The Role of Regional Values of Social Capital, Trust, and Social Networks in Entrepreneurship in Greek regions: the Services case.

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Abstract: This paper examines the role that regional social capital plays in regional entrepreneurship in services. The social capital variable used was constructed by the means of Exploratory Factor Analysis (EFA). The present analysis also separately assesses the effects of regional values of trust and social networks on the regional entrepreneurship. The results obtained from the use of fixed effects demonstrate the benefits of regional social capital for the formation of new firms at the regional level. In addition, regional trust and regional social networks positively affect the formation of the new firms at the regional level. From the other control variables, unemployment and within services knowledge spillovers lead to an increase of new firm formation in Greek regions, while human capital and knowledge spillovers across different sectors appear to restrict the entrepreneurial activity. In turn, the GDP growth has an insignificant effect on the formation of new firms at a regional level in services. The policy implications discussed herein emphasize the need to strengthen the amount of social capital in regions.

Keywords: new firm formation, social capital, trust, social networks, regions, services

JEL Classification: R12, L26, L80

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Ο ΡΟΛΟΣ ΤΟΥ ΚΟΙΝΩΝΙΚΟΥ ΚΕΦΑΛΑΙΟΥ ΣΤΗΝ ΠΕΡΙΦΕΡΕΙΑΚΗ ΕΠΙΧΕΙΡΗΜΑΤΙΚΟΤΗΤΑ: Η ΠΕΡΙΠΤΩΣΗ ΤΟΥ ΚΛΑΔΟΥ ΤΩΝ ΥΠΗΡΕΣΙΩΝ ΣΤΗΝ ΕΛΛΑΔΑ

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Περίληψη

Η εργασία εξετάζει τον ρόλο που παίζει το κοινωνικό κεφάλαιο στην περιφερειακή επιχειρηματικότητα για τον κλάδο των υπηρεσιών. Η μεταβλητή του κοινωνικού κεφαλαίου που χρησιμοποιείται κατασκευάστηκε μέσω μίας εφαρμογής της Διερευνητικής Ανάλυσης Παραγόντων (Exploratory Factor Analysis). Επίσης εξετάζει ξεχωριστά το αποτέλεσμα των περιφερειακών τιμών τόσο της κοινωνικής εμπιστοσύνης όσο και των κοινωνικών δικτύων για την περιφερειακή επιχειρηματικότητα. Τα αποτελέσματα από την χρήση σταθερών επιδράσεων (fixed effects) δείχνουν τα οφέλη του περιφερειακού κοινωνικού κεφαλαίου για την περιφερειακή επιχειρηματικότητα. Επιπλέον, τόσο η περιφερειακή κοινωνική εμπιστοσύνη όσο και τα περιφερειακά κοινωνικά δίκτυα επηρεάζουν θετικά τους περιφερειακούς ρυθμούς εισόδων των νέων επιχειρήσεων. Από τις άλλες μεταβλητές ελέγχου, η ανεργία και η διάχυση της γνώσης μέσα στον κλάδο των υπηρεσιών οδηγούν σε μία αύξηση των ρυθμών εισόδων νέων επιχειρήσεων, ενώ το ανθρώπινο κεφάλαιο και η διάχυση της γνώσης μεταξύ όλων των κλάδων της οικονομίας έχουν μία αρνητική επίδραση στις εισόδους των νέων επιχειρήσεων. Με τη σειρά της, η μεγέθυνση του ΑΕΠ έχει ένα μη στατιστικά σημαντικό αποτέλεσμα στην περιφερειακή επιχειρηματικότητα στις υπηρεσίες. Οι εφαρμογές της πολιτικής που συζητούνται στην εργασία δίνουν έμφαση στην ανάγκη να ενδυναμωθεί το ποσό του κοινωνικού κεφαλαίου στις περιφέρειες.

1. Introduction

The purpose of the present paper is to examine the effect of local social capital on the formation of new firms in Greek regions in the services sector over the 2002- 2010 period.

The literature on social capital has flourished over the last couple of decades. The concept of social capital has been established by theorists of the specific field, such as Coleman (1988) and Putnam (1993, 1995). Different definitions and considerations of social capital exist in varying levels of analysis including individual and/or macroeconomic perspectives (Burt 1992; Knack and Keefer 1997). Others explore the relation between social capital and economic development and growth as well as innovation (Knack and Keefer 1997; Tura and Harmaakorpi 2005). In entrepreneurship literature, most studies examine the connection between social capital and entrepreneurial activity at the level of the individual (Davidsson and Honig 2003). However, more recently, a number of scholars have made an effort to empirically associate local aspects of social capital with entrepreneurship at the regional level (Westlund et al. 2014).

The present analysis intends to analyze the influence of local social capital on the formation of new firms by contributing to a small but growing literature that conducts the analysis at the regional level (Bauernschuster et al. 2010; Kwon et al. 2013; Westlund et al. 2014; Westlund and Bolton 2003). The services sector focus of the analysis also contributes to evidence that has, so far, concentrated more on the tourism industries subsector (Johannesson et al. 2003; Zhao et al. 2011).

Both Putnam's (1993, 1995) and Coleman's (1988) definitions of social capital, which are dominant in the literature, have been adopted here. In addition, the service sector has been chosen for the analysis the effect of social capital on regional entrepreneurship. This sector has been a dominant emerging feature of many economies, growing faster than other sectors and having significant implications for the overall economic and productivity performance (Acs and Armington 2004). One important dimension of social capital, that of networks, seems to be particularly important for the development of innovation by services firms (Kandampully 2003), and their performance (Chell and Baines 2000)[1].

The results obtained from the econometric analysis, in particular those of the fixed effects estimations, show a positive and significant effect of regional social capital on new firm formation in Greek regions. In terms of control variables, unemployment and knowledge spillovers within services positively affect the formation of the new firms at the regional level. Knowledge spillovers across sectors and human capital, however, have a negative influence on regional entrepreneurship. Finally, the GDP growth impact was not found to be significant.

The present paper is organized as follows. The next section describes the theory and hypotheses. The third section includes a detailed description of data and variables which are used in the model. The fourth section contains the empirical results, while the final sector draws this study's conclusions and implications.

2. Theory and Hypotheses

2.1 Social Capital

In social capital studies, many consider the fundamental elements of social capital to be the ideas of trust, social networks and norms of reciprocity (Putnam 1993, 1995). He (1995, p. 67) states that social capital "includes the features of social organization such as networks, norms, and trust that facilitate

[1] For a discussion and analysis in the context of Greek firms in the tourism sector, see Petrou and Daskalopoulou (2013).

coordination and cooperation for mutual benefit". In addition to social trust, Narayan and Cassidy (2001) elaborate trust in institutions and treat it as a distinct dimension of social capital. Furthermore, Narayan and Cassidy (2001) and Guiso et al. (2004) regard the political participation as another significant dimension and measure of social capital. Generally speaking, social capital defined as in previous cases is mainly an attribute of regions and nations and conduces to an increase of political development of regions (Putnam 1993). Here, Malecki (2012, p. 1026), focusing on the regional implications of social capital, strongly supports that regions are spatial units where "social capital process affects development more directly".

2.1.1 The impact of Social Capital on Economic Outcomes

A number of research projects concentrate on the positive association of social capital with regional GDP growth. Specifically, Knack and Keefer (1997) reveal the positive and significant effect of social capital on per-capita income growth at a spatial level, whereas Guiso et al. (2004) show the beneficial impact of social capital on financial development in provinces of Italy. The above cases bring to light the fact that other than natural, physical and human capital, social capital related to the social interaction of economic actors is a further aspect that lends weight to the economic growth process. In addition to this, social capital propels the regional innovative process (Murhy et al. 2016; Tura and Harmaakorpi 2005). Specifically, Tura and Harmaakorpi (2005) approach social capital in terms of effectively exploiting and refreshing social relationships in order to actualize innovation activities. In this vein, social capital increases regional the technological learning activity (Malecki 2012). This has been defined as "the continuous, flexible and cheap creation of knowledge, fostering product and process innovation" (Lorenzen 2007, p. 802). Regarding entrepreneurship, the individual implications of the relationship of social capital with entrepreneurship stress that social capital is crucial for the formation of new firms and the discovery of entrepreneurial opportunities (Davidsson and Honig 2003; De Carolis and Saparito 2006). In social capital terms, connotations such as feelings of gratitude, reciprocity, respect and friendship make up notable elements which increase entrepreneurship levels. Furthermore, social capital is responsible for access to information and other resources (Davidsson and Honig 2003), despite the limitations in the amount of information available. Equally, Yli-Renko et al. (2001) mention that social capital assists in firms' knowledge acquisition. Indicatively, Anderson and Jack (2002, p. 195) argue that "one way to overcome some of the constraints the entrepreneur may face

is to acquire knowledge and resources by tapping into an extended pool, which exists outside the business".

2.1.2 Social Capital and Entrepreneurship at the Regional Level

In regional studies cases, local social capital is useful for the locational choice of entrepreneurial activities. Hence, "the propensity to start new firms is, among other things, a function of local entrepreneurial social capital, a space-bound asset that contributes to the 'place surplus' of a place or a region, which spurs entrepreneurship and makes the place attractive for investors, migrants and visitors" (Westlund et al. 2014, p. 975). In the most recent empirical studies, social capital leads to an increase of the formation of new firms across regions (Westlund et al. 2014). In this respect, the facilitating local social capital has direct conducive implications to regional entrepreneurship (Westlund and Bolton 2003). Local social capital, however, may have also discouraging consequences on the regional entrepreneurial activities (Westlund and Bolton 2003; see also Westlund et al. 2014). Westlund and Bolton (2003) explain that, sometimes, social networks may exclude individuals from participation in them. Or, in other cases, the conformity in certain social norms reduces the entrepreneurial incentives and limits the individual freedom. Conversely, local social capital may affect regional entrepreneurship indirectly because of its significant consequences on supply costs and human capital (Westlund and Bolton 2003; see also Westlund et al. 2014). Moreover, the importance of locally embedded values, beliefs and attitudes in fostering the regional entrepreneurial process captures another significant point of contribution of local social capital to regional entrepreneurship (Westlund and Bolton 2003). Given the above we can formulate the following hypothesis:

Hypothesis 1: Regional social capital should positively affect the formation of new firms at the regional level in services.

2.2 Trust

One basic component of social capital is trust (Putnam 1993, 1995). Our analysis adopts the Zaaher et al. (1998) view of trust. More specifically, the concept of trust may be framed as an expectation of a partner's reliability with regard to his obligations, predictability of behavior, and fairness in actions and negotiations while faced with the possibility of behaving opportunistically (Zaaher et al. 1998, p. 143; see also Beugelsdijk and Van Schaik 2005). Kwon and Arenius (2010) distinguish between two types

of trust: generalized trust and particularized trust. The first type is characteristic of nations and regions (Beugelsdijk and Van Schaik 2005; Kwon and Arenius 2010). As a result, it is observed in a more aggregate perspective. On the contrary, the particularized trust is found in individual or micro-level analyses (Kwon and Arenius 2010). According to Uslaner and Conley (2003, p. 335), the generalized trust is examined when "most people share common values and are willing to trust strangers who may outwardly seem quite different from themselves". Dominant in this opinion is the idea of generalized reciprocity (Putnam 1993). This is not only precious for societies but also a point of differentiation from the distrustful societies (Putnam 1993; Beugelsdijk and Van Schaik 2005). In particularized trust, Uslaner and Conley (2003) state that people trust people from their own social circle. Such examples include family, friends and other familiar individuals.

2.2.1 The Impact of Trust on Economic Outcomes

In trust theory, Tabellini (2010) has emphasized the effect of trust on the economic development of regions. Zak and Knack (2001) depict the favorable impact of trust on the spatial economic growth and, in particular, on GDP growth. The GDP levels also rely on the social trust concept in a sample of different regions (Weckroth et al. 2015). The result of trust on GDP growth and GDP levels reveals the significance of social trust for local prosperity. A meaningful explanation of this finding focuses on the capability of high trust societies to create a higher level of output in relation to low trust societies (Zak and Knack 2001). At the same time, trust is also vital for the configuration of innovation activity in spatial circumstances (Dakhli and De Clercq 2004). According to the latter, trust is a considerable enabler of innovation because it reduces the strict controls within firm and organizational environment. Across a sample of countries, trust also has positive consequences on trade (Guiso et al. 2009). Further to these effects, from an individual viewpoint trust brings about results in entrepreneurship in a positive way in the majority of empirical studies. Trust is the specific component of social capital that decreases transaction costs of exchange in terms of minimizing opportunistic behavior (Zaaher et al. 1998). A number of empirical studies illustrates the value of trust for new entrepreneurship (Liao and Welsch, 2005). Yet, trust is crucial for the discovery of entrepreneurial opportunities and the dominance of family firms (Kwon and Arenius 2010; Eddleston et al. 2010). Entrepreneurs who develop social trust are able to leverage personal relations with members of other networks for the fulfillment of their entrepreneurial purposes. Apropos family firms, "trust is linked to theoretical frameworks such as

agency theory, stewardship theory, social capital theory, and transaction cost economics that are often used in family business studies" (Eddleston et al. 2010, p. 1043).

2.2.2 Trust and Entrepreneurship at the Regional Level

In regional studies literature, Michelacci and Silva (2007) consider social trust as a significant tool for the amplification of regional entrepreneurship since a notable amount of local business entrepreneurs can be observed in regions with a high degree of trust. Specifically, trust is a basic driver of the creation of new firms at a regional and community level (Audretsch et al. 2011, p. 152; Kwon et al. 2013). In this respect, Lechner and Dowling (2003, p. 9), who examine the Munich IT regional cluster, suggest that "the successful development of entrepreneurial firms depends on a core of stable relations and that trust develops over time". Interpersonal trust that constitutes a notable element of regional psychological capital can assist in the discernment of spatial entrepreneurial opportunities as possible exposure to distrust can deteriorate economic and entrepreneurial achievements (Gordon 2007). In turn, Maskell and Malmberg (1999) underscore the significant and lucrative influences of trust on the knowledge exchange among firms at a geographical prospect, while the social and personal relationships between suppliers of advice and SME clients gives ground to social trust that helps in an ameliorated exploitation and use of advice services (Benett and Robson 1999). Trust also fosters the regional innovation entrepreneurship (Molina-Morales and Martinez-Fernandez 2010). Molina-Morales and Martinez-Fernandez (2010) contend that the existence of trust between actors allows them to help each other accomplish specific innovative goals. Given the above we can formulate the following hypothesis:

Hypothesis 2: Regional trust should positively affect the formation of new firms at the regional level in services.

2.3 Social Networks

When examining social networks as a distinct component of social capital (Putnam 1995), it is important to highlight the usefulness of social networks in relation to the creation of social ties among agents (Coleman 1988). In ethnic minorities in the US, the formation of social relationships among immigrants is a notable characteristic of living in the arrival country (Coleman 1988). In particular, Castilla et al. (2000, p. 219) define social networks as "a set of nodes or actors (persons or

organizations) linked by social relationships or ties of a specified type". The meaning of both bonding and bridging social capital has its own value in the social networks concept (Putnam 1993). According to Magnani and Struffi (2009, p. 232), the first pertains to "the links among the members of a homogenous community/social group who share a perceived common identity". In contrast, the second refers to "weaker and more diverse relationships extending beyond the immediate community" (Magnani and Struffi 2009, p. 232). Another similar consideration in the social networks literature makes a distinction between strong and weak ties (Granovetter 1973). The strong ties are mainly developed between the members of a family and close friends (Westlund and Bolton 2003; Davidsson and Honig 2003). These constitute a measure of informal social networks (Putnam 1995). Weak ties, on the other hand, "are characterized by a low intensity of relationship between two or more individuals" (Granovetter 1973, p. 1361; see also Davidsson and Honig 2003). They refer to the evaluation of the density of membership and the level of participation in formal associations (Davidsson and Honig 2003) and measure formal social networks (Putnam 1995).

2.3.1 The Impact of Social Networks on Economic Outcomes

Empirical studies show that the social networks empower the regional economic growth across a sample of countries (Knack and Keefer 1997). According to Knack and Keefer (1997), the lack of dense social networks of social interaction can be detrimental for economic growth. The low level of social networks presupposes an absence of cooperative behavior among the members of social networks as well as a conflict about their economic goals. Other scholars give emphasis to the significance of social networks for innovation activity from a regional perspective (Rost 2011; Dakhli and De Clercq 2004). Rost (2011) particularly promotes the value of strong ties for regional innovation. From an individual level, the establishment of new firms depends on social networks (Birley 1985). This is succeeded through personal contacts, personal acquaintances and face-to-face communication that facilitate the acquisition of financial capital for future and potential entrepreneurs in order to fund their new entrepreneurial effort. Subsequently, social networks assist in the discovery and recognition of entrepreneurial opportunities (Kwon and Arenius 2010). Kwon and Arenius (2010) consider that weak ties create more entrepreneurial opportunities because close and emotional strong ties prevent entrepreneurs from undertaking the appropriate entrepreneurial risks. Under these circumstances, the social networks allow entrepreneurs to succeed in their business activities. This success comes about

due to the fact that social networks provide entrepreneurs with valuable resources such as information and other resources useful for firm operation (Anderson and Jack 2002). The extensive use of personal social networks of private and business contacts can enable the inexpensive acquisition of scarce resources which they are not easily found in markets.

2.3.2 Social Networks and Entrepreneurship at the Regional Level

The social networks affect the entrepreneurial actions in different spatial units in Europe and U.S. (Greve and Salaff 2003; Castilla et al. 2000). Greve and Salaff (2003) declare that social networks have an important influence on the entrepreneurial process in different phases. Their major impact occurs during the phase where the potential future entrepreneur prepares to establish a firm. At this critical point of start-up, entrepreneurs shape large social networks which will help them realize their entrepreneurial intentions in an easier way. Therefore, influential in regional social networks theory is the work of those scholars who underline the significance of social networks in setting up new firms (Sorenson and Stuart 2001; Sorenson 2003; Butler and Hansen 1991). This shows that the entrepreneurial activities are increased by social networks in regional clusters as Lasch et al. (2013, p. 675) note that "network effects in clusters enable new firms to compete internationally by sourcing local assets and connecting to global networks". In this vein, social networks are essential for the acquisition of entrepreneurial resources at a local level (Zhang et al. 2011). Examining China and Singapore, Zhang et al. (2011) find that the above effect is stronger in China where social relationships dominate. Besides the above-mentioned benefits, Molina-Morales and Martinez-Fernandez (2010) state that social networks refresh innovation enterprises in a regional context. Social interactions among firms favor the broad exchange and combination of knowledge and ideas stimulating innovative practices within firms. Given the above we can formulate the following hypothesis:

Hypothesis 3: Regional social networks should have a positive effect on the formation of new firms at the regional level in services.

3. Data and Variables

The variables of our model cover the 2002-2010 period for 13 Greek regions (NUTS 2). Thus, there are 117 observations. The sector of interest is services. Our analysis below presents the analytical definitions of the variables in addition to the origin of the data for the construction of these variables.

3.1 Dependent variable

New firm formation rate (*NFFR*):

The new firm formation rates at the regional level arise from the ratio of new firms in services for Greek regions divided by regional employment in services sector. For the construction of new firm formation rates, the data originate from Firm's Registry and Annual Labor Force Survey of the Hellenic Statistical Authority.

3.2 Independent variables

Trust (*TRUST/FAIR*):

Trust is measured by two questions: a) "Most people can be trusted or you can't be too careful" (Knack and Keefer 1997) and b) "Most people would try to take advantage of you if they got the chance, or would they try to be fair" (Narayan and Cassidy 2001). Given the lack of data for particularized trust, the first variable reflects the generalized trust level of regions. The second variable sketches the fairness notion existent in regions. Both questions are measured on a scale from one to ten. Then, the highest value in the questionnaire is used to create the above variables. The basic reason is that this value secures the most meaningful and consistent responses in trust questions for the specific scale, given that the other scores include some degree of mistrust (Uslaner 2015). The data for the construction of trust variables come from the first, second, fourth and fifth rounds of the ESS (European Social Survey) where data are available for Greek regions.

Social networks (*SCLMEET/SCLACT/VOLUNT*):

In social networks, the informal networks are measured by two questions: a) "the level of frequency of meeting friends, relatives and colleagues" (Jones et al. 2008) and b) "the level of participation in social activities compared to others of the same age" (Jones et al. 2008). These variables express the social meetings and social activities observed in regions. Both variables are measured on a scale from one to seven and one to five respectively. As in the case of the trust variables, the highest values are used to construct these variables. Next, regional volunteerism in at least one of a list of organizations is the proxy for formal networks (Jones et al. 2008; Beugelsdijk and Van Schaik 2005). It is a dummy variable which takes the value '1' if volunteerism takes place and the value '0' in the opposite case. To

create social networks variables, the data originate from the first, second, fourth and fifth rounds of the ESS.

Social capital:

In order to construct social capital our paper applies a pooled Exploratory Factor Analysis (EFA) for all the years of sample. It exploits one of the most known uses of the above method which refers to the reduction of a large number of variables into a few factors (Fabrigar et al. 1999). The above factor model is estimated via maximum likelihood (MLE).

To assess the suitability of the respondent data for EFA, the present paper uses the Kaiser-Meyer-Olkin (KMO) measure. The KMO index ranges from 0 to 1, with 0.50 considered suitable for factor analysis. In this paper, the KMO score is 0.748. Another measure which is calculated herewith is Cronbach's alpha. This is a measure of the reliability of common factors derived from factor analysis and varies from 0 to 1. In our analysis, this measure gives a score of 0.648.

For the extraction of common factors three criteria are chosen. First, scree plot (Figure 1) and Kaiser's criterion (Kaiser 1960) for eigenvalues suggest four factors which are retained in the analysis. More specifically, there are four factors over 1 which is set by the above criteria as a limit. However, our analysis includes an additional factor which has an eigenvalue of 0.943. Despite the specific score being under 1, this score satisfies a third criterion which recommends retaining factors above 0.70. This is known as Jolliffe's criterion (Jolliffe 1972). .

Figure 1 near here

Another issue of high importance in EFA is the labeling of factors. Given that EFA is actualized using orthogonal varimax rotation, the following observed variables come from ESS: a) trust in national parliament, b) trust in legal system, c) trust in police and d) trust in European Parliament define the first factor which is that of institutional trust (***INSTTRUST***). The vote in the last national elections and the participation in at least a list of political actions in the last 12 months define the second factor. This is political participation (***PLPRTP***). The generalized trust and the fairness related to the third factor make up trust (***SOCTRUST***). The social activities and the social meetings form the fourth factor that is informal networks (***INFNET***). The fifth factor reflects the formal networks (***FORMNET***) which are represented by volunteerism and membership. The derived factors constitute

the regional amount of social capital. The factors will enter in econometric estimations as independent variables. Thus, the results of EFA are presented in Table 1.

Table 1 near here

3.3 Control variables

Knowledge spillovers (*INDINTENS/THEIL*):

The indicator for knowledge spillovers within the services sector is the service-industry intensity. This arises from the number of establishments in the services sector for each region divided by the population in each region. At the services sector's level, the literature reveals the positive and significant effect of knowledge spillovers from similar business establishments on the formation of new firms at the regional level (Acs and Armington 2004).

In contrast, knowledge spillovers across different sectors are measured by the Theil regional diversity index. The above index is computed as:

$$T = \sum_i [empl_{ri} / \sum_r \sum_i empl_{ri} / \sum_i (empl_{ri} / \sum_r \sum_i empl_{ri}) * \log (\sum_i (empl_{ri} / \sum_r \sum_i empl_{ri}) / empl_{ri} / \sum_r \sum_i empl_{ri})], \quad (1)$$

where $empl_{ri}$ is the employment in each region r of the 13 Greek regions and each industrial sector i of the n sectors of the economy as a whole and $\sum_r \sum_i empl_{ri}$ is the double sum of employment for all regions and all industries of the economy. This measure takes the value of 0 when only one sector is present in region r and the value ln (60) where all 60 two-digit industrial sectors employ the same number of persons in the region in question. Either a negative or a positive association of knowledge spillovers across different sectors with the formation of new firms at the regional level seems to observe in the empirical studies (Acs and Armington 2004; Rodriguez-Pose and Hardy 2015).

Unemployment (*UNEMP*):

The unemployment rate is defined as the ratio of unemployed in each region divided by the workforce and enters the model with five lags. The controversial effect of unemployment on the regional new firm formation rates in services is observed in several studies. Some authors note a positive outcome (Lee et al. 2004) while other studies find a negative relationship (Audretsch and Fritsch 1994).

Regional GDP growth (*GDPGR*):

This measure in constant prices enters the model with four and one lags respectively. The GDP growth arises from the difference between the GDP in each region in the present year and the GDP in each region in the previous year divided by the GDP in each region in the previous year. Regarding the services sector, a considerable piece of literature has showed the positive impact of GDP growth on the formation of new firms at the regional level (Lee et al. 2004).

Human capital (*HUMCAP*):

The human capital is proxied by the number of people of each region who possess a university degree divided by the total regional employment. A significant part of the empirical studies describes the positive implications of human capital for the formation of new firms at the regional level in services (Acs and Armington 2004). Other scholars, however, have emphasized a negative result (Bosma et al. 2008).

Share of professional occupations (*OCCUP*):

This variable is defined as professionals and managers per region divided by the total regional employment.

4. Empirical Results

The multicollinearity is present in the studies of new firm formation at the regional level (Bird and Wennberg 2014). For this reason, testing for potential multicollinearity is highly recommended. For this reason, Table 2 displays the correlation matrix with correlation coefficients for the variables of the model.

First, a detailed observation of the correlation matrix shows that there is a relatively high correlation coefficient for the following pair of variables: a) Theil index and human capital (0.56), b) generalized trust and fairness (0.62), c) generalized trust and social meetings (0.43) and d) human capital and share of professional occupations (0.68). This means that there is an increased possibility of multicollinearity.

In order to obtain a stronger indication for the existence of multicollinearity, our analysis applies the VIF (Variance Inflation Factors) method. The results of average values of VIF for the variables of the model are exhibited in the last row of Table 4 along with the results of econometric estimations. A value of 5 has been recommended as an accepted limit value of VIF for multicollinearity (Rogerson 2001). In all model permutations, the variables have average values of VIF that are lower than this limit. Therefore, there is no severe indication of the presence of multicollinearity.

Table 2 near here

Given the nature of panel data, two dimensions co-exist. On the one hand, the cross-sectional dimension that pertains to regions and on the other hand the time dimension. Thus, our econometric analysis is preceded by an exploration of the systematic sources of variation in our dependent variable that is carried out by a two-way analysis of variance (ANOVA). The findings in Table 3 reveal the existence of considerable regional as well as time effects. Both effects are statistically significant at 1%.

Table 3 near here

As both the regional and time effects represent statistically significant systematic sources of variation, our econometric analysis opts for a fixed-effects panel data model that accounts for both regional and time effects.

In this way, Tables 4 and 5 expound alternative results of fixed effects estimation model in the following cases: a) trust and social networks variables are included in the model (Table 4) and b) social capital which arises from common factors in EFA is involved in the model (Table 5). The estimator from fixed effects is known as LSDV estimator (Least Squares Dummy Variables). This estimator is unbiased and consistent (Baltagi 2008).The estimated coefficients are presented along with robust standard errors in parentheses. This means that our analysis takes into account the correction for heteroscedasticity of unknown form. In most cases, the estimated coefficients are generally consistent with our expectations confirming the hypotheses formulated in Section 3.

Tables 4 and 5 near here

The regional levels of generalized trust and fairness have a strong positive and significant effect (1% and 5% level) on the formation of new firms at the regional level in all model permutations displayed in Table 4. This finding proves that regional trust is a notable determinant in explaining regional variations in new firm formation in the services sector. This case is consistent with recent studies that show the positive impact of regional trust on the formation of new firms at the regional level (Audretsch et al. 2011; Michelacci and Silva 2007).

Similarly, the results underline the positive and statistically significant impact of volunteerism in regions on the formation of new firms in a regional context in all cases of Table 4 (1% level). In addition, in Table 4, the regional amounts of social meetings and social activities positively and significantly (1%, 5% and 10% level) affect the formation of new firms at a regional level. The above outcomes agree with those studies that highlight the beneficial role of social networks for new firm formation activity in a regional context (Butler and Hansen 1991; Castilla et al. 2000).

Two components of regional social capital created through EFA process have a strongly positive and significant relationship with the formation of new firms at the regional level (1% and 5% level) in Table 5. These are trust and formal networks. The informal networks also lead to a significant increase of new firm formation rates across regions (5% and 10% level). In turn, the positive effects of institutional trust are rather weak and in some cases significant. In contrast, political participation is not significantly associated with the new firm formation activity in Greek regions. To a great extent, the findings herein uncover the importance of regional social capital for entrepreneurship at a regional level and are in line with previous empirical studies that make similar conclusions for local social capital effect (Westlund et al. 2014; Westlund and Bolton 2003).

On the other hand, the service-industry intensity increases the formation of new firms in a regional context. This means that the regional specialization supports the entrepreneurial activity at the regional level in services sector.

In contrast, Theil index contributes to the formation of new firms at the regional level in a negative and statistically significant way. This finding shows that the local sectoral diversity constitutes a disincentive towards future and potential entrepreneurs to establish their own firms in Greek services sector.

The effect of unemployment with five lags on the formation of new firms at the regional level is strongly positive and statistically significant. This combination is chosen because it gives the best results in econometric estimations. The conditions of previous years in the unemployment appear to play an important role in decisions for the current entrepreneurial actions. The above outcome may imply that the services constitute a sector that requires small amounts of capital. Thus, this gives a higher flexibility to future competitors to enter the industry despite higher level of unemployment during the previous years.

In addition, the GDP growth has an insignificant influence on the new firm formation in Greek regions for the services sector. Surprisingly, the human capital affects the formation of new firms at the regional level in services negatively and significantly. Despite this being in contrast to other empirical studies at regional level, the specific outcome is in accordance with the negative effect which is found in the service industries in different regions (Bosma et al. 2008). Another additional and auxiliary reason for this finding refers to the negative and strongly significant effect of the share of professional occupations in each region on the formation of new firms at the regional level in services.

5. Conclusions

The present paper examines the effect of social capital and its key dimensions on the regional entrepreneurship in Greece. The regional focus (as well as the concentration on the services sector) distinguishes our study from the majority of empirical studies in the entrepreneurship literature as the latter examine the implications of social capital at the individual or the firm level. A social capital variable that was derived from the factorial analysis contains the most components which are analyzed in detail in social capital theory (Putnam 1995; Narayan and Cassidy 2001). In addition, the distinct influence of regional trust and regional social networks, as much-esteemed subcomponents of the general concept of social capital, on the formation of new firms at the regional level was also examined.

The results obtained from the fixed-effects panel data estimations suggest that, in general, the regional social capital plays a positive and significant role in fostering entrepreneurship in Greek regions. It accords with the most recent conclusions of similar empirical studies which show that the 'spatial' element in social capital is of high significance in explaining regional variations in new firm formation activity. The same applies to the effect of social networks and trust and this was separately accounted

for in the econometric analysis. From the other results, the positive influence of unemployment and knowledge spillovers within services is important to take into account. In contrast, the negative consequences of human capital and knowledge spillovers across sectors are in line with previous studies in different regional contexts that find a negative effect. The same concerns the insignificant role of GDP growth in the services entrepreneurship across regions.

Thus, the current study further informs the existing small but growing body of empirical evidence on the effect of social capital and its subcomponents on the regional entrepreneurship. The future research could further experiment with the level (but also the nature i.e. urban, rural) spatial aggregation when examining the effect of social capital on regional entrepreneurship. Some contrast between services and manufacturing within the same spatial context would also be an interesting way to go about for future research.

Regarding policy implications, policy should fortify the regional social capital by strengthening those variables that increase it. This takes places by stimulating social networks through encouraging and facilitating programmes that support volunteerism and engagement with the society. On the other hand, the improvement of the quality of local institutions would in turn stimulate trust and refresh the local framework for doing business.

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Table 1. Exploratory Factor Analysis (EFA) results for the construction of social capital.

	Rotated Factor Loadings				
Factors/ Variables	Institutional trust	Political participation	Social trust	Informal Networks	Formal networks
1. Trust in national parliament	0.95				
2. Trust in legal system	0.86				
3. Trust in police	0.90				
4. Trust in European Parliament	0.79				
5. Vote		0.94			
6. Participation in political actions		0.36			
7. Trust			0.88		
8. Fairness			0.43		
9. Social meetings				0.33	
10. Social activities				0.20	
11. Volunteerism					0.96
12. Membership					0.074

*Note: 1. Kaiser-Meyer-Olkin: 0.748 2. Cronbach's alpha: 0.648

Table 2. Correlation matrix with correlation coefficients of variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. New firm formation	1											
2. Industry intensity	0.16	1										
3. Theil index	-0.38	0.08	1									
4. Unemployment	0.29	-0.2	0.15	1								
5. Human capital	-0.37	-0.2	0.56	0.08	1							
6. GDP growth	0.000	0.08	-0.02	-0.09	0.166	1						
7. Volunteerism	0.4	0.1	0.09	0.34	0.13	0.05	1					
8. Trust	0.39	0.02	-0.18	0.002	-0.12	0.09	0.36	1				
9. Social meetings	0.37	0.03	-0.2	-0.066	-0.33	-0.08	0.23	0.43	1			
10. Fairness	0.39	-0.2	-0.26	0.22	-0.06	0.07	0.29	0.62	0.21	1		
11. Social activities	0.19	0.17	-0.00	0.09	-0.18	-0.04	-0.03	0.09	0.30	0.08	1	
12. Share of professional occupations	-0.16	0.25	0.37	-0.001	0.68	0.20	0.31	0.00	-0.32	-0.09	-0.07	1

Table 3. Results of a two-way analysis of variance (ANOVA) for new firm formation rates

Dependent Variable: New Firm Formation Rate					
	Partial SS	Df	MS	F	Prob>F
Independent Variables/Model	0.0014	20	0.0000	47.62	0.0000
1. Region	0.0009	12	0.0000	54.26	0.0000
2. Year	0.0004	8	0.0000	37.67	0.0000
Residual	0.0001	96	0.0000		R^2=0.9084 Adj R^2=0.889
Total	0.0015	116	0.0000		Root MSE=0.0012 Number of obs=117

Notes: 1) Region and year are the two sources of systematic variations
Both region and year effects are significant at 1%
2) Df: Degrees of freedom
3) Partial SS: Partial sums of squares
4) MS: Mean square
5) F: F-test
6) Prob: Probability
7) R^2 : Coefficient of determination
8) Adj R^2:Adjusted coefficient of determination
9) Root MSE: Root mean square error

Table 4. Results of fixed effects, 2002-2010 (N=117)

	Dependent Variable: New Firm Formation Rate					
	1.	2.	3.	4.	5.	6.
Variables						
1. INDINTENS	0.0392***	0.0417***	0.0654***	0.035***	0.03845***	0.0575***
	(0.0105)	(0.0094)	(0.009)	(0.0116)	(0.0105)	(0.014)
2. THEIL	-0.009***	-0.0063**	-0.0096***	-0.0097***	-0.007*	-0.0118***
	(0.0028)	(0.006)	(0.002)	(0.003)	(0.0033)	(0.0027)
3. UNEMP	0.0525***	0.0447***	0.0458***	0.0503***	0.0426***	0.0500***
	(0.0044)	(0.007)	(0.0051)	(0.0063)	(0.0102)	(0.0045)
4. VOLUNT	0.013***	0.0132***	0.0151***	0.0147***	0.0162***	0.0164***
	(0.0024)	(0.0031)	(0.0037)	(0.0021)	(0.0028)	(0.0026)
5. TRUST	0.0424**	-	-	0.0479***	-	0.0513***
	(0.0179)			(0.0152)		(0.0127)
6. FAIR	-	0.0608***	0.0579***	-	0.0527***	-
		(0.0181)	(0.0191)		(0.0177)	
7. SCLMEET	0.0079*	0.0106***	0.0097**	-	-	-
	(0.0039)	(0.003)	(0.0034)			
8. SCLACT	-	-	-	0.0149**	0.0143**	0.0154**
				(0.0064)	(0.0061)	(0.0054)
9. HUMCAP	-0.0208***	-0.024***	-	-0.0205***	-0.025***	-
	(0.0028)	(0.0033)		(0.0044)	(0.0056)	
10. GDPGR	-0.0002	-0.0006	0.0004	-0.0005	-0.0007	0.0014
	(0.0091)	(0.0096)	(0.0098)	(0.0089)	(0.0089)	(0.0092)
11. OCCUP	-	-	-0.0277***	-	-	-0.02747***
			(0.0039)			(0.0057)
CONSTANT	0.0252***	0.0227***	0.0279***	0.0264***	0.0243***	0.0308***
	(0.0036)	(0.0031)	(0.0029)	(0.0034)	(0.0032)	(0.003)
R^2	0.5063	0.5086	0.5084	0.4990	0.4907	0.5074
F(8,100)	21.13	22.27	21.34	21.20	21.25	21.39
F-fixed (8,100)	10.17	10.61	10.10	10.59	10.75	10.42
Avg VIF	1.6	1.55	1.46	1.57	1.54	1.43

Notes: Estimated coefficients and robust standard errors in parentheses.

*significant at 10%; **significant at 5%; ***significant at 1%

Table 5. Results of fixed effects, 2002-2010 (N=117)

	Dependent Variable: New Firm Formation Rate			
Variables	1.	2.	3.	4.
1. INDINTENS	0.0428***	0.0607***	0.0426***	0.0599***
	(0.0136)	(0.0167)	(0.0125)	(0.0160)
2. THEIL	-0.008**	-0.0109***	-0.0082**	-0.011***
	(0.0032)	(0.0027)	(0.0033)	(0.0027)
3. UNEMP	0.0485***	0.0491***	0.0488***	0.0493***
	(0.006)	(0.0040)	(0.006)	(0.00378)
4. HUMCAP	-0.0224***	-	-0.0217***	-
	(0.0045)		(0.0054)	
5. GDPGR	-0.0015	0.0004	-0.0033	-0.0055
	(0.010)	(0.0104)	(0.0051)	(0.0049)
6. SOCTRUST	0.0349**	0.0412***	0.0359**	0.0422***
	(0.0128)	(0.0129)	(0.0136)	(0.0137)
7. FORMNET	0.0134***	0.0151***	0.0132***	0.0147***
	(0.0029)	(0.0033)	(0.0029)	(0.0034)
8. INFNET	0.0109*	0.0138**	0.0112*	0.0141**
	(0.006)	(0.0053)	(0.0066)	(0.0056)
9. INSTTRUST	0.0017*	0.0010	0.0016*	0.0010
	(0.0013)	(0.001)	(0.0012)	(0.0010)
10. PLPRTP	0.0008	0.0002	0.0006	-0.0001
	(0.0007)	(0.0006)	(0.0009)	(0.0008)
11. OCCUP	-	-0.0266***	-	-0.0251***
		(0.0055)		(0.0057)
CONSTANT	0.0237***	0.0291***	0.024***	0.0294***
	(0.0042)	(0.0035)	(0.0046)	(0.0035)
R^2	0.5183	0.5191	0.5214	0.5210
F(10,98)	17.20	16.95	17.23	17.06
F-fixed effects (8,98)	10.12	9.85	9.74	9.60

Notes: Estimated coefficients and robust standard errors in parentheses

*significant at 10%; **significant at 5%; ***significant at 1%

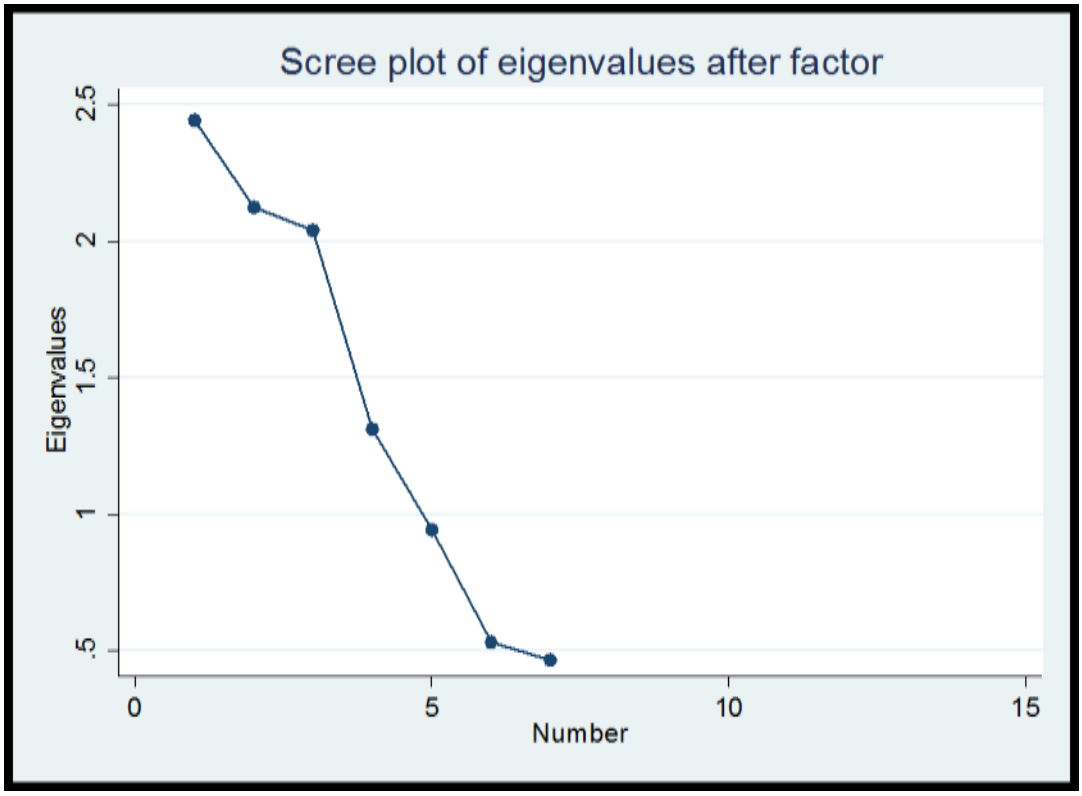

Figure1. Factorial Analysis: Scree plot