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Creative Industries, New Business Formation and Regional Economic Growth*

March 2009

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Abstract

The present study explores the impact exerted by a series of factors and processes including creativity, IPR activities, new business formation and the provision of amenities on economic growth for 103 Italian provinces (NUTS 3) over the period between 2001 and 2006. Provincial growth rates are measured alternatively by value added growth and employment growth. Findings show a positive effect of the increase in the number of firms active in the creative industries, net entry, and a greater provision of leisure amenities on regional economic growth. A large portion of employment in the manufacturing, mining, and energy sector, and a high relative number of university faculties are found to lead to slower economic growth, whereas trademarks, patents, cultural amenities and industrial districts do not affect economic growth. Finally, the share of legal immigrants is found to have a positive impact on employment growth.

JEL-classification: O18, O34, R11

Keywords: regional growth; creativity; entrepreneurship; Italian provinces

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1. Introduction

We focus on creativity, new business formation, Intellectual Property Rights (IPR) activities and other regional determinants of the growth in value added and employment, using new data covering all 103 Italian provinces (NUTS 3) for the period between 2001 and 2006. Italy is an interesting case since it is characterized by both a considerable variation in economic growth rates, and a permanently high difference across regions in terms of degree of specialization in creative industries, new business formation, provision of cultural and leisure amenities, and intensity of IPR activities (patents and trademarks).

The emergence of creative industries which may act as engines of regional economic growth is usually associated to the quality of human capital, that is to the development and refinement of specific individual attitudes and capabilities. Schultz (1961) and Barro (1991) were among the first to stress the importance of human capital in explaining economic growth. A number of studies have since then attempted to explore determinants and effects of new ideas and abilities from a regional perspective. Among others, Florida (2002) suggests that scholars in this field should use a new measure for human capital, based on a specific set of occupations that make up the 'creative class', including science, engineering, arts, culture, and entertainment. Lucas (2008) focuses on the channels through which new ideas may result in sustained growth, stressing the role of a class of educated people spending their careers exchanging ideas, solving work related problems and generating new knowledge. Barry and Glaeser (2005) show that the differences in the endowment of human capital across regions are likely to grow larger and more pronounced, therefore resulting in the persisting and substantial variation in wealth which can exist between regions within one country. Mellander and Florida (2007) identify some conventional and less conventional measures of human capital and "talent" in factors such as the presence of universities, amenities or service diversity, openness and tolerance. Florida, Mellander and Stolarick (2008; cf. also Howkins, 2001; and Florida, 2002) discuss the role of the creativity industries, the university system, and the concentration of gay and lesbian households (taken as a proxy of "diversity") in fostering economic growth by means of a stage-based general model of regional development. Glaeser, Kolko and Saiz (2001) argue that high amenity locations are likely to grow faster than low amenity ones, due to their attractiveness for the most creative, talented, and skilled individuals. Morrison (2008) follows an evolutionary approach in observing that industrial districts, as networks of heterogeneous agents, concentrating knowledge within small epistemic communities make some regions intrinsically more dynamic than others.

Also entrepreneurship and the process of new business formation have been shown to be drivers of progress at the regional level. Harvey (1989) already found a shift from managerialism to entrepreneurialism in urban governance, and Audretsch and Keilbach (2005) a direct link between *entrepreneurship capital*, a specific type of human capital referring to the capacity of a region to generate entrepreneurial activity, and regional economic growth. However, as aptly argued by Fritsch (2008), persuasive evidence on the ways in which entrepreneurship and new firm creation shape economic growth has not been provided yet and they are likely to interact in a haphazard fashion. Fritsch and Mueller (2004), for instance, find that new firms can have both a positive and a negative effect in terms of employment creation at the regional level, with the peak of the positive impact being reached only eight years after start-up.

A third major determinant of regional economic growth is technological change and innovation, even of an incremental nature. Acs and Varga (2002) identify three main aspects of research into technology-led regional economic growth. First is the concentration issue, i.e. the fact that knowledge-related economic activities tend to concentrate in certain regions rather than in others. Second is the identification issue, i. e. finding out the key processes and institutional arrangements which favor technological advances. Third is the modeling issue, i.e. the construction of an analytical framework explaining the role of technological change in regional economic growth (cf. also Acs, 2002). Whereas contributions in the areas of *new economic geography* and *new endogenous growth theory* deal with the first and the third issue, explanation of the institutional arrangements in the innovation process (e.g. those related to IPR activities) linking technological change to regional economic growth is left to the joint effort of *new economics of innovation* and what can be termed *new regional economics*.

Taking the approaches sketched above as not mutually exclusive but rather as complementary, the present study explores the impact exerted on regional economic growth by factors such as creativity in its various forms, new business formation, IPR activities, the provision of amenities, and other structural characteristics for Italian provinces. Findings show a positive effect of the increase in the number of firms active in the creative industries, net entry, and a greater provision of leisure amenities on regional economic growth. Besides, the share of legal immigrants is found to have a positive impact, even though only on employment growth. Conversely, a large portion of employment in the manufacturing, mining, and energy sector (restricted industry), and a high number of university faculties per capita are found to lead to slow economic growth. No statistically significant effect is found in relation to the provision of cultural amenities, and to trademarks, patents, and the presence of industrial districts.

The paper is organized as follows. In Section 2 we discuss existing literature on some of the main drivers of regional economic growth. Section 3 gives an overview of the prevailing growth patterns in the Italian provinces and regions. Section 4 introduces our variables and model. Section 5 presents and discusses the estimation results. Finally, Section 6 concludes, summarizing the main results in the paper.

2. Drivers of regional growth

Certain regional environments are characterised by a higher degree of embeddedness, with ongoing social relations affecting both economic behaviour and institutions. According to Granovetter (1985), this means that the links that individuals have among each other in that region are stronger than those arising in other regions, often shaping common values and behaviours more than at the national level. If one combines the concept introduced by Granovetter (1985) with the ideas put forward by Florida (2002), one may reasonably argue that social relations are an epiphenomenon of the market, so that places that succeed in attracting and retaining creative class people prosper while others do not. This means that those regions in which creative industries and creative people tend to cluster are doomed to grow faster, irrespective of the region's sector of specialization. In this respect, one might find evidence that systematic recourse to IPR protection is more common in those regions in which creative workers tend to cluster, since due to their compatibility with a variety of locations they will display a marked preference for acquiring property rights on the achievements of their activities, in view of a possible transfer to other regions (cf. Acs, 2002). Consistent with Barzel's (1989) view, it is in fact likely that creative individuals decide to use patents, trademarks and registered designs – when not too costly - to acquire IPRs on their creative outputs.

Building communities attractive to the creative class offers cities and regions the opportunity to capitalize on the creative economy also because of the creative class openness to diversity, the availability of an established technology base, and the endowment of appealing amenities (Acs and Megyesi, 2007). In fact, the creative class is usually unevenly distributed across regions, even those belonging to the same country. As put forward by Glaeser, Konko and Saiz (2001), during the 1980s and the 1990s areas with more amenities such as restaurants and live performance theatres per capita have grown faster, at least in terms of resident population, and this holds true not only for the US but also for European countries such as France. The rationale behind this empirical evidence is that the presence of a rich variety of amenities that make life pleasant attracts more educated, talented and creative workers who in turn contribute significantly to the growth of the city or the

region. Within a traditional neoclassical setting, Deller, Lledo and Marcouillier (2008) develop and estimate a model in which amenities and quality of life attributes with a focus on recreation influence growth. Creativity and the rate of new firm formation in the creativity industries are considered a main driver of regional economic growth.

Although a high birth rate of new enterprises is not a necessary condition for economic progress, many researchers and policy makers acknowledge the importance of continuous flows of firm entry for economic welfare. Within a Schumpeterian "creative destruction" framework these can be considered a seedbed of new activities from which new and successful businesses and industries emerge (Beesley and Hamilton, 1984) as a consequence of the conversion of new knowledge developed elsewhere (e.g. by large incumbent firms) into economic knowledge holding commercial value. In this respect, Acs et al. (2009, p. 16) claim that radical innovations come from new firm start-ups and that "entry by start-ups has played a major role in radical innovations, such as software, semiconductors, biotechnology and the information and communications technologies".

Consistent with this interpretation of the driving role played by start-ups in innovation is the assumption that industries and regions with low firm birth and death rates risk a misallocation of resources, formal or tacit collusion, and limited innovativeness (Geroski and Jacquemin, 1985). In fact, some authors (Harvey, 1989 and Audretsch and Thurik, 2000, among others) observe a shift from what was common practice for local governments until the 1970s, that is to focus on the local provision of services, facilities, and various kinds of benefits, to an increased attention for the new ways in which economic and employment growth might be fostered and encouraged. Harvey (1989) defines this shift as a transition from managerialism to entrepreneurialism. By the same token, Audretsch and Thurik (2000) identify a shift from a routinised technological regime in which each agent will tend to appropriate the value of his new ideas within the boundaries of incumbent firms, to an entrepreneurial regime. The agent will tend to appropriate in the new regime the value of his new ideas outside of the boundaries of incumbent firms by starting a new enterprise. Thus, the propensity for starting new businesses should be lower in industries in which the routinised technological regime prevails.

According to Audretsch and Keilbach (2004 and 2005), entrepreneurship capital denotes the capacity of a society to generate new firms. This involves the activity of creating new firms, in turn made possible by the presence of creative individuals who are willing to deal with the risk of starting a new firm. Thus, entrepreneurship capital can be seen as a variant of social capital: whereas the latter refers to connections among individuals and the norms of reciprocity and trustworthiness that arise from them (Putnam, 1995), the former involves a regional milieu of agents

that leads to the creation of new firms and is characterized by social acceptance of entrepreneurial behavior and the presence of bankers or venture capital firms who are willing to share the risk and the benefits. A high entry rate may thus signal a greater endowment of entrepreneurship capital and result in more sustained regional economic growth.

It is widely recognized that agglomeration of economic activity in space, by favoring Marshallian external economies of scale in production leads to increased and enhanced economic output. Economic agglomeration in a region spurs growth, which in turn fosters agglomeration, with growth and geographic agglomeration of economic activities representing mutually self-reinforcing processes (Martin and Ottaviano, 2001). By following a Hotelling framework, Glaeser et al. (1992) and Fujita and Thisse (2002) demonstrate that the extent of knowledge spillovers is determined by geographic proximity, and that agglomeration is limited by the centrifugal effects of transport costs, congestion, immobility of the factors of production. Agglomeration is made easier by a pooled labor market, greater provision of non traded inputs, and knowledge spillovers (Giovannetti, Neuhoff and Spagnolo, 2007). Glaeser et al. (1992) stress the importance of geographic proximity in defining the extent of knowledge spillovers among firms of a given industry to explain the agglomeration in cities and regions. The presence of industrial districts and their relative size in terms of resident population is, accordingly, often associated to regional growth.

The knowledge of a (regional) economy can be considered simply as a list of the knowledge of its members (Arrow, 1962; Lucas, 2008). Each person may gain from the knowledge of the people around her, and a concentration of highly knowledgeable people within a region might positively affect economic growth. Consistent with this assumption, in some studies (e.g. in Florida, Mellander and Stolarick, 2008) universities are found to be significantly associated with the presence in the same territory of both highly-skilled human capital and the creative class.

Less straightforward is the relationship between talent, innovation and tolerance as *joint* drivers of growth. As discussed by Storper and Scott (2009) some studies (including Florida and Gates, 2001; Florida, 2002) found a positive association between diversity and regional growth, under the assumption that a tolerant milieu is more likely to be conducive to creativity provided that talented people have a preference for tolerance. However, more recent studies by some of the same authors (e.g. Knudsen et al., 2008) emphasize the scant significance of bohemian (artists) and gay indices in explaining regional performances in the US. A likely stronger correlation is instead to be expected between tolerance and low barriers to entry for recent immigrants, because a tolerant atmosphere reduces the likelihood of potential social and cultural frictions and attenuates the typical perception

that immigrants are getting jobs that would have otherwise been taken by natives (de Palo, Faini and Venturini, 2006). According to Storper and Scott (2009), accumulation of high levels of human capital in 'tolerant' regions which prove successful both to attract the creative class and to economically and socially assimilate recent immigrants might prove successful in turning creativity into commercially exploitable knowledge, therefore leading to increased regional economic dynamism in the guise of employment growth.

Our paper seeks to investigate the effect of the creative industries, of entrepreneurial and IPR activity, of tolerance and industrial districts on economic growth. The above literature review suggests that there may be some important effects hitherto neglected to a large extent. We employ a range of variables to quantify the relationships. We focus on Italy, a country with a substantial variation in the importance of creative industries, of entrepreneurial and IPR activities and of tolerance. In addition, industrial districts are a key phenomenon of the Italian economy. We combine data from various secondary sources to arrive at a new and unique dataset.

3. Economic growth in the Italian provinces

To test for the relationship between value added growth and employment growth on the one side and creativity, new business formation, IPR activities, the provision of amenities, and tolerance on the other we use data for all 103 provinces in Italy[1]. Table 1 gives an overview of the highest and lowest provincial value added growth rates in Italy by presenting the top-20 and bottom-20 provinces, whereas Table 2 presents the same analysis for employment growth rates.

Value added growth is highest in some provinces in the Central part of Italy, in the regions Toscana (i.e., Grosseto) and Lazio (i.e., Rieti and Latina). Provinces with the lowest value added growth rates are located in Northern and Central Italy, covering regions such as Piemonte (i.e., Biella), Emilia Romagna (i.e., Parma), and Toscana (i.e., Prato). The variation in value added growth rates in Italy also becomes visible from Figure A.1 in the Appendix.

There is no clear geographical pattern with respect to high or low employment growth. Employment growth is highest in provinces located in the regions Toscana (i.e., Grosseto), Piemonte (i.e., Cuneo), Sicilia (i.e., Ragusa). It is lowest in various parts in the South and the North

[1] Article 114 of the Italian Constitution has introduced three different levels of autonomy and three different orders of decentralization for the government: regions, provinces (and metropolitan provinces), and municipalities. Provinces are sub-regional levels of government with only statutory, regulatory and administrative competences: they cannot approve statutes or law. According to the basic principles of the Nomenclature of Territorial Units for Statistics (NUTS) established by Eurostat and used by the European Commission, Italian provinces are NUTS 3 (normative) regions. Even though in 2006 some new provinces have been created, bringing their total number to 107, for the purposes of this paper we decided to focus only on the 103 provinces (provincial territories) already in existence at the beginning of the examined period, by adjusting data to conform with the original 103.

of Italy, particularly in the regions Campania (i.e. Benevento), Sicilia (i.e., Caltanissetta and Enna), and Liguria (i.e., La Spezia). The variation in employment growth rates in Italian provinces also becomes visible from Figure A.2 in the Appendix.

Table 1 – Value added growth in the Italian provinces (average yearly rates 2001-2006)

Code	*Provinces*	*Regions*	*Growth*	*Code*	*Provinces*	*Regions*	*Growth*
GR	Grosseto	Toscana	8.0	BI	Biella	Piemonte	1.2
RI	Rieti	Lazio	7.4	PR	Parma	Emilia-Romagna	1.3
LT	Latina	Lazio	7.0	PO	Prato	Toscana	1.3
OR	Oristano	Sardegna	5.9	BA	Bari	Puglia	1.6
RN	Rimini	Emilia-Romagna	5.8	AQ	L'Aquila	Abruzzo	1.8
RG	Ragusa	Sicilia	5.5	GE	Genova	Liguria	2.0
CE	Caserta	Campania	5.5	CT	Catania	Sicilia	2.1
KR	Crotone	Calabria	5.4	BL	Belluno	Veneto	2.3
VT	Viterbo	Lazio	5.3	FG	Foggia	Puglia	2.4
VA	Varese	Lombardia	5.2	VB	Verbano-Cusio-Ossola	Piemonte	2.4
LI	Livorno	Toscana	5.0	BN	Benevento	Campania	2.4
BG	Bergamo	Lombardia	5.0	CH	Chieti	Abruzzo	2.5
TA	Taranto	Puglia	5.0	NA	Napoli	Campania	2.5
PU	Pesaro-Urbino	Marche	4.9	PN	Pordenone	Friuli-Venezia Giulia	2.5
SV	Savona	Liguria	4.9	CZ	Catanzaro	Calabria	2.6
IM	Imperia	Liguria	4.8	MO	Modena	Emilia-Romagna	2.6
MS	Massa-Carrara	Toscana	4.8	TR	Terni	Umbria	2.7
FC	Forlì-Cesena	Emilia-Romagna	4.8	CA	Cagliari	Sardegna	2.7
CN	Cuneo	Piemonte	4.7	TS	Trieste	Friuli-Venezia Giulia	2.8
LO	Lodi	Lombardia	4.7	VI	Vicenza	Veneto	2.8
	ITALY		**3.5**				

Note: The twenty provinces with the highest value added growth rates are presented in the left part of the table, while the twenty provinces with the lowest value added growth rates are presented in the right part.

Differences in value added and employment growth rates are remarkable not only between, but also within regions. This emerges in a clear fashion also in some of the regions of the so called "Third Italy"[2], such as Emilia-Romagna where are located some of the best (Rimini, Ravenna) and some of the worst (Parma, Ferrara) performers.

Employment growth or decline in Italy cannot be simply connected to the extent of international relocation of production. In fact, Federico and Minerva (2008) found that employment growth in provinces where firms are more involved in international relocation of production is stronger than the average, being associated with both growth in the number and average size of local plants.

Whereas the data in Tables 1 and 2 referred to top-20 and bottom-20 provinces alone suggest there is no perfect relationship between value added growth rates and employment growth rates within the same province, it has to be noticed here that none of the provinces exhibiting high rates

[2] Comprising those Central and North-eastern regions in which industrial districts traditionally flourished, and small and medium sized enterprises active in traditional consumer goods industries represent the bulk of manufacturing.

of either value added or employment growth are characterized by particularly low rates for the other variable, as it is confirmed by the high correlation (0.60) between the average yearly rates of the two variables (cf. Table A.1 in the Appendix).

Table 2 – Employment growth in the Italian provinces (average yearly rates 2001-2006)

Code	*Provinces*	*Regions*	*Growth*	*Code*	*Provinces*	*Regions*	*Growth*
GR	Grosseto	Toscana	4.4	BN	Benevento	Campania	-1.4
CN	Cuneo	Piemonte	3.4	CL	Caltanissetta	Sicilia	-0.9
RG	Ragusa	Sicilia	3.1	SP	La Spezia	Liguria	-0.8
LO	Lodi	Lombardia	3.0	EN	Enna	Sicilia	-0.7
LT	Latina	Lazio	2.9	BA	Bari	Puglia	-0.4
RN	Rimini	Emilia-Romagna	2.9	AV	Avellino	Campania	-0.3
RI	Rieti	Lazio	2.8	BI	Biella	Piemonte	-0.2
RM	Roma	Lazio	2.5	FE	Ferrara	Emilia-Romagna	-0.2
VC	Vercelli	Piemonte	2.5	NU	Nuoro	Sardegna	-0.2
RA	Ravenna	Emilia-Romagna	2.3	CH	Chieti	Abruzzo	-0.1
MC	Macerata	Marche	2.2	GE	Genova	Liguria	-0.1
BG	Bergamo	Lombardia	2.2	BL	Belluno	Veneto	0.0
SO	Sondrio	Lombardia	2.2	FG	Foggia	Puglia	0.0
OR	Oristano	Sardegna	2.2	TS	Trieste	Friuli-Venezia Giulia	0.1
RC	Reggio Calabria	Calabria	2.1	PO	Prato	Toscana	0.1
SI	Siena	Toscana	2.1	AQ	L'Aquila	Abruzzo	0.1
VA	Varese	Lombardia	2.1	CZ	Catanzaro	Calabria	0.3
AR	Arezzo	Toscana	2.1	AO	Aosta	Valle d'Aosta	0.3
TV	Treviso	Veneto	2.0	TE	Teramo	Abruzzo	0.4
SV	Savona	Liguria	2.0	PR	Parma	Emilia-Romagna	0.4
	ITALY		**1.3**				

Note: The twenty provinces with the highest employment growth rates are presented in the left part of the table, while the twenty provinces with the lowest employment growth rates are presented in the right part.

4. Model specification and summary statistics

We seek to empirically examine the importance of creativity, new business formation, IPR activities, and other factors in determining regional growth. For this purpose we use a regression analysis for data covering all 103 Italian provinces over the period 2001-2006.[3] Our dependent variables are the relative rate of growth of value added (per province): $\Delta VA_t = (VA_t - VA_{t-1})/VA_{t-1}$ and the relative rate of growth of employment (per province): $\Delta EMP_t = (emp_t - emp_{t-1})/emp_{t-1}$.

We use two variables to measure the importance of creativity in a province. This is referred to both heavily industrialized fields (such as advertising) and less commodified ones (such as

[3] The main sources of data are: ISTAT, Movimprese (Union of the Italian Chambers of Commerce), UIBM (Italian Patents and Trademarks Office).

architecture and the visual arts). The first measure is in fact called Δ*creative* and is the rate of growth of the number of firms in creative industries.[4] It is defined as:

$$(1)\ \Delta creative_t = \frac{creativefirms_t - creativefirms_{t-1}}{creativefirms_{t-1}}$$

An overview of the highest and lowest provincial growth rates for this variable are given by presenting the top-10 and bottom-10 provinces in Table A.2 in the Appendix. A second measure, $Sh\_creative_{t-1}$, is the one-period lagged share of creative firms in the population of all non-agriculture firms active in the region relative to 100 employees. It is defined as:

$$(2)\ Sh\_creative_{t-1} = \frac{creativefirms_{t-1}}{allfirms_{t-1}} x100$$

Related are IPR activities, in relation to which we use data by province of application. A first measure is the incremental growth of the stock of trademarks and registered designs & models by province. It is defined as[5]:

$$(3)\ \Delta trademarks_t = \frac{tm_t + des_t}{\sum_{i=1995}^{t-1}(tm_i + des_i)}$$

A second measure, $Sh\_trademarks_{t-1}$, is the one-period lagged number of trademarks and registered designs &models in the respective province relative to 1,000 employees:

$$(4)\ Sh\_trademarks_{t-1} = \frac{tm_{t-1} + des_{t-1}}{employees_{t-1}} x1000$$

Trademarks and designs may simply imply new brand names or new varieties of a product rather than actual new products and is a measure typically used to take into account the impact of creativeness in and outside manufacturing, and to measure the innovative performance of traditional

[4] According to the relevant literature and different studies on the creative and cultural sector (e. g. European Commission, 2005), we restricted our creative sector to the following industries: Activities related to printing (NACE 225); Software consultancy and supply (NACE 7222); Architectural and engineering activities and related technical consultancy (NACE 742); Advertising (NACE 744); Designer fashion (NACE 7487); Artistic and literary creation and interpretation (NACE 9231).

[5] Registered designs & models are much less than trademarks. In fact, over the entire period they account on average for just 4% of the total number of trademarks and designs & models granted by UIBM.

and intermediate industries. In fact, trademark analysis may prove useful in identifying important features of the overall process of innovation and industrial change. In particular, as stressed by Mendonça, Pereira and Godinho (2004), they are crucial to the process of marketing innovations, due to their usefulness in differentiating the characteristics of goods and services which are brought to the marketplace.

However, one cannot forget that total patenting activity (patents and utility patents) is in turn a measure which may be typically used to summarize the climate for invention in high-tech and medium-tech product classes (Jovanovic and Rousseau, 2001). For this reason, a third and a fourth measure are employed: the incremental growth of the stock of patents and utility patents ($\Delta patents$), which can be also taken as a proxy of knowledge accumulation that is likely to affect positively the dynamics of value addition in the region (Kobayashi, 2008); and the one-period lagged number of patents and utility patents in the respective province relative to 1,000 employees ($Sh\_patents_{t-1}$). They are respectively defined as follows:[6]

$$(5)\ \Delta patents_t = \frac{pat_t + ut_t}{\sum_{i=1995}^{t-1}(pat_i + ut_i)}$$

$$(6)\ Sh\_patents_{t-1} = \frac{pat_{t-1} + ut_{t-1}}{employees_{t-1}} x1000$$

We incorporate two other one-period lagged explanatory variables that are aimed at capturing the alleged impact of cultural and leisure amenities as features that are likely to attract creative individuals to the location, therefore indirectly fostering provincial value added and employment growth. These are $Leisure_{t-1}$ (number of restaurants per capita x 1,000) and $Cultural_{t-1}$ (number of movie theatre tickets per capita) respectively. An overview of the highest and lowest provincial growth rates for the $Leisure_{t-1}$ variable are given by presenting the top-10 and bottom-10 provinces in Table A.3 in the Appendix.

A further explanatory variable that may pick up elements of creativity and of human capital is $Faculties_{t-1}$: the one-period lagged number of university faculties per resident population. The idea here is that a large number of university faculties may contribute to improve the quality of human capital in the province, ultimately resulting in accelerated economic growth. An overview of the

[6] Over the entire period patents represent on average 74% of the total number of patents and utility patents granted by UIBM.

highest and lowest provincial growth rates for this variable are given by presenting the top-10 and bottom-10 provinces in Table A.4 in the Appendix.

We test for a possible role of migration processes in fostering regional economic growth by adding the one-period lagged share of legal immigrants per 1,000 resident population ($Sh\_immigrants_{t-1}$), under the assumption that migrants are rapidly assimilated in the strata of the host society more open to international influence (de Palo, Faini and Venturini, 2006).

We use the net entry rate of firms ($NetEntry_t$) as explanatory variable to accommodate for the direct effect of entrepreneurial activity, in the form of its net contribution to total economic activity, in the region. More than a measure of entrepreneurship capital such as the number of start-ups in the respective province relative to its population, used by Audretsch and Keilbach (2004), which would reflect the propensity of the inhabitants of the province to start a new firm, we use a measure of the direct impact of entry on economic growth. Under the assumption that the most dynamic and successful among new firms may contribute to provincial value added and employment growth. The net entry variable is defined as:

$$(7)\quad NetEntry_t = \frac{(entryfirms - exitfirms)_t}{(0.5regfirms_t + 0.5regfirms_{t-1})}$$

where *regfirms* is the total number of firms registered.[7]

We have developed a measure of the importance of industrial districts in a province as the ratio of the one-period lagged number of industrial districts, identified by ISTAT on the basis of the Local Labor Systems and according to the national laws and rules, in the province relative to its population ($Popdistricts_{t-1}$). Industrial districts have traditionally played an important role in Italian manufacturing and this variable allows us to estimate whether the effect of such districts in the early 21st century is still significant (cf. Santarelli, Carree and Verheul, 2009[8]; Boschma and Iammarino, 2009). The lowest number of districts is in fact one in 27 provinces and the highest 9 in two provinces (Brescia and Pesaro-Urbino), whereas there are no districts at all in 41 provinces.

We add time dummies to adjust for time-specific nation-wide effects and we add as control variables the one-period lagged share of restricted industry (manufacturing, energy and extractive industries) in total employment ($Manu\_Extr_{t-1}$), and the one-period lagged provincial level of value

[7] For the denominator we use the average number of firms active during year *t* (mean of the absolute values at the beginning; i.e. end of year t-1) and the end of year *t*. See Audretsch, Santarelli and Vivarelli (1999).

[8] These authors used a specific definition of industrial districts, comprising only those "traditional" ones present in just 22 of the 103 Italian provinces (Unioncamere, 2002)

added per capita ($VApc_{t-1}$). Whereas the first variable corrects for difference in sectoral composition in provinces, under the assumption that specialization externalities may influence regional growth (Paci and Usai, 2000), the second controls for differences in the level of productivity and income across Italian provinces. Two final control variables have been included, respectively for the value added and the employment equation, namely one-period lagged value added growth (ΔVA_{t-1}) and one-period lagged employment growth (ΔEMP_{t-1}).

Table 3 – Summary Statistics

Variable	Mean	St. deviation	Min	Max
ΔVA	0.0341	0.0220	-0.0490	0.1240
ΔEMP	0.0113	0.0214	-0.0660	0.0800
Δcreative	0.0302	0.0210	-0.0731	0.1382
Sh_creative $_{t-1}$	6.5916	1.0779	4.3928	9.5176
Δtrademarks	0.1556	0.0490	0.0524	0.3614
Sh_trademarks$_{t-1}$	1.3675	0.6664	0.2196	3.7158
Δpatents	0.1219	0.0523	0.0204	0.6607
Sh_patents$_{t-1}$	0.3834	0.2646	0.0182	1.2650
Leisure$_{t-1}$	1.7499	0.5556	0.9089	4.3380
Cultural$_{t-1}$	1.5970	0.8107	0.1659	4.1521
Faculties$_{t-1}$	0.0106	0.0108	0.0000	0.0462
Sh_immigrants $_{t-1}$	32.759	20.547	3.366	97.748
NetEntry $_{t}$	0.0103	0.0095	-0.0445	0.0442
Popdistricts $_{t-1}$	0.0036	0.0048	0.0000	0.0258
Manu_Extr$_{t-1}$	0.2175	0.0935	0.0583	0.4425
VApc$_{t-1}$	47.113	5.012	34.391	60.695
ΔVA$_{t-1}$	0.0375	0.0235	-0.0510	0.1241
ΔEMP$_{t-1}$	0.0118	0.0232	-0.0660	0.1030

Thus, for assessing the impact of creativity, new business formation, IPR activities, and other factors on regional economic growth, we estimate a reduced form of the following kind:

$$
\begin{aligned}
(8)\quad & \Delta VA_t = \beta_0 d_{02} + \beta_1 d_{03} + \beta_2 d_{04} + \beta_3 d_{05} + \beta_4 d_{06} + \beta_5 \Delta creative_t + \beta_6 Sh\_creative_{t-1} + \\
& + \beta_7 \Delta trademarks_t + \beta_8 Sh\_trademarks_{t-1} + \beta_9 \Delta patents_t + \beta_{10} Sh\_patents_{t-1} + \\
& + \beta_{11} leisure_{t-1} + \beta_{12} cultural_{t-1} + \beta_{13} faculties_{t-1} + \beta_{14} Sh\_immigrants_{t-1} + \\
& + \beta_{15} NetEntry_t + \beta_{16} Popdistricts_{t-1} + \beta_{17} Manu\_Extr_{t-1} + \beta_{18} VAPC_{t-1} + \beta_{19} \Delta VA_{t-1} + \varepsilon_t
\end{aligned}
$$

Starting from the general specification of regional economic growth with ΔVA as dependent variable, we apply the same equation to employment growth (ΔEMP) in the province:

$$
\begin{aligned}
(9) \quad & \Delta EMP_t = \beta_0 d_{02} + \beta_1 d_{03} + \beta_2 d_{04} + \beta_3 d_{05} + \beta_4 d_{06} + \beta_5 \Delta creative_t + \beta_6 Sh\_creative_{t-1} + \\
& + \beta_7 \Delta trademarks_t + \beta_8 Sh\_trademarks_{t-1} + \beta_9 \Delta patents_t + \beta_{10} Sh\_patents_{t-1} + \\
& + \beta_{11} leisure_{t-1} + \beta_{12} cultural_{t-1} + \beta_{13} faculties_{t-1} + \beta_{14} Sh\_immigrants_{t-1} + \\
& + \beta_{15} NetEntry_t + \beta_{16} Popdistricts_{t-1} + \beta_{17} Manu\_Extr_{t-1} + \beta_{18} VAPC_{t-1} + \beta_{19} \Delta EMP_{t-1} + \varepsilon_t
\end{aligned}
$$

Table 3 presents summary statistics (i.e., mean, standard deviation, min, and max) for all variables included in the empirical analysis.

5. Empirical results

The results for equations (8a) up to (9b) are presented in Table 4. The equations (8a) and (9a) contain both changes and levels of the three creativity and IPR measures. The equations (8b) and (9b) only contain the changes of the three variables. The three level variables were significant neither in the value added growth regression nor in the employment growth regression. In fact, the adjusted R-squared increases when leaving out the three level variables. The top part of Table 4 (*d02* through *d06*) shows the year-specific fixed effects. Subsequently, the effects of creative industries, IPR activities, leisure and cultural amenities, university faculties, legal immigration, entrepreneurship capital and industrial districts are presented. The bottom part of the table shows the results for the remaining control variables. The regressions run for value added growth have a better goodness of fit, with values of R^2 adjusted around 72.5 per cent, whereas those for employment growth are around 37.4 per cent.

The year-specific effects are quite constant over the years. The dummies are not significantly different from each other (remember that a constant is not included in the model). A higher rate of growth of the number of firms active in the creative industries ($\Delta creative$) is associated to faster value added growth and employment growth in all estimates. The effect is significant at the 5% significance level for value added growth, but only at the 10% level for employment growth. The share of creative firms in the total number of firms does not have an effect, though. The results suggest that an increase of 10% in the number of creative firms is accompanied by an increase of 1.3 percent points in value added and 0.9% in employment. Note that we have also included a net entry variable, so that the effect of $\Delta creative$ is not due to the mere increase in the number of firms itself irrespective of them being in the creative industries or not. The results provide some (limited)

confirmation to findings by previous studies (e.g. Lee, Florida, and Acs, 2004) showing that creativity plays an important role in spurring regional economic growth.

There is no effect of either the level or the change in trademarks and patents. Hence, we fail to find evidence for the protection of property rights to have an important positive influence on economic growth in the next year. The results for the presence of amenities are mixed. Leisure amenities, in the form of restaurants, appear to affect value added growth positively, but not employment growth. The first finding is partly consistent with those by Glaeser, Kolko and Saiz (2001), showing that the most creative people are attracted by amenities such as the number of restaurants per capita. Cultural amenities, in the form of cinema visits, do not show any effect. Hence, we find little evidence even using a range of variables that talent or talent attraction directly impact economic performance of a region.

Table 4 – OLS estimates of growth in value added and employment between 2001 and 2006

Variable	(8a) ΔVA		(8b) ΔVA		(9a) ΔEMP		(9b) ΔEMP	
d02	0.0359	(2.30)**	0.0329	(2.16)**	0.0051	(0.36)	0.0062	(0.46)
d03	0.0340	(2.23)**	0.0310	(2.08)**	0.0011	(0.08)	0.0022	(0.16)
d04	0.0264	(1.73)*	0.0236	(1.58)	-0.0159	(1.17)	-0.0150	(1.12)
d05	0.0231	(1.53)	0.0204	(1.38)	-0.0111	(0.82)	-0.0103	(0.78)
d06	0.0248	(1.66)*	0.0220	(1.50)	0.0052	(0.39)	0.0058	(0.45)
Δcreative	0.1296	(2.28)**	0.1295	(2.29)**	0.0897	(1.76)*	0.0958	(1.88)*
$Sh\_creative_{t-1}$	-0.0009	(0.81)		-	-0.0009	(0.85)		-
Δtrademarks	-0.0044	(0.16)	-0.0031	(0.11)	-0.0017	(0.07)	-0.0047	(0.19)
$Sh\_trademarks_{t-1}$	-0.0012	(0.48)		-	0.0036	(1.59)		-
Δpatents	0.0158	(0.77)	0.0177	(0.87)	-0.0059	(0.32)	-0.0032	(0.17)
$Sh\_patents_{t-1}$	0.0002	(0.03)		-	-0.0009	(0.16)		-
$Leisure_{t-1}$	0.0058	(2.66)***	0.0059	(2.74)***	0.0007	(0.36)	0.0007	(0.34)
$Cultural_{t-1}$	-0.0009	(0.49)	-0.0013	(0.82)	-0.0013	(0.77)	-0.0002	(0.13)
$Faculties_{t-1}$	-0.2252	(2.24)**	-0.2534	(2.66)***	-0.2173	(2.40)**	-0.2295	(2.66)***
$Sh\_immigrants_{t-1}$	0.0001	(0.84)	0.0001	(0.74)	0.0001	(1.51)	0.0002	(2.33)**
$NetEntry_t$	0.2311	(2.09)**	0.2411	(2.20)**	0.2335	(2.35)**	0.2209	(2.25)**
$Popdistricts_{t-1}$	0.1101	(0.40)	0.1272	(0.47)	0.3327	(1.36)	0.3233	(1.33)
$Manu\_Extr_{t-1}$	-0.0282	(1.42)	-0.0318	(1.81)*	-0.0342	(1.93)*	-0.0330	(2.10)**
$VApc_{t-1}$	0.0000	(0.17)	-0.0000	(0.05)	0.0003	(1.05)	0.0002	(0.70)
ΔVA_{t-1}	-0.0161	(0.35)	-0.0104	(0.23)		-		-
ΔEMP_{t-1}		-		-	0.1865	(4.64)***	0.1879	(4.71)***
R^2adj.	0.7242		0.7250		0.3743		0.3747	
Observations	515		515		515		515	

Absolute Student's t in brackets; *** refers to 99% confidence level; ** refers to 95% confidence level; * refers to 90% confidence level.

Value added and employment growth rates are not higher in provinces characterized by more systematic recourse to intellectual property rights protection. It could be that, provided that most intellectual property-related activities are undertaken by a limited number of large firms in specific industries, these variables may not adequately reflect technological opportunities available to the (very) small firms (Choi and Phan, 2006). The latter represent the bulk of economic activities in Italian provinces. This is consistent with the findings arising for most of the countries (Italy included) participating in the 4th Community Innovation Survey. Enterprises were requested to indicate (for the period 2002-2004) the importance of various methods to protect innovations. The majority of firms with less than 50 employees responded that they have neither used patent nor trademark protection.

The number of faculties in universities has strongly increased in Italy, but our results suggest that this was not accompanied by increased economic growth. Quite the contrary, these institutional changes are a phenomenon mostly encountered in provinces that show less subsequent economic growth. Although the presence of universities is usually associated with both a higher quality of the human capital and a more significant presence of the creative class in the territory (cf. Florida, Mellander and Stolarick, 2008), our *faculties* variable displays a negative and statistically significant coefficient in both regressions. This finding should not be taken as highly surprising. Following the implementation of the so called *Bologna process* after 2001[9], Italy has experienced a proliferation of university faculties in most of its provinces. However, this did prove so far quite ineffective for attracting educated and skilled populations to the province and for enhancing the quality of human capital in the province. The share of legal immigrants in total population appears to have a positive effect for employment growth. Hence, regions that are more 'open' or 'tolerant' to newcomers benefit in the short-run. We stress that the immigrants are only counted when they are 'legal'. This indicates that they mostly come from other EU countries (27% in 2007), and less so from Africa (23% in 2007), Asia (16%) and America (9%).[10]

The (net) entry rate in a province appears to have a positive effect on both value added and employment growth[11]. This result confirms the direct positive impact of new firms as found and

[9] Pursuing the harmonization of tertiary education systems throughout Europe, soon after the signature in Bologna of a joint declaration on 19 June 1999, 29 European governments agreed to create a European Area of Tertiary Education with the purpose of enhancing the international competitiveness of the Member States. Accordingly, as early as Academic Year 2001-2002 Italian universities started to reorganize their traditional courses of study to fit the international Bachelor/Master system.

[10] The three countries of origin of the largest groups of foreign immigrants were in 2007 Romania (625,278 or 18%), Albania (401,949 or 12%), and Morocco (365,908 or 11%).

[11] We also tried with a measure for entrepreneurship capital, gross entry over resident population with one to five lags, but no statistically significant result was found.

explained by Fritsch and Mueller (2004). A 1% increase in the number of firms is accompanied by a 0.23 percent point increase in both value added and employment. There is no effect of the presence of industrial districts ($Popdistricts_{t-1}$). It suggests that industrial districts have been losing their importance in creating economic growth. After having played for decades a role in fostering growth in certain Italian regions (in particular in the North and the North-east of the country) industrial districts are perhaps becoming less and less fruitful areas for economic activities. In fact, a recent paper by Foresti, Guelpa and Trenti (2009) based on a careful analysis of balance sheet data shows that during the 2002-2005 period district firms lost their comparative advantage in terms of export performance, sales growth and profitability. According to the authors, the "district effect" has vanished in connection to the emergence of structural weaknesses in the endowment of non-manufacturing capabilities at the local level.

We have three further control variables. A larger share of industrial employment to total employment (in the previous period) has the expected negative effect on value added and employment growth. Consistent with the findings by Florida (2002), regions with a higher percent of their workforce in the traditional industrial occupations are less likely to be major creative-class centers and less likely to grow fast. The last two control variables are the provincial value added per capita and the lagged dependent variable (value added or employment growth in the preceding period). The variable measuring the regional economic wealth and productivity does not exert a statistically significant impact. Finally, whereas no persistence of the growth rates is found from previous period in relation to value added, the opposite holds true in relation to employment, with the coefficient positive and strongly significant.

6. Conclusions

This paper analyzes the impact on regional value added growth and employment growth by factors such as creativity, new business formation, IPR activities, the provision of amenities, and other structural characteristic of both market and non-market nature. We use data of 103 Italian NUTS 3 regions (provinces) over the 2001-2006 period. The main findings point to regional growth being significantly influenced by the prevailing patterns of sectoral specialization, with a higher rate of growth of the share of firms in creative industries (Artists and Writers creation, Designer fashion, Advertising, Architectural and Engineering activities, Software, etc.) significantly associated to accelerated growth both in value added and employment. Also new business formation is an important determinant of regional growth, along with the endowment of leisure amenities. Conversely, characteristics which in the past contributed significantly to regional economic growth

in Italy, such as the presence of industrial districts, turn out to have lost most of their propulsive function, whereas the ability of a region to realize inventions and introduce new trademarks does not foster economic growth in a straightforward manner. Also a large share of restricted industry (manufacturing, energy and mining) in total employment results in slow growth, whereas a widespread presence of university faculties is associated with slow economic growth.

These findings suggest that in Italian NUTS 3 regions change in sectoral composition of output, with a shift toward certain creative activities and a contraction of traditional industrial activities might prove beneficial for growth more than the agglomeration economies resulting from the organization of production within industrial districts and aggressive intellectual property right strategies.

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Figure. A.1 – Value added growth in the Italian provinces (average yearly rates, 2001-2006)

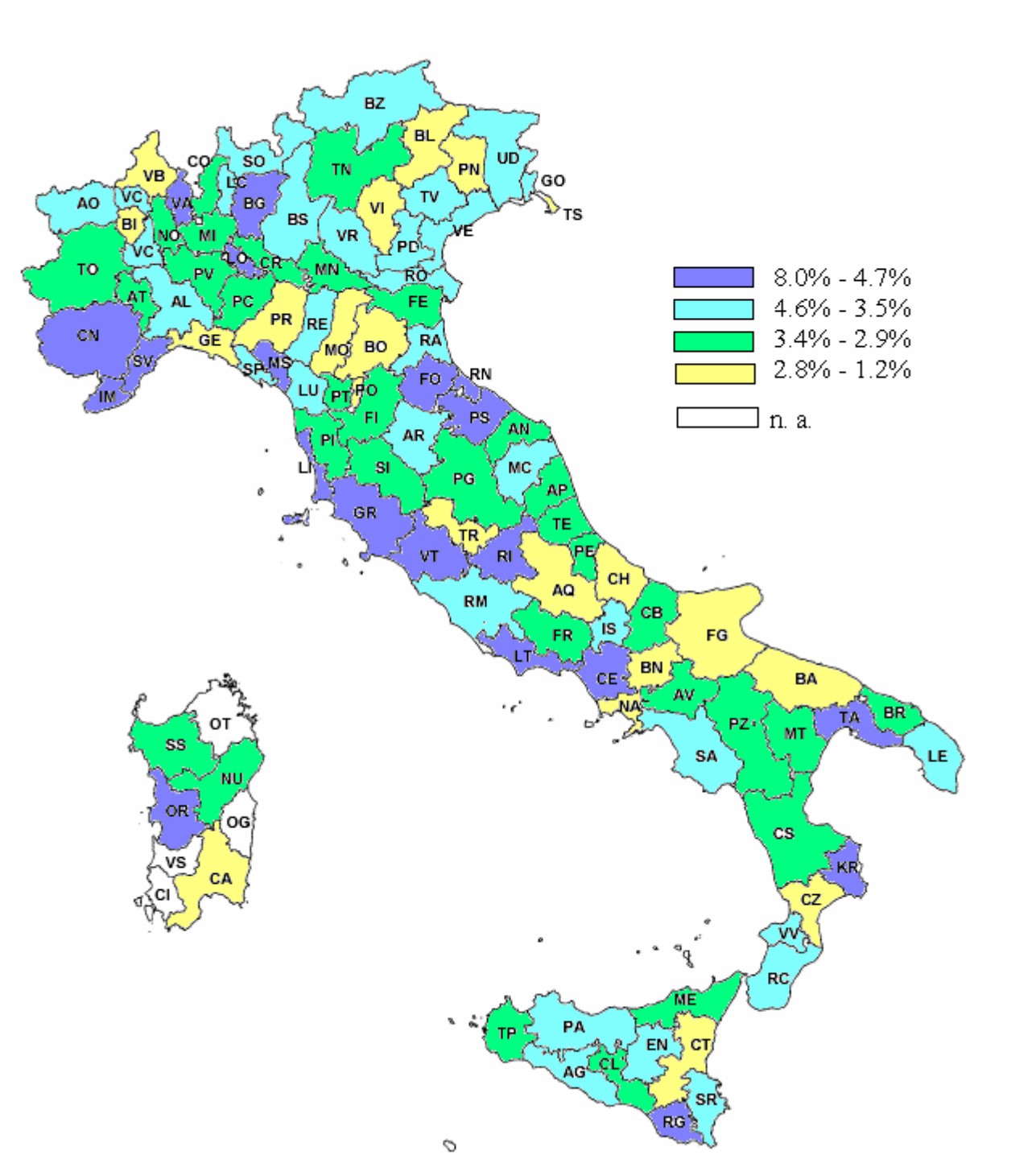

Figure A.2 – Employment growth in the Italian provinces (average yearly rates, 2001-2006)

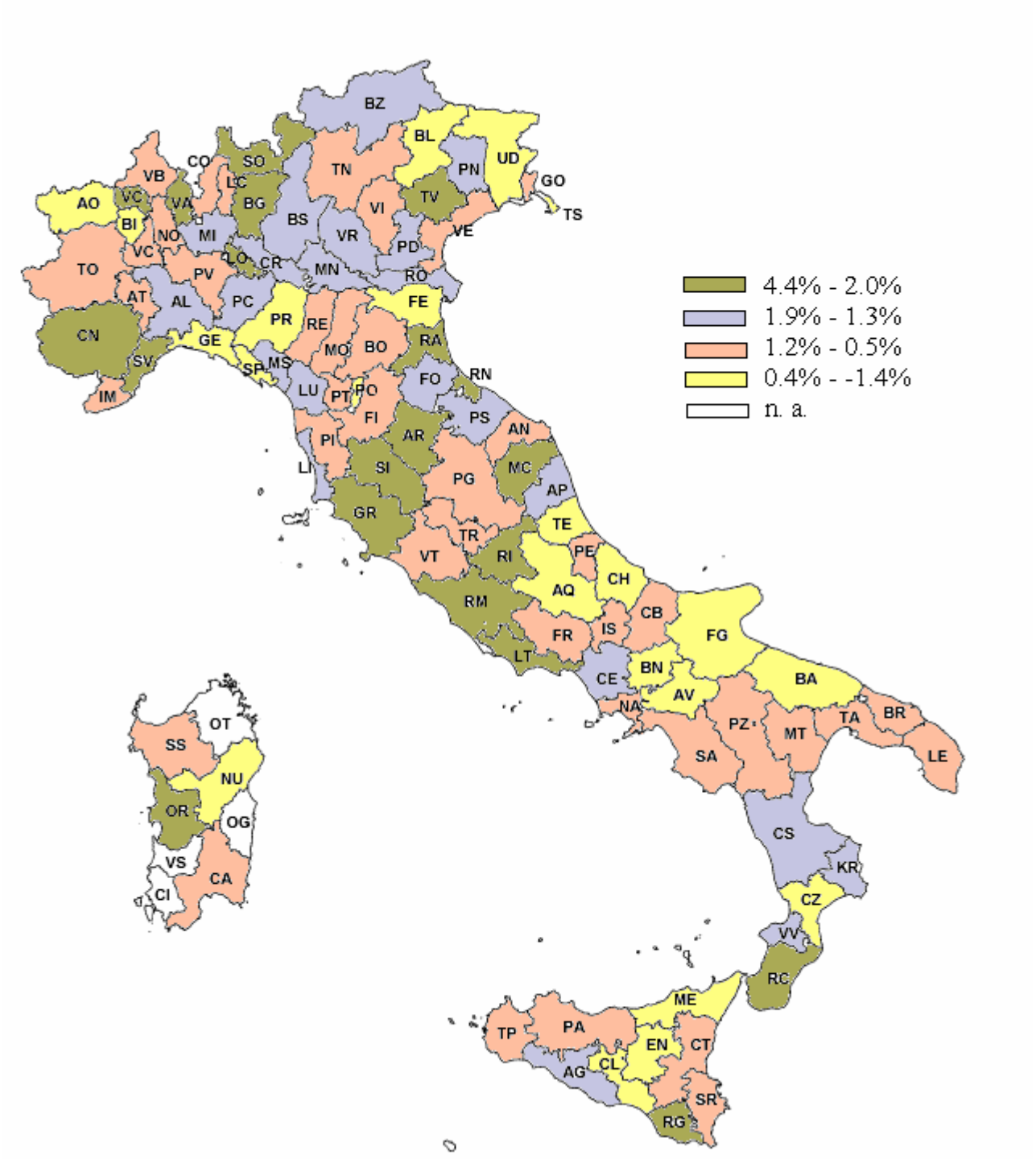

Table A.1 – Correlation matrix

	ΔVA	ΔEMP	Δcreative	Sh_creative $_{t-1}$	Δtrademarks	Sh_trademarks$_{t-1}$
ΔVA	1					
ΔEMP	0.5994	1				
Δcreative	0.0611	-0.0263	1			
Sh_creative $_{t-1}$	-0.1154	-0.0259	0.0727	1		
Δtrademarks	0.1255	0.0120	-0.1317	-0.3614	1	
Sh_trademarks$_{t-1}$	-0.0767	0.0983	0.1769	0.4198	-0.372	1
Δpatents	0.0683	0.0527	-0.1793	-0.2188	0.3468	-0.1287
Sh_patents$_{t-1}$	-0.0724	0.0338	0.1130	0.3926	-0.3122	0.6666
Leisure$_{t-1}$	0.1104	0.0726	0.0447	0.1680	-0.0911	0.1472
Cultural$_{t-1}$	-0.0196	0.0772	0.1574	0.3251	-0.2655	0.6641
Faculties$_{t-1}$	-0.0909	-0.1007	0.0175	0.2061	-0.0036	0.1528
Sh_immigrants $_{t-1}$	-0.0855	0.0948	0.1747	0.4550	-0.4915	0.7104
NetEntry $_{t}$	0.0830	0.0175	0.0595	-0.1425	0.1104	-0.1354
Popdistricts $_{t-1}$	-0.0514	0.0228	0.0888	0.1001	-0.1329	0.2903
Manu_Extr$_{t-1}$	-0.0930	0.0213	0.1370	0.3522	-0.3230	0.5451
VApc$_{t-1}$	-0.0394	0.0765	0.1288	0.5096	-0.5019	0.3997
ΔVA$_{t-1}$	0.1032	0.1577	0.0331	-0.1800	0.2342	-0.1029
ΔEMP$_{t-1}$	0.1813	0.2589	-0.0239	-0.1268	0.2003	-0.0061

	Δpatents	Sh_patents$_{t-1}$	Leisure$_{t-1}$	Cultural$_{t-1}$	Faculties$_{t-1}$	Sh_immigrants $_{t-1}$
Δpatents	1					
Sh_patents$_{t-1}$	-0.0502	1				
Leisure$_{t-1}$	-0.1457	0.0172	1			
Cultural$_{t-1}$	-0.1475	0.5125	0.28	1		
Faculties$_{t-1}$	0.0192	0.0992	0.1559	0.2298	1	
Sh_immigrants $_{t-1}$	-0.2333	0.6668	0.2200	0.5041	0.0505	1
NetEntry $_{t}$	-0.0400	-0.1016	-0.2379	-0.0711	-0.0334	-0.0776
Popdistricts $_{t-1}$	-0.0017	0.3827	0.0305	0.0975	0.1978	0.3329
Manu_Extr$_{t-1}$	-0.0351	0.7229	-0.1172	0.2329	-0.0848	0.5970
VApc$_{t-1}$	-0.2408	0.3156	0.3999	0.4137	-0.0834	0.5799
ΔVA$_{t-1}$	0.1238	-0.1075	0.0933	0.0162	-0.0544	-0.1783
ΔEMP$_{t-1}$	0.1098	-0.0072	0.0646	0.0592	-0.0751	-0.0500

	NetEntry $_{t}$	Popdistricts $_{t-1}$	Manu_Extr$_{t-1}$	VApc$_{t-1}$	ΔVA$_{t-1}$	ΔEMP$_{t-1}$
NetEntry $_{t}$	1					
Popdistricts $_{t-1}$	-0.1714	1				
Manu_Extr$_{t-1}$	-0.1270	0.5253	1			
VApc$_{t-1}$	-0.1535	-0.1134	0.2815	1		
ΔVA$_{t-1}$	0.1023	-0.0825	-0.1380	0.0223	1	
ΔEMP$_{t-1}$	0.0994	0.0151	0.0006	-0.0517	0.5872	1

Table A.2 – Δcreative: provinces with the highest and the lowest growth rates (average yearly rates 2001-2006)

Code	*Provinces*	*Regions*	*Growth*	*Code*	*Provinces*	*Regions*	*Growth*
OR	Oristano	Sardegna	7.0	CL	Caltanissetta	Sicilia	0.5
MN	Mantova	Lombardia	5.4	CZ	Catanzaro	Calabria	0.8
BS	Brescia	Lombardia	5.4	VV	Vibo Valentia	Calabria	0.9
RG	Ragusa	Sicilia	5.3	VC	Vercelli	Piemonte	1.3
TN	Trento	Trentino Alto-Adige	5.3	ME	Messina	Sicilia	1.3
SS	Sassari	Sardegna	5.0	BI	Biella	Lombardia	1.4
PO	Prato	Toscana	4.7	BR	Brindisi	Puglia	1.4
CA	Cagliari	Sardegna	4.7	PZ	Potenza	Basilicata	1.4
PE	Pescara	Abruzzo	4.6	CS	Cosenza	Calabria	1.6
CN	Cuneo	Piemonte	4.5	RC	Reggio Calabria	Calabria	1.6

Note: The ten provinces with the highest growth rates are presented in the left part of the table, while the ten provinces with the lowest growth rates are presented in the right part.

Table A.3 – Leisure: provinces with the highest and the lowest growth rates in the ratio of the number of restaurants to resident population (average yearly rates 2001-2006)

Code	*Provinces*	*Regions*	*Growth*	*Code*	*Provinces*	*Regions*	*Growth*
OR	Oristano	Sardegna	8.2	NU	Nuoro	Sardegna	-4.4
RG	Ragusa	Sicilia	6.7	TS	Trieste	Friuli Venezia-Giulia	-2.0
PO	Prato	Toscana	5.4	RO	Rovigo	Veneto	-1.9
EN	Enna	Sicilia	4.8	GO	Gorizia	Friuli Venezia-Giulia	-1.8
RC	Reggio Calabria	Calabria	4.6	PU	Pesaro-Urbino	Marche	-1.4
IS	Isernia	Molise	4.2	PN	Pordenone	Friuli Venezia-Giulia	-1.3
CB	Campobasso	Molise	4.1	RN	Rimini	Emilia Romagna	-1.3
CA	Cagliari	Sardegna	3.8	PD	Padova	Veneto	-1.2
LE	Lecce	Puglia	3.7	BS	Brescia	Lombardia	-1.1
SA	Salerno	Campania	3.7	PR	Parma	Emilia Romagna	-0.9

Note: The ten provinces with the highest growth rates are presented in the left part of the table, while the ten provinces with the lowest growth rates are presented in the right part.

Table A.4 – Faculties: provinces with the highest and the lowest growth rates in the ratio of university faculties to resident population (average yearly rates 2001-2006)

Code	*Provinces*	*Regions*	*Growth*	*Code*	*Provinces*	*Regions*	*Growth*
TS	Trieste	Friuli Venezia-Giulia	0.5	RE	Reggio Emilia	Emilia Romagna	-1.8
EN	Enna	Sicilia	0.5	LO	Lodi	Lombardia	-1.5
PZ	Potenza	Basilicata	0.2	BS	Brescia	Lombardia	-1.4
FG	Foggia	Puglia	0.2	BG	Bergamo	Lombardia	-1.3
NU	Nuoro	Sardegna	0.2	LT	Latina	Lazio	-1.3
ME	Messina	Sicilia	0.2	RN	Rimini	Emilia Romagna	-1.3
CZ	Catanzaro	Calabria	0.2	PR	Parma	Emilia Romagna	-1.2
CS	Cosenza	Calabria	0.2	RA	Ravenna	Emilia Romagna	-1.2
IS	Isernia	Molise	0.1	PG	Perugia	Umbria	-1.1
MT	Matera	Basilicata	0.1	TN	Trento	Trentino Alto-Adige	-1.1

Note: The ten provinces with the highest growth rates are presented in the left part of the table, while the ten provinces with the lowest growth rates are presented in the right part.