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The Impact of Social Proximity: On the Effects of in-house Ownership and Family ties on Firm Performance.

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Abstract

The Impact of Social Proximity: On the Effects of in-house Ownership and Family ties on Firm Performance. Evans Korang Adjei, Rikard Eriksson, Urban Lindgren, Einar Holm Department of Geography and Economic History Umea University Sweden. Enrolled: 01/03/2013, expected: 18/05/2017 evans.korang.adjei@umu.se Previous studies in regional studies and firm innovativeness have extensively emphasized on the role of geographic proximity and cognitive proximity. Most of these studies have assessed the relationship between regional and extra-regional knowledge flows and the potential effect on innovativeness and firm performance. Within this broader literature, emphasis is put on endogenous growth theory, where human capital is acknowledged as the driver for firm and regional development. It is also argued that geographical proximity per se is not sufficient for firm- and regional-level learning but rather knowledge networks enhanced by shared

social structures. A handful of studies in this direction has assessed the relationship between social proximity (family ties) and firm productivity. While family networks may enhance the possibility of finding a job, little is known about how in-house ownership and different family ties facilitate interactive learning and performance. We argue that the shared altruistic behavior between family members can help explain a considerable proportion of firm-level interactive learning. This is something that, to our knowledge, has not previously been assessed in a systematic manner with deep geographical considerations. By means of a longitudinal data (2002-20012) which matches information on all employees and their workplaces in the Swedish economy, and also provides a unique identity on family members, we are able to map all workers in the same firm with their family members and their socio-economic attributes. This, we argue, forms different measures for social proximity dependent on the type of family relation; (a) those related to the firm owner and, (b) different family ties not related to the firm owner. We run fixed effect models (FE) to estimate the effect of in-house ownership and family ties on firm performance in the Swedish economy after controlling for all possible firm- and regional-level characteristics. In total, we find a positive association between social proximity (family ties) and firm performance. Our findings suggest that altruistic behavior, or shared social capital between family members, play a crucial role in explaining firm level learning and productivity, however at different degrees of influences relating to whether if they are related to the firm owner or not, and the proximity of the relations (parent/child, partner, cousin etc.).

Jelcodes:J24,J12

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The Impacts of Social Proximity: On the Effects of in-house Ownership and Family Ties on Firm Performance

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Abstract:

In recent studies, scholars have shown that geographical proximity alone is not sufficient to trigger collaboration and knowledge spillovers but knowledge networks enhanced by mutual trust. A handful of studies in this direction have assessed the impacts of family ties on firm performance. While families may enhance the possibility of finding a job, little is known about how in-house ownership and family ties facilitate interactive learning and performance. By means of longitudinal data (2002-2012) on a sample of private owned firms with up to 50 employees with matched information on all the employees, we are able to map all in-house ownership and family ties. Our fixed effects estimates reveal that the existence of family ties in the firm changes previously reported positive effects of related variety in formal education – higher levels of related variety decrease performance in firms where there are family ties. This is especially the case when family ties involve owner/child relationships.

Key words: Social proximity, family ties, firm learning, plant performance.

JEL classifications: R11, R15, J12, J24

1. Introduction

In the literature on family firms it is often claimed that family ties is an important resource for firm performance. Besides trustful relations, family ties are also beneficial for establishing a culture of exchange, which is important for collaboration and performance (Sirmon & Hitt, 2003; Basco, 2015; Jones & Stout, 2015). However, most findings rely on case studies showing some mixed results, and the fact whether family firms (or firms with high concentrations of family ties) actually perform better than other firms is still under much scrutiny (Pearce, 2015).

The aim of this paper is to gain further knowledge on the potential impact that concentrations of family members may impose on the performance of firms. This is made possible by means of sample of 67,758 private firms with no more than 50 employees. The sample is retrieved from a unique matched employer-employee database covering all plants and workers in Sweden 2002 to 2012. This database makes it possible to connect all in-house family ties through a unique family identification code, and also provide detailed information regarding ownership and performance. The idea that the family is an important resource for firm performance is conceptually linked to the regional learning literature, stressing that different proximity dimensions influence the performance of plants (e.g. Boschma, 2005). Montgomery (1991), for example, identifies employees who are socially connected (e.g. kinship & friendship) in an organization to outperform employees who are not. As argued by Basco (2015), the role of family business is almost totally neglected in the regional learning literature, despite the fact that the embeddedness of family businesses in regional productive structures are likely to affect the regional proximity dimensions at hand, and, consequently, the regional externalities promoting development. In so doing, we argue that family relations are a particularly strong form of social proximity that may alter the influence of other proximity dimensions.

This study thus seeks to contribute to the literature on proximities, family business and firm performance in two key-aspects. Firstly, this will be carried out by empirically testing the proposed importance of family ties[1] (social proximity) as claimed in the literature (e.g. Sirmon & Hitt, 2003; Boschma, 2005) by identifying relatives (child, spouse, etc.) to the

[1] Family ties in this article is a measurement of social proximity and refers to different family relationships. The different relationships are explained in more details in section 3.

owner and other family relations present within firms. This will further increase our understanding on the potential impact that the concentration of family members impose of firm performance. Secondly, it is previously shown that firms having some optimal distance of skill variety (i.e. cognitive proximity) in their workforce tend to be more innovative (Cohen & Levinthal, 1990) and also outperform firms with very similar or very different sets of skills and competences (Boschma et al, 2009). However, while the idiosyncratic resources in the family may enhance information sharing and collaborative learning within the group, it might also impede new ideas from outside the family, thereby lower the potential for within-firm spillovers to occur. We therefore test for the potential interplay between family ties and formal skill varieties. By doing this we highlight potential latent relationships between family ties and formal skills, which cannot be revealed unless looking closer at the interplay between these two variables. To achieve this, we examine the importance of in-house ownership and family ties as an equally important proximity dimension for the economic success of firms.

The remainder of the paper is organized as follows. Section two explains the effects of in-house family ties on learning and plant performance by connecting the broader literature of family firms with the regional learning literature stressing the impact of different proximity dimensions. Section three explains the data and variables. Section four presents the empirical model and the results. Section five concludes.

2. In-house family ties and firm performance

In recent decades, after the French Group on Proximity Dynamics, scholars have shown that geographic proximity alone is not sufficient to trigger collaboration and knowledge spillovers (Boschma, 2005). Given this claim, there are still only a few empirical studies addressing the impact of non-geographical proximity dimensions on firm performance (Chang, 2011). One exception is however the role of cognitive proximity, related to education and experiences within a firm, showing some amble evidence that not too much or too little cognitive proximity, but related variety, is most beneficial for firm performance (e.g. Boschma et al, 2009). While it is often claimed that social proximity in terms of kinship and friendship can facilitate exchange and learning capabilities of organizations, (Montgomery, 1991), the number of empirical studies showing these relationships is

scarce. However, in the family firm literature social proximity (family ties and relations) has received extensive interest generating empirical studies on the impacts of the family and family values on performance (see Sirmon & Hitt, 2003; Bertrand & Schoar, 2006, etc.).

Within the family firm literature, the family is seen as a unique bundle of resources (commitment, trust, willingness, skills, etc.) created by the interaction between the family and the business. Habbershon and Williams (1999) refer to this as 'familiness', arguing that the uniqueness of the family firm arises as the result of family and business life integration. Sirmon and Hitt (2003) further argue that the integration of the family and the business creates unique characteristics (e.g. human capital, social capital, patient capital, survivability capital, and governance structure) that differentiate family firms from non-family firms. While the hire of family members can lead to a suboptimal employment situation, Sirmon and Hitt (2003) argue that the simultaneous participation of family members in the family and the business increases the complexity (both positive and negative) of the family human capital but also creates a unique form of human capital with deep firm-specific tacit knowledge. Similarly, in the learning and proximity literature, social proximity advocates an important role for interactive learning and performance (Boschma, 2005). The idea originates from the embeddedness literature (Polanyi, 1944; Granovetter, 1985) where relationships are embedded in trust. From this point of departure, we expect that trust and cohesion in the family can enhance knowledge transfer. From the literature, Maskell and Malmberg (1999) argue that trust-based social relationships facilitate the exchange of tacit knowledge which is, by nature, difficult to communicate and trade through markets. In inter-firm transactions, trust-based relationships facilitate tacit knowledge exchanges (Sako, 1992; Giuliani, 2005). While we argue that family ties exhibit cohesive relationships, Reagans and McEvily (2003) claim that social cohesion should have positive effect on knowledge transfer, primarily through influencing the willingness and motivation of individuals to invest time and effort to assisting others. Unlike other social relations, it is therefore reasonable to expect that trust and cohesion in the family will stimulate the exchange and transfer of tacit knowledge (e.g. Maskell & Malmberg, 1999; Boschma, 2005).

Family ties are however also associated with some problems that can abate interactive learning, affect the morale of employees and performance. Firstly, because families are socially embedded in relationships where loyalty and emotional bonds are involved, there

is always a high risk of underestimating opportunism (e.g. Uzzi, 1997; Boschma, 2005), especially in private firms where some workers are related to the owner. In other words, some family members may take a free ride on the success of the business at the expense of contributions through interactive processes. Moreover, because efforts in family relations are primarily pursued to enhance individual and collective growth, too much commitment to ensuring the welfare and success of every member may lock-in members into relationships and a specific ways of doing things (e.g. Uzzi, 1997; Boschma, 2005) at the expense of their own innovative capacities. This process may stifle the innovative capacities of family members such that it can negatively affect the total cognitive resources of the firm. Furthermore, apart from incurring opportunity costs due to denial of new ideas, there is a strong tendency of being confined by conservative practices and rationalities that can hinder collective innovative practices (Lang, 2005). Conservative practices (e.g. in power, routines, etc.) can hinder new ideas and collective learning. Jensen et al. (2004) argue that the impact of the family on growth tend to be constant or incremental because embedded relations like the family generate localized processes of learning and innovation. Pearce (2015) argues that in businesses, where some employees are related to owner, the perception that rewards are based on performance is undermined. This can generate coworker distrust, less employee commitment and greater employee dissatisfaction, which may have an influence on the general performance of the firm. Lastly, like in organizations where competition restricts the transfer of knowledge between different units (Argote, 1999), competition can also restrict the knowledge transfer and collaboration between family members. This is evident in family businesses where sons and daughters often compete on who to succeed the founder (Levinson, 1971; Bertrand & Schoar, 2006).

In line with other proximity dimensions, family ties have some innate characteristics that may facilitate performance. Firstly, family ties (in terms of committed relationships) reduce the effect of cognitive distance between family members over time. For instance, when cognitive distance is considered as the shared history/experience in specific economic or social activity, coming from the same family generates a sense of belongingness which facilitates the transfer and adoption of such experience (Reagans & McEvily, 2003). The 'familiness' facilitates (tacit) collaboration and knowledge spillovers, hence reduce the effect of cognitive distance over time. In family businesses, most family members have hands-on exposure to the business and deeper understanding of the business before they are formally involved (Dyer, 1986; Bertrand & Schoar, 2006), making the family a source

of capital (Olson et al., 2003). Consequently, firms with workers from the same family imply building a stock of social and human capital potential for localized learning and increased performance under higher levels of interpersonal trust (Granovetter, 1985; Uzzi, 1997; Maskell & Malmberg, 1999). Coleman (1988) suggests that social capital influences the creation and transfer of human capital. Van Hooft and Stout (2012) even argue that genetic offspring are likely to have specific dispositions and abilities in common with their parents, which enhances the offspring to fit with occupations similar to those of their parents (Jones & Stout, 2015). Also, by exposing offspring to occupation-specific knowledge facilitates quick learning and collaboration when formally introduced on the plant. Therefore, firms can rely on the bundles of cognitive and social resources within the family as a source for increased performance.

Furthermore, contrary to neo-classical economics, the embeddedness literature suggests that the more socially embedded are the relationships in a firm, the more interactive learning and the better its performance (Boschma, 2005). In this case, the family presents a durable embedded relationship which opposes pure market relationships. More importantly, the 'private language' used in family communication enhances (tacit) knowledge exchanges on the work floor, with efficiency and greater privacy (Tagiuri & Davis, 1996; Chirico, 2008). Tagiuri and Davis (1996) argue that over many years of shared experiences, family members develop meanings to special phrases, expressions and body movements. This 'family private language' allows family members to communicate more efficiently than is generally among friends, it also allows family members to exchange more information with greater privacy and arrive at decisions more rapidly than between non-relatives (Tagiuri & Davis, 1996). Family relations implies another form of relatedness characterized by interpersonal altruistic behavior. Altruistic behavior creates self-reinforcing system of incentives that encourage family members to be thoughtful and selfless to one another, and it reduces information asymmetries (Van den Berghe & Carchon, 2003) because everyone's welfare is connected to the others. It reduces agency problems and improve localized learning opportunities. In a similar claim, Nonaka (1994) argues that trust facilitates the creation and diffusion of new knowledge. Lastly, learning between family members is enhanced by DUI (learning by Doing, Using, and Interacting). DUI-mode of learning rely on know-how, which is tacit and often highly localized in specific knowledge networks (Jensen et al., 2004). At the plant-level, frequent interactions between

family members in different units may result in the combination and recombination of diverse sources of knowledge in a localized system of learning.

Besides the impacts of family ties for firm performance, it is important to reiterate that cognitive closeness is important for knowledge exchanges. Cohen and Levinthal (1990) argue that the foundation of innovation is the ability to exploit exogenous knowledge. Knowledge spillovers are not automatic no matter how geographically proximate people may be. For knowledge to spillover people have to be ready to interact and to learn (Mattes, 2012), because knowledge is dispersed among different economic agents (Antonelli, 2000). This means that knowledge held by actors prior to any learning process is very important, because it constitutes the 'absorptive capacity' – basic skills, common experience, etc. (Cohen & Levinthal, 1990). Absorptive capacity "confers the ability to recognize the value of new information, assimilate it and apply it to commercial ends" (pp. 128). The cognitive characteristics of people are major determinants for their ability to collaborate within the firm (Nooteboom, 2004). If the cognitive distance is too large, actors may not be able to understand each other, hence assimilate the transferred knowledge (Nooteboom, 1999; 2008). Also, if the cognitive distance is too small, cooperation will not guarantee access to new knowledge. While family ties are important door-openers for knowledge diffusion, spillovers benefit workers who have shared prior knowledge. Therefore the interplay between family ties and formal skill varieties may be an important condition for increased performance since knowledge and competencies are highly personal and require trustful relationships. To put our argument in context, we claim that, in spite of the fact that family ties may hamper performance through opportunism, 'lock-in' in conservatism (family ways), distrust among other employees and unproductive competition among family members, we posit that the trust and cohesion elements in family relations may reduce the associated negative effects and foster knowledge exchanges and support for family members.

3. Data and variables

3.1. Data

The data for this study is derived from the ASTRID database. The database is a longitudinal micro-database that connects information on all workers (gender, age, education etc.) and

workplaces (sector, spatial coordinates, etc.) as well as regional characteristics in the Swedish economy. The high resolution of the data and the rich information on different aspects of workers help to analyze the dynamics within and between different labor market regions. Since we are interested in capturing the influence of family ties (social proximity) on plant performance, the unique family identification code in the database enabled us to connect all family members in every plant.

Data on privately owned Small and Medium sized plants[2] (SMEs, maximum of 50 in 2002) from 2002-2012 were used in this analysis. Plants association with industrial sectors are defined by Swedish Standard Industrial Classification 2002 (SNI02). The industry/sector classifications are restricted to 3-digit SNI02. In the analysis, plants with missing or negative values on value-added (dependent variable), and plants without sector identification codes, were excluded from the analysis. The geographical reference point for the analysis is the local labor market region. Sweden is divided into 290 municipalities, which are further aggregated into 72 local labor market region called FA-regions[3]. The FA-regions are constructed from labor commuting patterns between municipalities (Carlsson et al., 1993), representing where people can live and work without commuting time-consuming distances.

3.2. Variables

3.2.1. Dependent variable: Labor productivity

We measure productivity by the firm's per capita value-added. As used in many studies (e.g. Boschma et al., 2009; Eriksson & Lindgren, 2009, etc.) value-added is a more straightforward measure of industrial output (Rigby & Essletzbichler, 2002) than other measures like patents and citations which exclude a large part of the economy. In our case, per capita value-added was calculated by, first, standardizing the value-added to remove the effects of inflation and secondly, dividing the value-added by the number of employees. Log of the values is used to reduce skewness.

[2] Plants included in this analysis are only single-firms. For that reason the term plant and firm are used interchangeably.

[3] The definition of local labor market region raise so many conceptual questions which with the focus of this paper we cannot tackle. However with the definition of local labor market regions, the FA-regions represent a concentration of economic activities where enough opportunity exist to allow most workers to change between jobs without necessarily changing residence.

3.2.2. Independent variables

We created the independent variables by, first, identifying the owners of all the selected firms in our analysis. From "*yrkesställning*" (occupational status), we are able to identify the owner as a private individual with shares or without shares. Second, with the available information on all family members and their respective workplaces together with the information on all private owned SMEs with their owners, we are able to connect every worker to his/her biological links (i.e. parents, children, siblings, etc.). From these family connections at the plant-level, we grouped the families into two categories, those related to firm owner (ownership family ties) and those who are not (other family ties). From these broad categories we further subdivided them into different family ties to assess whether the degree of social proximity, in terms of close or more distant family ties, impact firm performance. This is because different family ties have diverse sets of resources (Sirmon & Hitt, 2003), therefore differentiating between family ties can provide insights about the impacts of family relations and their exchange patterns. The first category defines in-house ownership family ties ('*owner-children'* – as count of the number of children to the firm owner; '*owner-partner'* – is a binary variable for a partner with the owner in the firm and '*owner-other relatives'* – as count of the number of other relatives of the owner in the firm). The second category also defines in-house family ties which are not related to the firm owner ('*parent-children pair*' – count of parents (mother or father) and any of their children in the firm and '*other-relatives*' – count of other pairs of relatives who are not parent-children pair). In SMEs, family ownership has a high correlation with firm performance but also when it is combined with family management and control (Chu, 2011). Bubolz (2001:129) suggests that "the family is a source, builder and user of social capital", this makes the family an ideal social group in which to create social capital and human capital (Coleman, 1988). Trust-laden relations in the family provide the foundation for moral behaviors, the principle of reciprocity and exchange (Bubolz, 2001). Therefore, it is normal that the 'familiness' (Habbershon & Williams, 1999) 'untraded linkages' (Dosi, 1984; Storper, 1995) among family members may facilitate cooperation and firm performance. Though there is a common mutual relationship in the family system, some ties are stronger than others (when ownership and control come in), therefore, we expect different degrees of impacts among the family ties.

3.2.3. Control variables

When choosing the control variables, we follow the existing literature on factors that influence plant performance. First, we measure the in-house formal skill varieties from the educational background of all employees to test the impacts of formal skills varieties on plant performance other than just higher human capital.

When estimating the in-house formal skill varieties, the entropy measurements proposed by Boschma et al. (2009) are used. The in-house formal skills similarity is computed for each plant as the inverted entropy at the 3-digit education level. From equation [1] P_i^3 is the share of 3-digit education categories i and N^3 is the number of 3-digit education categories. The larger the score, the more similar the in-house formal skills or education. In principle this does not induce real innovative performance because they are too similar. The in-house formal skills similarity was transformed to log(x+1) to reduce the effect of skewness of the variable and the high occurrence of zeros.

Equation [1].

$$\text{Inhouse\_sim.} = \frac{1}{\sum_{i=1}^{N^3} P_i^3 \;\; log_2 \;\; \left[\frac{1}{P_i^3}\right]}$$

Also to measure the effect of in-house relatedness, yet different competences, the weighted sum of entropy at the 3-digit level within each 2-digit education categories is calculated. P_j^2 [Equation 3] is the share of 2-digit education categories by summing the shares of all 3-digit education categories belonging to S_i^2, H_j [Equation 4] is a weight which controls the degree of similarity within the 2 or 3-digit education categories. A high score indicates higher in-house formal skills relatedness. Which in principle induces real learning processes.

Equation [2].

$$\text{Inhouse\_rel.} = \sum_{j=1}^{N^2} P_j^2 \, H_j$$

Where;

Equation [3].

$$P_j^2 = \sum_{i \,\epsilon\, S_j^2} P_i^3$$

And;

Equation [4].

$$H_j = \sum_{i=S_j^2} \frac{P_i^3}{P_j^2} \; log_2 \left[\frac{1}{P_i^3 \big/ P_j^2} \right]$$

Also, another entropy variable calculated is the degree of in-house unrelatedness. It is assumed that, in-house interactive learning is hindered by very different competence portfolios. The degree of in-house unrelatedness is measured by the entropy at the 1-digit education categories. P_i^1 in equation [5] is the share of 1-digit education categories, the higher the score, the more unrelated the in-house formal skill portfolio of the plant is and the more difficult it is for interactive learning.

Equation [5].

$$\text{Inhouse\_unrel.} = \sum_{l=1}^{N^1} P_i^1 \; log_2 \left[\frac{1}{P_i^1} \right]$$

With these measures of in-house formal skills portfolio, the larger the value, the more similar, related, unrelated the in-house educational background of the employees in the firm. These degrees of formal skills varieties have different implications for firm performance; e.g., where some do not induce real learning processes at the firm level when their educational level is too similar or too different. To understand the interplay between in-house family ties and cognitive proximity, centered interaction variables of in-house family ties and formal skill varieties are constructed[4]. With this, we seek to understand

[4] The interaction terms are demeaned with their respective means. In this particular case, the use of the centered interaction terms allow easy interpretation of the parameter estimates.

where family ties filter the effects of formal knowledge and examine if the relationship is multiplicative.

Also, we controlled for factors at the firm level that may influence firm productivity. In the models, we controlled for four main characteristics of the firm. We controlled for the share of 'Female', by drawing on the argument on labor market segregation and part-time workers (Hellerstein et al., 1999), we expect 'Female' to have a negative impact on productivity. We also include an indicator for in-house human capital defined as the share of workers with at least a bachelor's degree (Higher Education). Contrary to Boschma et al (2009), we thus include both in-house human capital with in-house formal skills varieties in our models. This is motivated because a recent study by Östbring (2015) shows that the impacts of in-house formal skill varieties depend on the level of human capital in the firm. We anticipate a positive impact of 'Higher Education' on productivity since higher human capital ratio is a signal of higher ability and presumed to be beneficial to plant performance (e.g., Becker, 1962). We also controlled for 'Workers Age' as a measure for experience and long tenure. A higher 'Workers Age' is presumed to positively impact productivity but to a certain degree (non-linearity - 'Worker Age^2'). Similarly, from the literature, an increase in 'Firm Size' has a positive impact on productivity (e.g. Baldwin et al., 2002; Leung et al., 2008). This claim is in line with the efficiency theory, where more highly educated persons easily find jobs in relatively large firms which are assumed to be more productive (Brown & Medoff, 1989). But unlike large plants where there are established routines to guide new competences, in SMEs closed networks may increase the inefficiencies of new workers.

Included in the models are also two measures for agglomeration effects. In theory the effects of agglomeration are shown in the access to specialized resources among related and diverse people or firms. This is accounted for in the measurement of urbanization and localization. When computing urbanization economies ('Regional Size'), which is a function of the concentration of people (Melo & Graham, 2009), we used the number of employees in the region to reflect total employment and human capital in the regional system. When assessing the influence of localization economies ('Specialization'), we define this as the as the ratio of plants in a specific industry in and region compared by the ratio of plants in all industries. Plants scoring more than 1 are classified as specialized in the specific sector in that region. This is assumed to facilitate spillovers in a localized industry setup where high rate of interactive learning and 'healthy' competition (Eriksson & Lindgren, 2009).

4. Empirical model

From a statistical point of view, a straightforward modelling approach for this kind of data is either the fixed-effects model (FE) or the random-effects models (RE). FE models account for within transformation (exclude time-invariant variables), which in effect allows for endogeneity accounted by unobserved heterogeneity by allowing for correlation between the error term and the unobserved explanatory variables. RE models allow time-invariant variables but it assumes that the unobserved time-invariant variables are random variables, therefore consequent correlation between them and the explanatory variables produce biased and inconsistent estimates. Since the Hausman-test suggests consistent estimates from the FE, we resort to this modelling approach. Cluster robust standard-errors are used in all the models to ascribe within plant-specific correlations. Also to abate the effects of plant's unobserved heterogeneity which may affect performance, we included time, region and industry fixed effects. The time fixed effects are based on the year variable, the region fixed effect on the 72 FA-regions and the industry fixed effects are based on the 3-digit SNI02 associated with the firms. The model is simplified as:

Equation [7].

$$lnPROD_{it} = \beta_0 + \beta_1 FAMILY\ TIES_1 + \beta_2 CONTROL_2 + \alpha_i + \varepsilon_{it}$$

Where $lnPROD_{it}$ represents the total labor productivity in firm *i* in time *t,* $FAMILY\ TIES_1$ is the vector of different family ties included in the model and $CONTROL_2$ is the vector of control variables. α_i and ε_{it} are the unobserved individual-specific effects and the unobserved random error term respectively.

To minimize the effect of reverse causality, the first lag (t-1) of the social proximity variables (*FAMILY TIES*) is used in the models. Though untraded capital (trust) takes a long time to build (Jaffe, 2003), interpersonal trust between family members is based on commonality of personal characteristics, history and extended period of experience (Sundaramurthy, 2008). Due to this extended history of trust building, a deeper lag is unnecessary because trust building in the family do not start at the workplace, therefore the first lag will be enough to capture the impact of family ties on performance. The control variables and the dependent variable are measured at time *t*.

Table 1 presents the summary and definition of the variables. In Table A1 in Appendix A, the decomposed variance (within and between SD) indicate some level of variation within the variables over time even though it is more obvious that the variations exist mainly between variables. A classic and more obvious example of the variation between and within firms is firm size. The variation in firm size across firms is higher compared to variation within a firm over-time. In other words, there is less variation in the size of firms over-time compared to between firms, which may imply that the within-estimator is less efficient. The correlation matrix for the variables are presented in table A2 in Appendix A. There are both positive and negative correlations, but there is no severe collinearity found.

Table 1 about here

4.1. Results

Table 2 presents the results on the impacts of in-house ownership and family ties on plant performance. The estimations are based on a total of 334,955 observations and 67,758 plants. The different models are based on the same sample but carried out in a stepwise manner. The initial models (1, 2 & 3) test the impact of the control variables on plant performance. Models 4 and 5 also test the impacts of in-house ownership and family ties on plant performance. Finally, models 6A and 6B present the additive estimates and the multiplicative estimates of the full model respectively.

For the control variables, all but regional specialization are significant in all the models and their impacts are in line with our expectations. From models 1 and 2, our human capital variable (high education) and formal skill varieties showed expected signs. Higher human capital positively impact plant performance. When analyzing the in-house formal skill varieties, our findings are in line with previous studies (e.g. Boschma et al., 2009; Östbring, 2015). Though higher human capital matters, it not human capital per se or similar occurrence of skills (insignificant but positive) or unrelated occurrence of skills (significant and negative) that most matters for plant performance but the occurrence of related skills. Also in model 3, high concentration of people in a region (regional size) generate positive spillover effects that enhance productivity. This supports the claim that urbanization matters for firm performance (Jacobs, 1969; Glaeser et al., 1992). There is a negative

relationship between firm size and productivity, in effect small SMEs show relative higher level of productivity than larger SMEs. Also, high average age positively impact plant performance but it is 'curvilinear'. Female have negative impact on plant performance. This was also expected considering the high share of female part-time workers (38%) in the Swedish economy.

Table 2 about here

Also, the in-house ownership and family ties showed expected signs when estimated separately (models 4 & 5) and together (model 6A). When controlling for plant and agglomeration factors and the fixed effects, all the in-house ownership and family ties variables positively impact plant performance. Among the independent variables, the highest point estimate is owner-children followed by parent-children. This supports Sirmon and Hitt´s (2003) claim on the uniqueness of the bundle of cognitive and social resources in the family which are enhanced by the shared 'familiness' (Habbershon & Williams, 1999). The mutual trust and cohesion influence different levels of interactions and deliveries among family ties that can be assumed to induce spillovers and enhance performance. Also because private owned firms are characterized by high concentration of ownership, control and often key management positions among family members, it facilitates efficient communication and the exchanges of information among family members in 'private language' (Tagiure & Davis, 1996). This is something that in turn enhances the transmission of firm related knowledge. Also, our findings also capture the effects of non-ownership through the impacts of the other measures of family ties. The findings indicate the importance of the dimensions of shared social capital between family members (irrespective of relationship with firm owner). Following Sirmon and Hitt (2003), we can argue that the dimensions of family social capital (cognitive – shared language, structure – interactions and relational – trust, etc.) may be important factors for spillovers. Moreover, model 6A also show that family relations produce different impacts on firm performance depending whether one is related to the firm owner or how proximate the relationship is. The result is not unexpected because depending on the people involve, family relations may produce different interactions and deliveries. For example, we can

assume that owner-child relation is enhanced by the shared 'familiness' (Habbershon & Williams, 1999) and early exposure to the business (Dyer, 1986; Bertrand & Schoar, 2006). Family members may have deeper (tacit) knowledge, thanks to early and direct exposure to matters of the business (Sirmon & Hitt, 2003). In most cases the acquired tacit knowledge becomes the main sources of human capital. This makes the family human capital (knowledge, skills, abilities, willingness, etc.) an exceptional form of human capital not only in family firms but also in private firms. In support of those claiming the positive influence of family relations within firms (e.g. Sirmon & Hitt, 2003; Basco, 2015; Jones & Stout, 2015), our results find that all types of family relations (not only in relation to the owner) is positive for performance. This suggests that an increase in family members mean an increase in guarded similar (tacit) knowledge (Jensen et al., 2004). However, as shown in Table 3, the effects are moderate. For instance, holding constant all the covariates, an increase in the owner-children connection (count) by two increases performance by 0.06% and three by 0.05%.

Table 3 about here

Finally, we are also interested in the potential interaction between the relative specialization of skills in the firm and family relations. Model 6B in table 2 reports the multiplicative effects of the independent variables. None of the centered interaction terms are significant, except for owner-children and relatedness (owner-children * Inhouse_rel.) and parent-children and unrelatedness (parent-children * Inhouse_unrel.), which both are significant and negative. From model 6B and Figure 1 (Graph 1c) the effects of family ties are addressed in combination with the effects of unrelatedness in formal skills. Our results reveal that a higher levels of unrelated variety decreases performance in firms when there are family ties, especially when it involves parent-children relationships. A higher level of unrelated variety in formal skills thus abate the positive impacts of parent-children on performance. Also from model 6B and Figure 1 (Graph 1b), a higher levels of related variety in formal skills decreases performance in firms when there are family ties. This is especially when the family ties involve owner-children relationship. A higher level of related variety in private owned firms abates the positive impacts of owner-children on performance. This

indicates a negative overlap between the two forms of proximity (social proximity & cognitive proximity). This implies that the influence of owner-children on performance is multiplicative and conditional on the level of relatedness in formal skills. The interplay between owner-children and related variety also show that as optimal cognitive distance in SMEs increases they turn to become suboptimal after repeated interactions and closure to ideas beyond or outside their scope. This scenario shows that private SMEs with ownership and family control may exhibit unique forms of learning which may be slightly different from learning dynamics in large firms (e.g. with or without family ties).

Figure 1 about here

To sum up, our findings suggest that in-house ownership and family ties have positive impact on plant performance. The results confirm the notion that dimensions of family social capital facilitates interactions and information circulation, thereby reducing cognitive distances between family members (Tagiure & Davis, 1996; Sirmon & Hitt, 2003). Also, though in-house ownership and family ties are important for performance, the impacts is multiplicative and conditional on the level of formal education or skill varieties in the firm. While the family connections on the firm-level can create a strong internal collaboration and learning dynamics and facilitate the search of new knowledge, it has a high tendency of blocking entry of new ideas, thus affecting flexibility and introduction of new knowledge (e.g. Uzzi, 1997; Boschma, 2005). It can also enforce conservative behaviors from the firm owner, which might have a negative effect on performance. Finally, our findings on the relationship between family ties and formal skill varieties resonate with Lang (2005) on rationality and power channels. We can assume that in private owned firms where owners practice a culture of openness, different competences and ideas are supported, it may abate the negative impacts of specific family conservative practices (e.g. in power, routines) and however, the opposite might be the case if otherwise (e.g. Cunningham et al., 2015).

4. Conclusion

Following the discussion in the family-firm literature on whether or not concentrations of family members – both to the owner and to other employees – actually is good or bad for performance, this paper is one of the first attempts to empirically assess this. By means of 334,955 observations over 67,758 Swedish private owned firms between 2002 and 2012, we have assessed this by conceptually relating the role of family ties to the discussion on proximity dimensions in the literature on regional learning (e.g. Boschma, 2005). In this sense, we argued that family ties is a strong and enduring proxy for social proximity which may influence the impact of other proximity dimensions, in particular cognitive proximity.

To some extent, we have been able to show that different forms of social proximity (in terms of family ties) matters for performance. While some studies in the family firm literature (e.g. Birley et al., 1999) have only shown the types of family relations (e.g. child, grandchild, siblings, etc. in relation to the owner) present in some family businesses, we have gone further to empirically assess the impacts of the different family relations on performance. Also, this article contributes to the current discussions on proximity dimensions in the literature on regional learning (Boschma, 2005) by empirically assessing the effects of social proximity on plant performance. From our results social proximity (owner-children and parent-children) are important for performance. This reechoes and contribute to the literature on labor market hiring – for instance, referral hiring where hiring opportunities are extended to the close networks of employees (Montgomery, 1991; Kramarz & Nordström-Skans, 2006). This makes a strong case or contribution to the literature on labor market matching on why some employers (especially in SMEs) may be more 'picky' and selective and rely more on their staff for hiring (Kramarz & Nordström-Skans, 2006) also knowing that it is less expensive. In general, this paper contributes to the regional learning and regional development literature which have previously avoided investigations on the family's effects on firm's behavior and the consequences these effects have on regional growth (Basco, 2015). Also, we have been able to empirically assess the relationship between the family and regional growth through firm performance. This is a major empirical contribution after Basco (2015), where he argued that researchers ought to consider the role of 'familiness' in the regional development literature since it matters.

Conclusively, our results show that there is more to know about social proximity (family ties) and cognitive proximity (formal education), and that family ties in the firm changes

previously reported positive effects of related variety in formal education especially when the family ties involves owner-children relationship. One potential limitation for this study could be the time-effect. For instance, it might be that the short-term effects of certain interactions are insignificant but that the long-term effect could yield positive effect on performance. Future studies can take up qualitative enquiries to understand the negative overlap between owner-children and related variety in formal education, for instance with questions like; what is the kind of relationship between owner-children and related variety? Is the relationship influenced by familiness or some other factors? This should offer promising avenues of future researches on the underdeveloped dimension of proximity.

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Table 1: Summary and definitions of variables

Variable	Definition
Dependent variable	
Productivity (log)	Average labor value-added
Owner's family ties	
Owner-children	Count of owner's children in the same firm
Owner-partner	Count of owner's partners in the same firm
Owner-other relatives	Count of owner's other relatives in the same firm
Other family ties	
Parent-Children pair	Count of parent-children pair in the same firm
Other-relatives	Count of other relatives except parent-children pair
Control variables	
Inhouse_sim. (log+1)	Degree of similarity of formal education
Inhouse_rel.	Degree of relatedness of formal education
Inhouse_unrel.	Degree of unrelatedness of formal education
Firm size (log)	Number of employees at the firm
Age	Average workers age
Age square	Square function of average workers age
Female	Share of Female workers
High education	Share of workers with a minimum of bachelor's degree
Regional size	Employment by region
Localization economies	Related plants in SNI02 classification

Table 2: Additive and multiplicative Fixed Effect Models with cluster robust standard errors (within brackets) on the effects of in-house ownership and family ties on plant performance between 2002 and 2012 in Sweden.

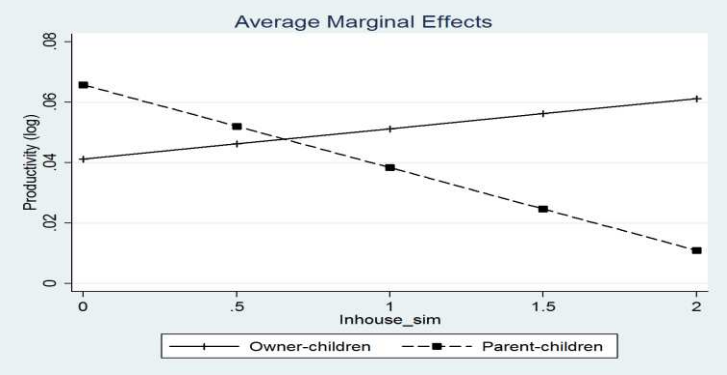
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6A**	**Model 6B**
Owner-children				0.0855***		0.0506***	0.0494**
				(0.0041)		(0.0054)	(0.0209)
Owner-partner				0.0380***		0.0330***	0.0319***
				(0.0063)		(0.0063)	(0.0063)
Owner-other relatives				0.0439***		0.0142**	0.0090
				(0.0064)		(0.0070)	(0.0071)
Parent-children					0.0627***	0.0331***	0.0879***
					(0.0029)	(0.0039)	(0.0197)
Other-relatives					0.0521***	0.0400***	0.0446***
					(0.0047)	(0.0048)	(0.0049)
Owner-children * Inhouse_sim							0.0031
							(0.0275)
Owner-children * Inhouse_rel							-0.0324**
							(0.0156)
Owner-children * Inhouse_unrel							-0.0091
							(0.0096)
Parent-children * Inhouse_sim							-0.0269
							(0.0255)
Parent-children * Inhouse_rel							-0.0150
							(0.0140)
Parent-children * Inhouse_unrel							-0.0379***
							(0.0085)
Inhouse_sim (log+1)		0.0072	0.0126*	0.0115*	0.0151**	0.0134**	0.0099
		(0.0067)	(0.0068)	(0.0068)	(0.0068)	(0.0068)	(0.0072)
Inhouse_rel		0.0216***	0.0198***	0.0198***	0.0193***	0.0195***	0.0344***
		(0.0074)	(0.0074)	(0.0074)	(0.0074)	(0.0074)	(0.0083)
Inhouse_unrel		-0.0361***	-0.0352***	-0.0351***	-0.0344***	-0.0344***	-0.0220**
		(0.0042)	(0.0042)	(0.0042)	(0.0042)	(0.0042)	(0.0044)
Firm size (log)	-0.3942***	-0.3762***	-0.3674***	-0.3782***	-0.3806***	-0.3818***	-0.3828***
	(0.0049)	(0.0057)	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0061)
Age	0.0077***	0.0076***	0.0077***	0.0080***	0.0080***	0.0080***	0.0080***
	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)
Age square	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0001***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Female	-0.0259***	-0.0254***	-0.0253***	-0.0250***	-0.0247***	-0.0249***	-0.0250***
	(0.0029)	(0.0029)	(0.0029)	(0.0029)	(0.0029)	(0.0029)	(0.0029)
High education	0.0179***	0.0189***	0.0186***	0.0183***	0.0186***	0.0184***	0.0186***
	(0.0041)	(0.0041)	(0.0041)	(0.0041)	(0.0041)	(0.0041)	(0.0041)
Regional size			0.0010***	0.0010***	0.0009***	0.0009***	0.0010***
			(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Specialization			-0.0005	-0.0007	-0.0005	-0.0006	-0.0005
			(0.0048)	(0.0048)	(0.0048)	(0.0048)	(0.0048)
Constant	6.0092***	6.0122***	5.9570***	5.9379***	5.9424***	5.9385***	5.9314***
	(0.0588)	(0.0588)	(0.0607)	(0.0605)	(0.0606)	(0.0605)	(0.0605)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	334955	334955	334955	334955	334955	334955	334955
n	67758	67758	67758	67758	67758	67758	67758
R-sq	0.103	0.103	0.103	0.106	0.106	0.106	0.107

Note: *** 1%. ** 5% & *10% significance level.

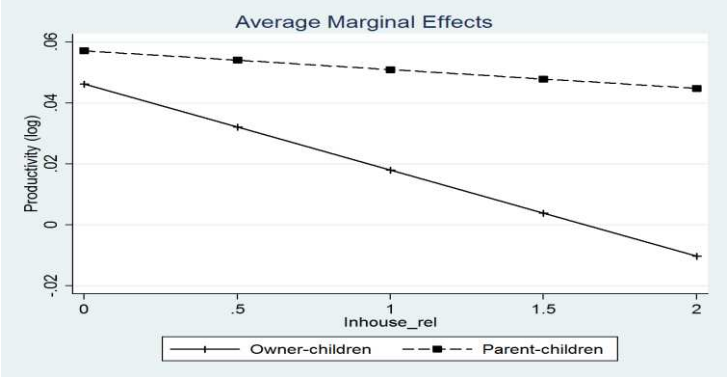
Table 3: Predictive Margins of Family ties.

Family ties/_at	0	1	2	3	4	5	6	7	8	9	10	11	12
owner-children	-	6.03	6.09	6.14	6.19	6.24	6.30	-	-	-	-	-	-
owner-partner	-	6.04	-	-	-	-	-	-	-	-	-	-	-
owner-other relatives	-	5.99	5.99	5.99	5.99	5.99	6.00	-	-	-	-	-	-
parent-children	-	6.02	6.05	6.08	6.12	6.15	6.18	6.22	6.25	6.28	6.32	-	-
other relatives	-	6.03	6.07	6.11	6.15	6.19	6.23	6.27	6.31	6.35	6.39	6.43	6.47

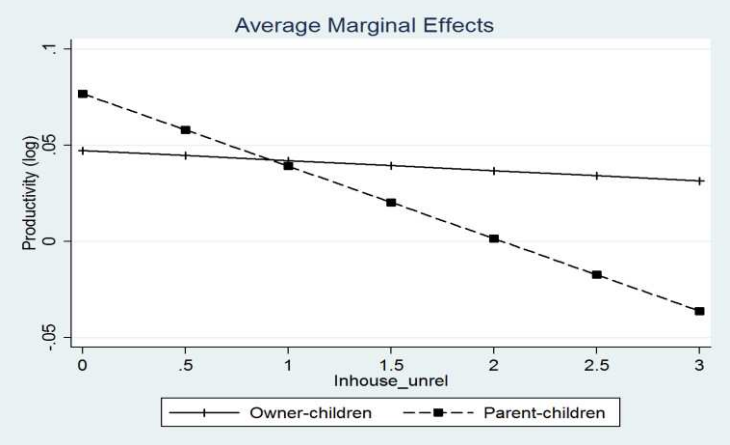
Figure 1: The effects of in-house family ties on plant performance as the level of in-house formal education (formal skill varieties) increases. All the interactions are reported here but only the significant interactions are discussed in the paper (graph 1b & graph 1c).



Graph 1a



Graph 1b



Graph 1c

Appendix A:

Table A1: Summary statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
Productivity (log)	overall	5.991	0.687	-1.386	10.581	N = 334955
	between		0.658	-0.405	10.154	n = 67758
	within		0.398	-0.040	10.123	T-bar = 4.9434
Owner-children	overall	0.177	0.457	0	6	N = 334955
	between		0.421	0	6	n = 67758
	within		0.226	-2.423	3.177	T-bar = 4.9434
Owner-partner	overall	0.107	0.308	0	1	N = 334955
	between		0.285	0	1	n = 67758
	within		0.136	-0.793	1.007	T-bar = 4.9434
Owner-other relatives	overall	0.066	0.287	0	6	N = 334955
	between		0.281	0	5	n = 67758
	within		0.135	-2.734	3.400	T-bar = 4.9434
Parent-children	overall	0.234	0.536	0	10	N = 334955
	between		0.494	0	7.375	n = 67758
	within		0.276	-6.266	4.734	T-bar = 4.9434
Other-relatives	overall	0.091	0.327	0	12	N = 334955
	between		0.302	0	6	n = 67758
	within		0.176	-3.534	7.466	T-bar = 4.9434
Inhouse_sim (log+1)	overall	0.326	0.296	0	2.031	N = 334955
	between		0.252	0	1.271	n = 67758
	within		0.170	-0.635	1.653	T-bar = 4.9434
Inhouse_rel	overall	0.062	0.178	0	1.459	N = 334955
	between		0.161	0	1.206	n = 67758
	within		0.097	-0.844	0.986	T-bar = 4.9434
Inhouse_unrel	overall	0.532	0.598	0	2.585	N = 334955
	between		0.556	0	2.522	n = 67758
	within		0.280	-1.148	2.381	T-bar = 4.9434
Firm size (log)	overall	0.858	0.852	0	5.357	N = 334955
	between		0.839	0	5.030	n = 67758
	within		0.280	-1.871	4.108	T-bar = 4.9434
Age	overall	52.546	13.197	16	97	N = 334955
	between		11.224	17	97	n = 67758
	within		8.587	6.768	102.421	T-bar = 4.9434
Age square	overall	2935.194	1313.248	256	9409	N = 334955
	between		1166.924	289	9409	n = 67758
	within		816.423	-1700	8909.819	T-bar = 4.9434
Female	overall	0.243	0.429	0	1	N = 334955
	between		0.378	0	1	n = 67758
	within		0.241	-0.657	1.143	T-bar = 4.9434
High education	overall	0.148	0.355	0	1	N = 334955
	between		0.328	0	1	n = 67758
	within		0.176	-0.752	1.048	T-bar = 4.9434
Regional size	overall	12.409	19.641	0.01	71.74	N = 334955
	between		19.814	0.01	71.74	n = 67758
	within		5.784	-44.569	75.294	T-bar = 4.9434
Specialization	overall	0.342	0.726	-3.311	7.770	N = 334955
	between		0.704	-2.870	6.973	n = 67758
	within		0.226	-4.339	4.471	T-bar = 4.9434

Table A2: Correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Productivity (log)	1														
2	Owner-children	0.01	1													
3	Owner-partner	0.04	0.08	1												
4	Owner-other relatives	-0.01	-0.01	0.02	1											
5	Parent-children	0.02	0.74	0.20	0.24	1										
6	Other-relatives	0.00	0.32	0.10	0.39	0.32	1									
7	Inhouse_sim(log+1)	-0.09	0.18	0.15	0.10	0.18	0.09	1								
8	Inhouse_rel	-0.02	0.15	0.17	0.11	0.26	0.26	0.10	1							
9	Inhouse_unrel	-0.08	0.23	0.20	0.15	0.30	0.22	0.54	0.22	1						
10	Firm size (log)	-0.07	0.29	0.28	0.20	0.42	0.37	0.49	0.57	0.71	1					
11	Age	0.00	-0.16	-0.07	-0.07	-0.17	-0.15	-0.26	-0.22	-0.26	-0.41	1				
12	Female	-0.14	0.00	0.11	0.01	0.03	0.01	0.12	0.06	0.13	0.12	-0.08	1			
13	High education	0.11	-0.06	0.00	-0.05	-0.07	-0.06	-0.10	-0.08	-0.06	-0.13	0.12	0.10	1		
14	Regional size	0.06	-0.15	-0.12	-0.10	-0.18	-0.14	-0.36	-0.20	-0.36	-0.46	0.22	-0.04	0.19	1	
15	Specialization	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.03	-0.02	0.01	-0.01	-0.12	1