Workshop “Developing European Labour Market Areas” and training on TTWA method

The definition of Industrial Districts

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Outline

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2. The definition of Industrial District
3. The importance of the territorial dimension in local economic development and policy
4. Mapping methodology of Industrial Districts: a critical review
   A) LMAs-based methodologies
   B) Not LMAs-based methodologies
   C) European and Extra European experiences
5. A comparison across methodologies and conclusions
6. The seminar in Rome
1. Introduction

- Industrial districts as an application of LMAs for the identification of meaningful territorial units in Italy

- A replicable experience in Europe?

- Why mapping industrial districts is important?

- Which methodologies for which countries have been implemented so far?
2. The definition of Industrial District (ID)

It All Started with Marshall…

The theoretical history on economic agglomeration is rooted in Alfred Marshall’s work (1890) “Principles of economics”

In particular:

Analytical tools:

“Marshallian external economies” as determinants of the location of industries explain the efficiency of firms in localized industries and IDs

The “industrial atmosphere” enables people living in the district to learn the industry as if it was “in the air” is the “advantage” benefited by firms

“External economies are competitive advantages that an independent producer gains from embeddedness in a system of organized division of labour.” (Bellandi 2009 in Becattini&al. 2009)

They are external to firms but internal to the system and arise as the the scale of production increases
Setting the stage

The theory of ID was developed and conceptualized by the seminal work of G. Becattini who developed Marshall thinking

- Conceptualizes the industrial district as a «unit of investigation» for the analysis -> revisited Marshall’s external economies to explain the performance of Italian IDs
  

- Conceptualizes the industrial district as a «model of production» -> is the starting point for empirical research (Tuscany, post WW2)
  

Source: Sforzi (2015)
The ID as a socio economic concept

Definition of ID: “a socio territorial entity which is characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area.” (Becattini 1990:38)

Stylized facts on IDs: the social side

- The sense of belonging of the human agents of production (employers and workers) to the place where production actually occurs.
- The values of a local community support the industrial organization of a population of firms
Stylized facts on IDs: the tecno-economic side

- SMEs-based

- Firms are **specialized** in specific production phases of the same production process (spinning, weaving, dyeing, finishing, etc.) organized in flexible teams

- Local **phase markets**

- Local **labour markets** for specialized skills

- Firms have access to **external economies** (**specialization, learning, creativity**) based on access to collective resources (public infrastructure, social capital and networks and pools of human and technical capitals)

Source: Becattini (2002)
Industrial district vs industrial clusters (and other forms of localized industries)

Industrial clusters (IC): «Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions in particular fields that compete but also cooperate» (…) «The geographic scope of a cluster can be a single city or state or a country or even a network of neighbouring countries» (Porter, 1998, pp. 197 and following).

- Geographical proximity
- «industries connected through vertical (buyer/supplier) and horizontal (common customers, technology, distribution channels, etc.) relationships» (Porter, 1990, p.73).

“(…) people (the local community) is the missing component, unlike in the case of the definition of the ID” (Sforzi 2015: 21)
Rationale for ID: the community of people and the population of firms, external economies, economic change

Rationale for IC: geographical proximity of firms and institutions

Rationale for industrial agglomerations: the presence of labour pooling, intermediate inputs, and technological/knowledge spillovers (agglomeration economies)
3. The importance of the territorial dimension in policy making

The international debate on agglomerations of firms is increasing i.e. The role of IDs in regional sciences, the role of industrial clusters in emerging economies, etc. …

What matters is not only the implication of physical proximity itself, but its effects in terms of external economies and reproduction of local contexts

i.e. cultural proximity and its relation with learning and innovation (knowledge spillovers); external economies and their role in division of labour, competitive reactions to challenges of globalization.
Why localized industries are important?

Such an interest is due to the role that localized industries play in terms of **local economic development** (Becattini&al. 2009)

In the Italian case, it is acknowledged the “**Italian structural paradox**” (Cannari&Signorini 2000) [i.e. few large firms, specialization in low tech “traditional sectors”]

‘**Geo-sector specialization**’ (Alampi&al. 2013) is therefore the explanation of the source of competitive advantage, in addition to firm size and high tech specialization

However, IDs are claimed to be the product of Italy’s industrialization by some scholars
Why mapping IDs is essential?

In Italy, the work of Becattini has exemplified the ID through the empirical evidence:

IDs have been an interpretative tool in understanding Italian development since World War II

**Mapping of IDs has been the quantitative evidence of the IDs thesis which rose the attention of policy makers**

→ the territorial dimension as the basis for economic/industrial (local) policies
The legal framework – The 1980s

Since the 1980s, the territorial policies began to incorporate more and more directly the concepts of local production system and IDs

- In the case of innovation, policies began to define strategies for providing support to the innovative processes rooted at the local level (in addition to interventions that designed to stimulate investments in individual firms)

  -> initial attempt: the creation of business development service centers and the promotion of consortia among IDs firms (1980s)

In the 1990s and the beginning of the 2000s IDs were legally recognized as instruments for industrial policy
The legal framework – The 1990s

1991: Law n. 317/91 «Interventions for innovation and development in small enterprises» is the National law on IDs. Article 36 defines ID as a “territorial area characterised by high concentration of small enterprises having a productive specialisation and where a special relationship between local population and enterprises exists”. Since 1991 the ID is a legal instrument for industrial policy.

Since 1993: Regional laws for the identification of IDs.

1993: Decree 21/04/93 by the Ministry of Industry
IDs must be identified among LMAs (ISTAT) + IDs must be manufacturing in terms of employment and establishments. Regions can identify their own IDs.

1999: Law n.140 /1999 «Regulation on productive activities» introduces Local Production Systems (IDs are a type of LPS, identified by less rigid criteria).

Source: Istat (2015c)
The legal framework – The 2000s

**2001: Deliberation CIPE/2001** «Criteria for subdivision of national territory into LMAs and identification of productive districts»
Transfers to Regions and Autonomous Provinces the role if identifying IDs also on the basis of LMAs

**2002: Institute for Industrial Promotion – Ministry of Industry** is a first assessment of the Italian experience of IDs

At the regional level, national legislation has been adopted by 13 out of 20 regions (Piedmont, Lombardy, Veneto, Friuli-Venezia Giulia, Liguria, Marche, Toscana, Lazio, Abruzzo, Campania, Basilicata, Sicilia, Sardinia) which have identified IDs (Regional Laws, Deliberations)

**Late 2000s**: regional laws supporting traditional IDs were not implemented

Silvia Lombardi – “The definition of Industrial Districts”. Nuremberg, 16 June 2016
Source: Istat (2015c)
The legal framework – The 2010s

During the 2010s, regional policies became more incisive with respect to *territorial systemic units and sectors*

In the case of innovation, a wide number of policies target territorial systemic units such as:

- the promotion of “*technological districts*” (2000s).
- the promotion of network contracts and of *innovative start-ups* (plus other supporting actions to the activity of SMEs on the basis of the SBA Directive at national and regional level)
- the *national technology clusters* (since the beginning of 2010s).
4. Mapping methodology of industrial districts: a critical review

…So far: only the Italian Commission for the Guarantee of Quality of Statistics Information (2005) has provided a complete review of methodologies

Here an updated review is presented following three main groups of methodologies:

A) LMAs-based methodologies
B) Not LMAs-based methodologies
C) European and Extra European experiences (IDs/ICs)
A) LMAs-based methodologies

A1) Istat 2015 mapping methodology (2011 LMAs methodology)

The methodology relies on employment data at the firm level provided by 2011 Business Census (enterprises, not for profit institutions and public institutions).

Employment data is calculated by LMAs and by economic sector.

The algorithm in four steps is composed of a hierarchical procedure which determines the dominant industry and the presence of SMEs by means of LQ and prevalence indexes at the LMA level.

It identifies LMAs specialized in manufacturing based on SMEs and a dominant manufacturing specialization mainly based on SMEs.
Variables

- All production activities (NACE Rev.2) are grouped in:
  - Agricultural activities, Extractive industry, Construction, **Manufacturing**
  - Business services, Consumer services, Social services and Traditional services
- Manufacturing activities are grouped into eleven categories:
  - Textile and clothing; leather and footwear; households goods (wooden furniture, tiles and other glass and ceramics items); jewellery, musical instruments and toys; food and beverages; machinery; electrical and optical equipment; manufacture of basic metals and fabricated metal products; chemicals and plastics; transport equipment; paper, publishing and printing; other manufacturing activities.
- Firm size: four sizes-European classification of micro enterprise
  - **Micro**: up to 9 persons employed
  - **Small**: 10-49
  - **Medium**: 50-249
  - **Large**: over 250 persons employed
  - MSMEs (Micro, Small, Medium and Large Enterprises)
The four steps (some traits 1/2)

**STEP 1**: identification of LMAs specialized in manufacturing (among 9 macro categories of all economic sectors)

- **1.A** \( LQ_m = \frac{(LMA_{emp, Nace} / ITA_{emp, Nace})}{(LMA_{emp, tot} / ITA_{emp, tot})} \)
- **1.B** Prevailing employment in Business services, consumer services, manufacturing

\[ \left( (LMA_{emp, Nace} / ITA_{emp, Nace}) - (LMA_{emp, tot} / ITA_{emp, tot}) \right) * ITA_{emp, Nace} \]

LMAs with prevailing employment in manufacturing go to Step 2

**STEP 2**: identification of manufacturing LMAs featured by MSMEs

- \( (LMA_{emp (class), manif} / ITA_{emp (class), manif}) / (LMA_{emp, manif} / ITA_{emp, manif}) \)

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The four steps (some traits 2/2)

**STEP 3**: identification of *dominant industry* of manufacturing SMEs-based LMAs (among the 11 manufacturing categories)

- 3.A \( (LMA_{emp, ind} / ITA_{emp, ind}) / (LMA_{emp, man} / ITA_{emp, man}) \)
- 3.B defines the dominant industry
  \[ [(LMA_{emp, ind} / ITA_{emp, ind}) - (LMA_{emp, man} / ITA_{emp, man})] * ITA_{emp, ind} \]

**STEP 4**: identification of LMAs based on MSMEs by verifying firms size of the dominant industry

- 4A \( (LMA_{emp (mpmi), dom_ind} / LMA_{emp (tot), dom_ind}) > 50.0\% \)
  In case of only one medium enterprise:
- 4B1 \( (LMA_{emp (p_imp), dom_ind} / LMA_{emp (m_imp), dom_ind}) > 50.0\% \)
- 4B2 \( (LMA_{emp (micro_imp), dom_ind} / LMA_{emp (m_imp), dom_ind}) > 50.0\% \)
Industrial Districts 2011

Business Census data in 2011 identified a set of 141 IDs (out of 611 LMAs) (Istat 2015)

Almost one fourth of total Italian employment was absorbed by IDs (24.5%)

Such share grows up to 37.9% in terms of manufacturing employment

Mainly specialized in mechanicals (27% of IDs), textile and clothing (23%), household goods (17%)

http://www.istat.it/it/archivio/150320
Flow and intermediate results

LMAs 2011 (611)

- Manufacturing LMAs (220)
  - MSMEs based Manufacturing LMAs (151)
    - Industrial Districts (141)
    - Other MSMEs based Manufacturing LMAs (10)
  - LEs based Manufacturing LMAs (69)
    - LEs based Manufacturing LMAs with prevailing MSMEs (28)
- Non Manufacturing LMAs (391)
  - Other LEs based Manufacturing LMAs (41)
Further LMAs: the role for large firms

STEP 1: identification of LMAs specialized in manufacturing (among 9 macro categories of all economic sectors)

STEP 2: identification of manufacturing LMAs featured by Large Enterprises (LEs) -> 69 in Italy in 2011

STEP 3: identification of dominant industry of manufacturing LEs-based LMAs (among 11 manufacturing categories)

STEP 4: identification of LEs-based LMAs that have more than 50% of persons employed in the dominant industry of MSMEs (29 in 2001)

http://www.istat.it/it/archivio/150320
LEs-based LMAs (2011)

28 LMAs based on LEs with prevalence of MPMI
One third is specialized in mechanicals, followed by household goods (18%) and food industry
One region (Emilia Romagna) absorbs one third of total and manufacturing employment of LEs LMAs

- Textile and clothing (3)
- Leather (2)
- Household goods (5)
- Food industry (4)
- Mechanicals (9)
- Chemicals and plastics (3)
- Polygraphs (2)

http://www.istat.it/it/archivio/150320
A) LMAs-based methodologies

A1) Istat 2015a mapping methodology (years 2011 and 2001)
    -> 3 firms’ class sizes  Sforzi&Lorenzini (2002)
    not NACE classification but deriving from the NAS; indicators based on population and establishments/local units
A4) Against the dichotomy ID/not ID: Signorini&Cannari (2000); Brusco&Paba (1997)
A5) Methodologies focused on specialization of IDs: Fortis&Carminati (2008); Istat classifications of LMAS (2006 and 2015b) based on cluster analysis  Cattivelli&luzzolino (2014)
B) Not LMAs-based methodologies

These approaches do not need ex-ante territorial units since they aim to detect high levels of agglomeration on the basis of the lowest administrative division level: the municipality in Italy. They disregard the socio-cultural environment behind the agglomeration of firms. It is the price to pay in order to have a more flexible and endogenous data driven algorithm (Cannari&Signorini 2000).


C) International experiences

C1) For industrial clusters (AMONG OTHERS):

- UK: Department of Industry and Trade (DTI): LQ applied to regions in order to identify business clusters “Business clusters in the UK - A first assessment” (2001)

- European Cluster Observatory: sectoral statistical analysis of regional data for several key performance indicators

- US cluster mapping: regional clusters based on the LQ. The geographic scope is the administratively defined region. The algorithm relies upon clustering analysis incorporates measures of inter-industry linkages based on co-location patterns, input-output links (Delgado, Porter and Stern, 2014)
C2.1) For industrial districts - *Quantitative methodologies* (Spain, Great Britain, Germany, France)

- The mapping of IDs in **Spain** (Boix 2009 in Becattini&al. 2009)
  Commissioned by the Spanish government (Ministry of Industry)
  and coordinated by the Universitat Autònoma da Barcelona.
  First application: 2001 data and Istat-2001 methodology of identification of LMAs (Boix and Galletto 2006)
  Results showed (expected) similarities between Italy and Spain since both countries have low incidence of large enterprises
  (<0.5% in number and <30% in terms of contribution to manufacturing employment)

- IDs in **Germany**: Brenner (2006), manufacturing firms distribution within *Kreise*; Alampi et al(2013) apply Iuzzolino/Ellison &Glaeser test to Kreise and find 37 IDs
The mapping of IDs in **UK** (De Propris 2009 in Becattini&al. 2009)

In UK there was an established tradition in defining LMAs: TTWA existed since 1980s

First attempt: Crouch and Farrell (2001) industrial local systems identified on the basis if LQ and indexes of production concentration and rations on 1996 data by TTWA and by 3-digit economic sectors. 24 IDs

First application of Istat-1990 methodology to 1997 data was in De Propris 2005 (overall 47 IDs) and then 2009 (40 IDs)

- **IDs in France**: INSEE, dominant sectors with respect to national average by *employment zones*; Guégan&Rousier (1989) LQ, no class sizes; Alampi et al. (2013) apply Iuzzolino/Ellison &Glaeser agglomerations index and find 12 IDs
C2.1) For industrial districts – *Qualitative studies*

- France (Benko&Pecqueur 2009 in Becattini&al. 2009)
  Since mid 1980s emerge Local Production Systems (LPSs) as target for industrial policies by DATAR (Délégation interministérielle à l'aménagement du territoire et à l'attractivité régionale). Since 2005 LPSs take the form of Poles of competitiveness, the successors of the PLSs of the mid 1990s and at the heart of French industrial policy

- Scandinavian countries (Johannisson in Becattini&al. 2009): Sweden, Denmark, Norway

- The mapping of IDs in China (Wang&Mei 2009 in Becattini&al. 2009)


In many developed (industrialized) countries empirical evidence is still qualitative or it is not built on a sound quantitative methodology
### A European comparison across methodologies

<table>
<thead>
<tr>
<th>Territorial unit</th>
<th>Methodology for LMA</th>
<th>Year of data utilized</th>
<th>N. IDs (by methodology)</th>
<th>% on manufacturing LMAs</th>
<th>% of manufacturing employment in IDs</th>
<th>% on LMAs</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ITALY</strong></td>
<td>LMAs</td>
<td>Istat/2011Euro</td>
<td>2011</td>
<td>141</td>
<td>64%</td>
<td>38%</td>
<td>23.1%</td>
</tr>
<tr>
<td></td>
<td>LMAs</td>
<td>Istat/2001</td>
<td>2001</td>
<td>132</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LMAs</td>
<td>Istat/2001</td>
<td>2001</td>
<td>156</td>
<td>39.3%</td>
<td>22.7%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minucipality</td>
<td>-</td>
<td>2001</td>
<td>156</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPAIN</strong></td>
<td>806 LMAs</td>
<td>Istat/2001</td>
<td>2001</td>
<td>205</td>
<td>61.7%</td>
<td>34.8%</td>
<td>25.4%</td>
</tr>
<tr>
<td><strong>GREAT BRITAIN</strong></td>
<td>232 TTWAs</td>
<td>UK</td>
<td>2001</td>
<td>40</td>
<td>41.2%</td>
<td>4%</td>
<td>17.2%</td>
</tr>
<tr>
<td></td>
<td>TTWAs</td>
<td>UK</td>
<td>1997</td>
<td>47</td>
<td></td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TTWAs</td>
<td>UK</td>
<td>1996</td>
<td>24</td>
<td></td>
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</tr>
<tr>
<td><strong>FRANCE</strong></td>
<td>348 Ezs</td>
<td>FR</td>
<td>2006</td>
<td>12</td>
<td>20.10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GERMANY</strong></td>
<td>440 Kreise</td>
<td>D</td>
<td>2001</td>
<td>37</td>
<td>17.10%</td>
<td></td>
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</tr>
</tbody>
</table>

Source: author’s collection
LESSONS LEARNED (1/3)

The comparison of results of such studies high light the need for

1. A harmonized LMAs structure for EU countries
2. Study of variance of results (IDs, LEs-based LMAs) within countries and between countries/sectors

AIM: to help policy makers in identifying the actions that should be accomplished in order to implement European economic/industrial/enterprise policies
LESSONS LEARNED (2/3)

- From Alampi et al. (2013): Italian industry is strongly characterized still in the first half of the 2000s’, with respect to strong competitors like France and Germany, by the presence of agglomerations of SMEs, of course in the so-called low tech sectors but also in medium to high tech sectors.

- A ‘selection effect’ has to be taken into account while applying methodologies in single countries/all countries.

- From Handbook of IDs (2009): Industrial districts present a large variety of types along history and geography.
LESSONS LEARNED (3/3)

The role for official statistics in Policy making by a place-based approach

- Provides harmonized statistically based geography that identifies proper labour market at the EU level
- Countries can characterized them in terms of industries
- And estimate indicators at the LMA level in order to detect regional disparities and tendencies useful to identify actions to implement EU policy
5. The seminar in Rome

- The algorithm: analytical steps
- The algorithm in SAS and R
- Sensitivity tests
- Output
- Bring your data!

Micro data / aggregate data by LMA

- on Business Census (establishments/local units level)
- Statistical units: Enterprises, public and not for profit institutions
- Variables: economic activity (Nace Rev.2 classification, 5 digit), LMA
- Count: persons employed by LMA and economic activity, N. of establishments by LMA and economic activity
Thank you for your attention!
References


Becattini G., (1990), “The Marshallian Industrial District as a Socio-Economic Notion”, in F. Pyke et al., Industrial Districts and Inter-firm Cooperation in Italy, International Institute for Labor Studies


Silvia Lombardi – “The definition of Industrial Districts”. Nuremberg, 16 June 2016

Istat 2006. Rapporto Annuale


Web sites


http://www.clusterobservatory.eu/