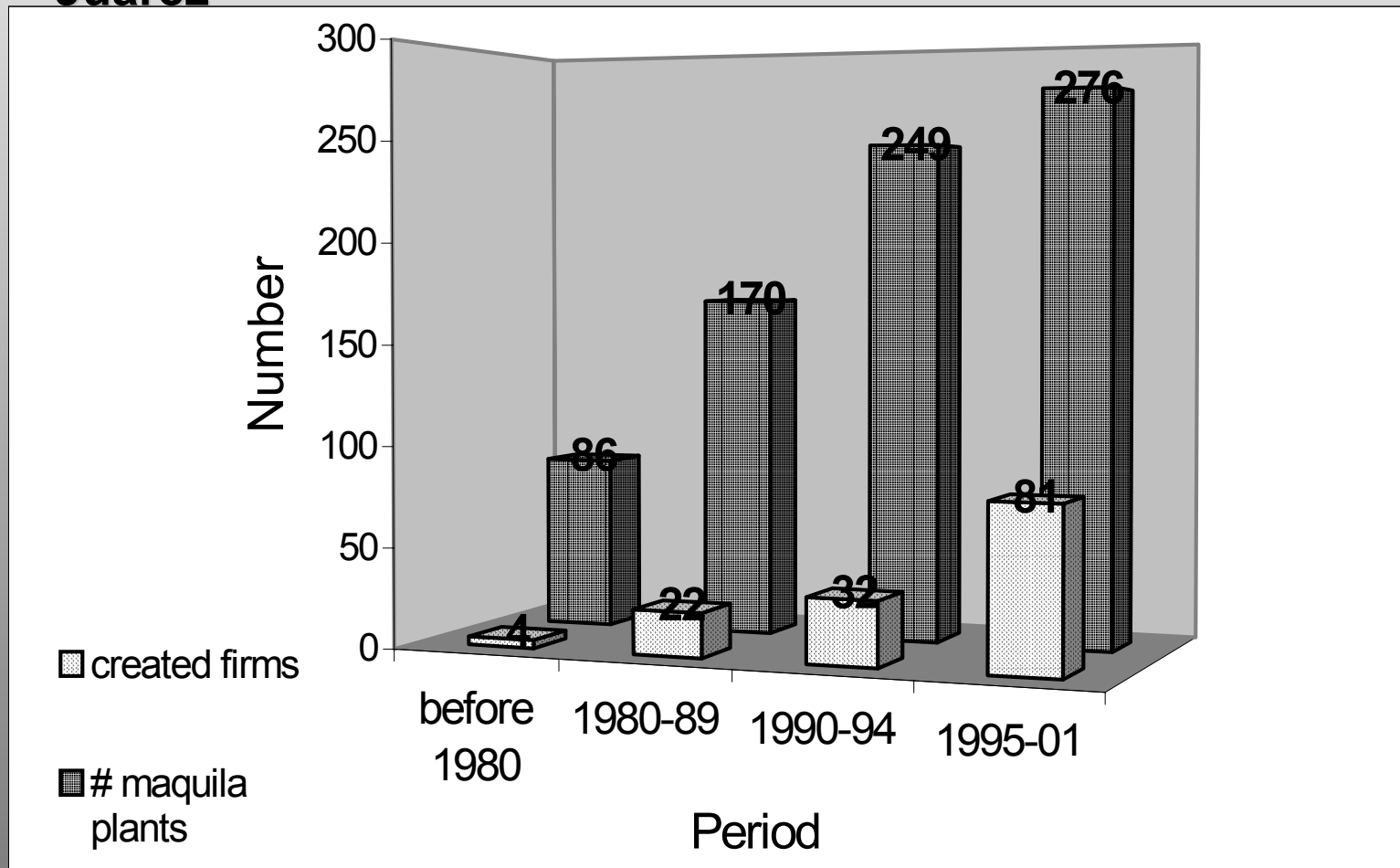
We analysed two types of knowledge spillovers towards SMEs:

1. Backward linkages between the TNCs and the local suppliers: the origin and growth of the machine shop industry

2. Technical training of employees: The creation of firms by former technicians of the maquila industry

The origin and growth of the machine shop industry

Figure: Year of creation of the machine shops operating in 2002 and growth of the maquila industry in Ciudad Juárez



The creation of firms by former technicians of the maquila industry

Table: Years of experience of the owners of machine shops at the maquila industry.

Did not work at the maquila industry	1 to 6 years	7 to 15 years	16 or more	Total of firms
38	36	42	22	138
27.5%	26.1%	30.4%	15.9%	100%

Local systems

Figure: The local agents and their main linkages

Institutions of technical training

- CONALEP I and II
- CAST-CONALEP
- CECATI 19 and 87
- CENALTEC
- CBTIS 114

Dependencies of the public sector

- CRECE
- COMPITE
- CIMO

**SMEs
suppliers**

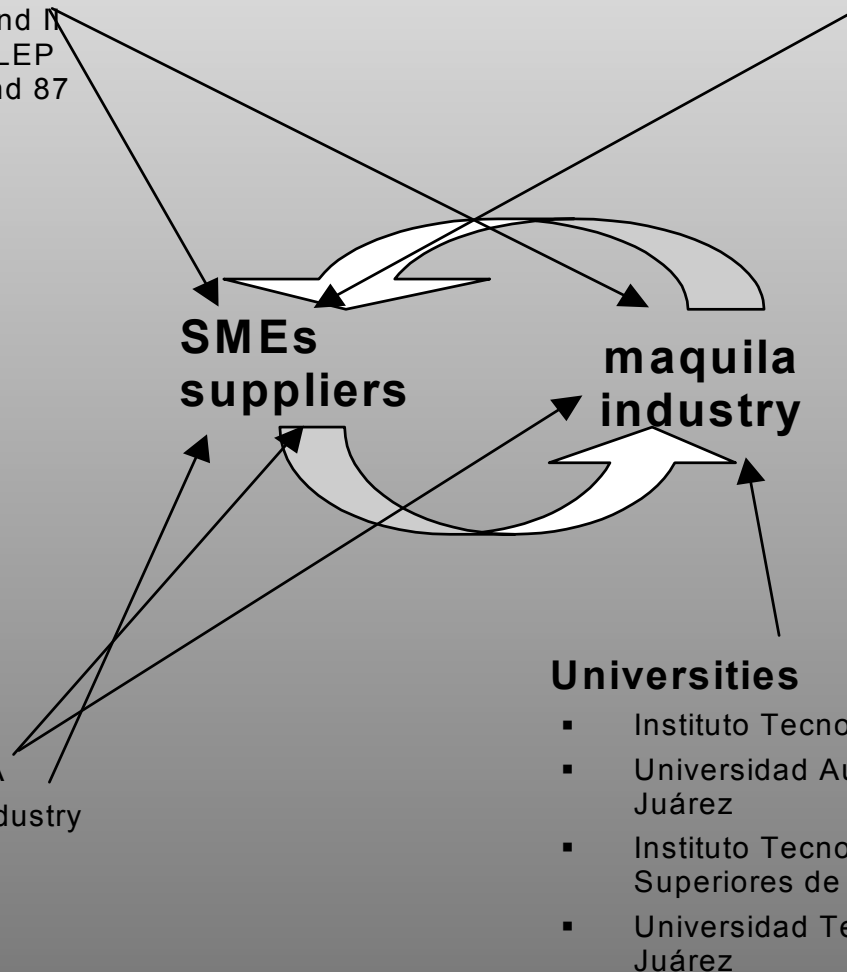
**maquila
industry**

Managerial associations

- CANACINTRA
- Maquinado Industry Association

Universities

- Instituto Tecnológico de Ciudad Juárez
- Universidad Autónoma de Ciudad Juárez
- Instituto Tecnológico de Estudios Superiores de Monterrey
- Universidad Tecnológica de Ciudad Juárez

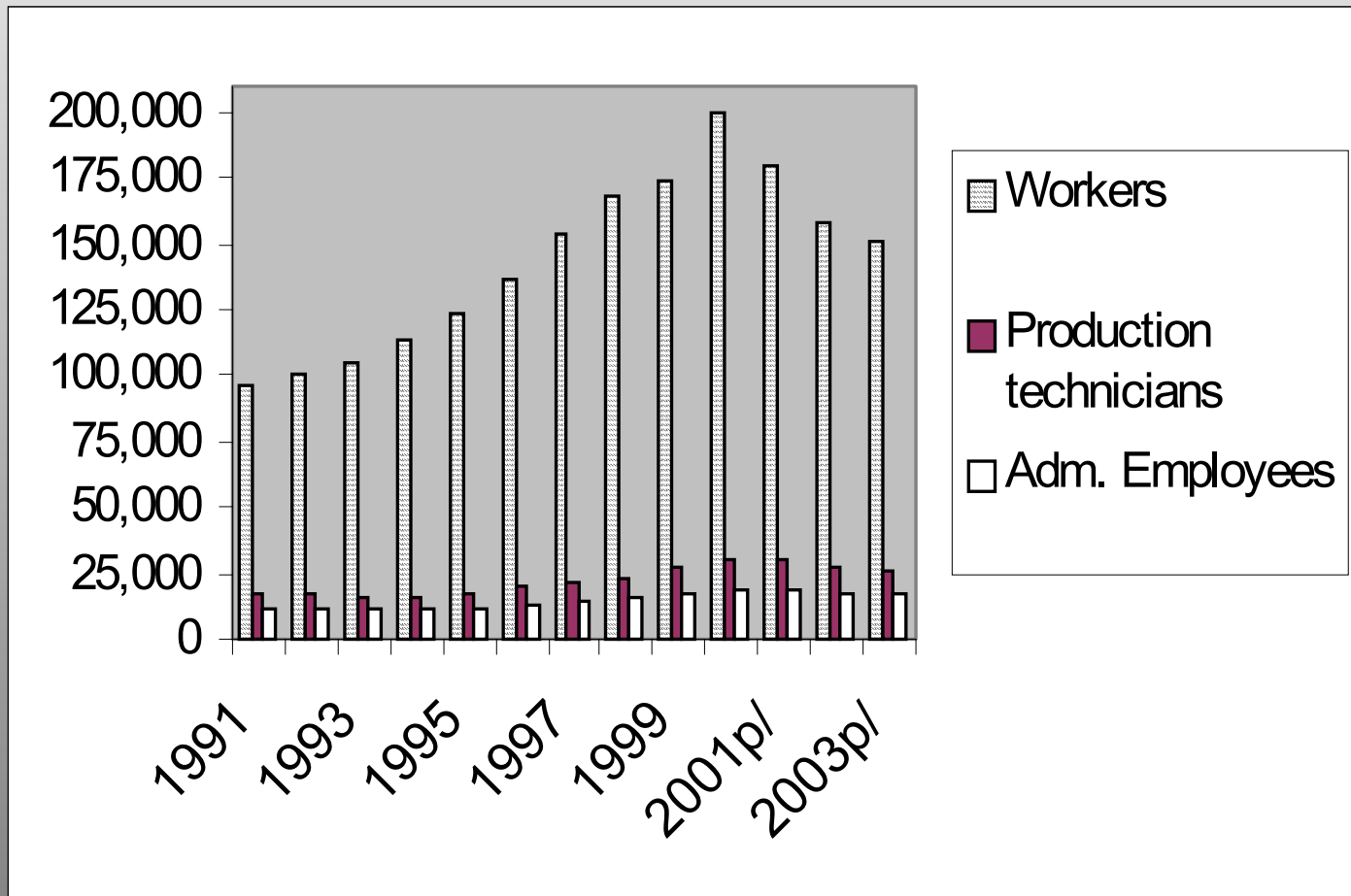


Spillovers and local systems

- Technical training of employees and increase in the number of technicians in the locality
- Demand for technicians and linkages with training institutions
- Demand of technicians and linkages with higher education institutions
- Collaboration efforts for the R&D

Increase in the number of technicians

Evolution in the number of technicians employed at the maquila industry in Juárez. 1991-2003/p



Linkages with training institutions

The case of Cenaltec:

- A new public-private institution created in 2001:
 - Royal Philips Electronics
 - Office of Education
 - Local Government
- To train technicians in high precision machining
- Highly dependent on Philips strategy

Weaknesses in the linkages

Table: Source for the training of personnel

Source	No. of firms
In-house training	31
Private Consultants	26
CECATI	21
CONALEP	7
CENALTEC	4
UACJ	2
CBTIs	2

✓ Spillovers effects towards SMEs:

- Backward linkages between the TNCs and the local suppliers, and the creation of an industrial sector
- Human capital spillovers

✓ Spillovers toward the local environment:

- Creation of institutions
- Development of other institutions
- Creation of an industrial business environment

But:

- ✘ **The industrial environment is still immature**
- ✘ **Huge asymmetries between the economical agents, in terms of managerial and technological capabilities**
- ✘ **High uncertainty limits the investment of SMEs in specific assets**
- ✘ **Weak structure of the linkages between these institutions and the firms**
- ✘ **The institutions have little flexibility to provide a fast response to the changing demand of the maquila industry**

It is necessary to implement policies oriented to:

- **Generate conditions to strengthen the managerial and technological capabilities of the local SMEs**
- **Strengthen the capacity of response of the institutions to the market needs**