



Mental maps of entrepreneurs and location factors: an empirical investigation on Italy

Dario Musolino^{1,2} · Ilaria Mariotti³

Received: 3 August 2018 / Accepted: 3 April 2019
© Springer-Verlag GmbH Germany, part of Springer Nature 2019

Abstract

The explanatory factors of firms' location have been largely studied by the location theory, and by the large amount of empirical studies on the revealed locational preferences of entrepreneurs. On the contrary, the literature studying how entrepreneurs perceive places, that is to say, their mental maps, is quite limited. Actually, only one international line of research so far has really focused on the perception of entrepreneurs, defining an original methodology and applying it to the country-level case studies of the Netherlands, Germany, Czech Republic, and Italy. The present paper belongs to this line of research and aims to investigate the relation between the entrepreneurs' perception of the NUTS3 Italian provinces as potential locations of investments and their socio-economic, spatial/infrastructural, environmental, social, and institutional characteristics. The research question in the present contribution is: 'are the mental maps of entrepreneurs related to the provinces' characteristics, and, if so, to which characteristics?' To do so, descriptive statistics and an econometric analysis (OLS) allow exploring the relationship between the perception score (average rating assigned to Italian provinces), as stated by the entrepreneurs, and the main location factors, usually taken into consideration in the most relevant literature. The main findings highlight not only the significant role of economic and accessibility factors, as expected, and but also the role of some contextual factors such as the presence of the mafia, which is notoriously present in some areas in Italy.

JEL Classification R12 · R30 · L26

✉ Dario Musolino
dario.musolino@unibocconi.it

¹ Centre for Research on Regional Economics, Transport and Tourism (CERTeT), Bocconi University, Via G. Roentgen 1, 20136 Milan, Italy

² Department of Economics and Political Science, Aosta Valley University, Strada Cappuccini 2A, 11100 Aosta, Italy

³ Department of Architecture and Urban Studies, Polytechnic of Milan, Via Edoardo Bonardi 3, 20133 Milan, Italy

1 Introduction

Mental maps are a long-standing tool that have been studied and investigated since the pioneering works by geographers such as Gould (1966) and Tuan (1975). This concept can assume different forms and meanings (Meester 2004), starting from a more narrow sense (the image of a place that exists in someone's mind), to sketch maps (maps drawn by an individual that represent his spatial understanding of a place) (Saarinen 1995), knowledge maps (the cartographic representation of spatial knowledge about 'objective' conditions, such as the existence of spatial units and geophysical characteristics) (Dieterovost et al. 1984), and preference maps (Tuan 1975), which are cartographic representations of attitudes and preferences that people hold about places.

The mental maps of entrepreneurs are a topic that have not been much studied in the last decades, despite their importance, particularly in terms of preference maps because they serve as proxies for the stated locational preferences of entrepreneurs. This typology of mental maps of entrepreneurs represents a key step to better understand characteristics and determinants of the actual physical location of investments (revealed locational preferences), the design of tailored policies to attract national and foreign investments, and the fostering of start-up development.

Only one line of research has so far focused its attention on this issue: that of Pellenbarg and Meester which surveyed and analysed the stated locational preferences of entrepreneurs in the Netherlands (Meester 2004; Meester and Pellenbarg 2006; Pellenbarg 2012), Germany (Meester 2004), Czech Republic (Spilková 2007), and Italy (Musolino 2015, 2018a). These studies, based on the concept of preferences maps, followed the same methodological approach, based on a sample survey of manufacturing and services entrepreneurs. The key element was a map of the country under investigation depicting the locations to be rated (cities, provinces, etc.). The authors aimed to describe and explain the shape, patterns, and explanatory factors of the mental maps of entrepreneurs using both quantitative and qualitative analyses. However, rarely has regression analysis been used to identify the explanatory location factors of the mental maps.

The present paper aims to contribute in this direction by trying to explain the mental maps of Italian entrepreneurs and focusing on key explanatory objective location factors as identified in the literature. In other words, the aim is to analyse the influence of the actual location factors that characterize the Italian provinces in the perception of entrepreneurs. To reach this goal, a quantitative approach based on descriptive statistics and regression analysis (OLS) has been used to explore the significance of the role played by objective location factors in the perception of entrepreneurs. Additionally, the study investigates, among the other location factors, the extent to which the quality of the institutional systems present, specifically criminal organizations such as the Mafia, act as deterrent against the location of firms in Italian provinces.

Indeed, the literature on firm location (both national and foreign investments) has underlined the role of the traditional pull factors (i.e. accessibility,

agglomeration economies, market size, human capital, etc.), while less attention has been placed on the quality of the institutional system and, specifically, on the role of criminal organizations such as the Mafia, which can be an obstacle for firm location in Italy. Some case studies (United Nations 2007; Broadman and Recanatini 2000) suggest that the attraction of investments is greater in areas with low levels of crime and corruption. How the quality of the institutional system and the business climate influence decisions regarding foreign companies' choice of location is an issue that clearly emerges in international literature. Such an effect could also be relevant at the regional level where, as in Italy, notable differences exist in the quality of the local socio-institutional environments (Nifo and Vecchione 2014).

The presence of organized crime imposes notable economic (and social) costs in many areas of Southern Italy, as the costs of protection rackets (Asmundo and Lisciandra 2011). One such cost, which is rarely considered, derives from the fact that the presence of criminal organizations tends to discourage both domestic and foreign investments; surveys of potential investors, both Italian and foreign, confirm this finding (Calderoni 2011). The effects of organized crime on economic development in Italy have been widely examined from sociological and historical points of view, but far less so from an economic one. This is remarkable since better data, measurement, and information sharing could effectively contribute to Italy's efforts to fight the mafia, for example, by reinforcing the existing laws against them (Calderoni 2011).

The structure of the paper follows accordingly: the second section is dedicated to the literature review concerning studies on mental maps of entrepreneurs and empirical analyses of firms' location factors at the regional and local levels. The third section presents data and methodology that have been used for investigating the relation between the mental maps of entrepreneurs and these location factors. Section 4 presents the results of the analyses, highlighting and discussing the role of the explanatory location factors. Lastly, the fifth section is dedicated to some concluding remarks and to policy implications.

2 Literature review

This section focuses on two main branches of literature: studies on mental maps of entrepreneurs, particularly on their explanatory factors, and analyses on firms' location factors at the regional and local level. The research belonging to the first branch can be traced back for more than 30 years and focuses on the perception of entrepreneurs (that is their stated locational preferences) in the following European countries: (1) the Netherlands (Meester and Pellenbarg 2006; Pellenbarg 2012); (2) Germany (Meester 2004); (3) Czech Republic (Spilková 2007); and (4) Italy (Musolino 2015, 2018a).

The studies on the mental maps of Dutch and German entrepreneurs highlighted the explanatory importance of several objective and subjective factors. Objective location factors included characteristics such as geographic centrality, a high level of accessibility, and the presence of agglomeration effects; the areas displaying such

characteristics were typically located in the ‘peak area’ of the entrepreneurs’ mental maps. Subjective characteristics also played an important role, most notably locational self-preferences (‘the best place is the one where I already am’), in shaping their mental maps. Thus, there is an attitude and special attachment towards particular places that are independent of that place’s objective characteristics (Meester 2004). Spilková’s (2007) research on foreign entrepreneurs in the Czech Republic similarly observed the importance of location factors such as geographic location, as well as other factors such as education level and qualifications of the labour force.

Concerning the case of Italy, Musolino (2015, 2018a) carried out a content analysis aimed at highlighting the key location factors that could explain the perception of provinces by Italian entrepreneurs. Data were derived from responses to the open questions of a web questionnaire survey for firms located in Italy with more than 20 employees, belonging to a range of manufacturing and service sectors. The findings revealed that the lack of transport infrastructure and services are extremely important factors in explaining why areas in Southern Italy were far more neglected as potential environments to locate. Secondly, the weakness of the agglomeration economies, poor access to supply chains and markets, general remoteness and poor security, which clearly refers to the presence and influence of crime organizations on economic activities, were also rather important factors for the firms. Concerning the highest-rated provinces, transport infrastructures and services were, once again, the most important location factor, followed by the proximity to markets and suppliers, and by geographic location. Therefore, accessibility, agglomeration economies, and the influence of organized crime, in the case of southern regions, are the key issues that explain the mental maps of Italian entrepreneurs. Compared with these factors, other location factors, such as human capital, amenities and quality of life, policies for enterprise creation and development as well as research and innovation, appeared to be less important.

Another type of qualitative analysis, aiming at providing an in-depth explanation of the mental maps of Italian entrepreneurs, was addressed in the thematic analysis of direct interviews with experts and key informants, conducted as a follow-up to the questionnaire survey (Musolino 2015, 2018a). The ultimate goal was to show the underlying motives and driving forces that might explain the perceptions of entrepreneurs. Interestingly, they confirmed that most of the location factors highlighted by the content analysis of the open questions (for example, accessibility and agglomeration economies) are actually fundamental as explanatory location factors. In areas such as the Padana region,¹ located in Northern Italy, these factors work as a circular cumulative mechanism that creates a favourable locational environment appreciated by entrepreneurs. On the contrary, where these location factors are scarce, or absent (mainly, in Southern Italy), they work as a vicious circle that leads to an extremely unfavourable perception of the location environment. The interviewees also explained that organized crime creates, more than other factors, a kind of prejudice against the Mezzogiorno (southern Italy). This bias, even from the very beginning, prevents (mostly foreign) investors from taking southern regions (even

¹ The so-called Padana Region is located in the Po valley, and includes approximately four Italian administrative regions: Piedmont, Lombardy, Emilia-Romagna, and Veneto.

those which are not strongly affected by this serious problem, such as Apulia, Basilicata, and Sardinia²) into consideration.³

Utilizing data derived from the same research, Musolino (2018b) also discovered that organized crime has an additional anomalous effect on the mental maps of entrepreneurs underlying the inconsistency between the reality and the perception of the North–South divide. On the one hand, he discovered that the width of the ‘perceived North–South gap’ in Italy is bigger than the ‘real North–South gap’. On the other hand, he found that entrepreneurs perceive regions and provinces in Southern Italy as far too homogenous compared to the actual level of differences in their economic and social development. In other words, the author suggests that the perception of regions by entrepreneurs can only partially be explained by ‘objective’ location factors.

An additional study by Musolino (2015), again using the same data as this paper, explored the main location factors to explain entrepreneurs’ mental maps. Using the principal component analysis, the authors discovered the key role of the factors associated with centrality and accessibility, which can be associated with the Italian centre-periphery dichotomy (Padana region with Tuscany and Lazio, characterized not only by a favourable geographical location but also by an efficient and modern transport network). Also, they recognized the explanatory power of the so-called Third Italy factor, which corresponds to the location of the industrial districts and the location environments that offer clear advantages in terms of agglomeration (localization) economies.

The second branch of the literature concerns firm location factors at the regional and local level. This branch belongs to a firm location theory and focuses on the optimal location choice that is determined by the attractiveness of a site for firm location (pull factors). This paper focuses on the location of firms at the regional and local level, while international locations are beyond the aim and scope of the present analysis.

Firm location factors have been widely studied by three main location theories: the neo-classical, behavioural, and institutional location theories (for a review, see Pellenberg et al. 2002). As Brouwer et al. (2004) state, neo-classical location theory focuses on the premise of the rationale that firms maximize profit in choosing the optimal location (see, among the others, Von Thünen 1826; Weber 1929; Losch 1954; Moses 1958; Alonso 1964). Mainstream economists have shown a renewed interest in the ‘neo-classical’ approach, labelling it ‘New economic geography’ (Krugman 1995; Fujita et al. 1999). The behavioural location theory considers firms as bounded rational agents with limited information and settle for sub-optimal outcomes rather than maximum profits (see, among others, Simon 1955; Cyert and March 1963; Pred 1967; Townroe 1972). The approach explores ‘internal’ factors

² See Fondazione Transcrime (2013).

³ Interestingly, the work by Musolino (2015) adopts the same data on entrepreneurs’ perceived attractiveness of Italian provinces, dividing entrepreneurs by macro-region of residence. He discovered that Southern Italy is quite neglected as a potential location also because the so-called locational self-preferences (Meester 2004) are not valid in the Italian case. Southern entrepreneurs themselves are more willing to prefer locations in Northern Italy.

(e.g. age and size) which are important in the decision-making process of the firm and can lead to selecting a particular location.

The neo-classical and behavioural theories have been subject to considerable criticism because they consider the firm as an active decision-making agent in a static environment; institutional location theory has been proposed to overcome this problem. It starts from the assumption that economic activity is socially and institutionally situated, and it is 'embedded' in ongoing social institutions or networks (Granovetter 1985; Storper and Salais 1997; Pellenbarg et al. 2002; see also the 'geography of enterprises' by Krumme 1969; and the 'industrial district literature' by Pike et al. 1990; Becattini 1990). Specifically, the quality of institutions may be important for both national and foreign investments for several reasons (see Daniele and Marani 2011): (1) efficient institutions improve productivity prospects, and this attracts investors; (2) a poor institutional environment means additional costs for firms (Broadman and Recanatini 2000; Wei 2000; United Nations 2007) and (3) due to high sunk costs, investments are highly exposed to uncertainty that stems from poor government efficiency or the weak enforcement of property rights and legal system.

All the above-mentioned location factors can be classified according to the following four typologies: (1) traditional location factors; (2) environmental, social, and institutional context; (3) policy framework; and (4) information costs, as reported in Table 1. Specifically, the traditional location factors concern: labour, market size and market potential, land, agglomeration economies, transportation costs, other costs, infrastructures, services, and intangible assets.

This paper gives particular attention to the presence of the Mafia—as an institutional location factor—in the Italian provinces as a deterrent against firm investments. As Calderoni (2011) has underlined, the number of studies and publications addressing this issue are scant, which is unfortunate since better data, measurement, and information sharing could indirectly help policy makers to prevent mafia in specific places, for example, by reinforcing the laws against them.

The effects of organized crime on economic development in Italy have been widely examined from the sociological and historical points of view, but far less so from the economic one. Some recent studies carried out by economists have focused on exploring how national and foreign investment location choices are influenced by the national political, institutional, and legal systems (Globerman and Shapiro 2002). In these cases, the institutional environment includes: the ease with which a firm can be set up, government effectiveness, security of property rights, the efficiency of the judicial systems, and the lack of corruption (Habib and Zurawicki 2001). It clearly emerges that the attraction of investments is greater in countries with low levels of crime and corruption (Broadman and Recanatini 2000; United Nations 2007), but this effect could also be relevant at a regional level where, as in the case of Italy, notable differences exist in the quality of the local socio-institutional environments (Nifo and Vecchione 2014). Albanese and Marinelli (2013) also explored the effect of organized crime on the productivity of Italian firms, finding that it reduced firm-level productivity regardless of firm size and sector. Recently, Ganau and Rodriguez-Pose (2017) focused on whether and to which extent organized crime (mafia-type criminality) affects a firm's performance (defined in terms of

Table 1 Firm location factors. *Source:* our own elaborations based on Brouwer et al. (2004) and Mariotti (2015)

Categories	Factors
Traditional location factors	Labour: Labour costs and availability Labour skills and labour unionization Market: Market size and market potential Competitiveness level and density Land: Land costs and availability Agglomeration economies: Localisation economies Urbanisation economies Transportation costs Other costs: Taxes and financing Infrastructures, services, and intangible assets Presence of and accessibility to infrastructures Utilities' quality Business services (banking and financial services) Scientific and technological assets
Environmental, social, and institutional context	Social cohesion and sense of legality Organized crime, mafia Economic, political, and social stabilities Legal system Intellectual property right protection Bureaucratic efficiency
Policy framework	Competition policy Trade policy Tax policy Environmental policy
Information costs	Geographical distance from the core (of city, region, nation) Geographical proximity to the home country Cultural proximity between the home and the host countries FDI penetration

TFP growth), both directly and indirectly. The analysis concerned Italian small- and medium-sized manufacturing firms over the period 2010–2013. It underlined the presence of a negative (direct) effect of organized crime on firm-level productivity growth as well as a negative (indirect) influence of organized crime which creates local conditions undermining the positive effect of industrial clustering on productivity growth.

Regarding the Italian Mezzogiorno, one survey consisting of a panel of businessmen from north-eastern Italy shows how almost all those interviewed believed the presence of criminality to be one of the principal obstacles to investment in this area (Fondazione Nord-Est 2002). An enquiry conducted on behalf of the Italian Ministry of the Economy in eleven countries confirmed that, in the perception of businessmen, the Mezzogiorno appears to be an area lacking in security (GPF and Ispo 2005). Economists have highlighted the deterrent effect of crime on foreign investors

for years. Over 30 years ago, Sylos Labini (1985) and Olson (1984) observed how the presence of organized crime in the South forces companies to transfer elsewhere, discouraging those who intend to invest. Although rich in implications, the observations of Paolo Sylos Labini and Mancur Olson have received little attention.

Only recently, some studies on Foreign Direct Investment (FDI) determinants have considered the crime rate among the explicative variables used in the analysis, showing how, in Italy, high crime rates tend to be negatively correlated with the regional capacity to attract foreign investors (Basile et al. 2005; Barba Navaretti et al. 2009; Daniele and Marani 2011). Specifically, the study by Daniele and Marani (2011) explored the role of organized crime, measured by the number of complaints regarding criminal offences of different kinds traditionally related to mafia groups, in Italian provinces during the period from 2002 to 2006. The authors found a significant and negative correlation between organized crime and FDI; therefore, crime represents a deterrent against foreign investors, suggesting that high levels of (certain) crimes may be perceived as a signal of a local socio-institutional environment unfavourable for FDI.

3 Data and methodology

Data of entrepreneurs' perceived attractiveness regarding Italian provinces in 2011 comes from the web questionnaire survey of firms with more than 20 employees belonging to a range of manufacturing and service sectors, developed by Musolino (2015). The online questionnaire was quite simple and relatively quick to fill in. The respondents first answered a few questions about their firm and then were brought to an interactive map of Italy containing the spatial units to be rated (administrative regions and provinces).⁴ They then had to evaluate each province as a possible location for their hypothetical investments on a five-point ordinal scale ('very unfavourable'; 'unfavourable'; 'neutral'; 'favourable'; 'very favourable').⁵ The question accompanying the map asked: 'Suppose that, for any possible reason, you have to change the location of your firm (or of one of the establishments) within the Italian territory. Given this hypothesis, how do you evaluate each of the areas indicated on the map as possible new locations of your firm?' (Musolino 2015).

The entrepreneurs selected for the survey had to satisfy the following three basic criteria (see also Meester 2004): (1) being capable of making a well-founded judgment on the locational environments in the study area; (2) have an interest, even hypothetically, to evaluate an alternative location; (3) have the power to make

⁴ These divisions correspond, respectively, to the NUTS 2 and NUTS 3 levels in Italy, as defined in the Classification of Territorial Units for Statistics by the European Union ([http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Nomenclature_of_territorial_units_for_statistics_\(NUTS\)](http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Nomenclature_of_territorial_units_for_statistics_(NUTS))).

⁵ Respondents rated the provinces following a stepwise mechanism: they had first to rate regions, and then eventually/optionally, provinces. In fact, they had the possibility not to assign any rate to the provinces, instead leaving them all with the same rating assigned to the region. This is why it is also interesting to take both maps (regional and provincial) into account when analysing the results of the web survey.

decisions regarding their location. The use of these criteria limited the range of sectors and sub-sectors of the survey. For example, firms belonging to sectors with a strong locational constraint, such as activities bound to the land (mining, agriculture, etc.), were kept out as they do not have any interest in evaluating alternative and different locations and thereby did not satisfy the second criteria. A total of 9985 entrepreneurs were selected for the web survey, all of whom were contacted to participate in the web survey between January 2010 and July 2011. A total of 645 replied and, of those, only 225 properly filled out the questionnaire (2.5%), the results of which have been used in the analysis.

As described in Sect. 2, the literature suggests that firm location is mainly driven by: (1) traditional location factors; (2) environmental, social and institutional context; (3) policy framework; and (4) information costs (see Table 1). In order to explain the attractiveness of the Italian NUTS3 provinces (dependent variable), as perceived by the entrepreneurs, the independent variables described in Table 2 have been adopted.

Specifically, firm density is a proxy of agglomeration economies (intended as urbanization economies) and the 'district' variable, which measures the share of employees in manufacturing industries belonging to industrial districts over the total employment of the province, proxies localization economies. The share of skilled employees describes the labour quality, thus it serves as a proxy for knowledge intensity of the place, local commons (Barzotto et al. 2016a, b; Mariotti and Barzotto 2018), and knowledge spillovers. Total trade value on value added is a measure of openness (Driffield and Taylor 2006) and territorial competitiveness. The variable about accessibility refers to multimodal potential accessibility, as defined by Spiekermann and Wegener (2014), while the Mafia index⁶ is a proxy of the legal framework and of the social and institutional context. The Università Cattolica of Milan (see Calderoni 2011) developed this index, and it results from a combination of the following dimensions: (1) presence of criminal groups providing illicit goods and services; (2) use of violence, threat, or intimidation; (3) infiltration of the political system; and (4) infiltration of the economic system. Compared to other existing indexes (i.e. the Organized Crime Index compiled by ISTAT, for a review see Eurispes 2010), this has the advantage of allowing comparison among different areas as it is disaggregated at the provincial level while also providing a long-term analysis.

The perceived territorial attractiveness is explored by means of an OLS estimation and run at the provincial scale (NUTS3: 110 Italian provinces) in the year 2011 where the explanatory variables are described in Table 2, and $\phi X_{s,p}^{12}$ is a vector of controls:

$$\begin{aligned} MM_p^{12} = & \alpha + \beta_1 Mafia_p^{0011} + \beta_2 Acc_p^{12} + \beta_3 Dens_p^{12} + \beta_4 Trade_p^{12} \\ & + \beta_5 Skill_p^{12} + \beta_6 Distr_p^{12} + \phi X_{s,p}^{12} + \varepsilon_{s,p} \end{aligned}$$

⁶ Traditionally in Italy, there are four main Mafia groups: the Sicilian Mafia, the Camorra, in Campania, the 'ndrangheta, in Calabria, and the Sacra Corona Unita, in Apulia. Some authors also refer to a 'fifth' mafia, concerning the criminal phenomena exhibiting some of the significant features of the four main groups (for an overview, see Calderoni 2011).

Table 2 Dependent and explanatory variables

	Description	Source
<i>Dependent variable</i>		
MM	Mental Maps — Average ratings at the provincial scale (110 NUTS3) (2011)	Musolino (2015)
<i>Explanatory (independent) variables</i>		
Mafia index	Mafia index at the provincial scale (107 NUTS3) (2000–2011)	Fondazione Transcrime (2013)
Accessibility	Multimodal potential accessibility at the provincial scale (110 NUTS3) (2011)	ESPON- S&W Spiekermann & Wegener, Urban and Regional Research (2014)
Density	Entrepreneurial density (firms/population) at the provincial scale (110 NUTS3) (2012)	ISTAT (ASIA database and demographic data)
Trade/VA	Trade (Import + Export)/value added at the provincial scale (110 NUTS3) (2012)	ISTAT (Coeweb)
Skill	No. of high-skilled employees/Tot. employees at the provincial scale (110 NUTS3) (2012)	ISTAT
District	District intensity at the provincial scale (110 NUTS3) in 2011: 1 = low, 2 = medium, 3 = high	Di Bernardino and Mauro (2011), ISTAT

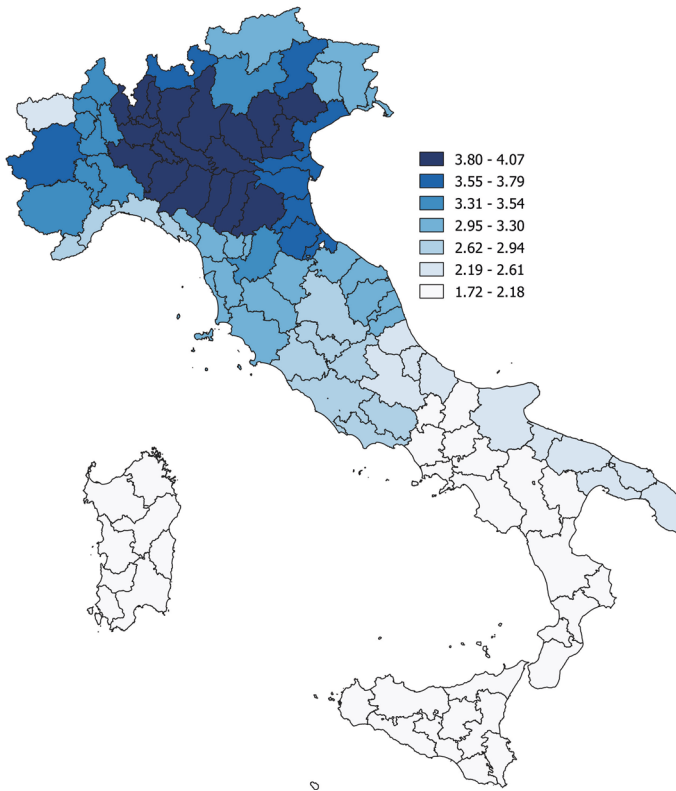


Fig. 1 Average rating of Italian provinces (NUTS3 level). *Source:* our own compilation based on data from Musolino (2015)

4 Empirical analysis

4.1 Descriptive statistics

The findings of the web questionnaire survey showing the mental maps of entrepreneurs at the provincial scale are shown in the thematic map below, which represents the average ratings obtained by the Italian provinces (Fig. 1), and in Table 3. The mental maps are characterized by the following spatial patterns: first, the centre–periphery dichotomy, with most of the Padana region at the centre and the area around the city of Milan constituting the core.⁷ Secondly, the spatial hierarchy from the north to the south of Italy is also evident. This is the well-known North–South

⁷ For relevant studies about the emergence of the Padana region, see, e.g. Bramanti et al. (1992), OECD (2006) and Turri (2000). Concerning the role of Milan in attracting inward foreign direct investments, see Mariotti and Mutinelli (2014), and Mariotti (2018).

Table 3 Ranking of the NUTS3 Italian provinces by average rating obtained *Source*: our own calculations based on Musolino (2015)

1	Milan	4.07	56	Trieste	3.13
2	Brescia	4.00	57	Gorizia	3.13
3	Monza e Brianza	3.99	58	Rome	2.94
4	Bergamo	3.98	59	Genoa	2.80
5	Bologna	3.95	60	Perugia	2.79
6	Mantova	3.93	61	La Spezia	2.78
7	Reggio Emilia	3.92	62	Terni	2.77
8	Varese	3.91	63	Savona	2.74
9	Modena	3.90	64	Viterbo	2.73
10	Parma	3.90	65	Imperia	2.71
11	Lodi	3.89	66	Frosinone	2.70
12	Como	3.89	67	Latina	2.70
13	Verona	3.88	68	Rieti	2.67
14	Pavia	3.88	69	Pescara	2.61
15	Lecco	3.87	70	Chieti	2.59
16	Cremona	3.84	71	Teramo	2.58
17	Vicenza	3.84	72	Aosta	2.58
18	Padua	3.84	73	L'Aquila	2.56
19	Treviso	3.83	74	Bari	2.49
20	Piacenza	3.82	75	Barletta-Andria-T.	2.44
21	Ferrara	3.79	76	Taranto	2.43
22	Forlì-Cesena	3.77	77	Foggia	2.43
23	Ravenna	3.76	78	Lecce	2.43
24	Rimini	3.76	79	Brindisi	2.42
25	Sondrio	3.75	80	Campobasso	2.18
26	Venice	3.72	81	Isernia	2.18
27	Rovigo	3.67	82	Matera	2.06
28	Belluno	3.64	83	Potenza	2.06
29	Turin	3.60	84	Catania	2.05
30	Novara	3.54	85	Palermo	2.00
31	Alessandria	3.48	86	Naples	1.98
32	Asti	3.44	87	Messina	1.98
33	Vercelli	3.43	88	Salerno	1.97
34	Biella	3.42	89	Siracusa	1.95
35	Cuneo	3.42	90	Benevento	1.93
36	Verbano-C.O.	3.38	91	Avellino	1.93
37	Florence	3.36	92	Caserta	1.93
38	Trento	3.33	93	Agrigento	1.92
39	Lucca	3.30	94	Ragusa	1.92
40	Bolzano	3.30	95	Trapani	1.92
41	Livorno	3.29	96	Caltanissetta	1.90
42	Pisa	3.29	97	Cagliari	1.89
43	Siena	3.29	98	Enna	1.89
44	Prato	3.28	99	Olbia-Tempio	1.88
45	Pistoia	3.25	100	Sassari	1.87

Table 3 (continued)

46	Arezzo	3.25	101	Medio Campidano	1.87
47	Grosseto	3.24	102	Ogliastra	1.86
48	Massa-Carrara	3.23	103	Oristano	1.85
49	Pordenone	3.22	104	Nuoro	1.85
50	Pesaro e Urbino	3.20	105	Carbonia-Iglesias	1.84
51	Ancona	3.18	106	Reggio Calabria	1.74
52	Udine	3.17	107	Cosenza	1.73
53	Macerata	3.16	108	Catanzaro	1.73
54	Ascoli Piceno	3.15	109	Vibo Valentia	1.72
55	Fermo	3.14	110	Crotone	1.72

divide, which is historically rooted and has remained a persistent characteristic of Italy's economic geography.⁸

Therefore, the city of Milan receives the highest rating, confirming its key role in Italian economic geography as the main economic and financial centre that hosts the largest share of Italian MNEs and inward Foreign Direct Investments (FDI) as well as being the most important infrastructural and logistic hub (Fig. 2). It is also the world-renowned centre for highly competitive *Made in Italy* specializations, such as design, fashion, and furniture. Specifically, the Milan Metropolitan City, which proxies the Milan NUTS3 province, hosted about 34% of inward FDIs in Italy, employing 30.4% of workers and producing about 34% of the total turnover of inward FDIs (Mutinelli 2016; Mariotti 2018).

Also relevant in Northern Italy is the rating given to the other highly developed Lombardy provinces neighbouring Milan (Bergamo, Brescia, Monza, Pavia, Varese) as well as to the metropolitan cities of Verona, in Veneto, and Bologna, in Emilia-Romagna, whose level of accessibility is also high (Fig. 2). Provinces with high ratings even surround these provinces. These are all provinces located along the main East–West axis running through the Padana region. The metropolitan city of Rome stands out in the ranking of the Lazio provinces and within the Central macro-region. Rome is the political capital of Italy and the second global Italian city after Milan.

In Southern Italy, the low ratings assigned to each province follow more strictly the average rating assigned to the region the province belongs to. The perceived attractiveness of the southern provinces clearly follows the spatial pattern of some of the key location factors such as accessibility (Fig. 2), which is low in most of them. Interestingly, the spatial pattern of other well-known factors, such as the presence of the Mafia (Mafia index) (Fig. 3), which notoriously negatively affects the economy of these areas, to a certain extent adheres to the pattern of the perceived attractiveness of Italian provinces. Most of the provinces in Calabria, Campania, and Sicily, which are at the bottom of the provincial ranking (Fig. 4a), are also those where the intensity of the influence of the Mafia is at its peak.

⁸ See among the others, Svimez (2011).

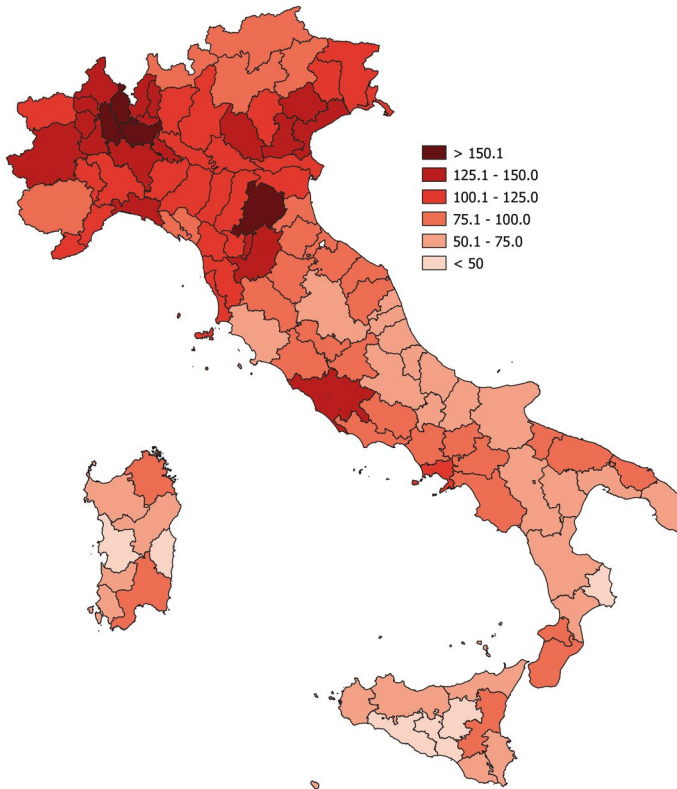


Fig. 2 Multimodal potential accessibility (NUTS3 level). *Source:* Our own compilation based on data from S&W Spiekermann & Wegener, *Urban and Regional Research* (2014)

The only southern provinces receiving a score remarkably different from the regional and macro-regional average are Bari, the regional capital of Puglia, and Catania in Sicily. These provinces host some of the most important industrial agglomerations in southern Italy. For example, Catania is home to what is called *Etna Valley*, a high-tech cluster born around the plant of the computer multinational company STS-Microelectronics (Santangelo 2004). Meanwhile, Bari hosts a ‘mechatronics district’ where the establishments of some multinational companies are located (Prota 2013).

As expected, the correlation between perceived territorial attractiveness and the Mafia index is negative. Italian provinces experiencing highly organized crime levels are less attractive for entrepreneurs due to the perceived signal of being a socio-institutional system unfavourable for investments (Fig. 3a). On the other hand, agglomeration economies, proxied by firm density, multimodal potential accessibility, and openness are positive location factors attracting investments (Fig. 4b–d, respectively).

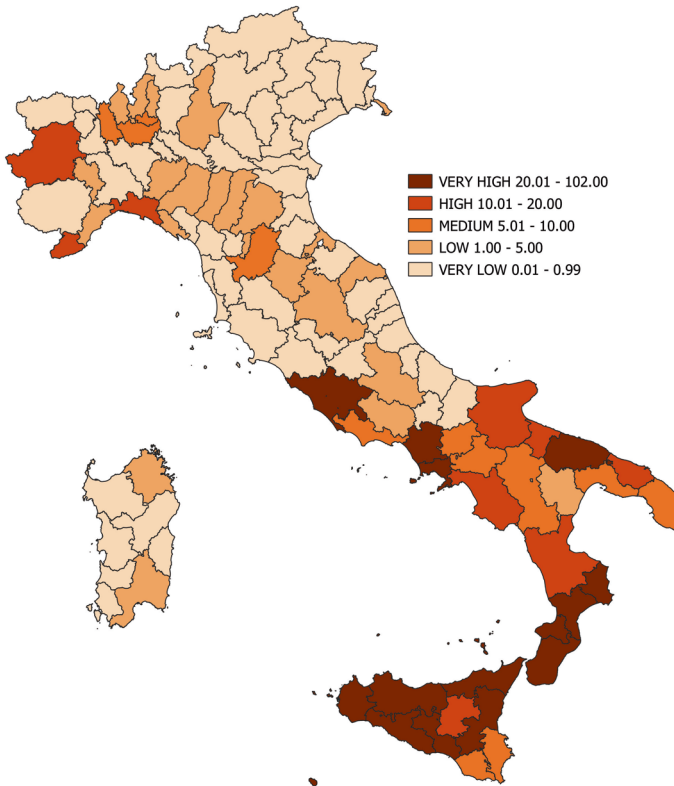


Fig. 3 Index of mafia presence (2000–2011) (NUTS3 level). *Source:* Our own compilation based on data from Fondazione Transcrime (2013)

4.2 Econometric analysis

The results of the descriptive statistics are corroborated by the econometric analysis (OLS), as presented in this section. Table 4 reports the results of estimations. Four models have been developed⁹ by consequently adding the explanatory variables in ln; they are sufficiently robust and with a high explicative power. All the explanatory variables are found to be significant.

The stated location preference of the Italian entrepreneurs (their mental maps) regarding Italian provinces is negatively influenced by the presence of Mafia-type criminal organizations, signifying that the higher the Mafia index in a location, the lower will be the propensity to invest. This variable, therefore, represents a deterrent for investors because it may condition business activities in various ways: racketeering, retail market limitations, and market distortions (see among others, Centorrino

⁹ Models (3) and (4) show robustness check.

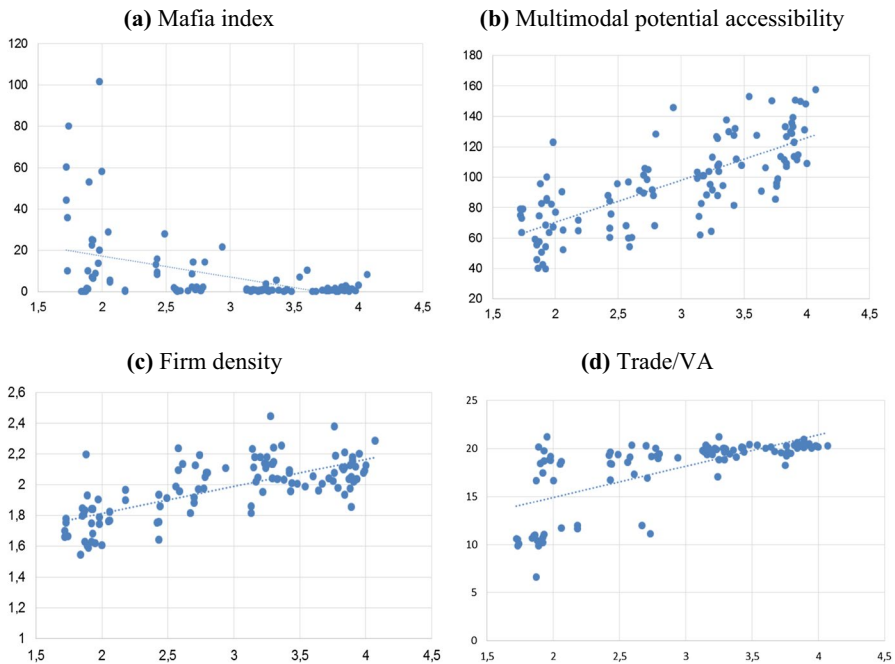


Fig. 4 Correlations of perceived territorial attractiveness with explanatory variables. *Source:* our own calculations

et al. 1999). A high presence of organized crime should be considered as an unfavourable aspect for the general business climate and, consequently, a disincentive for foreign and national investments (Daniele and Marani 2011). These results confirm the findings of Daniele and Marani (2011) about the impact of crime on FDI inflows in the Italian provinces from 2002 to 2006.

On the other hand, provinces with higher transport accessibility, firm density, and openness are perceived as more attractive. Transport accessibility is one of the main location factors, as also underlined by the literature. This means that the more accessible and well connected a province is to global markets (that is to say the better the endowment of transport infrastructure and the quality of transport services), the higher the rating it will receive as a potential location for investments. The firm density proxies agglomeration economies, while the province district intensity corresponds to localization economies. This finding implies that provinces with a high presence of external economies (related to the proximity both with other firms and people and in particular with firms belonging to the same sector) are seen by entrepreneurs as being more attractive than others. The importance of localization economies, and therefore of the presence of industrial districts, has been underlined by the aforementioned statistical analysis carried out by Musolino (2015) as well. Finally, openness is a proxy for an innovative and competitive area. On the contrary, the perception of places where these factors are scarcely present tends to be worse.

Table 4 Econometric estimation

Explanatory variables	(1)	(2)	(3)	(4)
Mafia index	-0.038283*** (0.006307)	-0.030823*** (0.006090)	-0.038283*** (0.006034)	-0.030823*** (0.005860)
Accessibility	0.277264*** (0.056648)	0.229250*** (0.053689)	0.277264*** (0.052210)	0.229250*** (0.053718)
Density	0.389434*** (0.086457)	0.293242*** (0.083003)	0.389434*** (0.091937)	0.293242*** (0.091782)
Trade/VA	0.017984*** (0.005503)	0.015079*** (0.005133)	0.017984*** (0.005685)	0.015079*** (0.005354)
Skill	0.026893*** (0.013155)	0.024726*** (0.012272)	0.026893*** (0.012359)	0.024726*** (0.011610)
District (2)		0.080071*** (0.032788)		0.080071*** (0.038633)
District (3)		0.153906*** (0.035594)		0.153906*** (0.040417)
Cons.	-1.452751***	-1.06015***	-1.452751***	-1.060157***
Obs.	107	107	107	107
F test (Prob.)	94.03 (0.0000)	81.21 (0.0000)	83.38 (0.0000)	84.42 (0.0000)
Adj R ²	0.8158	0.8425	0.8246	0.8530
Mean VIF	2.41	2.40	2.41	2.40

The explanatory variables are in natural logarithm

***, **, * are significant at 10%, 5% and 1%, respectively

Even the share of skilled workers, representing local commons and knowledge spill overs, is positive, although to a lesser extent. In advanced economies such as Italy, human capital endowment plays a crucial role in attracting investments from firms. As Pisano and Shih (2012: 23) claim, there is a close connection between the competitiveness of companies and their local workers. Additionally, dense concentrations of highly skilled workers in geographically localized clusters trigger virtuous processes of economic growth (Barzotto et al. 2016b).

5 Conclusions and policy implications

This paper has contributed to the branch of studies on the mental maps of entrepreneurs by carrying out an econometric analysis (OLS) aiming to explore the provinces' location factors for attracting investments. The results corroborate the main findings of previous studies (Musolino 2015, 2018a) and provide empirical evidence about the role of a particular element of institutional theory, the Mafia, in reducing the degree of territorial attractiveness of Italian provinces. The paper thus has explored an issue that has been poorly studied in the literature and which deserves greater attention. Towards this end, an original data set, containing interviews with Italian entrepreneur aimed at representing their mental maps, has been employed. Ultimately, these results could help in understanding and better knowing the dramatic negative effects caused by the presence of organized crime on regional and local economic development. Therefore, they could effectively contribute to Italy's efforts to fight and prevent the Mafia, not only in the areas where it is historically rooted and remains extremely powerful, but also in the most developed areas, such as Milan and Lombardy. As it is well known, the Mafia itself, paradoxically, is attracted to and invests in the most developed areas, aiming to expand its influence in these areas (Agostino and Riccardi 2013).

The analysis showed that entrepreneurs' perception about Italian provinces is related to traditional location factors, infrastructures, services, and intangible assets as well as institutional characteristics, including the presence of the Mafia. Provinces with higher accessibility, agglomeration economies, skilled human capital, and openness are perceived by entrepreneurs as potential places to be located. The analysis also confirms how the Mafia is a factor capable of reducing the degree of territorial attractiveness. As the literature has stressed, criminal organizations have direct and indirect effects. They reduce firms' performance by increasing the costs of economic activity and also reduce trust and reciprocity among individuals, increasing transaction costs, thereby making the local business environment less competitive (Ganau and Rodriguez-Pose 2017). Improving the attractiveness of Italian provinces for national and foreign investments might be advocated since Italy has always been considered a multinational follower due to its attractiveness and internationalization propensity, which remains below the European average (for an overview, see Mariotti and Mutinelli 2014). This low attractiveness is even confirmed by the World Economic Forum (2016), which ranks Italy 43rd, behind all other industrialized countries.

In conclusion, our findings have twofold policy implications for both the strongest (most attractive) and weakest (least attractive) areas. As far as the former are concerned, it is fundamental to maintain the high level of accessibility and the endowment of infrastructure and services that make these areas privileged agglomerations for locating firms in Italy, and to maintain the high level of qualification and competence of the labour force. As for the latter, they require on the one hand a considerable improvement in terms of accessibility, which would reduce the ‘perceived remoteness’ of the southern provinces from northern and central areas. On the other hand, a strategy to increase the fight against the Mafia groups would effectively neutralize their ability to negatively influence not only entrepreneurship, but also attractiveness for exogenous investment. Moreover, investing in education (in particular higher education) and improving the vocational training system should also be a pillar of the strategy to create an improved image of Southern Italy.

References

- Agostino V, Riccardi M (2013) Mafia investments: where mafia groups invest their money and what business sectors they prefer. *Eur Police Sci Res Bull* 9(Winter 2013/2014):2–8
- Albanese G, Marinelli G (2013) Organized crime and productivity: evidence from firm-level data. *Riv Ital degli Econ* 18:367–394
- Alonso W (1964) Location and land use. Toward a general theory of land rent. University Press, Cambridge, Harvard
- Asmundo A, Lisciandra M (2011) The cost of protection racket in Sicily. *Glob Crime* 9(3):221–240
- Barba Navaretti G, Basile R, Benfratello L, Castellani D (2009) Il Mezzogiorno e gli investimenti diretti esteri, Centro Studi Luca D’Aglia
- Barzotto M, Corò G, Volpe M (2016a) Territorial capital as a company intangible: exploratory evidence from ten Italian multinational corporations. *J Intellect Cap* 17(1):148–167
- Barzotto M, Corò G, Mariotti I, Mutinelli M (2016b) The impact of Inward FDI on host country labour markets. A counterfactual analysis on Italian manufacturing companies. c.MET working paper series, 03/2016
- Basile R, Benfratello L, Castellani D (2005) Attracting foreign direct investments in Europe: are Italian regions doomed? Centro studi Luca d’Aglia development studies working paper no. 200 (March)
- Becattini G (1990) The Marshallian industrial district as socioeconomic notion. In: Pike F, Becattini G, Sengenberger W (eds) *Industrial districts and inter-firm cooperation in Italy*. IILS, Geneva, pp 37–51
- Bramanti A, Senn L, Alessandrini S, Centro Studi sui Sistemi di Trasporto, Camagni R, Mazza L et al (1992) *La Padania, una regione italiana in Europa*. Fondazione Giovanni Agnelli, Turin
- Broadman H, Recanatini F (2000) Seeds of corruption: do market institutions matter? Policy research working paper n. 2368. World Bank, Washington, DC
- Brouwer AE, Mariotti I, van Ommeren JN (2004) The firm relocation decision: an empirical investigation. *Ann Reg Sci* 38(2):335–347
- Calderoni F (2011) Where is the mafia in Italy? Measuring the presence of the mafia across Italian provinces. *Glob Crime* 12(1):41
- Centorrino M, La Spina A, Signorino G (1999) Il nodo gordiano. Criminalità mafiosa e sviluppo nel Mezzogiorno. Laterza, Rome-Bari
- Cyert RM, March JG (1963) *A behavioural theory of the firm*. Prentice Hall, Englewood Cliffs
- Daniele V, Marani U (2011) Organized crime, the quality of local institutions and FDI in Italy: a panel data analysis. *Eur J Polit Econ* 27:132–142
- Di Berardino C, Mauro G (2011) Crescita economica e impatto della crisi: il ruolo dei distretti industriali in Italia. *Economia e società regionale* 2011(1):92–114

- Dieterstov AGJ et al (1984) *Algemene sociale geografie: ontwikkelingslijnen en standpunten*. Weesp, Roma
- Driffeld NL, Taylor K (2006) Domestic wage determination: regional spillovers and inward investment. *Spat Econ Anal* 1(2):187–205
- Eurispes (2010) 22° Rapporto Italia 2010. Eurilink, Roma
- Fondazione Transcrime (2013) Dove operano le mafie in Italia. In: Progetto PON Sicurezza 2007–2013. Gli investimenti delle mafie. <http://www.transcrime.it/pubblicazioni/progetto-pon-sicurezza-2007-2013/>. Accessed 30 Oct 2017
- Fujita M, Krugman PR, Venables AJ (1999) *The spatial economy: cities, regions and international trade*. MIT Press, Cambridge
- Ganau R, Rodriguez-Pose A (2017) Industrial clusters, organized crime, and productivity growth in Italian SMEs. *Pap Reg Sci* 58:363–385
- Globerman S, Shapiro D (2002) Global foreign direct investment flows: the role of governance infrastructure. *World Dev* 30:1899–1919
- Gould PR (1966) On mental maps. Michigan Inter-University Community of Mathematical Geographers (Discussion paper 9), Ann Arbor. Reprint in: Downs RM, Stea D (eds) (1973) *Image and environment: Cognitive mapping and spatial behavior*. Aldine, Chicago, pp 182–220
- GPF and ISPO (2005) *L'immagine del Mezzogiorno d'Italia. Esiti della rilevazione condotta nel 2004 presso la Business Community di 10 Paesi esteri e del Centro Nord Italia*
- Granovetter M (1985) Economic action and social structures: the problem of embeddedness. *Am J Sociol* 91:481–510
- Habib M, Zurawicki L (2001) Country-level investment and the effect of corruption: some empirical evidence. *Int Bus Rev* 10:687–700
- Krugman P (1995) *Development, economic geography and economic theory*. MIT Press, Cambridge
- Krumme G (1969) *Towards a geography of enterprise*. *Econ Geogr* 45:30–40
- Losch A (1954) *The economics of location*. Yale University Press, New Haven
- Mariotti I (2015) *Transport and Logistics in a globalizing world. A focus on Italy*, springer briefs in applied sciences and technology. Springer, Berlin
- Mariotti I (2018) The attractiveness of Milan and the spatial patterns of international firms. In: Armondi S, Di Vita S (eds) *Milan. Productions, spatial patterns and urban change*. Routledge, London, pp 48–59
- Mariotti I, Barzotto M (2018) Inward FDI and skilled labour force in Veneto's industrial districts. In: Herivas Oliver LJ, Belussi F (eds) *Cluster advantage and firm performance*. Springer, Frankfurt
- Mariotti S, Mutinelli M (2014) *Italia multinazionale 2014. Le partecipazioni italiane all'estero ed estere in Italia*. Rubbettino Editore, Soveria Mannelli
- Meester WJ (2004) *Locational preferences of entrepreneurs: stated preferences in The Netherlands and Germany*. Physica, Heidelberg
- Meester WJ, Pellenberg PH (2006) The spatial preference map of Dutch entrepreneurs: subjective rating of locations, 1983, 1993 and 2003. *Tijdschrift voor Economische en Sociale Geografie* 97:364–376
- Moses LN (1958) Location and the theory of production. *Q J Econ* 72:259–272
- Musolino D (2015) *Stated locational preferences of entrepreneurs in Italy: the patterns, the characteristics and the explanatory factors of the Italian Entrepreneurs' mental maps*. Ph.D. thesis, University of Groningen
- Musolino D (2018a) The mental maps of Italian entrepreneurs: a quali-quantitative approach. *J Cult Geogr* 35(2):251–273
- Musolino D (2018b) North-south divide in Italy: reality or perception? *Eur Spat Res Policy* 25(1):29–53
- Mutinelli M (2016) *L'internazionalizzazione tramite investimenti diretti esteri*, Milano Produttiva 2016. Camera di Commercio di Milano, Milan, pp 83–96
- Nifo A, Vecchione G (2014) Do institutions play a role in skilled migration? The case of Italy. *Reg Stud* 48(10):1628–1649
- Nord-Est Fondazione (2002) *Nord-Est e Mezzogiorno. Tra nuove relazioni e vecchi stereotipi*. Donzelli Editore, Roma
- OECD (2006) *OECD Territorial Reviews: Milan, Italy*. OECD Publications, Paris
- Olson M (1984) *Einaudi Notizie. Circolare ai soci della Fondazione Einaudi*, Roma
- Pellenberg PH (2012) *De Mental Map van de Nederlandse Ondernemer: 1983–1993–2003–2012*. Faculteit Ruimtelijke Wetenschappen, Rijksuniversiteit Groningen
- Pellenberg PH, van Wissen LJG, van Dijk J (2002) Firm migration. In: McCann P (ed) *Industrial location economics*. Edward Elgar Publishing, Cheltenham

- Pike F, Becattini G, Sengenberger W (1990) *Industrial districts and inter-firm cooperation in Italy*. IILS, Geneve
- Pisano GP, Shih WC (2012) *Producing prosperity. Why America needs a manufacturing renaissance*. Harvard Business School Press, Boston
- Predd A (1967) *Behaviour and location: foundations for a geographic and dynamic location theory: part I*. University of Lund, Lund Studies in Geography B n. 28
- Prota F (2013) Il sistema produttivo della meccatronica in Puglia: trasformazioni recenti e prospettive di sviluppo. *QA Rivista dell'Associazione Rossi-Doria* 2013(1):117–142
- S&W Spiekermann & Wegener, *Urban and Regional Research* (2014) *ESPON MATRICES final Report*. <https://www.espon.eu>. Accessed 20 May 2014
- Saarinen TF (1995) Classics in human geography revisited: commentary 2. *Prog Hum Geogr* 19:107–108
- Santangelo G (2004) FDI and local capabilities in peripheral regions: the Etna Valley case. *Transnatl Corp* 13(1):72–107
- Simon HA (1955) A behavioural model of rational choice. *Q J Econ* 69:99–118
- Spilková J (2007) Foreign firms and the perception of regions in the Czech Republic: a statistical examination. *Tijdschrift voor Economische en Sociale Geografie* 98:260–275
- Storper M, Salais R (1997) *Worlds of production: the action frameworks of the economy*. Harvard University Press, Cambridge
- Svimez (2011) *150 anni di statistiche italiane Nord e Sud 1961–2011*. Il Mulino, Bologna
- Sylos Labini P (1985) L'evoluzione economica del Mezzogiorno negli ultimi trent'anni. *Temi di Discussione* n. 46. Banca d'Italia, Rome
- Townroe PM (1972) Some Behavioural considerations in the industrial location decision. *Reg Stud* 6:261–272
- Tuan YF (1975) Images and mental maps. *Ann Assoc Am Geogr* 65:205–213
- Turri E (2000) *La megalopoli padana*. Marsilio, Venice
- United Nations (2007) *Crime and development in Central America. Caught in the Crossfire*. United Nations, Office on Drugs and Crime, New York
- Von Thünen JH (1826) *Der Isolierte Staat in Beziehung auf landwirtschaft und Nationalökonomie*. Puthes, Hambourg
- Weber A (1929) *Theory of the location of industries*. University of Chicago Press, Chicago
- Wei SJ (2000) How taxing is corruption on international investors? *Rev Econ Stat* 82:1–11
- World Economic Forum (2016) *The global competitiveness economic report 2016–2017*. Insight Report, Geneva

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.