





Local/Regional Ecosystems for Knowledge-Intensive Enterprises Brazil

Renato Garcia

Unicamp, Brazil

renatogarcia@eco.unicamp.br 
@RenatogUnicamp 

Brief conceptual remarks



- The proximity argument
 - Knowledge is “spatially sticky”
 - Knowledge sharing
 - Face-to-face interaction
 - Interactive learning
 - Co-location and geographical proximity

Brief conceptual remarks

- Previous empirical studies
 - Positive correlation between inputs and outputs for innovation
- The role of cities for innovation
 - Cities as the main locus for innovation

Brief conceptual remarks



- University
 - An important source of knowledge for firms' innovation
 - Essential component of the local knowledge system

Brief conceptual remarks



- Geographical proximity U-I
 1. Firms close to university can benefit from local knowledge spillovers
 2. Local firms can participate in academic knowledge networks
 3. Proximity facilitates interactive learning



UNICAMP

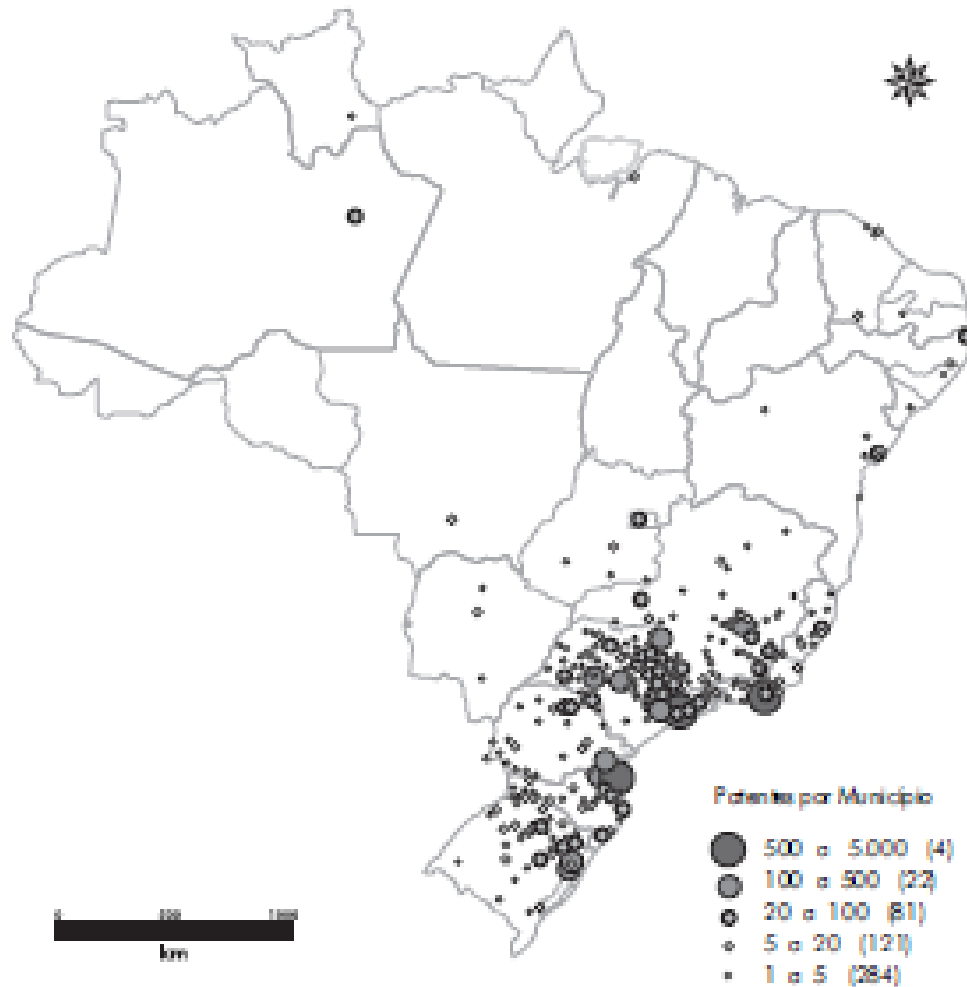
Regional distribution in Brazil

Regional distribution in Brazil

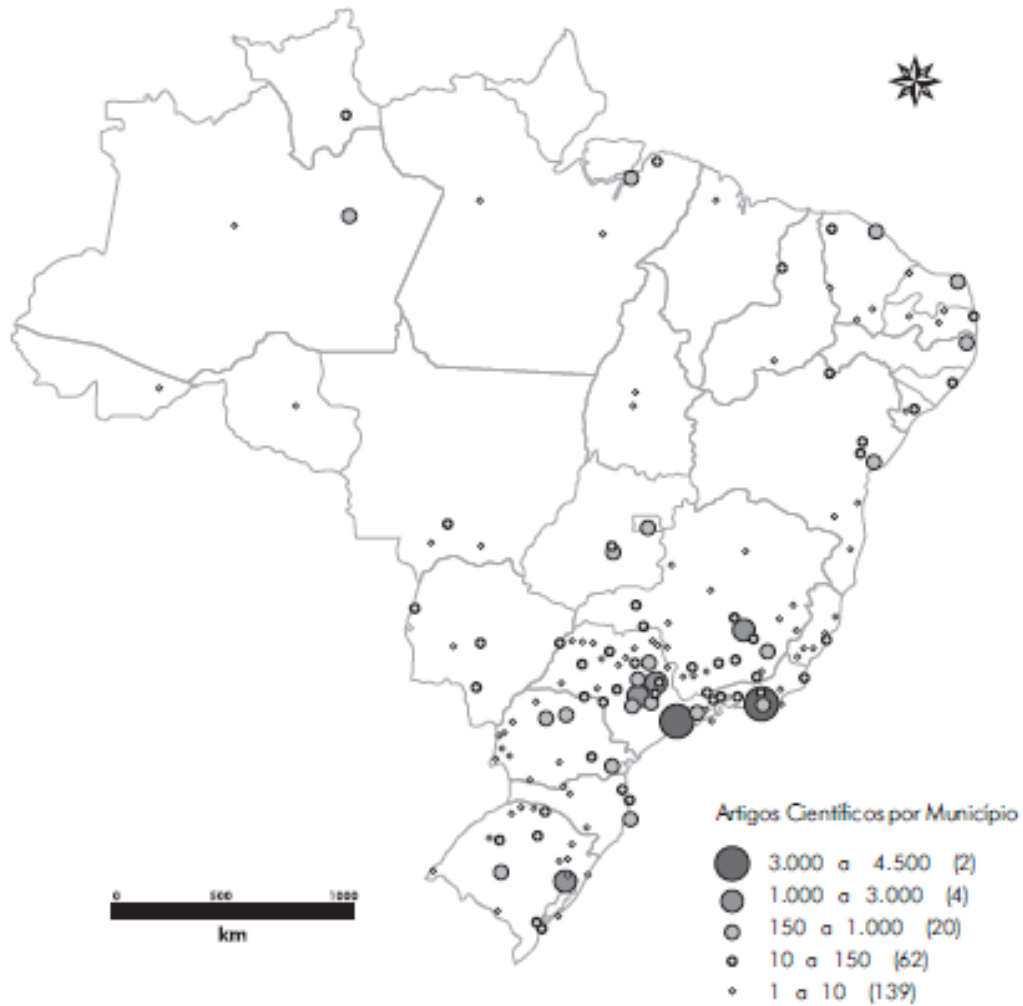


- Unequal regional distribution
 - Any S&T&I indicator
 - R&D expenditure
 - Patents
 - Published papers
 - U-I collaboration

Patents



Published Papers



U-I collaboration



Source: Lattes/MCT from Garcia, RSRS, 2015

Territorial factors that affect innovation

The role of territorial factors I



- Patents (as a proxy for innovation)
 - Local Industrial and Academic R&D: positive impact on innovation
 - Spatial lagged spillovers: regions benefit from neighbours R&D

The role of territorial factors I



- Patents (as a proxy for innovation)
 - Local Industrial and Academic R&D: positive impact on innovation
 - Spatial lagged spillovers: regions benefit from neighbours R&D
- Agglomeration and diversification
 - Together, positively affects innovation
 - The role of big and diversified cities (Jacobs)

Results at regional level

The role of territorial factors II



- Patents (as a proxy for innovation)
 - Role of urban factors
 - Urban density
 - Urban scale
 - The presence of a main city in a metropolitan region

Results at regional level

*(data: INPI,
from Gonçalves, 2009)*

The role of territorial factors III



- Innovation rate is positively affected by:
 - Local knowledge spillovers
 - Economic agglomeration
 - Diversification
 - Local U-I collaboration

Results at regional level, only São Paulo State

*(data: Pintec,
from Mascarini, 2017, non-published)*

The role of territorial factors IV



- Degree of novelty of innovation
 - Agglomeration effects positively affects innovation
 - Economic agglomeration (density of firms)
 - Qualification of labour force

Results at firm level

*(data: Pintec,
from Mascarini, 2017, non-published)*

Regional Innovation Systems: *The role of universities*

Universities and local innovation



- The importance of geographical proximity
 - 40% of total U-I collaboration are local

*data: Lattes/MCT, 2008
from Garcia 2011, Rev Economia*

University level I



- High quality research performance
 - Higher average geographical distance

*(data: Lattes/MCT, 2010
from Garcia 2015, RSRS)*

University level I

- High quality research performance
 - Higher average geographical distance
 - Firms search for more skilled universities and researchers
 - Despite geographical distance

*(data: Lattes/MCT, 2010
from Garcia 2015, RSRS)*

University level II



- Geographical proximity and quality of research performance
 - Inverted U-shaped curve
 - Top quality research performance
 - Average geographical distance decreases

*(data: MCT/Lattes, 2008
In: Garcia 2014, Estudos Econômicos)*

University level II



- Geographical proximity and quality of research performance
 - Inverted U-shaped curve
 - Top quality research performance
 - Average geographical distance decreases
 - Technological problems closer to knowledge frontier
 - Transfer of tacit knowledge
 - Requires geographical proximity

*(data: MCT/Lattes, 2008
In: Garcia 2014, Estudos Econômicos)*

Firm level

- Higher absorptive capacity firms'
 - Higher average geographical distance

*(data: MCT/Lattes, 2010
In: Garcia 2015, RSRS)*

Firm level

- Higher absorptive capacity firms'
 - Higher average geographical distance
 - Firms are able to search for more distant academic capabilities
 - More experienced firms are able to perform distant interactions

*(data: MCT/Lattes, 2010
In: Garcia 2015, RSRS)*

Locational factors

- Spatial lagged Industrial R&D
 - Higher average geographical distance
 - Presence of spatial spillovers

*(data: MCT/Lattes, 2010
from Garcia 2015, RSRS)*

Locational factors

- Spatial lagged Industrial R&D
 - Higher average geographical distance
 - Presence of spatial spillovers
- Specialization vs diversification
 - Diversified local industry reduces average geographical distance
 - Role of agglomeration and diversity

*(data: MCT/Lattes, 2010
from Garcia 2015, RSRS)*

Non-spatial forms of proximity



- Cognitive proximity
 - Higher cognitive proximity: more geographically distant collaboration
 - Facilitate communication and knowledge sharing
 - Decrease the importance and benefits of the co-location
 - Reduce the costs of interactions over long geographical distances

*(data: MCT/Lattes, 2010
from Garcia 2017, non-published)*

Policy perspective

- Importance of the Regional Innovation System
 - Universities and knowledge transfer
 - Firms with high absorptive capacity
 - Agglomeration effects

List of main references



ALBUQUERQUE, E.; SIMÕES, R.; BAESSA, A.; CAMPOLINA, B.; SILVA, L. (2002). A distribuição espacial da produção científica e tecnológica brasileira: uma descrição de estatísticas de produção local de patentes e artigos científicos. *Revista Brasileira de Inovação*, 1(2 jul/dez), 225-251.

ARAÚJO, V.; GARCIA, R. (2017). Determinants of Regional Innovation in Brazil and its Spatial Dependence – unpublished.

GARCIA, R.; ARAÚJO, V.; MASCARINI, S.; SANTOS, E.G.; COSTA, A.R. (2015). Looking at both sides: how specific characteristics of academic research groups and firms affect the geographical distance of university-industry linkages. *Regional Studies, Regional Science*, v. 2, p. 517-533.

GARCIA, R.; ARAÚJO, V.; MASCARINI, S. (2013). The role of geographical proximity for university-industry linkages in Brazil: an empirical analysis. *Australasian Journal of Regional Studies*, v. 19, p. 433-455.

GARCIA, R.; ARAÚJO, V.; MASCARINI, S.; SANTOS, E. G. (2014). Efeitos da Qualidade da Pesquisa Acadêmica sobre a Distância Geográfica das Interações Universidade-Empresa. *Estudos Econômicos* (São Paulo. Impresso), v. 44, p. 105-132.

GARCIA, R.; ARAUJO, V.; MASCARINI, S.; SANTOS, E.G.; COSTA, A. (2014). Perfil espacial das interações Universidade-Empresa e papel da localidade do grupo de pesquisa. *Revista Economia & Tecnologia*, v. 10, p. 121-133.

GARCIA, R.; ARAUJO, V.; MASCARINI, S.; SANTOS, E.G.; COSTA, A. (2017). An analysis of the relations between geographical and cognitive distance in university-industry linkages – unpublished.

GONÇALVES, E.; ALMEIDA, E. (2009) Innovation and Spatial Knowledge Spillovers: Evidence from Brazilian Patent Data, *Regional Studies*, 43:4, 513-528.

MASCARINI, S.; GARCIA, R.; QUATRARO, F. (2017) . Determinants of the degree of novelty of innovation in Brazil: an analysis of territorial factors – unpublished.

MASCARINI, S.; GARCIA, R.; ROSELINO, J.E. (2017). Dinâmica territorial da inovação no Estado de São Paulo: uma análise a partir dos dados regionalizados da PINTEC - unpublished.


SIMÕES, R. (2009). A Geografia da Inovação: uma Metodologia de Regionalização das Informações de Gastos em P&D no Brasil. *Revista Brasileira de Inovação*, 4(1 jan/jun), 157-185.



Local/Regional Ecosystems for Knowledge-Intensive Enterprises Brazil

Renato Garcia

Unicamp, Brazil

renatogarcia@eco.unicamp.br 
@RenatogUnicamp 