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The Role of Geography and Institutions in determining FDI flows into Italian Provinces

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The Role of Geography and Institutions in determining FDI flows into Italian Provinces

Attilio Di Battista* - June 2013

Abstract

This paper describes the determinants of FDI location among Italian provinces, focusing on the role of market potential (in terms of market access to Mediterranean and European countries) and institutions (presence of Mafia-type crime, corruption, inefficiency of the labour judicial system). Provinces with better access to neighbouring countries are expected to receive larger amounts of investments. Better efficiency in settling disputes relative to labour subjects, fewer corruption episodes and lower presence of organized crime should also be associated with higher flows of FDIs.

Data have been drawn from different sources (FDIMarkets Database, OECD, IMF, EuroStat Regio, and various Italian statistical, economic and political institutions) and were elaborated in order to create specific indices. All together, they constitute a detailed collection of information on this subject (the appendix contains maps to better visualize data on the Italian territory). The particular structure of the data – characterised by high presence of zeros, large overdispersion and high volatility of the dependent variable – required extensive econometric testing. Baseline analysis was carried out through Zero-Inflated Negative Binomial, Poisson Pseudo-Maximum-Likelihood and Logit estimations. Additional tests were conducted adopting fixed effects methodologies (including a Mundlak procedure on a Negative Binomial random effects estimation) and other procedures able to deal with excess zeros and overdispersion in the dependent variable (Zero-Inflate Poisson, Hurdle Poisson, Hurdle Negative Binomial).

Conclusions partially confirm initial hypotheses, while giving new insights on this issue. Market potential has a positive impact on FDIs, especially in relation to Mediterranean countries. Provinces with better infrastructural networks, in particular port and railway facilities, are more able to grasp the opportunities offered by economic growth in the Mediterranean. Inefficiencies in the labour judicial system are associated with lower probability to receive any investment (binary process). The relation between FDIs and Mafia follows a more insightful pattern, as the presence of Mafia reduces the probability of receiving inflows of foreign capital, but it is associated with larger projects, implying the investment of higher volumes of money. To the contrary, higher levels of corruption seem to be associated with smaller investment projects, although the significance of this result is very weak and evidence is not sufficient to draw final conclusions.

Regressions were further estimated with year fixed effects and additional covariates. Results were also tested introducing 1- and 2-period lags of the dependent variable. Dummies for specific areas of the country (north, centre, south) were constructed and interacted with market potential indices.

JEL Classification Codes: F23; R30; R58

Keywords: Foreign Direct Investment, regional policy, market potential, economic geography, industrial location, institutions, corruption, labour market, organised crime, Italy, Mediterranean.

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1 - Introduction

This paper attempts to shed some light on the determinants of foreign direct investment (FDI) location among Italian provinces, particularly with regard to the role of access to European and Mediterranean markets and of institutions and civil society. Italy as a whole receives much smaller inflows of FDIs than comparable European and OECD countries. However, national data hide large heterogeneity at the local level, with some areas of the country (especially in the North) attracting most investments. As the Mediterranean region experienced fast economic growth over the last decade, increased market access to neighbouring countries is expected to increase the capacity of Southern Italian provinces to attract FDIs. However, institutional and infrastructural deficits might impair overall business environment and prevent Southern Italy from grasping this opportunity. Focusing on variables such as market potential, Mafia-type crime, corruption and inefficiency of the labour market, and carrying out the analysis at a NUTS3 level of disaggregation, this research represents an original contribution to the existing literature on the location of FDIs within Italy.

Results are partially consistent with expectations. Better access to Mediterranean markets seems to have a positive impact on flows of FDIs into Italian provinces, especially if they are equipped with good quality infrastructures. Higher levels of inefficiencies in the labour judicial system are associated with a lower probability to receive *any* investment (binary process). Corruption does not generally have a strongly significant impact on FDIs, although the number of jobs created by investment projects seems to be lower in provinces where corruption is higher. The relation between FDIs and Mafia follows a more insightful pattern, as a higher presence of Mafia reduces the probability of receiving inflows of foreign capital, but it is associated with larger projects, implying the investment of higher volumes of money. Surprisingly, better market access to European countries and to the rest of Italy seems to have a negative effect on the capacity of provinces to attract investments. This counterintuitive result might be explained by a “competition effect” between provinces within Italy arising from the way the *Euro-Italian Market Potential Index* was constructed. As the total added value of each province has been excluded from the measure of its own market potential, areas around major economic poles (Milan, Rome, Turin) tend to have much higher indices than the centres of the poles themselves that, however, attract most of the investments. This problem could be addressed in further research through a reformulation of the market potential indices.

The paper is organized as follows. Section 2 describes more in detail the Italian context, with references to the findings of previous literature. Section 3 presents the data and discusses the relative advantages of the different methodologies which have been applied. Section 4 analyses the role of market potential, commenting both fixed effects and baseline analysis. It contains additional results to determine how market potential affects investments in association with infrastructures and how heterogeneous its relative effect is in different areas of the country. Section 5 focuses on the role of institutions, in particular Mafia crime, labour judicial system inefficiency and corruption.

2 - The Italian case: context and previous literature

Italy has experienced over the last twenty years stagnant economic growth, which has contributed to widen the gap with other European and OECD countries and led the country to the current situation of financial instability. Although there has not been so far univocal consensus in the empirical literature over the positive relationship between FDI and economic growth¹, the Italian government has engaged in a series of reforms aiming to increase the country's international competitiveness and attractiveness for foreign investors. Particular attention has been given to reducing the internal gap between Northern and Southern regions, as convergence among these two areas of the country could be the main driver of economic growth in the future.

A few data can show the magnitude of the gap between Italy and the rest of Europe, and how FDI tend to concentrate locally within the country. Between 2003 and 2007, Italy has received an average of 8 greenfield investment projects every million people, against an average of 19.7 in Western Europe, 36.9 in Eastern Europe and 15.4 in the Western European regions included in the European Union Objective 1 list². Over the same period, Southern Italian³ regions have received 2 projects every million inhabitants, against 9.5 in the centre of the country and 12.3 in the north⁴. There are wide differences within the country. Between

¹ (Ewing & Yang, 2009)

² In the 2000-2006 European Union Structural Funds regulation, some European areas had been identified as eligible to receive special funds aiming "to promote the development and structural adjustment of regions whose development is lagging behind" (Objective 1). In Italy, these areas corresponded to the regions of Sicily, Sardinia, Calabria, Basilicata, Puglia, Campania, and (in transitional support) Molise. In the 2007-2013 Structural Funds regulation, the Objective 1 was merged into the so-called "Convergence Objective", targeting once again areas of the E.U. lagging behind in their economic development. For the 2007-2013 period, Italian regions considered eligible to receive these funds are Sicily, Sardinia, Calabria, Basilicata (phasing out of the programme), Puglia, and Campania.

³ Throughout the paper we will refer to Southern Italy as the area including Sicily, Sardinia, Calabria, Basilicata, Campania, Puglia, Molise, and Abruzzo. This area largely corresponds to the part of the country which used to be under Spanish control until 1861 (with the notable exception of Sardinia) and which has been since then identified as "il Mezzogiorno" (the South), benefiting from specific economic incentives to foster economic growth and convergence with the rest of the country (as the funds provided by the Cassa del Mezzogiorno between 1951 and 1992 or the European Union Objective 1 Structural Funds).

⁴ (Barba Navaretti, Basile, Benfratello, & Castellani, 2009)

2003 and 2011, the top receiver was the region of Lombardia, with a total of about 52.8 greenfield investment projects per million people, followed by the region of Lazio with 36.7 projects and Friuli Venezia Giulia with 26.3. At the other end of the ranking, Calabria, Marche and Sardegna received respectively 2, 3.2 and 4.8 greenfield investment projects every million people (Figure 1). Moving to the NUTS3 level, over the same period 18 of the 20 provinces that received the highest number of projects are in the Northern and Central part of the country. At the top, the Province of Milan received 119.7 investments every million people, followed by Trieste with 54.8 and Rome with 46.3 (Figure 2). Not surprisingly, as we move to a more local level of aggregation, the concentration and the variance of the number of investment projects increase exponentially.

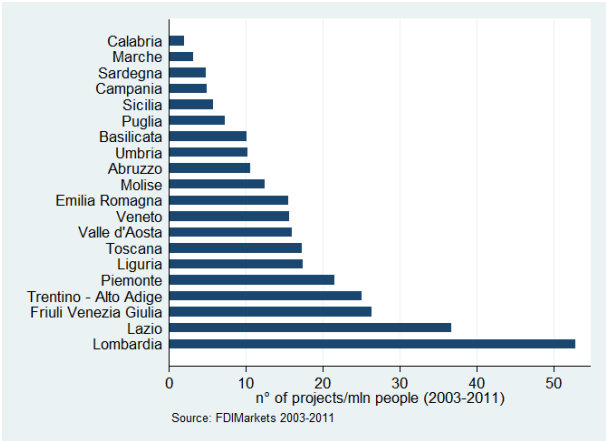


Figure 1: Number of Greenfield Investment Projects per million of people (Cumulative 2003-2011)

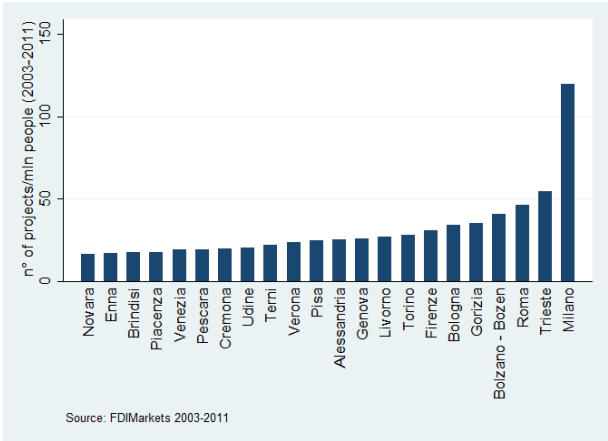


Figure 2: Number of Greenfield Investment Projects per million people in the top 20 Provinces (Cumulative 2003-2011)

Given its position at the core of continental Europe and yet deep in the middle of the Mediterranean Sea and close to the African coasts, Italy could potentially be an ideal bridge between Europe and Africa and an important logistic and production platform between the two continents. Yet, economic relationships with Northern African and Mediterranean countries have so far been weak and largely limited to the supply of energy commodities, and Italy has not been able to grasp the opportunity provided by its geography. The size and the importance of this “missed opportunity” have grown in the recent years in parallel with the fast economic development and demographic growth of many Mediterranean and Middle-Eastern countries. According to New Economic Geography theories, the attractiveness of Southern Italian provinces, measured by their market potential, should have increased more than in the Northern part of the country, and therefore attracted a larger amount of FDI⁵.

⁵ (Krugman, Geography and Trade, 1991)

On an international level, Italy presents worse institutions than most other OECD countries⁶. However, large differences exist within the country, with Southern areas performing largely worse than their Northern counterparts. Between 2001 and 2006 judicial trials of first instance for subjects related to labour lasted an average of 193 days in Turin, 353 in Milan, 746 in Bologna, 854 in Rome, 927 in Naples and 1079 in Palermo. Figure 3⁷ shows how the performance of the judicial system progressively improves as we move from the South to the North of the country. The presence of organized crime also follows a very skewed distribution across the peninsula: the penetration of Mafia-type crime is much higher in Southern areas of the country (Figure 4⁸). Similarly, the plague of corruption appears to be more present in the South (with peaks in Molise and Calabria), although some Northern provinces are also deeply affected by the problem (Figure 5).

This paper gives an important contribution to the existing literature on FDI flows into Italy. Firstly, it is the first attempt to analyse the association between investments and market potential within different areas of Italy, and in particular at a NUTS3 level of disaggregation. This issue is particularly important given geographical differences among Italian provinces, which could have had a significant role in determining current gaps in development between the Northern and Southern part of the country. Moreover, analysing the role of market access of Italian provinces to Mediterranean countries will be increasingly important as convergence between the two shores of the Mediterranean Sea increases.

A second merit of this research is to deepen the analysis of the effects of organized crime on FDIs. Previous research on the Italian case is limited to the analysis carried out by Daniele and Marani⁹. In carrying out their analysis at NUTS3 level, they also used the UIC – Banca d'Italia database to proxy for foreign direct investment. It is therefore useful to verify whether their findings are consistent with the use of a more precise dataset, and also to test how the effect of Mafia-type crime changes when applying two-stage procedures with a binary and a count process (such as Zero-Inflated or Hurdle estimations).

⁶ For detailed analysis and statistics, refer to World Bank Doing Business Surveys, the Heritage Foundation Index of Economic Freedom, or Transparency International Corruption Perceptions Index.

⁷ Elaboration on data from Sistema Informativo Territoriale sulla Giustizia – ISTAT.

⁸ Elaboration on data from Sistema Informativo Territoriale sulla Giustizia – ISTAT; *Annuario delle Statistiche Ufficiali dell'Amministrazione dell'Interno 2009, 2010*.

⁹ (Daniele & Marani, *Organized Crime and Foreign Investment: The Italian Case*, 2012), but also (Daniele, *Perchè le imprese estere non investono al Sud?*, 2005)

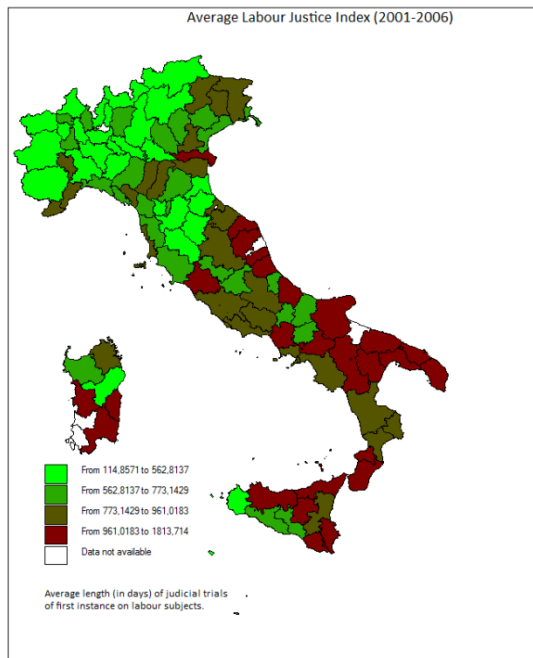


Figure 3: Average Length of Judicial Trials of First Instance for Labour Subjects (2001-2006)

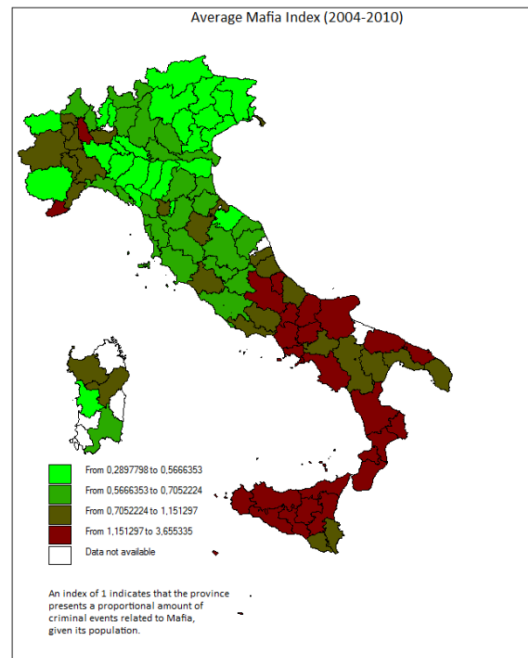


Figure 4: Average Index of the Presence of Mafia-Type Crime (2004-2010)

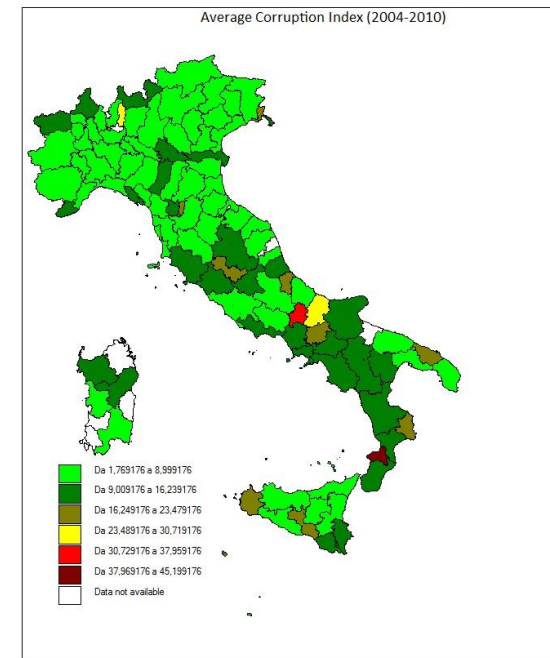


Figure 5: Average Corruption Index (2004-2010)

A third major improvement lies in the data used for research. Most previous empirical literature on FDI flows into Italy, especially when considering a NUTS3 level of disaggregation, has resorted to the Ufficio Italiano Cambi – Banca d’Italia dataset on foreign investments¹¹. This dataset, which until some years ago was the only and most easily available one, was not meant to monitor FDIs, as it monitored all financial flows of money from abroad into Italian provinces. Hence, it also took into account financial transactions that have little or nothing to do with FDIs and it considered only the province of “entrance” of foreign money but not its actual final destination¹². This paper has the merit of being the first one to use the FDI Markets – Financial Times database for a NUTS3 level analysis of FDIs within Italy, taking on all the econometric challenges of handling a dataset with high overdispersion and a very high proportion of zeros¹³.

Finally, this paper is the first attempt to take into account the effect of labour justice inefficiencies and corruption on flows of FDIs into Italian provinces.

3 - Data and methodology

Data collection constituted one of the main obstacles to the research, as variables and indicators had to be gathered from a wide range of institutions. Data on greenfield investments are from the FDI Markets Financial Times database, while the rest of the data has been gathered mostly from Italian statistical databases, in particular: Sistema di Indicatori Territoriali (ISTAT), Atlante della Competitività delle Province e delle Regioni (Istituto Guglielmo Tagliacarne/Unioncamere), Sistema Informativo Territoriale sulla Giustizia (ISTAT). Data on European countries added value at a NUTS3, NUTS2 and NUTS0 level is extracted from EuroStat Regio; while information on other countries’ GDP is sourced from the IMF Economic Outlook Database. Data on police complaints have been sourced from the Italian Ministry of Internal Affairs. Raw information has been elaborated in different ways to obtain indices for market potential, presence of Mafia, corruption, efficiency of the labour judicial system at a province level, infrastructural networks. The final dataset represents a useful tool in analysing and designing Italian policies at the local level; for this purpose, a complete presentation of the data has been included in the appendices.

¹¹ Among the literature mentioned above, only (Barba Navaretti, Basile, Benfratello, & Castellani, 2009) resorted to the FDI Markets – Financial Times data, although at a NUTS2 level of disaggregation. The UIC – Banca d’Italia database has currently been rendered unavailable by the Banca d’Italia.

¹² Hence, investment flows for provinces with a strong financial role (especially Milan) would result upwardly biased.

¹³ The UIC – Banca d’Italia dataset had very few zero-entries as basically all Italian provinces would receive at least some flows of foreign money (at least from tourism), thus reducing overdispersion and eliminating the need to handle high proportions of zero-counts.

Dealing with a rather unique dataset required testing several econometric methodologies. Baseline analysis was carried out through Zero-Inflated Negative Binomial, Poisson Pseudo-Maximum-Likelihood and Logit estimations; but tests were also conducted adopting fixed effects methodologies (including a Mundlak procedure on a Negative Binomial random effects estimation¹⁴) and other procedures able to deal with excess zeros and high overdispersion in the dependent variable (Zero-Inflate Poisson, Hurdle Poisson, Hurdle Negative Binomial)¹⁵.

Two of the three specifications of the dependent variable (*Jobs Created* and *Number of Investment Projects*) are purely count data, while *Money Invested* is better characterised as a continuous variable. Poisson-type estimators will be nonetheless largely applied, as Silva and Tenreyro have addressed this issue through Pseudo-Maximum-Likelihood estimations¹⁶.

The main dependent variable of the model, greenfield FDIs, is characterised in all its three specifications (*Number of Investment Projects*, *Jobs Created*, and *Money Invested*) by a high, although varying, degree of overdispersion, with the distribution variance being several times higher than the mean¹⁷.

There is also a high percentage of zeros in the dependent variable (64.33%). In this context it is desirable to use two-step methods as the Hurdle or the Zero-Inflated estimators, which model the occurrence of zero- and count-events through two different processes. In particular, when dealing with investment flows it is preferable to let “zero counts occur in two ways: as a realization of the binary process and as a realization of the count process when the binary random variable takes on a value of 1”¹⁸ and hence to not adopt zero-truncated models (i.e. Hurdle models), as the occurrence of a zero adds valuable information also in the second stage of the model.

The use of two-stage procedures rules out the possibility of applying panel data Fixed Effects and/or Random Effects estimations. Although it would be desirable to capture and control for all the historical, cultural and geographical time-invariant differences across provinces, other features of the dataset render it hard to significantly apply panel data F.E. estimations. The panel contains only 6 years with full observations, therefore there is not much variance in the

¹⁴ (Mundlak, 1978)

¹⁵ Results available upon request.

¹⁶ (Silva & Tenreyro, On the existence of the maximum likelihood estimates in Poisson regression, 2010) (Silva & Tenreyro, *The Log of Gravity*, 2006)

¹⁷ See Appendix 5 for full statistics.

¹⁸ (Cameron & Trivedi, *Microeconometrics using STATA*, 2010, p. 587).

variables over time. The variance of the market potential indices can be almost totally explained through province and year fixed effects¹⁹, while other variables have been constructed as inherently time-invariant (in some cases in order to keep a timeframe of at least 6 years). The high number of provinces considered (103) further discourages the application of F. E. estimations. Results from F.E. estimations are available in the appendix²⁰, although, not surprisingly, they do not produce significant results.

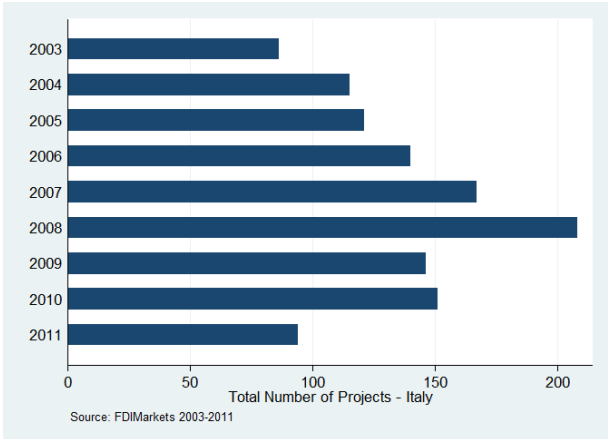


Figure 6: Yearly Total Number of Investment Projects - Italy (2003-2011)

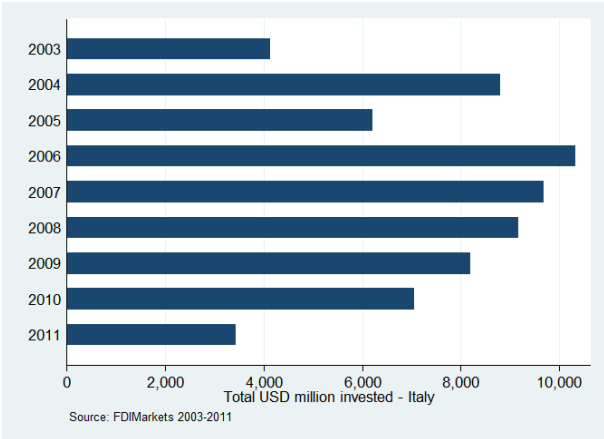


Figure 7: Yearly Total USD million invested - Italy (2003-2011)

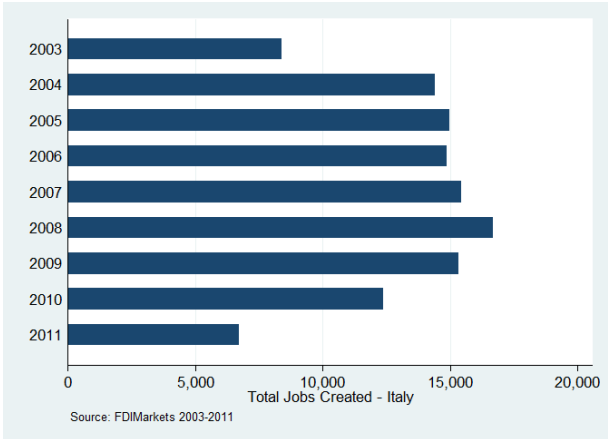


Figure 8: Yearly Total Number of Jobs Created - Italy (2003-2011)

Year dummies have been introduced in the estimation to control for high yearly volatility in investment flows. Volumes of FDIs vary a lot across different years both at a province level and on a national scale. In particular, on a national scale, *Number of Investment Projects* and *Money Invested* show higher yearly variations, while the number of *Jobs Created* stays quite stable between 2004 and 2010 (Figure 6, Figure 7, Figure 8). Within-province volatility is also very high, not only in smaller provinces but also in cases like Rome or Milan.

¹⁹ See regression results in Appendix 1.
²⁰ Poisson Robust F.E., Mundlak Negative Binomial and Logit F.E. estimations available in Appendix 2.

The three specifications of the dependent variable (*Number of Investment Projects*, *Jobs Created*, and *Money Invested*) behave in a slightly different way, as investment projects implying larger inflows of capital or the creation of more jobs seem to concentrate in some particular provinces. The graphs below report data for the top 20 provinces receiver of FDIs between 2003 and 2011, in the form of *Jobs Created* and *Money Invested* (Figure 9, Figure 10). Comparing them with Figure 2, it is easy to point out differences in the distribution of jobs and capitals across provinces: some provinces appear at the very top of the ranking according to one indicator and far behind according to another. In general, Central and Northern areas of the country are top receiver when investments are measured by the number of projects, while Southern provinces reach the top positions of the ranking when money invested and jobs created are considered. A detailed analysis of this phenomenon falls beyond the scope of this research. Nonetheless, all regressions have been carried out in parallel for the three specifications of the dependent variables, leading to insightful differences in the results.

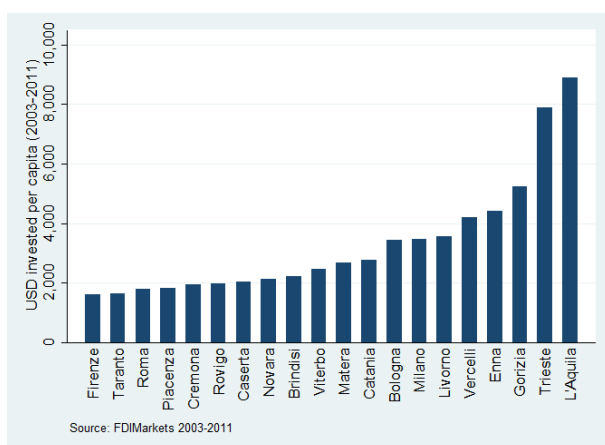


Figure 9: USD per capita invested via Greenfield Investments in the top 20 Provinces (Cumulative 2003-2011)

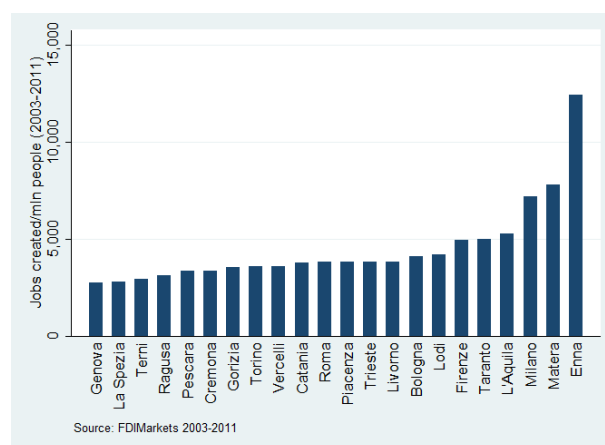


Figure 10: Number of Jobs created every million people via Greenfield Investments in the top 20 Provinces (Cumulative 2003-2011)

Three sets of regressors will be applied: core regressors; core regressors and year dummies; core regressors, year dummies and additional regressors²¹. The rationale for introducing additional regressors lies in the need to control for a larger part of province-specific characteristics (in the absence of F.E. estimations). Additional regressions were performed introducing lagged values (1 and 2 lags) of the dependent variable, confirming the robustness of the results²². Dummy variables and interaction terms were used to analyse more closely the behaviour of market potential: firstly, North, Centre and South dummy variables were

²¹ Equation 1 in Appendix 6 helps clarify this point.

²² Results available upon request.

introduced and interacted with market potential indices; secondly, the latter were interacted with infrastructural indices.

Finally, this research avoids commenting on the magnitude of the relation between dependent and independent variables. Although the signs of the results are largely consistent across different types of estimators, the size of the coefficients can vary significantly in some cases. Given the difficulties in reaching a final decision about one, univocal estimation technique, it seems rather adventurous to draw conclusions about elasticity among variables or marginal effects. Moreover, many of the independent variables assume the form of indices whose variation is hardly quantifiable in real terms (i.e., it can be difficult to quantify in real terms a decrease of 10% of the *Mafia Index*).

4 - The role of Market Potential

The role of market potential was analysed resorting to Zero-Inflated Negative Binomial (ZINB), Poisson Pseudo-Maximum-Likelihood and Logit estimations. Additional tests with F.E. techniques are available in Appendix 2.

Baseline results

Two-stage estimation techniques allow addressing the high presence of zero-entries in the dependent variable. Firstly, a series of ZINB regressions has been performed, testing three sets of regressors in parallel: a first one including only the core covariates; a second one introducing also year dummies; and a third one adding additional covariates. The rationale behind the third option lies in the fact that additional covariates might contribute to capture unobserved individual specific effects which we cannot control for without fixed effects methodologies. ZINB estimations presented convergence problems when applied to the *Number of Investment Projects*, due to the different magnitudes of variances of the dependent and some of the independent variables.

Variables	(1) Money Invested		(2) Money Invested		(3) Money Invested		(4) Money Invested		(5) Money Invested		(6) Jobs Created		(7) Jobs Created		(8) Jobs Created		(9) Jobs Created		(10) Jobs Created		(11) Jobs Created		(12) Jobs Created	
	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate
GDP	0.278	-1.471***	0.305	-1.573***	0.189	-1.528***	0.361	-1.464***	0.480**	-1.557***	-0.030	-1.517***	0.209	0.000	0.142	0.000	0.547	0.000	0.103	0.000	0.013	0.000	0.918	0.000
Patents	0.000499***	-0.00382**	0.000546***	-0.00230*	0.000	-0.00259*	0.000636***	-0.00350**	0.000677***	-0.00219*	0.000542**	-0.00243*	0.001	0.032	0.000	0.063	0.109	0.054	0.001	0.028	0.000	0.068	0.017	0.064
High School	0.021	0.0474*	0.014	0.045	0.003	0.040	-0.004	0.0454*	-0.015	0.043	-0.033	0.038	0.340	0.089	0.521	0.117	0.900	0.178	0.842	0.097	0.453	0.126	0.108	0.199
Mafia	0.879**	1.091***	0.643	0.899***	1.252***	0.915**	0.419	1.072***	0.251	0.881***	0.261	0.882**	0.041	0.000	0.118	0.002	0.009	0.020	0.221	0.001	0.417	0.002	0.525	0.021
Total Crime	0.128	0.406	0.025	0.188	-0.188	0.327	0.078	0.394	-0.110	0.182	-0.403	0.305	0.867	0.538	0.974	0.790	0.801	0.686	0.910	0.542	0.869	0.793	0.528	0.698
Labour Justice	0.000	0.00155***	0.000	0.00104**	0.000	0.00134***	0.000	0.00154***	0.000	0.00104**	0.000	0.00134***	0.900	0.001	0.652	0.027	0.930	0.009	0.351	0.001	0.959	0.024	0.504	0.008
Corruption	-0.004	-0.019	-0.009	-0.024	-0.019	-0.021	-0.030	-0.019	-0.024	-0.024	-0.0412**	-0.019	0.885	0.383	0.649	0.276	0.368	0.342	0.166	0.363	0.209	0.280	0.049	0.354
Roads	0.003	-0.003	0.004	-0.003	0.004	-0.004	0.001	-0.003	0.001	-0.003	0.002	-0.004	0.397	0.254	0.227	0.288	0.152	0.143	0.602	0.237	0.256	0.279	0.501	0.141
Railways	0.000	-0.00743**	0.001	-0.00542*	0.002	-0.004	0.001	-0.00727**	0.003	-0.00544*	0.00397*	-0.004	0.867	0.018	0.634	0.082	0.297	0.126	0.405	0.016	0.115	0.072	0.053	0.104
Harbours	0.000314*	0.000	0.000	-0.000539*	0.000	0.000	0.000	0.000	0.000	-0.000531*	0.000	0.000	0.091	0.144	0.130	0.070	0.221	0.436	0.820	0.129	0.898	0.069	0.426	0.425
Euro-Italian MP	-0.812	2.178***	-1.521**	1.000	-3.023***	0.858	-0.660	2.194***	-1.493**	1.044*	-2.117*	0.963	0.153	0.000	0.019	0.107	0.006	0.370	0.153	0.000	0.011	0.086	0.054	0.308
Med. MP	0.978	-1.278**	1.945**	0.500	1.918**	0.079	0.962*	-1.286**	1.996***	0.444	2.260***	0.030	0.125	0.027	0.013	0.491	0.028	0.926	0.081	0.023	0.008	0.529	0.009	0.972
Regional Capital	0.351	-0.040	0.292	-0.089	0.148	-0.243	0.426	-0.026	0.265	-0.083	0.426	-0.222	0.406	0.921	0.492	0.825	0.720	0.543	0.180	0.947	0.368	0.834	0.179	0.574
Year dummies	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes												
OECD PISA					0.0283**	0.004					0.011	0.003												
Labour Cost					0.029	0.759	2.076	2.836*			3.943**	2.740*												
Energy					0.180	0.074					0.013	0.078												
Phone					-0.008	-0.0100*					-0.00703*	-0.00945*												
Finance					0.126	0.075					0.098	0.077												
					-0.007	0.000					0.007	0.000												
					0.462	0.966					0.391	0.974												
					0.0111*	0.006					0.006	0.005												
					0.053	0.577					0.356	0.585												
Alpha	0.428***		0.391***		0.339***		0.288***		0.247***		0.188**		0.000		0.000		0.001		0.004		0.006		0.028	
N	618		618		618		618		618		618													
Log-Likelihood	-1694		-1681		-1672		-1814		-1800		-1789													

legend: * p < .1; ** p < .05; *** p < .01

Table 1: Baseline Regression - Zero-Inflated Negative Binomial Estimation

Differently from other two-stage procedures as the Hurdle model, zero-inflated regressions do not perform a zero-truncated estimation in the second step, but their density specification allows for the zero counts to occur also as a realization of the count process²³. Zero-Inflated models should be preferred if we believe that there are provinces which cannot receive any investment and provinces which might receive them, but not necessarily do so; while Hurdle models are to be applied if we consider that there are simply provinces which do not receive investments (but potentially could) and provinces which always receive at least one investment. In our dataset, there are 22 provinces that did not receive any FDI between 2003 and 2008 and which, given their characteristics (size, location, economic structure) hardly could receive any nor are likely to put in place any specific policy to attract them. Only 5 provinces (Turin, Florence, Milan, Rome and Genoa) have received investments every year. Hence, Zero-Inflated models appear to be a better fit for this research. In particular, due to high overdispersion (especially in *Jobs Created* and *Money Invested*), ZINB performs better than Zero-Inflated Poisson (ZIP) regressions (the alpha coefficient is always significantly different from zero, indicating the necessity of resorting to Negative Binomial models)²⁴.

Results from ZINB (Table 1, above) are largely consistent across investment specifications and sets of regressors²⁵. The Vuong test²⁶ rejected in all cases the null hypothesis of equivalence of zero-inflated and non-zero-inflated models. Note that a positive coefficient in the first stage (zero-inflation) indicates that that covariate is associated with a higher probability of not receiving any investment. *Total GDP* and *Number of Patents for Inventions* are consistently associated with higher probability of receiving at least some investments, while higher presence of organized crime and longer length of judicial trials dealing with labour subjects decrease the probability of attracting at least one foreign investor. Corruption is not significant in the zero-inflation stage. The occurrence of at least one FDI is more likely where railways infrastructure is better, while the effect is much less significant for the *Access to Harbours Index* (*Road Network Index* never has a significant effect in the estimation). As of the role of market potential, the *Euro-Italian* and the *Mediterranean Market Potential Index* lose their significance once year dummies are introduced in the regression. The two indices are associated with opposite signs, negative for the Mediterranean market potential and, somehow surprisingly, positive for the Euro-Italian market potential.

²³ (Cameron & Trivedi, 2010, pp. 569-587)

²⁴ ZIP and Hurdle results are available upon request. Results are largely consistent.

²⁵ Results with clustered standard errors at the province level. Results of the ZINB estimation for the *Number of Investment Projects* are not available due to lack of convergence.

²⁶ (Vuong, 1989)

In the second stage, the count process, the *Number of Patents for Inventions* is positively associated with inflows of FDIs, the length of justice trials for labour subjects is not significant, and infrastructural indices and corruption rarely have significant effects and, when they do, their sign is positive. The *Mafia Index* presents a positive sign when *Money Invested* or *Jobs Created* are analysed, although the coefficient is significant only in the first case. Consistently with what emerged from the binary process, *Mediterranean Market Potential Index* is associated with a positive coefficient, while the *Euro-Italian Market Potential Index* is associated with a negative one. However, the relation is more solid, as its significance increases after the introduction of year dummies and additional covariates.

Variables	(1) Money Invested	(2) Money Invested	(3) Money Invested	(4) Jobs Created	(5) Jobs Created	(6) Jobs Created	(7) N° of Projects	(8) N° of Projects	(9) N° of Projects
GDP	0.857**	0.787**	0.595	1.291***	1.207***	0.712**	1.517***	1.479***	1.369***
Patents	0.000383*	0.000435**	0.000	0.000	0.000338*	0.000	0.000226**	0.000271***	0.000133***
High School	0.007	0.005	0.002	-0.035	-0.034	-0.046	0.001	0.000	-0.002
Mafia	0.206	0.147	0.230	-0.207	-0.247	-0.378	-0.293**	-0.325**	-0.338*
Total Crime	0.287	0.439	0.178	0.440	0.528	0.072	0.313	0.311	-0.025
Labour Justice	0.000	-0.001	-0.001	0.000	-0.001	-0.001	-0.000631**	-0.000738**	-0.000726**
Corruption	-0.028	-0.031	-0.036	-0.028	-0.033	-0.053	0.019	0.018	0.015
Roads	0.002	0.003	0.004	0.002	0.003	0.00370*	0.000	0.001	0.001
Railways	0.003	0.003	0.003	0.00458***	0.00404**	0.00512***	0.00271***	0.00258***	0.00247***
Harbours	0.000464*	0.000537**	0.000	0.000390**	0.000429**	0.000	0.000446***	0.000456***	0.000354*
Euro-Italian MP	-1.408	-1.483	-2.119	-1.840**	-1.911***	-2.817**	-0.387	-0.485	-0.804
Med. MP	1.277**	-0.956	-0.869	1.130**	-0.941	-0.726	1.381***	0.767	1.569
Regional Capital	0.065	0.143	0.101	-0.194	-0.100	0.086	-0.208	-0.177	-0.190
Year dummies	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
OECD PISA			0.012			0.004			0.000
Labour Cost			0.326			0.741			0.983
Energy			0.181			2.337			-1.042
Phone			0.904			0.174			0.178
Finance			-0.005			0.001			0.000
Constant	-1.695	16.060	17.310	2.184	18.870	26.590	-22.01***	-16.16*	-17.15**
N	618	618	618	618	618	618	618	618	618
R-squared	0.395	0.415	0.439	0.605	0.624	0.628	0.931	0.93	0.946
Log-Likelihood	-55619	-53885	-53217	-72429	-70834	-69055	-571.7	-568.7	-561.1

legend: * p < .1; ** p < .05; *** p < .01

Table 2: Baseline Results - Poisson Pseudo-Maximum-Likelihood Estimation

A Poisson Pseudo-Maximum-Likelihood estimation was also performed, confirming the robustness of the results. This estimator is designed to handle overdispersion and a high presence of zeros in the dataset without resorting to Negative Binomial and/or Zero-Inflated

models, and it shares with the Hurdle model the advantage of being independent with respect to the scale of the dependent variable. The model shows a good fit when the *Number of Investment Projects* is being regressed, and it produces results largely consistent with previous regressions. Once again, *Mediterranean Market Potential Index* is associated with a positive significant coefficient unless year dummies are introduced in the regression.

Variables	(1) Logit	(2) Logit	(3) Logit
GDP	1.459*** 0.000	1.552*** 0.000	1.496*** 0.000
Patents	0.00338** 0.027	0.00214* 0.070	0.00234* 0.072
High School	-0.0449* 0.095	-0.042 0.122	-0.038 0.191
Mafia	-1.065*** 0.001	-0.876*** 0.002	-0.878** 0.020
Total Crime	-0.385 0.544	-0.183 0.788	-0.313 0.687
Labour Justice	-0.00151*** 0.001	-0.00102** 0.024	-0.00131*** 0.009
Corruption	0.019 0.373	0.023 0.291	0.018 0.379
Roads	0.003 0.227	0.003 0.266	0.004 0.143
Railways	0.00721** 0.015	0.00550* 0.064	0.00464* 0.087
Harbours	0.000 0.125	0.000522* 0.071	0.000 0.448
Euro-Italian MP	-2.205*** 0.000	-1.080* 0.073	-1.023 0.276
Med. MP	1.296** 0.020	-0.399 0.568	0.013 0.987
Regional Capital	0.027 0.945	0.086 0.827	0.224 0.567
Year dummies	No	Yes	Yes
OECD PISA			-0.002 0.848
Labour Cost			-2.566* 0.095
Energy			0.00891* 0.088
Phone			0.001 0.940
Finance			-0.005 0.600
N	618	618	618
Log-Likelihood	-316.9	-306.9	-304.7

legend: * p < .1; ** p < .05; *** p < .01

Table 3: Baseline Regression - Logit Estimation

Finally, a cross-sectional Logit estimation was carried out. Results are similar to the ones emerged from the ZINB binary process. Once more, market potential loses significance after the introduction of year dummies.

The role of Market Potential

Summing up on the effect of market potential as it has emerged from these baseline results, evidence suggests that the attractiveness of Italy in relation to its geographical position is positively associated with its proximity to the Mediterranean area, and negatively with its closeness to European countries. In other words, being close to European markets seems to

constitute by itself a disadvantage in attracting FDIs, while lying at the centre of the Mediterranean appears as an advantage. Foreign investors would therefore see Italy more as a “gate to the Mediterranean” rather than a core European country. Is this plausible?

Market potential indices showed weak significance via one-stage estimation processes, i.e. not taking into account the presence of zeros and assuming that the same process determines both the binary and the count outcome. Mediterranean and Euro-Italian market potentials appear to have opposite relations with FDIs, but none of the two is significant once year dummies are introduced to take into account high volatility in investment flows.

In the ZINB estimation, the binary process shows similar loss of significance in the market potential indices once year dummies are introduced. To the contrary, in the count process market potential increases its significance once year dummies and additional regressors are introduced. The application of Zero-Inflated Poisson regression to the *Number of Investment Projects* modifies only partially the outcome, while Hurdle Negative Binomial procedures show less consistency. Overall, having previously justified the preference given to Zero-Inflated over Zero-Truncated methods, it is possible to conclude that a high market potential in relation to Mediterranean countries is associated with higher flows of FDIs. On the contrary, a high market potential in relation to core European Union countries and other Italian provinces corresponds to lower volumes of investments.

It is worth having a closer look at the data with the support of some maps (Figure 11-Figure 14). The *Mediterranean Market Potential Index* is higher for North-Western Italy and Sardinia, as the effect of Spain and Southern France prevails²⁷. However, cumulative growth of the index in the 2003-2008 period is skewed towards the South-Eastern provinces, as countries on Southern and South-Eastern side of the Mediterranean grew relatively more in the analysed period. The analysis of the *Euro-Italian Market Potential Index* is a bit less intuitive. Firstly, let’s recall that the index of each province includes the effect of all other 106 Italian provinces. Not surprisingly the index is higher for the Central and Northern Italy, in correspondence of the richest part of the country, Switzerland, Germany and the rest of Northern Europe. The *Euro-Italian Market Potential Index* grew rather homogeneously across Italy, with a slight edge in Southern and South-Eastern provinces²⁸.

²⁷ The following countries were included in the *Mediterranean Market Potential Index*: Albania, Algeria, Bosnia and Herzegovina, Croatia, Egypt, Greece, Israel, Jordan, Lebanon, Libya, Montenegro, Morocco, Portugal, Slovenia, Spain, Syria, Tunisia, Turkey and the French departments (NUTS3) corresponding to the regions of Languedoc-Roussillon, Provence-Alpes-Côte d’Azur, and Corse.

²⁸ This effect could derive from the larger relative weight that South-Eastern European countries like Romania and Bulgaria (which experiences high rates of GDP growth between 2003 and 2008) exert on market potential of South and South-Eastern Italy. Internal effects

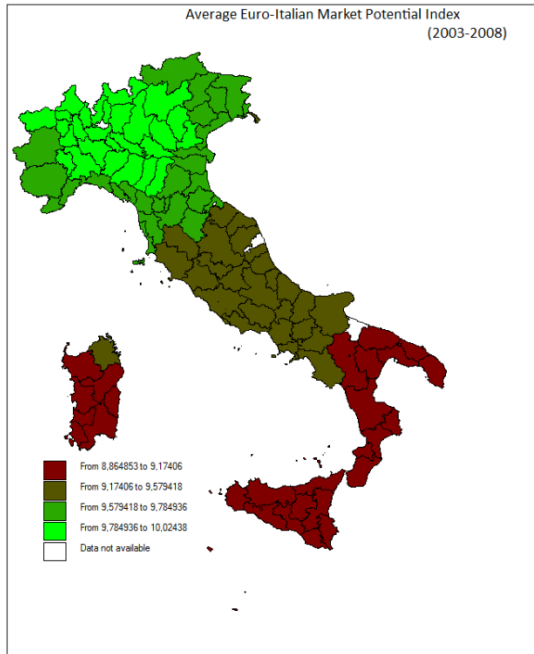


Figure 11: Euro-Italian M. P. Index (2003-2008)

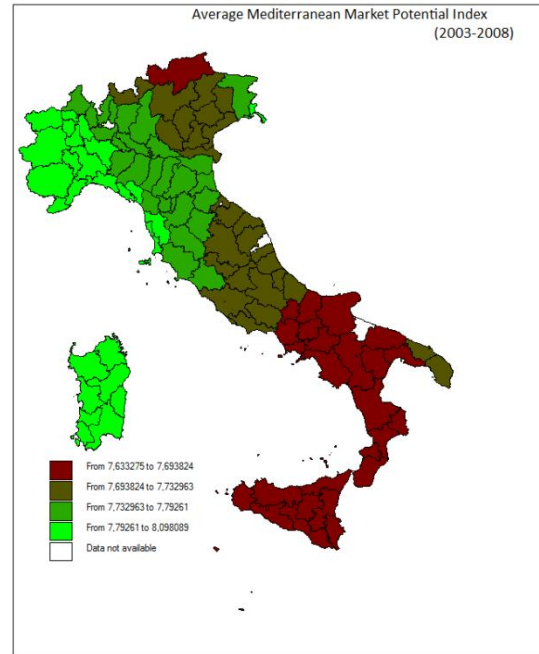


Figure 12: Mediterranean M. P. Index (2003-2008)

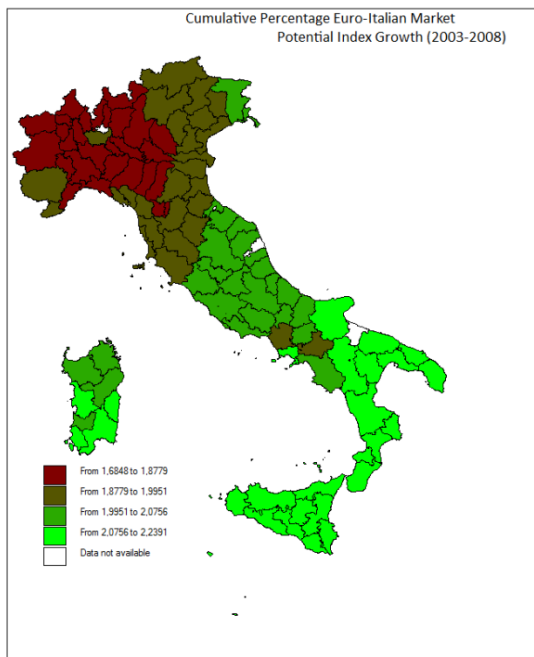


Figure 13: Cumulative Percentage European M. P. Index Growth (2003-2008)

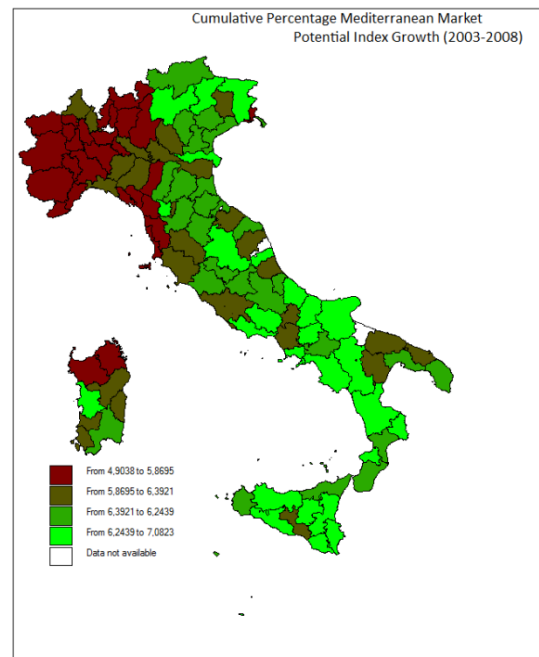


Figure 14: Cumulative Percentage Mediterranean M. P. Index Growth (2003-2008)

How do data and results fit together? The negative relation between high *Euro-Italian Market Potential Index* and FDIs hardly copes with economic literature on market potential and FDIs. Proximity of a province to a large market like the European Union should incentivize the allocation of foreign investments, but this does not seem to apply in Italy. Italian provinces

due to the distribution of GDP growth across Italian provinces might also play a role. Overall, cross-province differences are very low, as the maximum growth gap accounts to only 0.55%

closer to European countries might face a “competition effect” from the more-attractive neighbours and this negative competition effect might prevail over the advantage of being closer to larger markets. As outlined by most international studies and surveys²⁹, Italy performs worse than average OECD countries in economic freedom, bureaucracy, perceived corruption, competitiveness and flexibility of the labour market, productivity, taxation and ease of doing business. Hence, a foreign company which is trying to access the European market will not choose Milan over Zurich or Munich; or Turin over Lyon or Geneva. This might seem strange given that, within Italy, Northern areas, the part of the country closer to the core European Union, receive most FDIs. However, our results simply suggest that foreign investors could prefer Northern provinces over their Southern counterparts *not because* attracted by their proximity to the rest of Europe, *but rather in spite* of the competition exerted by more attractive European neighbours. This hypothesis will be tested among the additional results interacting a *North dummy* with the market potential indices.

The “competition effect” might also arise from large neighbouring provinces within Italy, as GDP of other Italian provinces has been included in this index together with the one of the Central and Northern EU countries. The effect of neighbouring provinces is obviously weighted more than the effect of areas outside of Italy. Hence, areas close to economically larger provinces will have very high market potential indices. Looking at the data, Milan, Rome and Turin have the largest *Total GDP* among Italian provinces; however, if provinces are ranked according to the *Euro-Italian Market Potential Index*, Milan places 16th, Rome 76th and Turin 37th. This happens systematically in the dataset: provinces with relatively larger GDP have a relatively smaller market potential index³⁰. In light of the significant positive sign of *Total GDP* emerged from the results, the negative relation between investments and the *Euro-Italian Market Potential Index* is less surprising. In other words, smaller provinces close to large economic agglomerations might have a high market potential, and yet suffer from a “competition effect” arising from their neighbours.

Mediterranean Market Potential Index is positively associated with FDI inflows. In this case, the “competition effect” is likely to be lower as inter-province relations do not feed into the index and areas with higher market potential (like Sardinia, Liguria and Tuscany) are further

²⁹ For detailed analysis and statistics, refer to World Bank Doing Business Surveys, the Heritage Foundation Index of Economic Freedom, or Transparency International Corruption Perceptions Index.

³⁰ The bias given by neighbouring Italian provinces could be addressed by creating a third separate index of market potential and excluding inter-province relations from the *Euro-Italian Market Potential Index*. However, this third index would have been highly correlated with Total GDP and it would have increased multicollinearity issues in the estimation. Given the primary interest in the role of the geographical position of Italy in the Mediterranean, the final construction of the indices adopted in this research seemed the most appropriate

from neighbouring Mediterranean countries. The data³¹ show that investments tend to gather around large harbour areas. Not surprisingly, infrastructural indices tend to be positively associated with FDIs in the baseline results provided above. Several Italian harbours have attracted in recent years large investments by cargo shipping companies (mostly Chinese) looking for hubs to develop their business in the Mediterranean³². Indeed, investments in logistics and infrastructures are likely to gather where market potential is higher (especially in relation to the Mediterranean area). Lack of sector-specific FDI data, aggregated at NUTS3 level, renders it difficult to verify this hypothesis.

Some additional tests can be carried out resorting to interaction terms. In particular, it will be tested below whether market potential (both Euro-Italian and Mediterranean market potential) shows a different relation with FDIs in different areas of the country. This could clarify whether it is possible to identify what we have called a “competition effect” from neighbouring European countries and Italian provinces. Also, the relation between infrastructures and market potential will be assessed, trying to identify which type of infrastructural investment should be preferable in one particular area of the country.

Additional results

All additional results are available in Appendices 3 (North, Centre and South dummies) and 4 (infrastructural indices – market potential indices interaction terms).

Introduction of North, Centre and South dummies

Three dummy variables were constructed determining whether a particular province belongs to the North, the Centre, or the South of the country³³; each of these dummy variables was introduced in three different estimations together with the interaction terms between the dummy itself and the *Euro-Italian Market Potential Index* and the *Mediterranean Market Potential Index*. Determining whether these dummies and interactions are significantly associated with FDIs will help understanding whether market potential has a different impact on Italian provinces according to where these provinces are located within the country, and it will shed some more light on the hypothesis of the existence of a “competition effect” arising

³¹ Appendix 7

³² (FerPRESS - Agenzia d'Informazione, 2012)

³³ Once again, we define these three macro-areas according to general classification by ISTAT and the literature (Barba Navaretti, Basile, Benfratello, & Castellani, 2009) (Daniele & Marani, 2012). Hence, we included in the North the regions of Piemonte, Valle d'Aosta, Lombardia, Liguria, Emilia Romagna, Trentino – Alto Adige, Veneto, and Friuli Venezia Giulia; within the Centre the regions of Tuscany, Umbria, Marche, and Lazio; finally within the South the regions of Sardinia, Sicily, Calabria, Basilicata, Puglia, Campania, Molise, and Abruzzo.

from neighbouring foreign countries. Moreover, it might indicate whether one macro-area is particularly able to exploit the opportunities offered by high market potential.

The introduction of a *North dummy* in the baseline regression produces significant results. The interactions with the market potential indices show a rather consistent pattern. In particular, the *Mediterranean Market Potential Index - North dummy* term does not seem to have significant effects on FDIs; while the interaction with the *Euro-Italian Market Potential Index* shows a positive significant effect, especially when the volume of *Jobs Created* and *Money Invested* is analysed. Hence, in Northern provinces the relation between investments and market potential would follow a different direction than in the rest of the country: a larger *Euro-Italian Market Potential Index* is associated with higher inflows of FDIs.

These results cope better than previous ones with standard literature on FDIs and New Economic Geography, and they seem to contradict the hypothesis of the existence of a strong negative “competition effect” arising from neighbouring countries. Northern provinces, closer to large European markets, benefit more from a high Euro-Italian market potential than the rest of the country. If countries like Switzerland, Austria and Germany constituted a competitor rather than an opportunity, this would have been more evident in Northern provinces; thus the interaction term between the *North dummy* and the *Euro-Italian Market Potential Index* would have been associated with a negative sign. However, the results do not rule out the existence of an internal “competition effect” among Italian provinces.

The introduction of both the *Centre dummy* and the *South dummy* does not change significantly the evidence emerged from the baseline analysis. The interaction terms with market potential measures rarely show any significant relation with FDIs.

Infrastructures and Market Potential

Three other sets of regressions were carried out interacting each time the market potential indices with one of the three infrastructural indices (*Access to Harbours Index*, *Road Network Index*, *Railway Network Index*). Such an analysis might reveal what are the best policies in terms of public infrastructures investments that the Italian government should carry out in order to effectively attract more FDIs. In particular, one could expect harbour infrastructures to have a positive correlation with investments when interacted with the *Mediterranean Market Potential Index*, while road and railways infrastructures might have a stronger effect in association with the *Euro-Italian Market Potential Index*.

Results are largely consistent with expectations. The interaction between the *Mediterranean Market Potential Index* and the *Access to Harbours Index* shows a significant positive correlation with FDIs, while harbour infrastructure has a negative, although less significant effect, when associated to the *Euro-Italian Market Potential Index*. The effect of the interaction between the *Railway Network Index* and the market potential indices seems to be less significant, especially in the PPML regression. Resorting to two-stage estimation procedures, provinces with higher Mediterranean market potential and better railways have a higher chance to receive at least *some* FDI (binary process), while areas with higher Euro-Italian market potential and better rail and road infrastructures tend to receive *more* investment.

The above results show that higher market potential actually constitutes an opportunity for Italian provinces if they are ready to take advantage of it with good infrastructures. An efficient railway system appears to be important in allowing companies to access both the European and the Mediterranean market, while, not surprisingly, harbour infrastructures have a strong positive effect only in those provinces with better access to Mediterranean countries. It is also worth noting that the interaction terms between market potential and these two infrastructural indices tend to be more significant than the market potential indices *per se*, whose effect vanishes after the introduction of the year dummies in the regression.

5 - The role of Institutions

The baseline analysis (Table 1, Table 2, Table 3) allows drawing some additional conclusions about the role of institutions.

The role of Mafia-type crime

At large, Mafia seems to be negatively associated with flows of foreign investments, i.e. a more rooted presence of organized crime tends to be associated with less FDIs. This is evident from Logit and PPML estimations. However, the most interesting picture emerges from two-stage estimation procedures. A higher *Mafia Index* corresponds to a lower probability of receiving *any* investment (binary process), but the effect varies remarkably moving to the count process. ZINB results show that, when *Money Invested* is considered, a deeper presence of Mafia is actually associated with larger volumes of investments. Looking at other two-

stage estimations³⁴, a similar dynamics, although less univocal, occurs for *Job Created*, but not for the *Number of Investment Projects*.

Hence, provinces with a stronger presence of Mafia tend to attract less FDIs, but, whenever they do receive FDIs, these tend to be larger. This could be explained by the fact that only large companies can take the risk of investing in areas characterised by a large presence of organized crime. Small and medium enterprises have fewer resources to defend themselves from the Mafia clans or to compete with companies affiliated with them. Hence, investment projects in these areas would tend to be large because carried out by larger investors.

The results could also suggest that Mafia itself clusters around areas with higher investment potential, where larger profit opportunities are available. This could be particularly true around large harbours in Southern Italy, as Mafia needs port facilities for its business activities (e.g. human trafficking, drug dealing, counterfeiting). The *eco-Mafia*, i.e. groups mostly dealing with illegal waste and industrial waste management, is also likely to concentrate around larger industrial zones, which in turn attract larger investment projects.

Mafia itself could actively foster large flows of FDIs while managing its daily business. For example, organized crime could be resorting to foreign investors to carry out *money laundering* operations and recycle profits arising from illicit businesses.

It is difficult to test any of the above hypotheses about the role of Mafia. It is clear though that organized crime affects the flows of FDIs into Italian provinces and needs to be considered whenever enacting policies on this topic.

The role of Labour Justice Inefficiency

The role of labour justice inefficiency shows more consistency across different specifications of FDIs and different types of estimation models. A longer length of judicial trials dealing with labour subjects tends to be associated with a lower probability of receiving *some* investment; while labour justice inefficiency does not have a significant effect in the count process of two-stage estimation procedures. Results from the PPML regressions confirm that higher inefficiency of the labour justice system is associated with lower FDIs (considering the regression of the *Number of Investment Projects*, for which PPML performs better).

³⁴ Results available upon request.

The *Labour Justice Index* might actually be controlling for more general inefficiencies of the public sector and not specifically for the effect of uncertainty and damages generated in the labour market by a slow judicial system. The *Labour Justice Index* does not show any differentiated, stronger effect when analysing the number of *Jobs Created*. If companies were to base their investment decisions also on the relative ease in settling labour disputes in the different provinces, a more pronounced effect on the number of *Jobs Created* would have been expected. It is therefore likely that the negative effect associated with this measure is somehow controlling for a more general lack of efficiency in public administration, or in civil justice at large. This hypothesis does not render the implications of the results less interesting for policy-making. More unambiguous conclusions could be drawn introducing an additional variable specifically controlling for public administration efficiencies.

The role of Corruption

The results obtained in the ZINB regression of *Jobs Created* seem to indicate that corruption is associated with smaller investment projects, in particular projects involving a smaller number of new employees. Hurdle Poisson and Hurdle Negative Binomial estimations produced consistent results³⁵. However, the general significance of the result is too weak and unstable to draw final conclusions. Results might change considering only a subset of crime categories, for example restricting the index to the most serious violations, or the ones that affect the most the business environment. Unfortunately, previous literature does not provide any guidance. Further research is necessary on this topic.

6 - Conclusion

This research outlined the main determinants of FDI location among Italian provinces with a focus, in particular, on the role of market potential and institutions. Results largely confirm previous expectations and indicate that market potential has a positive impact on flows of investments, especially in relation to the Mediterranean area. Provinces with better infrastructural networks, in particular port and railway facilities, are more able to grasp the opportunities of market access offered by economic growth in neighbouring countries. A reduction in the inefficiency of the labour judicial system and in the presence of organized crime would also help attracting more FDIs, especially in the South where these problems are

³⁵ Results available upon request.

more widespread. Interestingly, the presence of Mafia, although discouraging flows of investment *tout court*, is associated with larger projects in terms of money invested.

Estimations were carried out resorting to different econometric models in an effort to fit highly overdispersed data with a large proportion of zeros and high volatility. Several factors discouraged the adoption of fixed effects methodologies, including the fact that the market potential indices show very small variation over time and across provinces. Baseline analysis resorted to Zero-Inflated Negative Binomial, Poisson Pseudo-Maximum-Likelihood and Logit models. Additional results include Zero-Inflated Poisson, Hurdle Poisson, Hurdle Negative Binomial estimations.

The research implied gathering relevant data for the analysis of FDI flows at a NUTS3 level or disaggregation, and elaborating some of them in order to create appropriate indices and proxies for the variables of interest. The final dataset represents a useful tool for further research and analysis of the Italian context and the country's capacity to attract FDIs.

Further research could be developed, both deepening the analysis of the variables already included in this paper and introducing additional variables to test and control for. In particular, the market potential calculation could be changed so as to exclude from the index domestic, inter-province market access. This would shed more light on whether access to European markets actually plays a role in attracting more FDIs into specific provinces. Maintaining two separate measures for European and Mediterranean market potential, Harris' "atheoretical approach" could be abandoned and substituted with Head and Mayer formulation taking into account the ease of trade across borders³⁶. Within the same perspective, the effects of deeper political and economic integration between the European Union and other Mediterranean countries should be analysed. Any further analysis on market potential should resort to a larger dataset including a timeframe of at least 10 years.

The analysis of the role of institutions could be improved introducing additional variables. For example, a measure of general public administration inefficiency should be introduced to fully isolate the effect of the *Labour Justice Index*. Also, the role of public incentives could be analysed, especially in Southern Italian provinces where assistance from both the Italian government and European Union has been consistent along the years.

³⁶ For reference, see (Harris, 1954) and (Head & Mayer, 2004)

In the absence of fixed effects estimations, geographical characteristics of the different provinces could be taken into account, in particular in relation to how mountainous a specific territory is. Spatial effects should also be considered in the analysis in order to control for spill-overs across provinces. Flows of investment to one province might have consequences on future flows in neighbouring ones. This would be particularly relevant in some economic sectors. Indeed, a sectorial analysis of FDIs would also provide insightful information about investment location within Italy. Once again, limitations in the data availability seem to be one of the main obstacles to overcome.

Main Appendices

Appendix 1: Linear Regressions of Market Potential Indices on year and province-specific dummies

Variables	(1) World MP	(2) Euro-Italian MP	(3) Med. MP
2003	omit	omit	omit
	omit	omit	omit
2004	0.137***	0.041***	0.102***
	0.000	0.000	0.000
2005	0.204***	0.074***	0.190***
	0.000	0.000	0.000
2006	0.277***	0.119***	0.279***
	0.000	0.000	0.000
2007	0.420***	0.173***	0.377***
	0.000	0.000	0.000
2008	0.520***	0.186***	0.468***
	0.000	0.000	0.000
Constant	23.33***	9.397***	7.517***
	0.000	0.000	0.000
N	642	642	642
R-Squared	0.9995	0.9999	0.9962
Log-Likelihood	2421	2900	1978

legend: * p < .1; ** p < .05; *** p < .01

1: Linear regression of Market Potential Indices on year dummies (absorbing the effect of Provinces)

Variables	(1) World MP	(2) Euro-Italian MP	(3) Med. MP
2003	omit	omit	omit
	omit	omit	omit
2004	0.137***	0.0415	0.102***
	0.000	0.361	0.000
2005	0.204***	0.0743	0.190***
	0.000	0.102	0.000
2006	0.277***	0.119***	0.279***
	0.000	0.009	0.000
2007	0.420***	0.173***	0.377***
	0.000	0.000	0.000
2008	0.520***	0.186***	0.468***
	0.000	0.000	0.000
Constant	23.33***	9.397***	7.517***
	0.000	0.000	0.000
N	642	642	642
R-Squared	0.5045	0.0398	0.7727
Log-Likelihood	222.1	-200	662.9

legend: * p < .1; ** p < .05; *** p < .01

2: Linear regression of Market Potential Indices on year dummies

Dependent Variable	(1) World MP	(2) Euro-Italian MP	(3) Med. MP
N	642	642	642
R-squared	0.4950	0.9602	0.2235
F test	0.0000	0.0000	0.0044
Log-Likelihood	216	821.7	268.6

For brevity, coefficients on Province dummies have not been reported.

3: Linear regression of Market Potential Indices on Province dummies

Appendix 2: Baseline Regression, results with Fixed Effects Estimators

Variables	(1) Money Invested	(2) Jobs Created	(3) N° of Projects
GDP	4.198	1.411	1.589
	0.179	0.717	0.369
Patents	-0.000	0.000	0.0000823***
	0.375	0.751	0.002
Euro-Italian MP	5.366	-1.739	-2.617
	0.317	0.804	0.577
Med. MP	-2.336	1.281	2.461
	0.363	0.592	0.186
Year dummies	No	No	No
N	486	486	486
Provinces	81	81	81
Log-Likelihood	-34304	-46929	-368.5

legend: * p < .1; ** p < .05; *** p < .01

4: Robust Poisson Fixed Effects Estimation

Variables	(1) Mundlak Proc.	(2) Simple R.E.
GDP	-1.662	1.243***
	0.611	0.000
Patents	0.000	0.000
	0.910	0.179
High School	-0.0413***	-0.0372**
	0.006	0.010
Mafia	-0.666***	-0.619***
	0.002	0.002
Total Crime	-0.015	0.117
	0.969	0.744
Labour Justice	-0.000976***	-0.00100***
	0.002	0.001
Corruption	0.012	0.013
	0.465	0.429
Roads	0.003	0.003
	0.110	0.136
Railways	0.00517***	0.00487***
	0.000	0.001
Harbours	0.000446***	0.000417***
	0.003	0.005
Euro-Italian MP	-35.670	-0.909**
	0.270	0.015
Med. MP	3.982	-0.556
	0.580	0.232
Regional Capital	0.099	0.096
	0.661	0.665
GDP (Mundlak)	2.860	
	0.381	
Patents (Mundlak)	0.001	
	0.107	
Euro-Italian MP (Mundlak)	34.730	
	0.281	
Med. Mp (Mundlak)	-4.748	
	0.512	
Year dummies	Yes	Yes
N	618	618
Provinces	103	103
Log-Likelihood	-1707	-1709

legend: * p < .1; ** p < .05; *** p < .01

5: Negative Binomial Estimation with Mundlak procedure (Money Invested)

Variables	(1) Logit F.E.	(2) Logit F.E.
GDP	1.945	-1.791
	0.707	0.762
Patents	-0.000	-0.002
	0.836	0.564
Euro-Italian MP	-18.92	-39
	0.117	0.45
Med. MP	10.28**	-2.364
	0.033	0.85
Year dummies	No	Yes
N	456	456
Provinces	76	76
Log-Likelihood	-164.8	-162

legend: * p < .1; ** p < .05; *** p < .01

6: Logit Fixed Effects Estimation

Appendix 3: Regressions with North, South and Centre dummies, main results

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Money Invested Neg. Bin.	Money Invested Inflate	Money Invested Neg. Bin.	Money Invested Inflate	Money Invested Neg. Bin.	Money Invested Inflate	Jobs Created Neg. Bin.	Jobs Created Inflate	Jobs Created Neg. Bin.	Jobs Created Inflate	Jobs Created Neg. Bin.	Jobs Created Inflate
Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
North dummy	-8.601	40.54***	-23.51	21.16	-31.85**	22.07	-19.70*	39.69***	-49.00***	20.44	-36.31**	21.58
EU-IT MP-North	1.933	-3.078*	3.402*	-1.361	3.883**	-1.19	3.588**	-3.004*	5.625***	-1.313	4.297**	-1.168
Med. MP-North	-1.341	-1.395	-1.242	-1.042	-0.812	-1.391	-1.986	-1.378	-0.755	-1.01	-0.758	-1.356
Year dummies	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Additional Regressors	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes
Alpha	0.403***		0.369***		0.303***		0.243**		0.178**		0.145	
	0.000		0.000		0.004		0.012		0.038		0.101	
N	618		618		618		618		618		618	
Log-Likelihood	-1686		-1678		-1666		-1802		-1789		-1782	

legend: * p < .1; ** p < .05; *** p < .01

7: North dummy and interaction terms (Zero-Inflated Negative Binomial Estimation)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Money Invested	Money Invested	Money Invested	Jobs Created	Jobs Created	Jobs Created	N° of Projects	N° of Projects	N° of Projects
Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
North dummy	-35.08**	-32.44**	-33.51**	-40.83***	-41.43***	-31.64**	-9.932	-9.181	-13.750
EU-IT MP-North	3.785**	3.322*	3.368*	4.078***	4.030**	2.591	1.043	0.986	1.333
Med. MP-North	-0.258	-0.019	0.058	0.122	0.257	0.804	-0.033	-0.061	0.089
Year dummies	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Additional Regressors	No	No	Yes	No	No	Yes	No	No	Yes
Constant	4.775	9.930	8.557	11.670	11.720	21.650	-18.31***	-18.32*	-21.22*
	0.705	0.694	0.728	0.254	0.501	0.297	0.000	0.098	0.068
N	618	618	618	618	618	618	618	618	618
R-squared	0.417	0.432	0.457	0.641	0.656	0.662	0.933	0.932	0.948
Log-Likelihood	-54511	-53183	-52524	-70095	-69034	-67926	-570.4	-567.9	-559.6

legend: * p < .1; ** p < .05; *** p < .01

8: North dummy and interaction terms (Poisson Pseudo-Maximum-Likelihood Estimation)

Variables	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)	
	Money Invested		Money Invested		Money Invested		Money Invested		Money Invested		Money Invested		Jobs Created		Jobs Created		Jobs Created		Jobs Created		Jobs Created		Jobs Created	
	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate
Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Centre dummy	22.54	20.82	23.12	10.78	30.36	-0.67	33.03*	20.58	24.72	10.19	13.99	-1.362	0.188	0.420	0.162	0.682	0.131	0.981	0.075	0.417	0.147	0.693	0.503	0.960
EUIT MP-Centre	-2.982	-0.333	-3.822	-1.389	-3.853	0.447	-4.571*	-0.356	-4.636*	-1.351	-2.688	0.496	0.232	0.925	0.121	0.698	0.211	0.914	0.069	0.919	0.053	0.701	0.374	0.903
Med MP-Centre	0.78	-2.218	1.728	0.373	0.867	-0.414	1.379	-2.16	2.512	0.401	1.521	-0.386	0.655	0.202	0.365	0.847	0.664	0.856	0.395	0.209	0.136	0.834	0.424	0.863
Year dummies	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Additional Regressors	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Alpha	0.420***		0.379***		0.326***		0.265***		0.229***		0.184**		0.000		0.000		0.002		0.005		0.007		0.030	
N	618		618		618		618		618		618		618		618		618		618		618		618	
Log-Likelihood	-1690		-1679		-1670		-1809		-1796		-1788													

legend: * p < .1; ** p < .05; *** p < .01

9: Centre dummy and interaction terms (Zero-Inflated Negative Binomial Estimation)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Money Invested	Money Invested	Money Invested	Jobs Created	Jobs Created	Jobs Created	N° of Projects	N° of Projects	N° of Projects
Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Centre dummy	2.910	9.244	15.990	10.360	17.270	13.630	-12.670	-10.820	9.651
EUIT MP-Centre	0.924	0.379	-0.689	0.220	-0.444	0.157	2.618*	2.287	-0.849
Med MP-Centre	-1.542	-1.684	-1.240	-1.613	-1.684	-1.966	-1.598**	-1.427*	-0.196
Year dummies	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Additional Regressors	No	No	Yes	No	No	Yes	No	No	Yes
Constant	-3.496	15.190	17.060	-0.602	18.540	25.890	-22.88***	-17.91**	-17.88**
N	618	618	618	618	618	618	618	618	618
R-squared	0.416	0.437	0.46	0.64	0.661	0.669	0.94	0.937	0.948
Log-Likelihood	-55336	-53578	-52892	-71948	-70175	-68369	-568.2	-566.1	-560.4

legend: * p < .1; ** p < .05; *** p < .01

10: Centre dummy and interaction terms (Poisson Pseudo-Maximum-Likelihood Estimation)

Variables	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)	
	Money Invested		Money Invested		Money Invested		Money Invested		Money Invested		Money Invested		Jobs Created		Jobs Created		Jobs Created		Jobs Created		Jobs Created		Jobs Created	
	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate
Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
South dummy	11.740	19.60*	12.540	-2.617	10.440	-0.476	27.98***	19.63*	27.32**	-2.321	19.47*	-0.055	0.198	0.067	0.244	0.839	0.352	0.971	0.008	0.066	0.015	0.856	0.054	0.997
EUIT MP-South	-0.531	-2.588*	-0.846	-0.810	-0.363	-1.226	-2.206	-2.575*	-1.951	-0.819	-0.428	-1.238	0.759	0.076	0.653	0.574	0.858	0.363	0.158	0.072	0.233	0.564	0.810	0.355
Med MP-South	-0.779	0.573	-0.523	1.250	-0.806	1.482	-0.890	0.553	-1.121	1.222	-1.827	1.442	0.625	0.717	0.746	0.397	0.600	0.300	0.545	0.722	0.443	0.400	0.216	0.306
Year dummies	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Regressors	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Alpha	0.401***		0.379***		0.323***		0.220**		0.210**		0.138		0.000		0.000		0.002		0.010		0.014		0.104	
N	618		618		618		618		618		618		618		618		618		618		618		618	
Log-Likelihood	-1689		-1679		-1670		-1803		-1794		-1782													

legend: * p < .1; ** p < .05; *** p < .01

11: South dummy and interaction terms (Zero-Inflated Negative Binomial Estimation)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Money Invested	Money Invested	Money Invested	Jobs Created	Jobs Created	Jobs Created	N° of Projects	N° of Projects	N° of Projects
Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
South dummy	2.171	-2.194	-9.655	7.736	2.513	-4.597	4.982	4.056	-1.834
EUIT MP-South	0.100	0.668	1.991	-0.655	0.069	1.408	-0.569	-0.464	0.547
Med MP-South	-0.221	-0.369	-0.982	-0.111	-0.332	-0.966	0.126	0.113	-0.384
Year dummies	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Additional Regressors	No	No	Yes	No	No	Yes	No	No	Yes
Constant	-10.350	5.284	16.210	-5.255	12.040	25.640	-26.12***	-25.04**	-17.28*
N	618	618	618	618	618	618	618	618	618
R-squared	0.415	0.429	0.45	0.614	0.625	0.629	0.939	0.937	0.946
Log-Likelihood	-54267	-52862	-51859	-71773	-70540	-68230	-568.4	-566.4	-560.6

legend: * p < .1; ** p < .05; *** p < .01

12: South dummy and interaction terms (Poisson Pseudo-Maximum-Likelihood Estimation)

Appendix 4: Regressions with Infrastructural Indices – Market Potential interaction terms, main results

Variables	(1) Money Invested		(2) Money Invested		(3) Money Invested		(4) Money Invested		(5) Jobs Created		(6) Jobs Created		(7) Jobs Created	
	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate
Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EUIT MP-Harbour	-0.001	0.0048**	-0.001	0.0045**	0.001	0.0048**	0.000	0.0048**	-0.001	0.0045**	0.000	0.0047**	0.671	0.012
Med MP-Harbour	-0.001	-0.01***	-0.001	-0.01***	-0.002**	-0.01***	0.001	-0.01***	0.001	-0.01***	0.001	-0.01***	-0.001	-0.01***
Year dummies	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Additional Regressors	No	No	No	No	Yes	Yes	No	No	No	No	No	No	Yes	Yes
Alpha	0.421***		0.384***		0.327***		0.287***		0.246***		0.187**		0.000	0.028
N	618		618		618		618		618		618		618	
Log-Likelihood	-1686		-1676		-1666		-1808		-1796		-1786			

legend: * p < .1; ** p < .05; *** p < .01

13: Harbour Index – Market Potential interaction terms (Zero-Inflated Negative Binomial Estimation)

Variables	(1) Money Invested	(2) Money Invested	(3) Money Invested	(4) Jobs Created	(5) Jobs Created	(6) Jobs Created	(7) N° of Projects	(8) N° of Projects	(9) N° of Projects
	Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EU-IT MP-Harbour	-0.003	-0.00356*	-0.003	-0.003	-0.003	-0.002	-0.00226**	-0.00222**	-0.00171*
Med. MP-Harbour	0.001	0.001	0.001	0.00167**	0.00183***	0.00141*	0.00150***	0.00156***	0.00130**
Year dummies	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Additional Regressors	No	No	Yes	No	No	Yes	No	No	Yes
Constant	-0.135	22.440	21.290	4.171	24.620	30.77*	-20.39***	-11.800	-13.68*
N	618	618	618	618	618	618	618	618	618
R-squared	0.403	0.428	0.444	0.612	0.63	0.631	0.934	0.935	0.946
Log-Likelihood	-54993	-53133	-52760	-71655	-69950	-68623	-567.6	-564.4	-558.7

legend: * p < .1; ** p < .05; *** p < .01

14: Harbour Index – Market Potential interaction terms (Poisson Pseudo-Maximum-Likelihood Estimation)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Money Invested		Money Invested		Money Invested		Jobs Created		Jobs Created		Jobs Created	
	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate
Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EUIT MP-Rail	0.009	0.009	0.008	0.001	0.0109*	0.001	0.017***	0.009	0.0124**	0.000	0.0137**	0.000
	0.147	0.213	0.139	0.950	0.066	0.918	0.003	0.215	0.030	0.988	0.046	0.966
Med MP-Rail	-0.004	-0.027**	-0.004	-0.0215*	-0.006	-0.021**	0.001	-0.027**	0.005	-0.0208*	0.001	-0.0203*
	0.591	0.015	0.595	0.054	0.393	0.046	0.913	0.014	0.483	0.058	0.853	0.050
Year dummies	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Additional Regressors	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes
Alpha	0.412***		0.385***		0.331***		0.242**		0.218**		0.164*	
	0.000		0.000		0.001		0.014		0.017		0.062	
N	618		618		618		618		618		618	
Log-Likelihood	-1689		-1678		-1669		-1804		-1794		-1784	

legend: * p < .1; ** p < .05; *** p < .01

15: Railway Index – Market Potential interaction terms (Zero-Inflated Negative Binomial Estimation)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Money Invested	Money Invested	Money Invested	Jobs Created	Jobs Created	Jobs Created	N° of Projects	N° of Projects	N° of Projects
Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EU-IT MP-Rail	0.012	0.009	0.008	0.008	0.006	0.003	0.00843*	0.008	0.002
	0.195	0.319	0.372	0.250	0.424	0.688	0.090	0.140	0.672
Med. MP-Rail	0.002	0.003	0.002	0.008	0.009	0.008	0.003	0.003	0.005
	0.782	0.750	0.839	0.218	0.231	0.302	0.512	0.450	0.226
Year dummies	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Additional Regressors	No	No	Yes	No	No	Yes	No	No	Yes
Constant	-4.757	7.608	9.716	1.712	11.220	21.330	-21.60***	-20.60**	-18.74**
	0.609	0.748	0.659	0.849	0.517	0.304	0.000	0.028	0.029
N	618	618	618	618	618	618	618	618	618
R-squared	0.41	0.424	0.441	0.606	0.619	0.623	0.939	0.937	0.946
Log-Likelihood	-54960	-53520	-52969	-71168	-69973	-68522	-567.2	-565.1	-559.9

legend: * p < .1; ** p < .05; *** p < .01

16: Railway Index – Market Potential interaction terms (Poisson Pseudo-Maximum-Likelihood Estimation)

Variables	(1) Money Invested		(2) Money Invested		(3) Money Invested		(4) Money Invested		(5) Jobs Created		(6) Jobs Created		(7) Jobs Created		(8) Jobs Created	
	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate	Neg. Bin.	Inflate
Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EU-IT MP-Road	0.011	-0.006	0.008	-0.0168**	0.009	-0.0140*	0.013	-0.006	0.009	-0.0167**	0.007	-0.0141*	0.129	0.440	0.334	0.017
Med MP-Road	-0.001	-0.006	0.002	-0.001	0.001	-0.004	0.002	-0.006	0.007	-0.001	0.003	-0.004	0.952	0.524	0.889	0.878
Year dummies	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Additional Regressors	No	No	No	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No	No	No
Alpha	0.413***		0.385***		0.333***		0.264***		0.232**		0.183**		0.000		0.000	
N	618		618		618		618		618		618		618		618	
Log-Likelihood	-1691		-1677		-1669		-1809		-1794		-1786		-1691		-1677	

legend: * p < .1; ** p < .05; *** p < .01

17: Road Index – Market Potential interaction terms (Zero-Inflated Negative Binomial Estimation)

Variables	(1) Money Invested	(2) Money Invested	(3) Money Invested	(4) Jobs Created	(5) Jobs Created	(6) Jobs Created	(7) N° of Projects	(8) N° of Projects	(9) N° of Projects
	Core Regressors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EU-IT MP-Road	0.0152*	0.014	0.014	0.012	0.010	0.006	0.0131***	0.0125**	0.0116***
Med. MP-Road	0.001	0.002	0.003	0.012	0.015	0.014	0.005	0.005	0.008
Year dummies	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Additional Regressors	No	No	Yes	No	No	Yes	No	No	Yes
Constant	-6.278	11.130	10.510	-1.681	13.380	21.940	-25.05***	-22.45**	-25.49***
N	618	618	618	618	618	618	618	618	618
R-squared	0.404	0.424	0.448	0.625	0.642	0.645	0.936	0.934	0.948
Log-Likelihood	-54847	-53205	-52596	-70861	-69356	-68153	-566.1	-563.6	-555.6

legend: * p < .1; ** p < .05; *** p < .01

18: Road Index – Market Potential interaction terms (Poisson Pseudo-Maximum-Likelihood Estimation)

Data Appendices

Appendix 5: Dependent variable descriptive statistics

Greenfield FDI (value USDmln)				
	Percentiles	Smallest		
1%	0	0	Obs	642
5%	0	0	Sum of Wgt.	642
10%	0	0		
25%	0	0	Mean	75.23748
			Std. Dev.	250.7587
50%	0		Variance	62879.91
		Largest		
75%	29.8	2112.89	Variance/Mean	835.7525
90%	179.6	2132.2		
95%	452.4	2167.25	Skewness	6.062381
99%	1576	2561	Kurtosis	46.77727

Greenfield FDI (Jobs Created)				
	Percentiles	Smallest		
1%	0	0	Obs	642
5%	0	0	Sum of Wgt.	642
10%	0	0		
25%	0	0	Mean	132.0265
			Std. Dev.	447.6423
50%	0		Variance	200383.6
		Largest		
75%	59	3354	Variance/Mean	1517.7529
90%	316	4198		
95%	690	4276	Skewness	6.533094
99%	2016	5209	Kurtosis	56.96903

Greenfield FDI (Number of Projects)				
	Percentiles	Smallest		
1%	0	0	Obs	642
5%	0	0	Sum of Wgt.	642
10%	0	0		
25%	0	0	Mean	1.303738
			Std. Dev.	5.508718
50%	0		Variance	30.34598
		Largest		
75%	1	42	Variance/Mean	23.2761
90%	2	54		
95%	4	66	Skewness	8.817436
99%	31	70	Kurtosis	91.92686

Appendix 6: Metadata

Carrying out the research at a NUTS3 level of agglomeration has implied a long and in some cases complex work of data research and elaboration. ISTAT (Istituto Nazionale di Statistica) does not provide all its economic indicators at a NUTS3 level, and it publishes others with some years of delay (giving priority to NUTS0, NUTS1 and NUTS2 data). It was therefore necessary to pool together data from different sources and/or elaborate proxies to account for some variables of interest. Data for 103 provinces were gathered³⁷ for a total of 618 observations in the baseline regression. Equation 1 shows the variables included in the baseline regression of the analysis.

$FDI_{it} = Mafia_i + Labour_i + Corr_i + MPEU_{it} + MPMed_{it} + CORE_{it} + CORE_i + YD + ADD_i$	
<ul style="list-style-type: none"> • FDI_{it} Received FDIs • Mafia_i Mafia Index • Labour_i Labour Justice Index • Corr_i Corruption Index • MPEU_{it} Euro-Italian Market Potential Index • MPMed_{it} Mediterranean Market Potential Index 	<ul style="list-style-type: none"> • CORE_{it} (time-varying) Total GDP Number of Patents for Inventions • CORE_i (time-invariant) Population with a High School Degree Total Crime Index Access to Harbours Index Road Network Index Railway Network Index (Capital dummy) • YD Year dummies • ADD_i OECD PISA Score Regional Relative Labour Cost Index Energy Infrastructure Index Phone and Communication Services Index Banking and Finance Services Index

Equation 1: Baseline Regression

Data	Source	Additional Comments
<i>Number of Investment Projects</i> (per province, per year)	FDI Markets Financial Times	Number of greenfield investment projects.
<i>Jobs Created</i> (per province, per year)		Number of jobs created by greenfield investment projects.
<i>Money Invested</i> (per province, per year)		USD million invested in greenfield investment projects.
<i>Total GDP</i> (per province, per year)	ISTAT - Sistema di Indicatori Territoriali	Total added value at current prices.
<i>Population with a High School Degree</i> (per province, 2004-2008 average)		Persons aged 25-64 with upper secondary education attainment, %.
<i>Number of Patents for Inventions</i> (per province, per year)	Ufficio Italiano Brevetti e Marchi	Number of patents registered for new inventions.

³⁷ Although Italy currently counts 110 provinces, 7 of them were founded only recently and, therefore complete data are not yet available. In particular, the provinces of Olbia-Tempio, Ogliastra, Medio Campidano and Carbonia-Iglesias were founded in 2005 (all in Sardinia); while the provinces of Monza-Brianza, Fermo and Barletta-Andria-Trani were constituted in 2008, respectively in the regions of Lombardia, Marche, and Puglia. The latter three provinces have been excluded from our database, while the former four were, insofar as possible, kept aggregated to the initial provinces from which they have been detached.

<i>Access to Harbours Index</i> (per province, 2009 value)	Atlante della Competitività delle Province e delle Regioni - Istituto Guglielmo Tagliacarne / Unioncamere	The infrastructure indices have been constructed on the basis of the indices contained in the Atlante della Competitività delle Province e delle Regioni. The three raw indices represent a weighted average of the quantity and quality of infrastructures within each province in 2009. However, this measure does not take into account any “network effect” arising from neighbouring provinces. As an example, every landlocked province reports a zero harbour index, even if it is very close to seaside provinces with good harbour infrastructures. This paper tries to correct these indices taking into account as much as possible the effect of being connected to a network of infrastructures. Firstly, the distance in kilometres between every pair of provinces was calculated (assuming as reference the main city within its territory ³⁸). The STATA module elaborated by Ozimek and Miles ³⁹ was used for this purpose, as it provides the latitude and longitude in decimals of a location via a connection to Google Maps. Hence, the distances in kilometres between the pairs of points were retrieved with a module by Nichols ⁴⁰ , which uses an ellipsoidal model of the Earth. For each province the index formula adopted sums up its own infrastructure index (harbour quality index, road quality index, and railway quality index) weighted by 1, plus the indices of all the other provinces weighted by the respective distance in kilometres. Hence, the new indices take into account the “network effect” of one province being interconnected with the infrastructures of the rest of the country.
<i>Road Network Index</i> (per province, 2009 value)		
<i>Railway Network Index</i> (per province, 2009 value)		
<i>Capital Dummy</i>		A dummy equal to 1 when the province hosts the capital city of one of the 20 Italian administrative regions ⁴¹ .
<i>Euro-Italian Market Potential Index</i> (per province, per year)	EuroStat Regio; ISTAT - Sistema di Indicatori Territoriali; ISTAT. Conti Nazionali - Valore Aggiunto nelle Province Italiane (2008); IMF World Economic Outlook Database	A procedure similar to the infrastructural indices was adopted. Initially, the distance between each Italian province and the capitals of the rest of the world was calculated. Two market potential indices were constructed: a Mediterranean Market Potential Index, including only EU and non-EU countries of the Mediterranean area ⁴² , and a Euro-Italian Market Potential Index, including all other EU countries plus Italy ⁴³ . Whenever considering EU countries, the smallest possible level of agglomeration for which data were available was considered, so as to increase the cross-province variation in the variable ^{44 45} .
<i>Mediterranean Market Potential Index</i> (per province, per year)		
<i>Mafia Index</i> (per province, 2004-2010 average)	ISTAT - Sistema Informativo Territoriale sulla Giustizia; Annuario delle Statistiche Ufficiali dell'Amministrazione dell'Interno (2009, 2010)	The Mafia Index was elaborated on the basis of raw data on police complaints in Italian provinces, and following previous examples in the literature ⁴⁶ . Hence, it was selected a particular set of complaints considered as indicators of the presence of Mafia-type crime: threats, extortions, usury, mafia-based murder, attacks, arsons, criminal association and mafia-type criminal association ⁴⁷ . For each province and for each category of complaint, the ratio between the number of complaints in the province and the total number of complaints in Italy was divided by the ratio of the province population and total Italian population. An index of 1 indicates that the province presents a proportional amount of that particular category of crime given its population; and index larger or smaller than one indicates a larger or lower concentration of crime. Finally, the above 8 types of complaints were averaged in order to obtain the Mafia index. The same procedure was adopted for the
<i>Total Crime Index</i> (per province, 2004-2010 average)		

³⁸ It was considered as the main city the one with the highest number of inhabitants and/or the largest pole of economic activities.

³⁹ (Ozimek & Miles, 2011)

⁴⁰ (Nichols, 2007)

⁴¹ Only 18 provinces were actually assigned a *Capital dummy* variable equal to 1, as regions including only one province were not considered, i.e. Valle d’Aosta and Trentino – Alto Adige (divided into the two Autonomous Provinces of Trento and Bolzano).

⁴² The following countries were included in the *Mediterranean Market Potential Index*: Albania, Algeria, Bosnia and Herzegovina, Croatia, Egypt, Greece, Israel, Jordan, Lebanon, Libya, Montenegro, Morocco, Portugal, Slovenia, Spain, Syria, Tunisia, Turkey and the French departments (NUTS3) corresponding to the regions of Languedoc-Roussillon, Provence-Alpes-Côte d’Azur, and Corse.

⁴³ All European Union countries/regions not included in the *Mediterranean Market Potential Index* fell into the *Euro-Italian Market Potential Index*, therein also Italian provinces.

⁴⁴ For Hungary and Austria, only national (NUTS0) data were available; for Spain, only NUTS2 level data were available; all other European Union countries were considered at a NUTS3 level.

⁴⁵ Data about EU countries are from EuroStat Regio; for Italy data are sourced from Sistema di Indicatori Territoriali - ISTAT; for the rest of the Mediterranean countries data is from the IMF World Economic Outlook Database, April 2012.

⁴⁶ (Daniele & Marani, Organized Crime and Foreign Investment: The Italian Case, 2012)

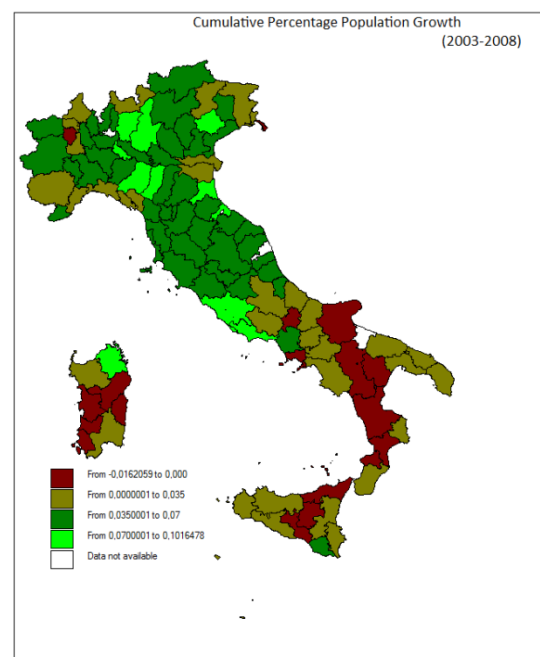
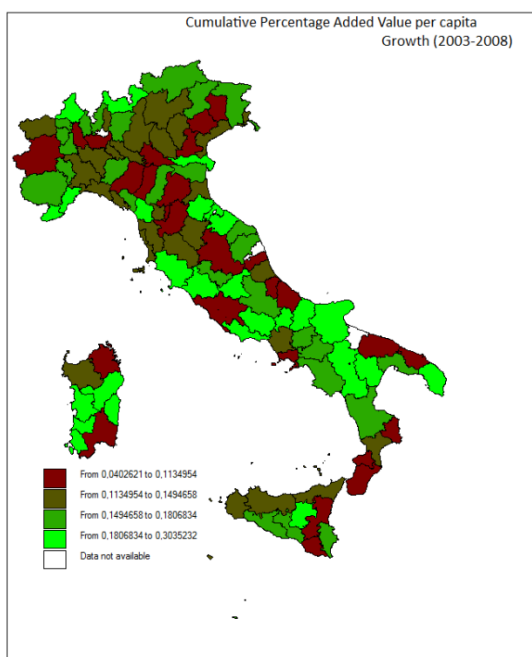
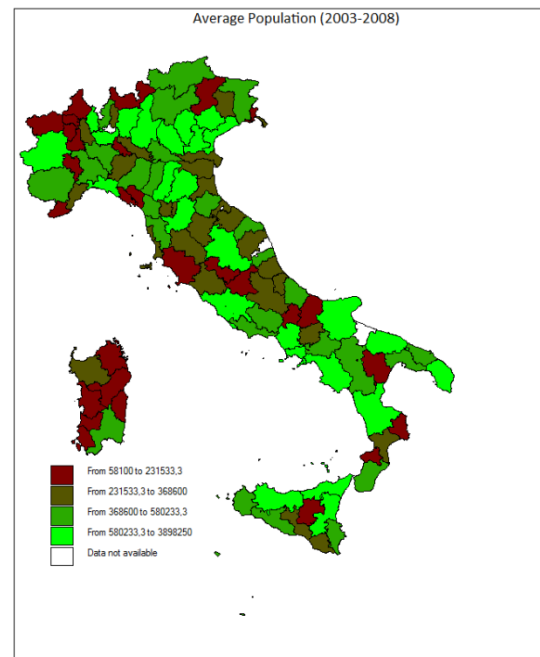
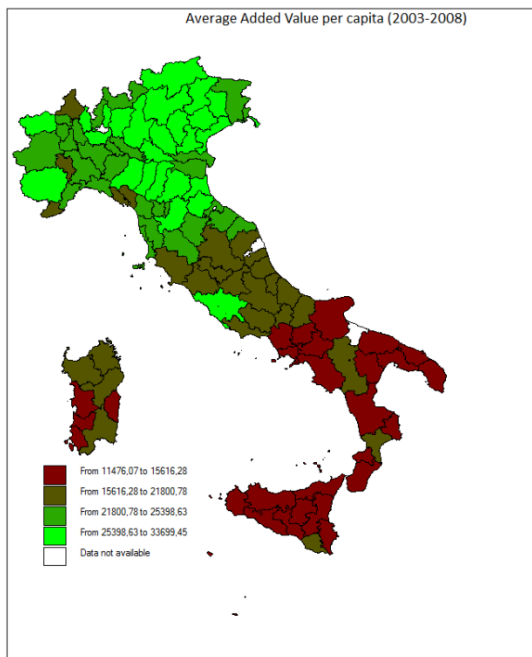
⁴⁷ Original headers of the complaints considered in the *Mafia Index*: minacce, estorsione, usura, omicidio di stampo mafioso, attentati, incendio, associazione a delinquere e associazione a delinquere di stampo mafioso. Daniele and Marani included only estorsione, incendio, attentati, associazione a delinquere e associazione a delinquere di stampo mafioso (Daniele & Marani, 2012). However, analysis of the 6-month reports of the Direzione Investigativa Antimafia (DIA) suggested the inclusion of the above complaints. Geographical distribution of the index does not vary sensibly across the two formulations.

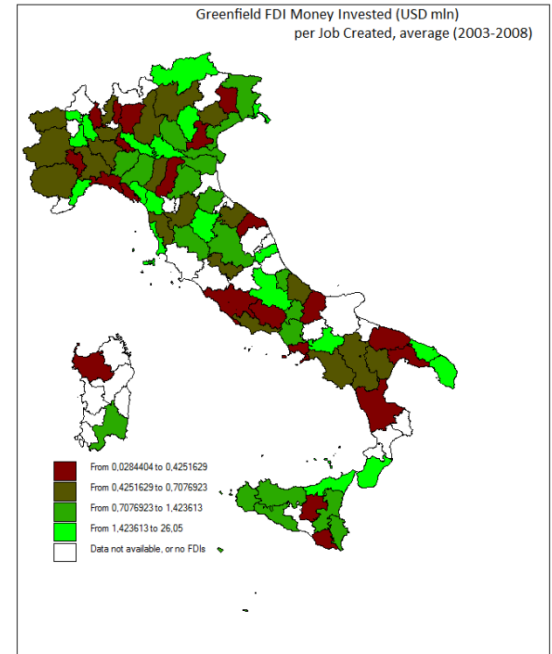
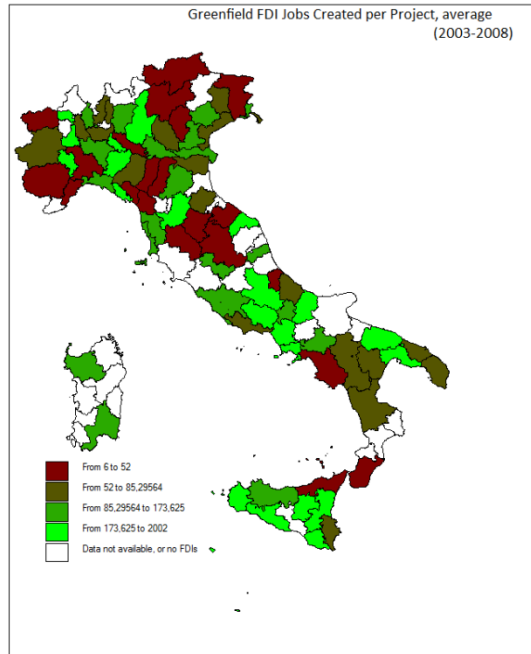
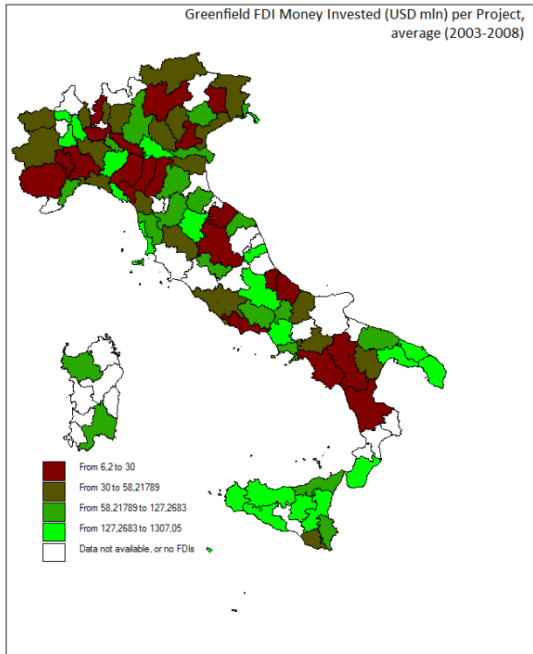
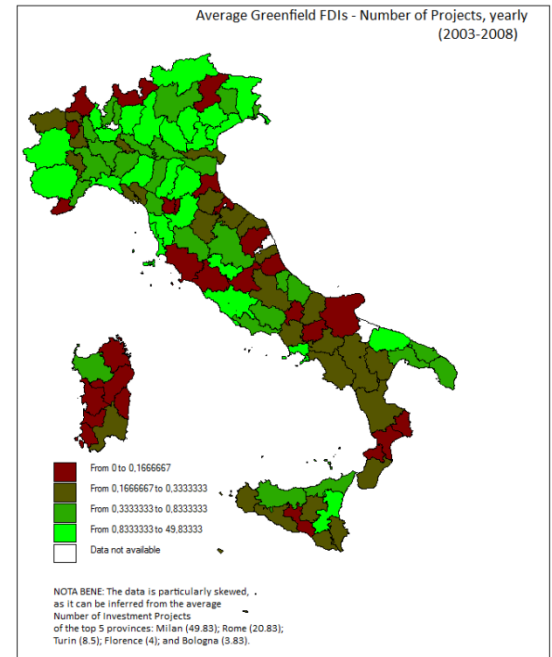
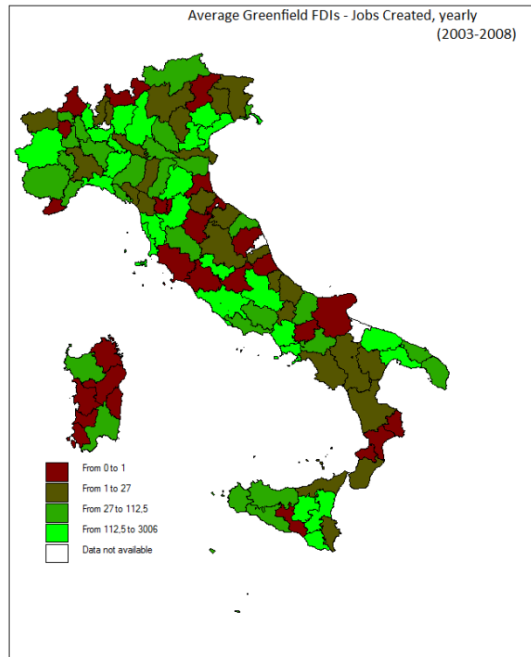
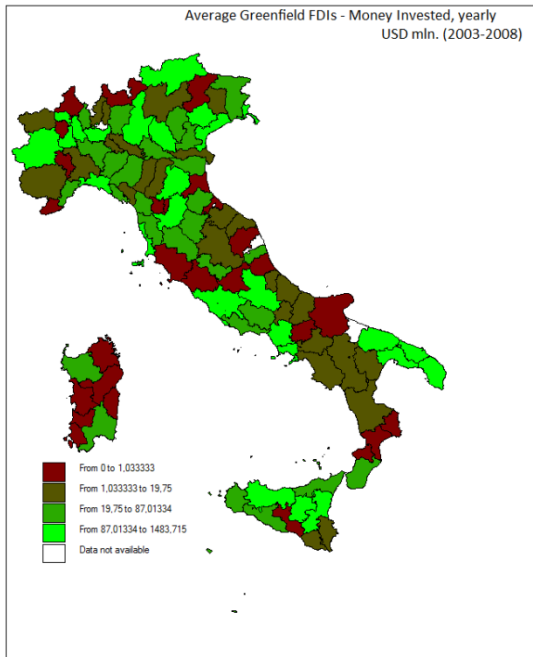
<i>Corruption Index</i> (per province, 2004-2010 average)	Ministero dell'Interno - Dipartimento della Pubblica Sicurezza	elaboration of the Corruption Index, based on police complaints in Italian provinces concerning corruption crimes: abuse of authority, embezzlement, bribery, judicial corruption, corruption of a public officer, corruption for an act contrary to public duties, corruption for an official act, and embezzlement to the detriment of the state ⁴⁸ . Similarly, a Total Crime Index was constructed taking into account the total number of complaints (including mafia-type and corruption complaints) in each province.
<i>Labour Justice Index</i> (per province, 2000-2006 average)	ISTAT - Sistema Informativo Territoriale sulla Giustizia; Annuario delle Statistiche Ufficiali dell'Amministrazione dell'Interno (2009, 2010)	The Labour Justice Index has been elaborated on the basis of raw data on the average length of judicial trials of first instance on labour subjects. Data at the smallest possible level of aggregation were gathered, corresponding to the 167 tribunal's areas (circondario giudiziario). These jurisdictions were grouped in alignment with the 110 Italian provinces, weighting the performance of every tribunal by the number of procedures it carried out ⁴⁹ .
<i>Regional Relative Labour Cost Index</i> (per region, 2000-2004)	ISTAT - Sistema di Indicatori Territoriali	Index equal to 1 for the national average labour cost.
<i>OECD PISA Score</i> (per region, 2009 value)	OECD	Average OECD PISA score for mathematics, reading and science.
<i>Phone and Communication Infrastructure Index</i> (per province, 2009 value)	Atlante della Competitività delle Province e delle Regioni - Istituto Guglielmo Tagliacarne / Unioncamere	
<i>Energy Infrastructure Index</i> (per province, 2009 value)		
<i>Banking and Finance Services Index</i> (per province, 2009 value)		

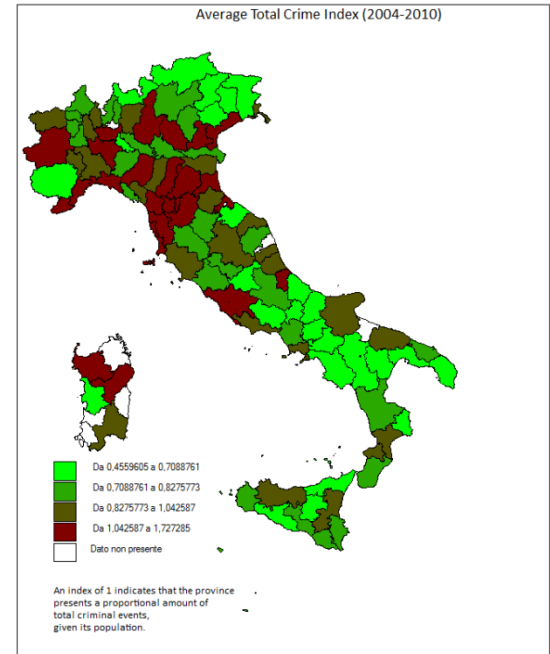
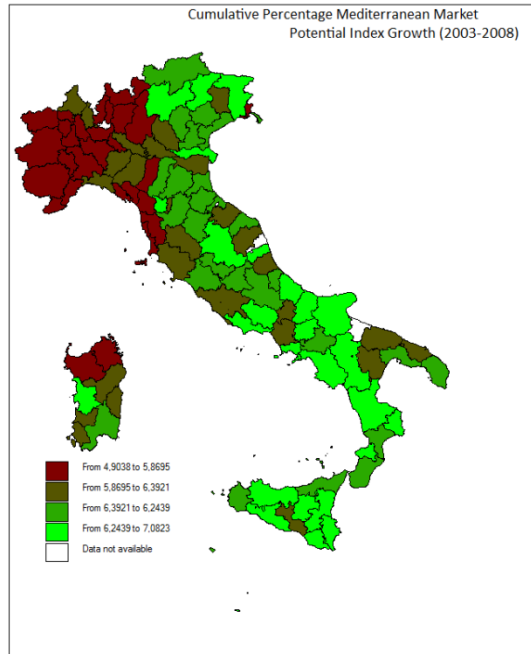
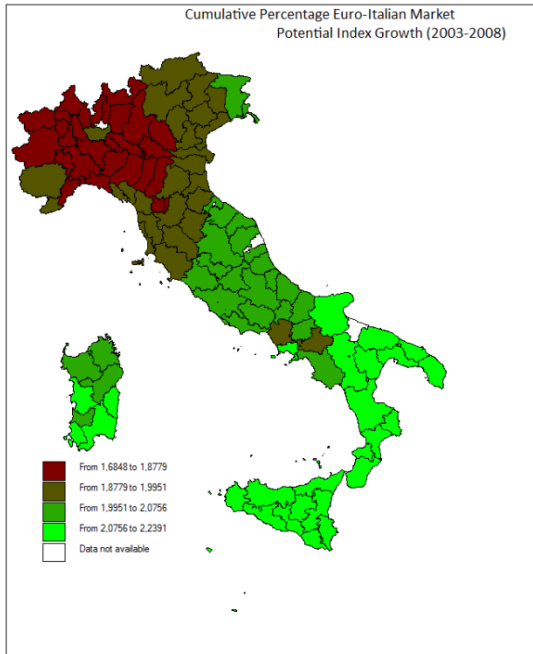
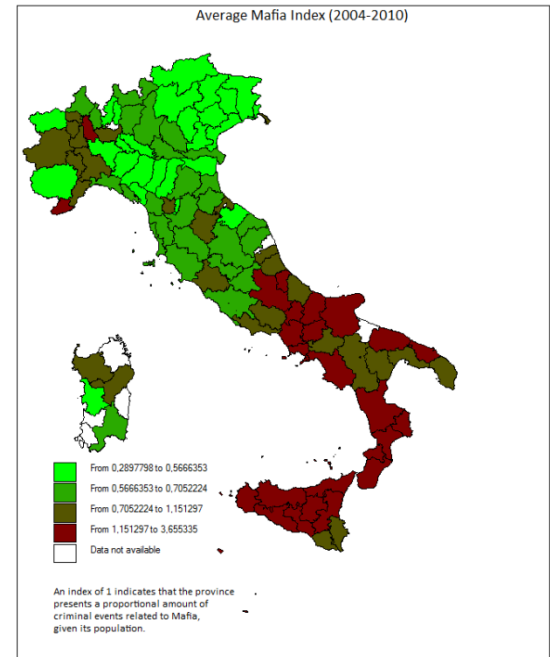
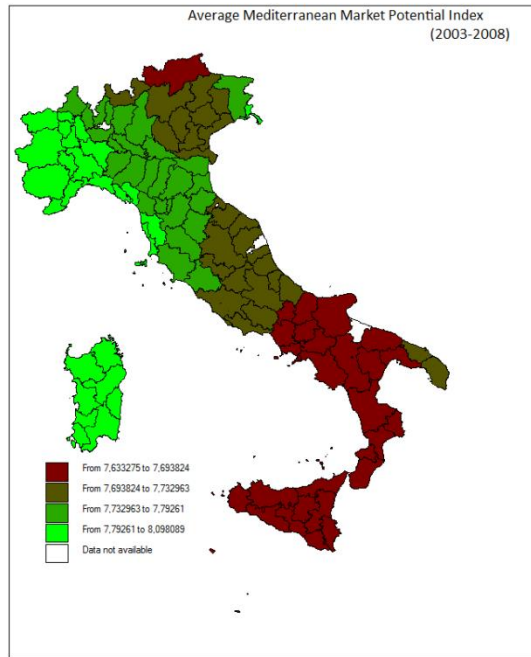
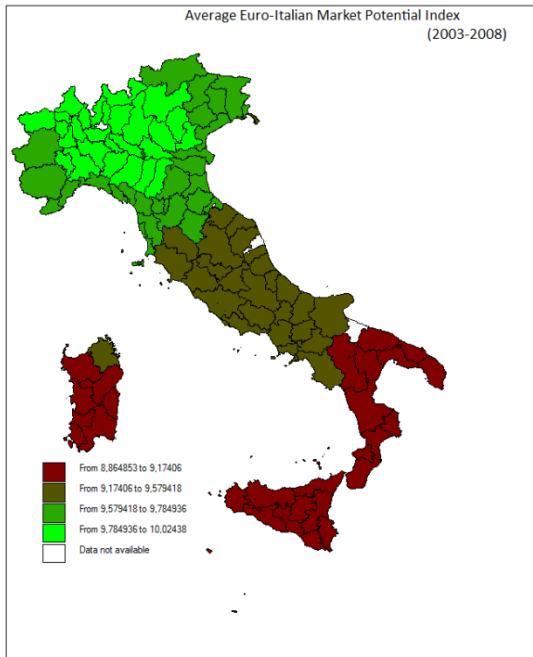
⁴⁸ Original headers of the complaints considered in the *Corruption Index*: abuso d'ufficio (art. 323 CP), peculato (art. 314 CP), concussione (art. 317 CP), corruzione in atti giudiziari (art. 319ter CP), corruzione di una persona incaricata di un pubblico servizio (art. 320 CP), corruzione per un atto contrario ai doveri d'ufficio (art. 319 CP), corruzione per un atto d'ufficio (art. 318 CP), malversazione a danni dello stato (art. 316bis CP). Data were sourced from the Italian Ministry of Internal Affairs – Department of Public Security. I am thankful to Ms. Annamaria Di Maggio (Scuola Superiore dell'Amministrazione dell'Interno) for providing the data.

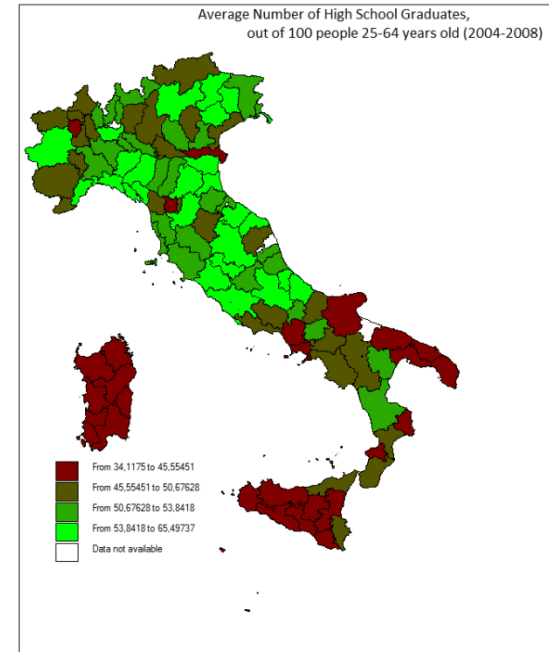
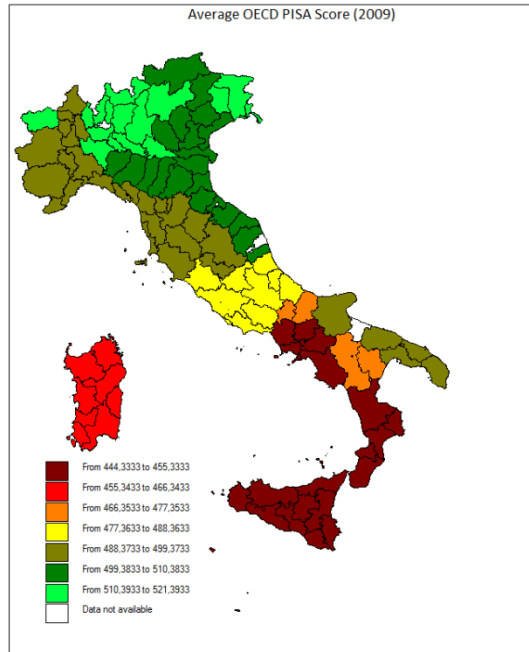
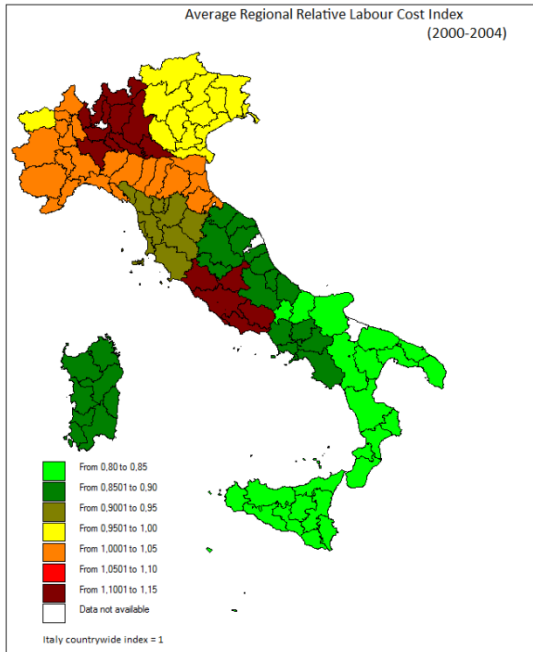
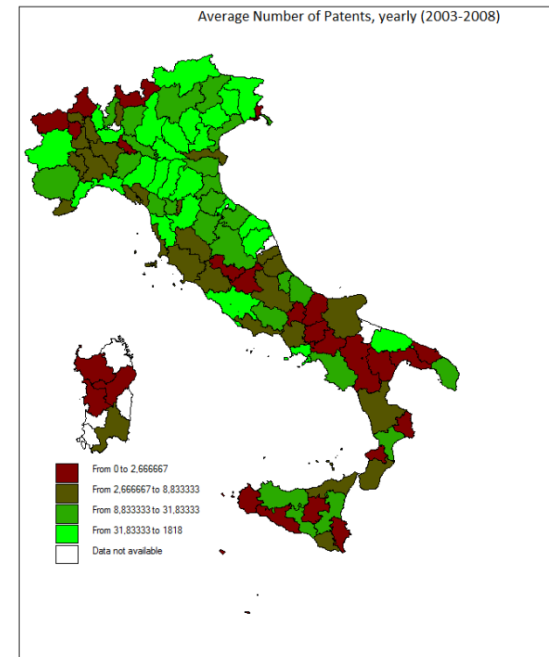
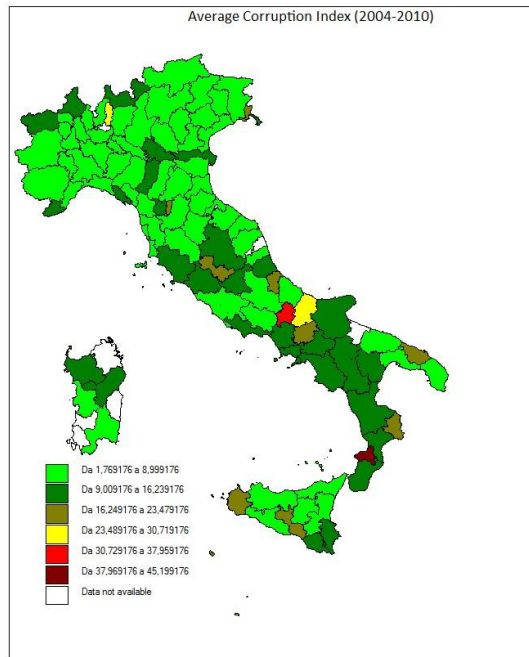
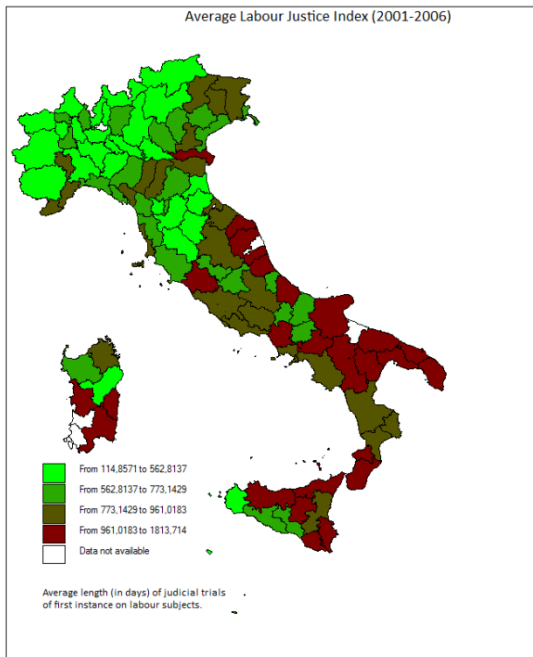
⁴⁹ The average length in days of procedures in each tribunal (raw data) was multiplied by the number of procedures carried out. These products were summed over each province and divided by the total number of procedures occurred in the province. The allocation to one single province of tribunal's areas falling within the territory of multiple provinces was decided looking at where (in which province) the population of the tribunal's areas was mostly concentrated.

Appendix 7: Data Overview









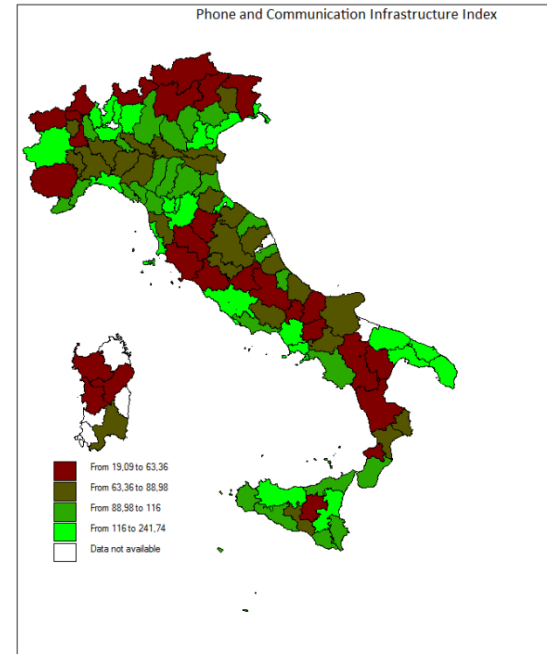
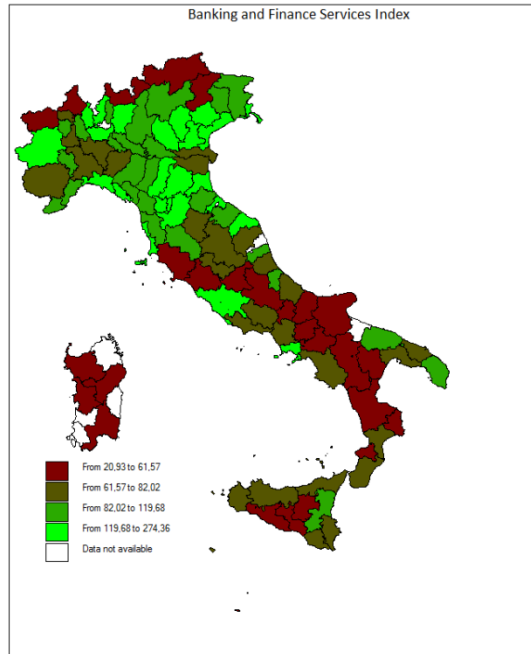
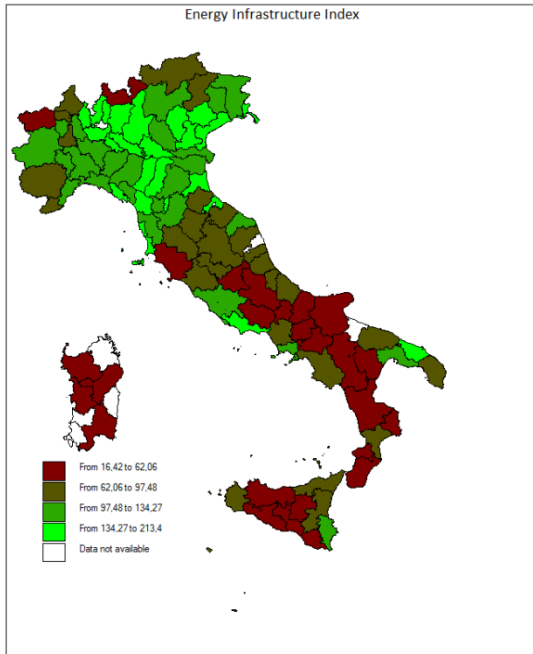
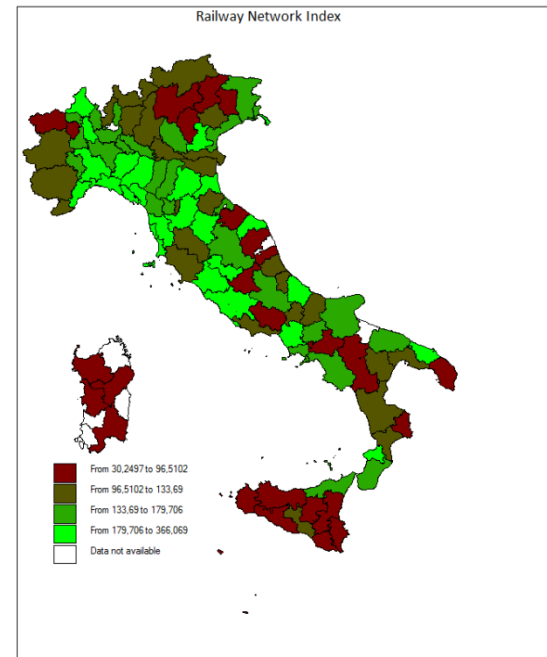
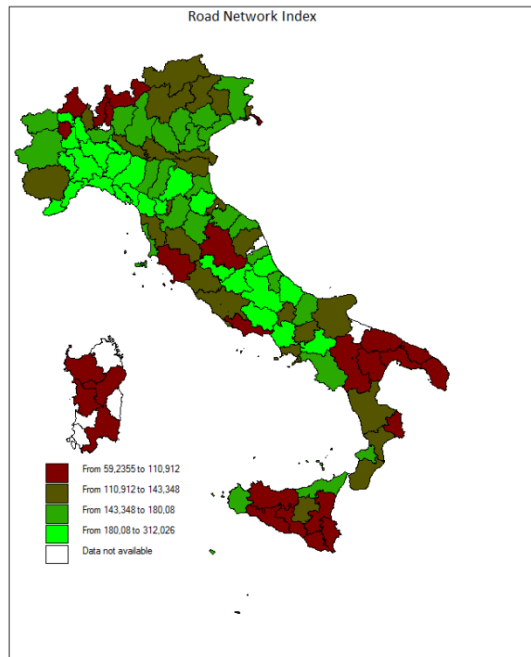
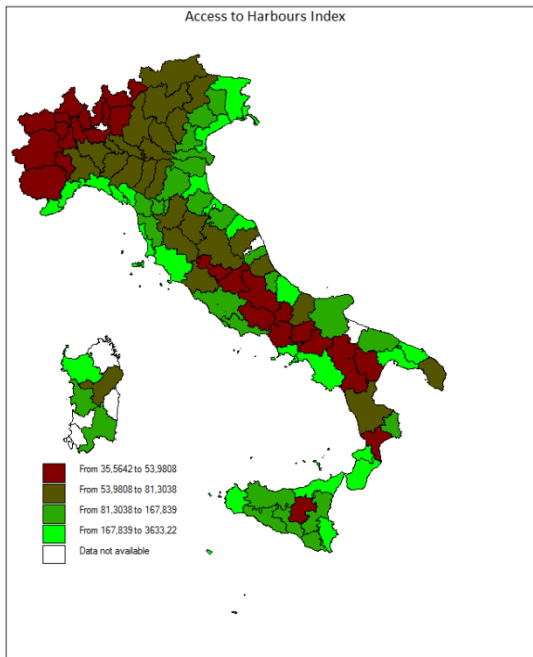


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