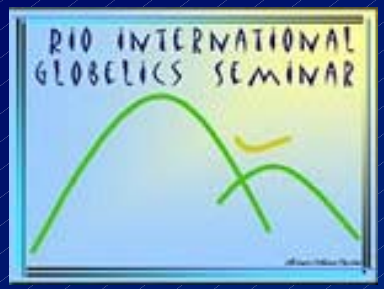



THE FIRST GLOBELICS CONFERENCE:
INNOVATION SYSTEMS AND DEVELOPMENT
STRATEGIES FOR THE THIRD MILLENNIUM

# FORMS OF GOVERNANCE, LEARNING MECHANISMS AND LOCALIZED INNOVATION: A COMPARATIVE ANALYSIS IN LOCAL PRODUCTIVE SYSTEMS IN BRAZIL

**Renato Ramos Campos** **Marco Antonio Vargas**

Rio de Janeiro, November 3-6, 2003

# Objectives/Research Questions

- Explore some of the possible configurations emerging from the interaction between diverse productive and knowledge structures within local productive systems in developing countries

- Explore the impact of these diverse configurations on the shaping of interactive learning mechanisms and innovative strategies

*How the diverse organisational and institutional characteristics of local productive systems in developing countries affect their learning strategies and capabilities for innovation?*

# Exploratory framework

- Based on an analytical distinction between Systems of production and Systems of knowledge: Explores the interaction between the main elements associated with the organisation of productive activities and those elements related to the organisation of knowledge flows

# Theoretical framework

Departs from the National systems of innovation approach: innovation as a interactive, path-dependent process, embedded in specific institutional contexts.

Highlights the relationship between proximity, learning and innovation: focus on the localized nature of learning and innovation processes

# Empirical Basis

Five selected case studies on agro-industrial and industrial agglomerations in the South of Brazil :

**a)** In the Sate of Rio Grande do Sul: The tobacco agro-industrial complex - Rio Pardo Valley, The wine agro-industrial complex - Serra Gaúcha region; The leather-footwear cluster - Sinos-Valley

b) In the State of Santa Catarina: The textile and clothing - Itajai Valley; The software - Joinville city

These case studies comprise part of the 26 local productive and innovative arrangements analysed in Brazil, from 1998 to 2000, and reflects an ongoing research effort carried out by RedeSist .

# Common features about National Systems of Innovation in a Developing Country context

(Cassiolato and Lastres, Arocena and Sutz, Villashi, Viotti, Albuquerque, etc.)

- Reduced investments in R&D activities
- Great instability in the macroeconomic, political and financial environment
- Higher diversity and instability of institutional frameworks supporting innovative activities
- Lack of interaction between most of the actors comprising systems of innovation
- High significance of external flows of knowledge in the technological upgrade of firms

# Some common features about Local Productive and Innovative Systems in Brazil

- Deep impacts on competitive and innovative dynamic emerging from structural reforms in 1990s (deregulation, privatisation, etc);
- Important bottlenecks concerning financing for SMEs and human resource capabilities;
- Knowledge infrastructure focused mainly in training and labour technical development;
- Low tendency to develop interactive learning processes – either along the productive chain (user-producer) or with support organisations (technological and training infrastructure, industry associations, etc).

# I- The institutional and organisational dimension of production systems

Focused on the density of productive structure at local level, degree of specialisation and existence of productive complementarities associated to the organisation of productive flows within local productive chains, entails:

a) division of labour within the local productive chain and;

b) Predominant and complementary forms of governance

# I- The institutional and organisational dimension of production systems

a) Division of labour on the local productive chain: number and size of firms; degree of complementarities

b) Predominant and complementary forms of governance: networks and hierarchies

## Table 1: Institutional and organisational dimension of the production systems

| | Division of Labor | | | |
|---|---|---|---|---|
| | Low/ Few complementarities | | High/ Many complementarities | |
| | Mostly SMEs | Some large firms and SMEs | Mostly SMEs | Some large firms and SMEs |
| Predominant forms of governance | Predominance of networks **(Type 1)** | Predominance of hierarchies **(Type 2)** | Predominance of networks **(Type 3)** | Predominance of hierarchies **(Type 4)** |
| Complementary forms of governance: | Public/private coordination (ie.industry associations) | Public/private coordination (ie.industry associations) | SMEs Networks of subcontractors | Networks of subcontractors SMEs Networks of subcontractors |

# II - Institutional and organisational dimension of knowledge systems

Focused on the role played by technology and training infrastructure and the nature of intra-firm learning mechanisms within agglomerations

Main analytical elements:

1) **the technological and educational infrastructure**
2) **2) knowledge sources and intra-firm learning mechanisms**

# II - Institutional and organisational dimension of knowledge systems

## 1) the technological and educational infrastructure:

- takes into account the existence of physical infrastructure like technological and training institutes, business associations, and other support organisations that provide information, generate and diffuse knowledge within local productive systems.

# II - Institutional and organisational dimension of knowledge systems

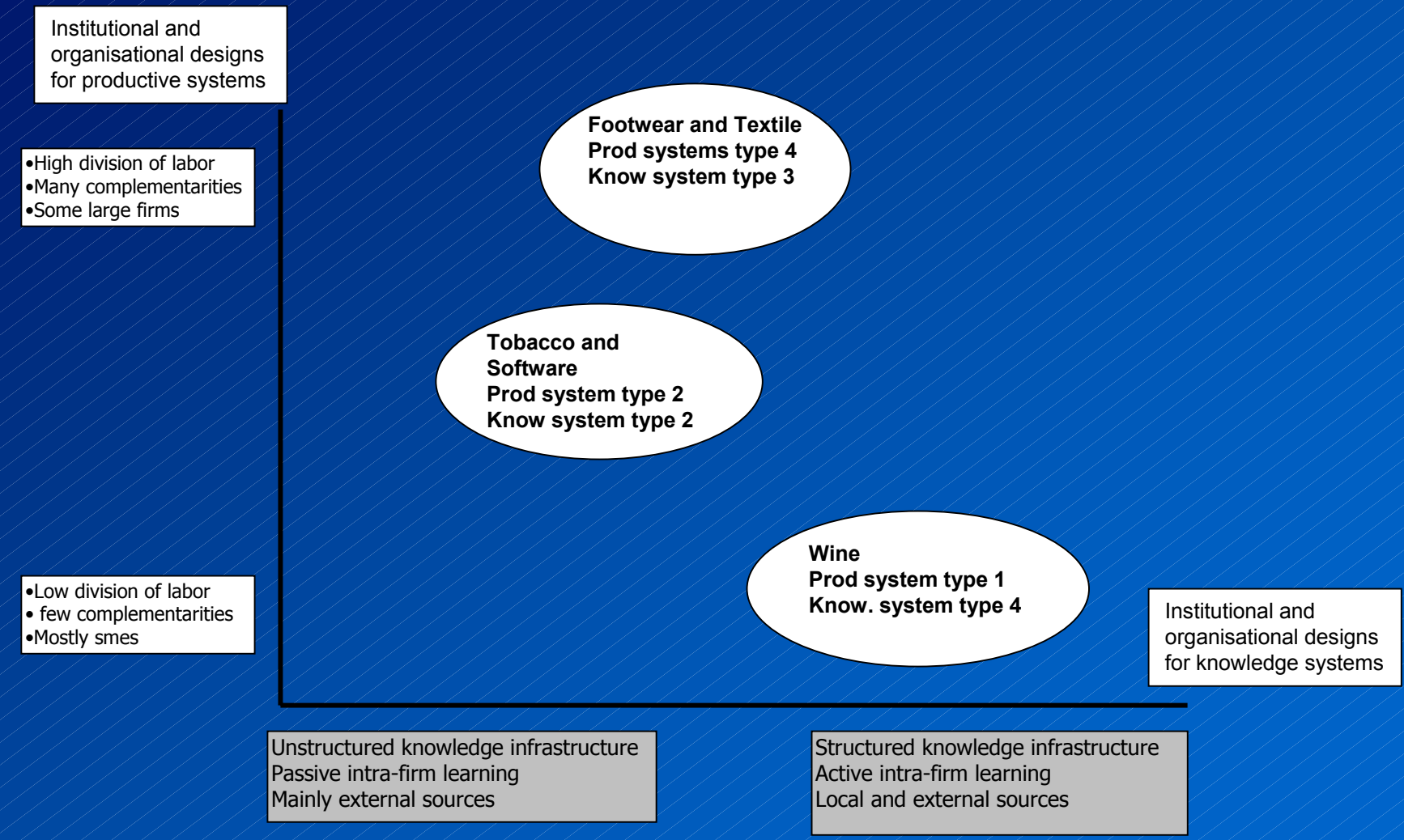
## 2) knowledge sources and intra-firm learning mechanisms

- Explores the (active/passive) role of firms in promoting learning processes and the (internal/external) origin of knowledge sources used to promote product and process innovation

## Table 2: Institutional and organizational dimension of knowledge systems

| **Role of technological and training organizations (knowledge infrastructure)** | | | |
|---|---|---|---|
| Unstructured | | Structured | |
| **Intra-firms learning mechanisms** | | | |
| Restricted and passive | Open and active | Restricted and passive | Open and active |
| **Type 1** Small or not-existent role of tech./training infrastructure and poor intra-firm learning mechanisms | **Type 2** Small or not-existent role of tech./training infrastructure and active intra-firm learning mechanisms | **Type 3** Persistent role of tech./training infrastructure and poor intra-firm learning mechanisms | **Type 4** Persistent role of tech./training infrastructure and active intra-firm learning mechanisms |

# THE FIRST GLOBELICS CONFERENCE: INNOVATION SYSTEMS AND DEVELOPMENT STRATEGIES FOR THE THIRD MILLENNIUM



# Table 3: Local productive Systems in Brazil according to institutional and organisational characteristics of productive and knowledge systems

| Categories/empirical cases | Footwear | Wine | Tobacco | Software | Textile |
|---|---|---|---|---|---|
| **Systems of production** | Mainly type 4 | Type 1 | Mainly type 2 | Type2 | Mainly type 4 |
| Level of division of labor | High with some large firms | Low with mostly SMEs | Low with some large firms | Low with mostly SME | High with some large firms |
| Main governance modes | Hierarchies w/ network of subcontractors and global chains | Diffused networks w/ public private coordination | Hierarchies through global chains | Only public/ private coordination | Diffused networks w/ public private coordination |
| **Systems of knowledge** | Type 3 | Type 4 | Type 2 | Mainly type 2 | Mainly type 3 |
| Knowledge infrastructure | Structured | Structured | Unstructured | Unstructured with many training institutions | Structured |
| Intra-firms learning mechanisms | Restricted and passive learning-by-doing/using | Active and learning by searching and by interacting | Active Learning by searching | Active Learning by interacting with users | Restricted and passive learning-by-doing/using |

## Reflexes on productive and innovative capabilities

| Categories/empirical cases | Footwear | Wine | Tobacco | Software | Textile |
|---|---|---|---|---|---|
| Impacts on inter-firms' linkages | High Incentives for manly vertical linkages | High Incentives for manly horizontal linkages | Low Incentives for linkages | Low Incentives for linkages | High Incentives for horizontal and vertical linkages |
| Impacts on local learning strategies | Broad but focused mainly on productive capabilities | Broad and focused on productive and innovative capabilities | Restrict (encapsulated within MNCs subsidiaries) focused on productive and innovative capabilities | Restrict (encapsuleted within medium and large firms) focused on productive and innovative capabilities | Broad but focused mainly on productive capabilities |

# Concluding remarks

Territorial/Institutional specificities: A solely sectorial approach (sectorial systems) tends to neglect specificities emerging from institutional and historical contexts which are specific to territories.

Empirical evidences shown differences on innovative and learning capabilities among local productive systems belonging to the same industry.

# Concluding remarks

Great variety in the patterns of division of labor and governance modes associated to systems of production on the one hand, and the knowledge structure and inter-firm learning mechanisms on the other.

There is not an one-to-one correspondence between different degrees of division of labor and governance modes, nor between knowledge infrastructure and intra-firm learning mechanisms

# Concluding remarks

On the one hand, some configurations that combine an unstructured knowledge system with intra-firms' active learning strategies (like in the tobacco and software cases) reflects a weak basis for knowledge diffusion within the local productive system. (encapsulated innovation system; e.g: tobacco)

On the other hand, configurations that combine structured knowledge systems with restricted and passive intra-firms learning strategies will also difficulties to foster interactive learning mechanisms at local level. (eg. footwear, textile)

# Further research:

- More comparative work on innovative dynamic of local productive systems in developing countries (empirical research)
- Explorations on the possible developmental tendencies of local productive systems according to changes in their productive and knowledge structures
- Development of indicators to Measure knowledge, cooperation and other intangibles

# Structure

1. Objectives and research questions;
2. Key issues on the theoretical and analytical framework.
3. Common features concerning NSI in a developing country context;
4. Common features concerning local productive and innovative systems in Brazil
5. Analytical framework: Institutional and organisational dimension of productive and knowledge systems
6. Empirical evidences from Brazil
7. Concluding remarks and further research