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ABSTRACT

In this paper we study the relation between parenting events and the performance of firms. Using data from the Italian motorcycle industry (1893-1993), we find that parents have higher survival chances after generating a spinoff (i.e. parenting event), confirming results from previous studies about other manufacturing industries. We also show that the survival patterns of parent firms differ across space, and we link them to cluster characteristics: parenting events are associated to survival advantages in the clusters of Milan and the Motorvalley, and to survival disadvantages in the cluster of Turin. The paper contributes to the literature on spinoffs and employee mobility and adds to the debate on the role of clusters and their institutions in evolutionary economic geography, by highlighting the importance of contextual factors for the performance of parent firms.

Keywords: Spinoffs; Employee entrepreneurship; Parents; Clusters; Evolutionary economic geography

JEL Codes: B52, L26, O18, R11.

1. Introduction

Spinoffs are new firms originating from existing companies within the same industry (Agarwal et al. 2004; Klepper 2007). Spinoffs are present in many industries and typically show a superior performance compared to other, less experienced entrants (Klepper 2009). Recent evidence also suggests that they played an important role in the emergence of successful industry clusters, such as the semiconductor cluster in Silicon Valley (Cheyre, Klepper, and Veloso 2015) or the automobile cluster in Detroit (Klepper 2007).

Established companies, however, do not share the enthusiasm of policy-makers for spinoffs and can be quite hostile to spinoff formation (Garvin 1983; Walter, Heinrichs, and Walter 2014). In fact, the creation of a spinoff is a form of employee mobility (Agarwal, Gambardella, and Olson 2016): parent firms typically endure the costs of this process, without accruing any benefit. The early literature on the topic has confirmed this view: parents suffer from the loss of human capital (Phillips 2002), the disruption of organizational routines (McKendrick, Wade, and Jaffee 2009), and the competitive threat originated from the replication of these routines in the new firm (Wezel, Cattani, and Pennings 2006). More recent works, however, have suggested that parenting can also be a positive event, when considering a longer time period (McKendrick, Wade, and Jaffee 2009), to the extent that it generates a realignment with the environmental conditions (McKendrick, Wade, and Jaffee 2009), it increases the level of coherence of internal activities by reducing the amount of conflict within a firm (Ioannou 2014), or opens a communication channel that makes the new firm a knowledge source for the parent (Corredoira and Rosenkopf 2010; Kim and Steensma 2017).

In this paper, we claim that finding adequate substitutes for employees leaving to form a spinoff is very important for the subsequent performance of parent firms, and we show that the context in which the event takes place plays a role in this process. To this purpose, we exploit a novel dataset of the Italian motorcycle industry (1893-1993) that allows us to identify spinoffs and parents over a long period of time and both within and outside three industrial clusters, and to investigate the contextual elements that might be positively or negatively associated to parent survival.

Our results show that parenting events are associated to higher survival chances of firms, but also that these patterns of survival differ across space. Although we provide only indirect evidence of the actual mechanisms driving these processes, after controlling for many confounding effects, we find that parenting firms have greater survival chances in the Motorvalley and Milan clusters and lower survival chances in the Turin cluster, compared to non-parenting firms in the same areas.

The contribution of the paper is twofold. First, we contribute to the literature on spinoffs (Klepper, 2009) and more generally on employee mobility (Agarwal, Gambardella, and Olson 2016). While previous studies have focused on the role of firm-specific and employee-specific factors in the relation between parenting events and subsequent firm performance, we show that this relation differs across contexts, and we propose that some contextual factors – including localization economies, institutions and the presence of related sectors – might be the drivers of these differences. Second, we contribute to the debate within evolutionary economic geography (Boschma and Frenken 2009; MacKinnon et al. 2009; Boschma and Capone 2015; Pike et al. 2016), by looking at clusters, institutions, and related sectors, and what role they play in the evolutionary mechanism of capabilities reproduction through spinoffs.

The paper is organized as follows. First, we review the current literature about the relation between parenting events and firm performance, and we develop our theoretical perspective from it. Then we illustrate the empirical context, the data and the methodology that we use for our analysis. In the following section we present the results of our work. Finally, we conclude by discussing their implications for the existing literature.

2. Background Theory

In the last 15 years the phenomenon of spinoffs has gained increasing attention by academic scholars and policy makers. A large set of empirical studies supports the claim that spinoffs perform better than other firms in many sectors (see Klepper [2009] and Capone, Malerba, and Orsenigo [2019], for a review). This superior performance is attributed to the transfer (or 'inheritance') of successful routines (Phillips 2002; Wezel, Cattani, and Pennings 2006; Dahl and Reichstein 2007) and capabilities (Agarwal et al. 2004) from the parent firm, as well as to the experience in the industry that allows to identify potential opportunities (Costa and Baptista 2015).

2.1 Relation between parenting and performance

A possible implication of the 'inheritance' view is that the spinoff formation process is detrimental to the parent firm. As reported by Garvin (1983), managers of existing organizations see spinoffs as a particularly dangerous competitive threat: leaving employees, in fact, might appropriate innovations and ideas developed within the parent and exploit them in the new firm (Anton and Yao 1995; Hellmann 2007). However, spinoffs quite often are motivated by strategic disagreements (Klepper and Thompson 2010): therefore they differentiate from the parent (Fontana and Zirulia 2015) and do not target the same market (Klepper and Sleeper 2005; Capone, Malerba, and Orsenigo 2018).

A further and sometimes more severe threat to the performance and survival of parenting firms might result from the loss of employees leaving to form the new entity. First, people leaving the parent firm represent a loss of human capital (Phillips 2002; Wezel, Cattani, and Pennings 2006): when employees leave a firm they take with themselves skills and resources that are currently used within the parent and sustain its activities. Second, if leaving people were linked to actors external to the organization, the parent firm suffers also from a loss of external social capital, i.e. relational assets that involve important external stakeholders such as customers or suppliers (Somaya, Williamson, and Lorinkova 2008; Correidora and Rosenkopf 2010). Third, the departure of employees represents a loss of complementary assets, which disrupts the routines of the existing organization (Campbell et al. 2012). The disruption of routines can be easily fixed if it involves a limited number of operational routines (Nelson and Winter 1982), but higher order routines or capabilities that deal with the use or change of operational routines (Dosi, Nelson, and Winter 2000) can be modified with greater costs and difficulties (Phillips 2002; Wezel, Cattani, and Pennings 2006; Campbell et al. 2012).

Although the exit of employees represents a loss of valuable assets, it does not necessarily imply harmful consequences for the parenting firm. Leaving people can be substituted minimizing routines disruption (McKendrick, Wade, and Jaffee 2009). If this substitution process is properly managed, parent firms might even benefit from the creation of a spinoff. When new firms are born, they create routines and internal structures that are influenced by the external environment and persist beyond the founding phase (Stinchcombe 1965). Established routines and bureaucratic processes determine structural inertia, reducing the opportunities for change and adaptation of existing firms in a dynamic environment (Hannan and Freeman 1984). When a spinoff is generated, there is a transfer of these routines and capabilities from the parent (Ferriani, Garnsey, and Lorenzoni 2012), but the parent itself might be more susceptible to external influences due to such a demographic shock (Pennings and Wezel 2010; Marquis and Tilcsik 2013). So, hiring new people to substitute leaving employees following a parenting event might help the firm to modify its internal processes and routines, realigning with the external environment (McKendrick, Wade, and Jaffee 2009).

Firm performance is also affected by its internal coherence, that is the capacity to generate and explore synergies among its competences (Teece et al. 1994; Piscitello 2004). When spinoffs result from strategic disagreements within a firm (Klepper 2007; Klepper and Thompson 2010), the substitution of leaving people with new employees will increase its overall coherence (Ioannou 2014).

2.2 The Role of Contextual Factors

Finding adequate substitutes for leaving employees depends on many factors. Some of them might actually be firm-specific. For example, firms parenting successful spinoffs might benefit from a signalling effect to attract talented people (McKendrick, Wade, and Jaffee 2009). However, contextual factors might also be relevant. Recent studies have pointed out that spatial (Frenken, Cefis, and Stam 2014; Baltzopoulos, Braunerhjelm, and Tikoudis 2016), sectoral (Capone, Malerba, and Orsenigo 2019), and institutional (Cheyre, Klepper, and Veloso 2015; Starr, Balasubramanian, and Sakakibara 2018) factors matter for the creation and performance of spinoffs.

Similar findings also emerge from the literature on spinoffs and clusters (Klepper 2007; Boschma 2015), and in particular on the paradigmatic case of Silicon Valley (Klepper 2010). This region has been characterized by a high level of workers mobility, facilitated by the lack of regulatory barriers, and by a widespread entrepreneurial culture (Saxenian 1994). Moreover, new firm founders could also benefit from the presence of supportive institutions, such as venture capitalists and specialized law firms (Kenney 2000). All these factors have enormously contributed to the entry dynamics in Silicon Valley, and specifically to the emergence of numerous spinoffs (Cheyre, Klepper, and Veloso 2015). Spinoffs located in clusters take advantage from their position in the knowledge network (Giuliani 2007; Bagley 2018) and benefit from the possibility of hiring high quality early employees (Buenstorf and Costa 2018), given that clusters attract the best workers (Buenstorf and Klepper 2010) and both employees and entrepreneurs prefer to remain in their home regions (Berchicci, King, and Tucci 2011; Dahl and Sorenson 2010).

Agglomeration economies stemming from cluster location might not be a prerogative of spinoffs, and could actually benefit all cluster firms (Boschma 2015; Cusmano, Morrison, and Pandolfo 2015; Morrison and Boschma 2019; Enrietti et al. 2019). In particular, firms looking for adequate substitutes after a parenting event might take advantage of the presence of high quality employees in the cluster. Their search process, however, might also depend on specific clusters characteristics. Local institutions and culture may enhance knowledge diffusion, helping the parent to successfully integrate the new employees in the firm routines (Winter, 2000; Cattani, Pennings, and Wezel 2003). The presence of related industries might reinforce this process and improve firm performance, allowing the circulation of knowledge workers (Boschma, Eriksson, and Lindgren 2009; Timmermans and Boschma 2014) or through the mediation of research universities (Agrawal and Cockburn 2003). However, it might also create excess competition on the labor market (Sorensen 1999), making it harder to recruit workers both for new firms (Sorensen 2004) and for parenting firms needing adequate substitutes for leaving employees. In particular, in presence of large asymmetries between industries, the dominant industry might absorb most resources, increasing the costs (e.g. time for recruitment, skill mismatch, salaries) for industries requiring the same set of skills (Fitjar and Timmermans 2019). Although this pattern is more common in the case of natural resources industries, it might also apply to manufacturing sectors experiencing a boom (Corden and Neary 1982).

3. Empirical Setting

3.1 The Italian motorcycle industry

Italy is today the largest motorcycles producer in Europe, and among the world leaders (ACEM 2015). However, the industry emerged a bit later compared to other European countries, such as Germany, where Gottlieb Daimler invented the motorcycle in 1885, or UK and France, where some companies started mass production of motorcycles as early as 1895 (Wilson 1995). In the last decade of the 19th century, Italian prospective producers were still developing prototypes: the first commercialized motorcycle was produced in Milan by Lazzati and Figini in 1899 (Grizzi and Clarke 2014). In the early years of the 20th century, however, the industry quickly took off, profiting from knowledge developed in neighbouring countries, especially in France.

Data about industrial demography (entry, exit, and number of active firms), show the presence of three industry cycles, with a peak in the number of firms due to sustained entry in the early phase of the cycle, followed by a quick decline. The three periods are roughly delimited by the two World Wars. The exit dynamics is partly related to external shocks, such as financial crises (1907, 1911) government policies (1925, 1935), or shifts in consumers preferences (1953).

3.2 Contextual factors in the Italian Motorcycle industry

The Italian motorcycle industry is characterized by a relevant heterogeneity along the spatial dimension, that makes it an excellent empirical setting to explore our theory. Figure 1 presents the spatial distribution of firms in the industry over all the period of analysis[1], considering for each province the maximum number of firms that have been active in a year. Three clusters emerge clearly from it, accounting for about 60% of the firms that entered the

[1] See Section 3 for more details about the data.

industry. First, there is a large area centred around the city of Milan, which also includes the current provinces of Monza-Brianza and Varese[2]. Milan was part of the industrialized area of the country, and had the highest number of motorcycle firms active in one year, including some of the most known and successful ones (FB Mondial, Gilera, MV Agusta). It was also characterized by the presence of many successful firms in the mechanical and related sectors, including trains (Breda), automobiles (Alfa Romeo, Isotta Fraschini), engines and components (Marelli), steel (Falck), rubber and tires (Pirelli), and bicycles (Bianchi).

INSERT FIGURE 1 ABOUT HERE

The cluster in the Emilia Romagna region includes the provinces of Bologna and Modena and is the area with the highest industry concentration after World War II. However, the industry here emerged already at the end of World War I, with a few companies focusing on race motorbikes and some of them gaining national relevance (G.D., Moto Morini) by winning important national and international races in the 1920s. In the two provinces emerged also car producers specialized in sport and luxury cars (Ferrari, Maserati, and later on Lamborghini and Pagani), earning the area the ‘Motorvalley’ nickname after World War II (Wezel and Lomi 2009). The Motorvalley represents a paradigmatic case of Italian industrial districts (Becattini 2004), with thick governance institutions, embeddedness and interfirm cooperation positively affecting survival chances of small firms. The area was also characterized by peculiar features identifying an ‘Emilian’ model (Brusco 1982), where local development was the outcome of the combination of economic, social, and institutional factors (Amin 1999). Although the ‘Emilian’ model consolidated after WWII, its key features

[2] The province of Monza-Brianza was created only in 2004. Until then, its territory was part of the province of Milan. The province of Varese was created in 1927. Until then, its southern part was included in the province of Milan.

(i.e. flexible specialisation, social cohesion, government quality) were strongly rooted in the incipient industrialisation process taking place in the early nineteenth century, when technical and vocational schools (created through the coordinated action of organized workers and progressive entrepreneurs) contributed to the formation and diffusion of technical, scientific, and entrepreneurial culture, both in urban and rural areas (Capecchi 1990). On this background, the dense network of relations between entrepreneurs, workers, and politicians, that characterized the area after WWII, enhanced the circulation of knowledge across firms. The presence of a high number of successful, but relatively small firms in the motorcycle and automobile industry spurred the development of specialized suppliers and workers, as well as strong interfirm networks, which made knowledge diffusion easier and faster (Lipparini, Lorenzoni, and Ferriani 2014).

Finally, the third cluster includes the urban area of Turin, where in the last decade of the 19th century emerged also the automobile industry (Annibaldi and Berta 1999). The area was characterized by an intense entry dynamics of small automobiles (Kim, Dobrev, and Solari 2003) and motorcycles (Morrison and Boschma 2019) producers, among which soon FIAT took the lead, becoming the largest car manufacturer in Italy with a market share around 80% after WWI (Enrietti et al. 2019), and affecting the development of the whole automotive sector in the Turin area (Castronovo 1999).

Between the two World Wars FIAT experienced a rapid growth both in absolute and relative terms: FIAT employees were about 3000 before WWI and increased up to 57000 in 1938, that is a change from the 9% to the 58% of the workforce in the mechanical sectors in the province of Turin (Musso, 1987). So, although FIAT was not a direct competitor in the product market for small motorcycles producers, it definitely was a dominant and booming competitor on the factor market, absorbing most of the local resources in terms of human capital and workforce. Historical accounts provide some evidence of this process. Between the two wars, FIAT offered slightly higher wages than other automobile producers, and wages offered in the automobile industry were 10-25% higher compared to mechanical sectors and 40-60% higher compared to other sectors (Musso, 1987). Moreover, FIAT also offered many non-wage benefits such as access to after-work activities, welfare measures including health insurance and holidays for children and families, and schools for workers and their children (Sapelli, 1978; Bigazzi, 1981; Musso, 1987). However, the impact of FIAT on other related industries went beyond competition. Following the construction of the 'Lingotto' plant in the late 1910s, FIAT became the Italian pioneer in the adoption of the assembly line, specialized machine tools and the principles of scientific management. This had important consequences on the composition of the labor force: multi-skilled, experienced workers became increasingly specialized in single tasks that still required high skills (Musso, p. 118); the majority of tasks, however, became simpler and could be assigned to unqualified workers (Sapelli, 1978; Bigazzi, 1981). Most of these workers were recruited from small farmers and independent craftsmen working in small workshops that abandoned their activities to work for FIAT (Levi, 1985). On the contrary, small artisanal firms – including motorcycle producers – still required workers performing different tasks, that were increasingly difficult to find (Musso, 1987).

Besides absorbing local human capital, FIAT acquired control over other companies and relevant resources in the local economic system. In the mid-1920s the company became a fully vertically integrated industrial conglomerate, with activities covering its core business (i.e. automobile) but also related businesses including steel production, electricity supply, transportation companies, naval and airplane engines, machine tools, and newspapers among others (Piluso 1999). So, its presence could be particularly worrisome for firms subject to an unexpected shock, such as parents following an involuntary spinoff event, and negatively affect their survival chances.

Although we cannot test directly the mechanisms referring to the successful substitution of leaving employees due to lack of historical data, the heterogeneity in the contextual factors prevailing in the three clusters provides an excellent setting to explore our theory. The above arguments suggest that the specific conditions prevailing in the different clusters could determine different performance patterns of parenting firms. In particular, we expect firms to have better performance following a parenting event if located in the clusters of Milan and the Motorvalley. The performance advantage might be stronger in the case of the Motorvalley due to its peculiar institutions. However, we expect a negative performance of parent firms in the cluster of Turin, due to the dominant presence of FIAT, the almost monopolistic leader of the booming automobile industry.

4. Methodology

4.1 Data sources

This work is based on a dataset of motorcycle companies in Italy in the period 1893–1993, developed by Morrison and Boschma (2019) and based on two main sources: "Moto Italiane, i primi 50 anni 1895–1945" (Milani, 1998) and "Enciclopedia della motocicletta" (Wilson, 1995). From these two encyclopedias of motorbike companies it has been possible to extract the following information: year of foundation of a company; ending year of production; major re-organization or ownership changes; location of the company; name and background of all firms or their founders. All this information was integrated using specialized magazines, company websites, and other internet sources[3]. For economic and social data, we employ databases from the Italian statistical office (ISTAT, 2011) and the Bank of Italy (Nuzzo, 2006). Further sources are Cainelli and Stampini (2002), that report historical census

[3] The most relevant sources were: Moto Club Storico Conti, Wheels of Italy, Moto di Lombardia, Motorvalley.

data on regional employment in the Italian manufacturing sector, and Felice (2013), that reports historical data on regional school enrolment and gross domestic product (GDP).

Overall, we gathered data about 869 motorcycle companies in Italy in the period 1893-1993. However, our analysis is limited to 641 companies that commercialized at least one motorcycle product on the market before 1993 and for which we have reliable location information. Companies are excluded from the analysis if: 1) they entered the industry after 1993 (7 firms), or 2) they limited their activity to the production of prototypes or race motorcycles (194 firms), 3) we were not able to univocally identify their location (27 companies).

4.2 Econometric model

Our data allow us to measure firm performance in terms of survival. Therefore, we use the Cox proportional hazard regression model, a semi-parametric model that does not impose any restriction on the shape of the baseline hazard function (Cox 1972). As other hazard models, the Cox model allows to study the relation between a set of explanatory variables describing firm characteristics and the survival rate of a population, taking into account the specific structure of duration data. Formally, the Cox model is expressed in terms of hazard rate $h(t)$, which represents the risk of failure at a specific instant *t*, conditional on survival up to *t*:

$$h(t) = h_0(t) \cdot e^{\beta' X_i} \quad (1)$$

where X_i is a vector of explanatory variables. The expression $h_0(t)$ represents the baseline hazard function, i.e. the extent to which failure depends on time irrespective of heterogeneity across observations. The Cox model belongs to the family of proportional hazard models: therefore, regression coefficients included in the vector β indicate the proportional effect in the hazard rate due to a unit change in the covariates (Jenkins 2005). In this class of models, it is possible to present results in terms of hazard ratios. This feature is particularly useful in the case of dummy variables, as the hazard ratio represents the ratio between the hazard of observations with the specific characteristic identified by the dummy (e.g. parenting event) and the hazard of observations without that characteristic. Hazard ratios close to 1 mean that there is no effect of the specific covariate; values higher (lower) than 1 indicate a higher (lower) hazard for the group identified by the dummy variable.

4.3 Dependent variable

The construction of the dependent variable and the control explanatory variables closely follows the methodology used in similar studies about spinoffs (Phillips 2002; Klepper 2007; Ioannou 2014). Firm survival is computed as the difference between the year of exit (i.e. last year of production) and the year of entry (i.e. first year of production). Based on this variable, the hazard rate is computed for each period of analysis.

Overall, we observe 616 exits by 1993. Firms exiting after that date are treated as censored. The total analysis time at risk is 5246, although the number of observations effectively used are 4997[4]. Mergers and acquisitions (M&A) are treated as exits if the name of the company acquired/merged disappears or its location changes[5]. In this case, the year of M&A is taken as the time of exit. The firm is treated as continuing if it keeps the same name and location. In total we count 30 cases of M&A, and 21 of them are treated as continuing firms[6]. If a firm changes name for reasons different from M&A (e.g. when one of the founders leaves the firm), the firm is treated as continuing.

4.4 Explanatory variables

[4] In the Cox model estimates are derived using information about the subjects at risk only at each failure time (Jenkins, 2005).

[5] Our approach to M&A differs from Klepper (2007), that treats these observations as censored, and follows Boschma and Wenting (2007).

[6] In the few M&A cases with a name change, the company resulting from the M&A was clearly moving away from the activities of the original company.

Our explanatory variables refer to the generation of spinoffs by parent firms, that we define as a parenting event. We use a dummy variable to code for it (*Parenting Event*): it takes value 1 for firms that generate a spinoff, starting from the period in which the spinoff occurs, and until the parent firm exits; it takes the value 0 for parent firms before they generate the first spinoff, and for all firms that never generate a spinoff. Overall, we count 56 parenting events, occurred from 40 parent firms. Details about the geographical distribution of parent firms and comparison with all firms are reported in Table 1.

INSERT TABLE 1 ABOUT HERE

To check for the role of contextual factors in the relation between parenting events and survival, we partition the main explanatory variable in four groups, by using the following procedure. First, we created four location dummy variables: *Motorvalley* takes value 1 if the firm was located in the provinces of Bologna or Modena, and 0 otherwise (it includes 11% of the firms); *Milan area* takes value 1 if the firm was located in the provinces of Milan, Varese, and Monza-Brianza, and 0 otherwise (it includes 29% of the entrants); *Turin area* takes value 1 if the firm was located in province of Turin, and 0 otherwise (it includes about 20% of the entrants. *Rest of Italy* takes value 1 if the firm was located in any other province. Then we obtain the variables defining parenting events occurring in any of these areas (*Parenting in Motorvalley*, *Parenting in Milan area*, *Parenting in Turin area*, *Parenting in Rest of Italy*) by multiplying the *Parenting Event* dummy and the four location dummies. In some specifications, we also merge together parenting events in the Motorvalley and Milan clusters (*Parenting in clusters*).

4.5 Control variables

Control variables include characteristics referring to entrants background, entry timing and geographical location, that are defined for all firms. Specifically, we distinguish four types of entrants background, that are identified integrating the sources listed in Section 3.1: *spinoffs*, which are firms founded by employees of companies already active in the motorcycle industry; *experienced firms*, that are the firms which enter an industry by diversifying their portfolio of activities from related industries; *experienced entrepreneurs*, that are individuals that have worked in firms from related industries; *inexperienced entrants*, that include all companies and entrepreneurs with no prior experience in the same industry or in related industries, as well as the cases for which the entrant background is unknown[7]. Related industries include automobiles and carriages, but mainly consists of bicycle producers, in particular in the early years of the industry, and suppliers of core inputs, like engines. From previous evidence, we expect that inexperienced entrants are outperformed by firms belonging to the other three categories. To check for these effects, we coded four dummy variables: each of these variables takes value 1 if the entrant firms falls in the specific entrant background category described by the variable, and 0 otherwise. Since the four variables completely partition the data, we include in the model only the first three categories (*Spinoff*, *Experienced firm*, *Experienced entrepreneur*), and we treat *Inexperienced entrants* as the reference category. In the case of spinoffs, we also include a variable (*Parent Duration*) describing the performance of the parent firm, which is measured by its number of years of production.

A second group of variables controls for the effect of entry timing. In the specific case of the Italian motorcycle industry, it is possible to identify three distinct phases, with waves of entry and exit. To control for these effects, we coded three time cohort dummy variables. The first dummy (*Before WW1*) takes value 1 for firms entering before the end of World War

[7] If there are multiple founders, we consider as a spinoff a firm where at least one founder has previous experience in the motorcycle industry, and as an experienced entrepreneur a firm where at least one founder has experience in a related industry, but nobody has worked in the motorcycle industry (otherwise it would have been defined as a spinoff)

1, (i.e. between 1893 and 1918), and 0 otherwise. The second dummy (*Between wars*) takes value 1 for firms entering between the two wars (i.e. from 1919 to 1945), and 0 otherwise. The last dummy (*After WW2*) takes value 1 for the cohort of all remaining firms (i.e. those entering between 1946 and 1993), and 0 otherwise. Also in this case, the three variables completely partition the data. Therefore, we include in our regression models only the first two dummies, and we leave the last cohort as reference category. Moreover, since the effect of time of entry on the hazard is not constant over time, we also included time varying covariates given by the interaction of time of entry variables with time.

A third group of variables controls for the effect of geographic location. Location dummies as defined in the previous section are included as controls, considering *Rest of Italy* as the reference category. To take into account more general location effects, we also include some more controls: the number of active motorcycle firms at the regional level (*Industry density*), and the regional employment in the mechanic sector (*Related variety*), to account for localization economies from the same or related industries; the relative number of inhabitants in the region (*Population*), to account for urbanization economies; the school enrolment rate in the region (*Education*), to account for the effect of human capital; regional gross domestic product per capita (*Regional GDP*), to account for the level of economic development. All these variables are time invariant, and are measured at the entry period[8] and the NUTS2 level for all firms. Descriptive statistics and pairwise correlations among them are reported in the Appendix (Tables A1 and A2).

5. **Results**

[8] Our findings are robust when we use a yearly measure of regional control variables. Results are reporter in the Appendix.

The results of our analysis are reported in Table 2 in the form of hazard ratios: values below 1 (above 1) indicate higher (lower) survival chances associated to that factor. Table 3 reports estimated coefficients for the same models.

In all models control variables confirm previous findings from Morrison and Boschma (2019). As expected, experienced firms, entrepreneurs and spinoffs have better survival chances compared to inexperienced entrants. Spinoffs from better parents enjoy further survival advantages. Entry cohort dummies indicate that firms founded before WW1 and between the two World Wars have a higher hazard rate than firms entering after WW2. Moreover, the coefficient of the cohorts interacting with time suggests that the hazard related to time of entry changes with age, and specifically that firms in the earlier cohorts have a lower hazard at older ages as compared to those in the latest cohort. Finally, we also notice that among the three cluster dummies, only Motorvalley is significant, indicating that firms located in this area enjoyed survival advantages when compared to firms in the rest of Italy, including the other two clusters (Turin and Milan).

INSERT TABLE 2 ABOUT HERE

In Model 1 we include the dummy *Parenting Event* as explanatory variable. We find that firms experiencing a parenting event present a hazard rate 30% lower than other firms. Model 2 reports the results of the analysis when splitting the parenting events across geographical locations. Firms parenting in the Motorvalley have a hazard rate 38% lower than non-parenting firms, on top of a survival advantage enjoyed by all firms in the area. The pattern is very similar in the cluster of Milan, where parenting firms have a hazard rate 39% lower than non-parenting firms. On the contrary, firms experiencing a parenting event in the Turin area show a 50% higher hazard rate compared to non-parenting firms. Finally, parenting firms in the rest of Italy have the lowest hazard rate, but the coefficient is only weakly significant.

INSERT TABLE 3 ABOUT HERE

Due to the limited number of parenting firms in some of the geographical locations that we consider, we run some additional analysis to check that results are not driven by some outliers. First, we run the analysis considering Milan and Motorvalley as a unique group, and results (not reported here) are confirmed. Due to theoretical considerations, it is not possible to merge Turin with other groups. However, we run an outlier analysis, removing one by one all parenting firms, and we check that our results about Turin are not affected by the inclusion or removal of any specific firm. The coefficient for the rest of Italy instead is quite volatile when running this analysis.

As we mentioned in the theory section, a positive role of parenting in clusters might be attributed to localization economies, such as the presence of high quality employees that might ease the process of substitution of leaving employees. Alternatively, this process might also be driven or reinforced by the presence of specific local institutions, as those characterizing the Motorvalley. Density when the parenting event occurs could be a better proxy for localization economies in a cluster than a simple dummy for parenting. However, the effect of density might be non-linear, and might even become negative if it generates too much competition on the labor market. In Model 3, we substitute the *Parenting Event* dummy with a measure of the density of motorcycle firms computed at the cluster level and at the time of the parenting event[9]. In Model 4, we a use a logarithmic specification of density[10] at

[9] This measure is computed at the province (NUTS3) level for firms located in the rest of Italy. Therefore it varies both because of changes in the year of the parenting event and because of the actual province where the event occurs.
[10] We use the logarithm in base 2, so that estimated hazard ratios refer to a doubling density.

the parenting event, to take into account that the additional effect of density might reduce as density increases. If localization economies matter, we would expect to find a positive association between cluster density when parenting occurs and survival chances. If other factors drive the results of Model 2, then we should observe no relation between cluster density when parenting and the hazard rate.

Results show that the advantages from parenting in the two clusters of Milan and the Motorvalley are related to the level of density at the time of spinoff generation. In particular, a unit increase in density yields a 1.1% lower hazard rate in the Milan area and a 3.8% lower hazard rate in the Motorvalley. Results from Model 4 show that a doubling density is associated to a 8% lower hazard rate in Milan and a 12% lower hazard rate in the Motorvalley. This evidence is consistent with the idea that advantages from parenting in clusters might stem from localization economies. However, institutions are not completely ruled out, as they might explain the different magnitude of the coefficients that we find in Milan and the Motorvalley. In fact, institutions favouring the circulation of workers and knowledge might amplify the role of standard localization economies.

The estimates of density when parenting in the Turin area also offer some insights. Here we find that a unit increase in density is associated to a 1.5% higher hazard rate and that doubling density is associated to a 9% higher hazard rate. This finding is consistent with our story of excess competition on the factor market (and especially the labor market) induced by the presence of FIAT. The presence of more motorcycle firms in the area further increases this competition. Finally, we observe that the coefficient for the rest of Italy is not statistically significant, signalling that localization economies are not relevant outside the clusters.

5.1 Robustness checks

A major issue when dealing with the relation between parents and spinoffs, is how to disentangle the jungle of effects that might run in both directions. In particular, two aspects are particular worrisome[11]. First, the literature has showed that better firms generate more spinoffs (Klepper, 2009). Therefore, the relation that we find between parenting and survival might be due not to the parenting event, but to parent superior capabilities that determine both spinoff generation and the parent superior performance. Second, other studies have also showed that some spinoffs are pushed from their parents when they are in bad waters (Dahl and Reichstein, 2009). So, it might well be that a negative association between parenting and survival is not due to the parenting event itself, but that both are driven by pre-existing adverse conditions.

Overall, our data do not allow us to properly deal with these endogeneity issues and therefore we cannot give a causal interpretation to our results. However, we think we can provide some evidence suggesting that there might be a role of the parenting event, beyond the above considerations. To this purpose, we adopt two strategies. First, we consider that any effect attributable to the parenting event should be stronger at a time close to the event itself, and then fade away over time. In Model 5, we add two dummy variables indicating: 1) *Early Phase*: from period 1 to period 8 after the parenting event; 2) *Late Phase*: from period 9 after the parenting event[12]. Results show no immediate relation between parenting and survival (the coefficient of *Parenting Event* is positive, but not significant), a 48% lower hazard rate in the early phase after parenting, and no difference in hazard rates when the parenting event is far in time. However, these results do not rule out the possibility that the firms' characteristics driving both spinoff generation and parent performance change over time, so that firm performance is highest at the time of the event, and then declines over time.

[11] We thank two anonymous reviewers for these observations.

[12] We chose 8 as a threshold as it is median value of survival after parenting. Results are robust to different specification of the threshold (from 5 to 11), and also to different structures of time dummies (up to 5).

INSERT FIGURE 2 ABOUT HERE

Second, we build a control sample to better match the characteristics of parent firms. Figure 2 shows the survival curves of all firms in our sample, distinguishing between two groups: parenting and non-parenting firms. The graph clearly points out that the suspects about the heterogeneity of the groups are well grounded. Our data do not allow us to employ sophisticated matching algorithms, such as the propensity score (Rosenbaum and Rubin 1983). Therefore, we use exact matching, adapting it to our specific needs. Moreover, although we can look for firms that are similar to parents according to observable characteristics, the matching procedure does not allow us to claim that the parenting event is really exogenous, as it might be related to unobservable features of the firm.

For each parenting event, we run the following procedure. First, we look for companies that survive at least until the period in which the parenting event occurs. Within this restricted set of companies, we look for a match over the following dimensions: 1) entrants background; 2) geographical location, at the province level; 3) year of entry[13]. If one or more firms perfectly match the parenting firm, we include them in the control group, assigning them weights summing up to one. If we do not find any perfect match, we relax the conditions on the three dimensions[14]. This procedure gives a matched sample of 158 firms, of which 56 are parenting firms and 102 controls[15].

[13] Notice that the combination of the last two dimensions univocally determines the values of all other control variables.

[14] We assume that spinoffs, experienced firms and experienced entrepreneurs are closer to each other, than they are to inexperienced firms. We also look for firms in the same cluster, when this includes more provinces, and for firms founded in a range of +/- 3 years. We take as control(s) all firms satisficing the same number of conditions. If more than one firm is included, appropriate weights are given. Finally, in some cases we further relax the geographical boundary, considering firms in the same region, and the temporal boundary considering firm in a range of +/- 5 years.

[15] Both parenting firms and controls may appear more than once.

INSERT FIGURES 3, 4 AND 5 ABOUT HERE

Figure 3 reports the survival curves of the two groups of parenting and non-parenting firms in the matched sample. The survival patterns are more similar, but they still diverge for high values of age. However, this is consistent with an effect of parenting events that cumulates over time. Since by construction all firms in the matched sample survive until the period in which the parenting event occurs, we can compare the survival patterns of the two groups looking at what happens after that time. In Figure 4, the analysis time on the horizontal axis is not firm age (time since entry) but time since the parenting event (for parent firms) and the corresponding age (for control firms). The survival patterns between the two groups are quite different, suggesting that even if they were similar before the parenting event, they diverge after it. Estimates from the Cox regression show that after the parenting event parent firms have a 49% lower hazard rate compared to non-parenting firms ($p<0.001$). Finally, Figure 5 shows the survival patterns of four groups of firms: parenting firms in the clusters of Milan and Motorvalley (grouped together), parenting firms in Turin, and their respective control groups. The survival patterns of the two control groups are quite similar, parenting firms in Turin have lower survival rates, whereas parenting firms in Milan and the Motorvalley have a survival advantage over their control firms.

6. Conclusions

In this paper, we showed that in the Italian motorcycle industry parenting events in general are associated to lower hazard rates. We also showed that this relation differs across geographical areas. Parenting events occurring in the two clusters of Milan and the Motorvalley are associated to lower hazard rates, whereas those occurring in the Turin area present higher hazard rates. We propose that these different patterns might be related to the role that clusters characteristics have on the probability of finding adequate substitutes for leaving employees. In the case of Turin, we think that the presence of FIAT, the almost monopolistic leader of the Italian automobile industry, was a major driver of the observed patterns, as it induced both competition and transformation in the labor market. Our explanation is in line with empirical findings about the negative impact of a dominant and booming sector on related industries (Corden and Neary 1982; Fitjar and Timmermans, 2019). In the cases of Milan and the Motorvalley, we think that localization economies are relevant, as results show that hazard rates are lower when density at the time of parenting is higher. However, the decrease in the hazard rate associated to a unit density increase is higher in the Motorvalley than in Milan, suggesting that its institutional context, by favouring the circulation of workers and knowledge (Brusco 1982; Capecchi 1990), might amplify the role of standard localization economies.

We acknowledge some important limitations in our work. First, limited sample size and high variability do not allow us to obtain precise estimates of parenting events outside the three clusters and therefore to test whether parenting in clusters is more beneficial or less harmful than parenting outside clusters. Future work could focus on this issue, and also consider whether firm-specific factors are more relevant outside the clusters. Second, given our data, we cannot consider as causal effects the relations that we find between parenting events and survival. The processes leading to spinoff formation are a huge source of endogeneity, and the performance of a firm after a parenting event is certainly influenced by the factors that lead to the creation of a spinoff, either in a positive or a negative manner. Third, our results provide only partial and indirect evidence of the theory that we laid out. In particular, our data do not allow us to observe the employees leaving the parent and their characteristics, as well as the actual substitution process occurring in parenting firms after these employees leave to form a spinoff. One might expect that key employees leaving a firm might be more difficult to substitute. Moreover, the impact of leaving employees and their substitution could also extend to other unexpected forms of employee mobility that do not involve spinoff formation. In this work, we simply assume that the substitution process can be more or less easy or costly depending on the contextual conditions. We hope that these shortcomings might be addressed in future work, by employing databases with complete information about the mobility of all employees.

Our work also suggests that the welfare implications of the spinoff phenomenon may differ across regions. In regions where spin-off effects are detrimental to their parents we can still expect that their generation compensates for this loss, so the net effect will be positive. It is beyond the scope of our analysis to investigate these dynamics thoroughly, however we acknowledge that welfare effects of spin-off formation are important because of their policy implication at regional level and should deserve attention in future research.

Overall, our work confirms results from previous studies about the positive relation between parenting events and performance in manufacturing industries that have emphasized the role of firm-specific and employee-specific factors (McKendrick, Wade, and Jaffee 2009, Ioannou 2014; Kim and Steensma 2017) and suggests that looking also at contextual factors can improve our understanding about the phenomenon.

Our results contribute to the literature about spinoffs (Klepper 2007) and employee entrepreneurship (Agarwal, Gambardella, and Olson 2016), by showing that contextual factors are related not only to the patterns of spinoff formation (Cheyre, Klepper, and Veloso 2015, Starr, Balasubramanian, and Sakakibara 2016) and performance (Cusmano, Morrison, and Pandolfo 2015; Capone, Malerba, and Orsenigo 2019; Morrison and Boschma 2019), but also to parent performance.. We also contribute to the evolutionary geography literature, that has emphasized the role of spinoffs to explain the uneven distribution of economic and innovation activities in space (Boschma and Frenken 2006; Martin and Sunley 2006), and in particular to its recent institutional turn (Boschma and Frenken 2009; MacKinnon et al. 2009;

Boschma and Capone 2015; Pike et al. 2016; Cortinovis et al. 2017; Antonietti and Boschma 2018), by showing how the institutional context interacts with the evolutionary mechanism of capabilities reproduction that characterizes the link between parents and spinoffs.

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TABLES

Table 1. Summary statistics about firms parenting events, by geographical area

Summary Statistics	Motorvalley	Milan area	Turin area	Rest of Italy	Total
Number of firms	76	190	131	244	641
Number of exits	69	183	131	233	616
Time-at-risk	924	1685	803	1834	5246
Parenting events	11	26	8	11	56
Parenting firms	6	18	8	8	40
Exits of parenting	5	17	8	4	34
Time-at-risk after parenting	146	390	42	204	782

Notes: Motorvalley includes the provinces of Modena and Bologna. Milan area includes the provinces of Milan, Monza-Brianza and Varese. Turin area includes the province of Turin. Rest of Italy includes all other provinces in Italy.

Table 2. Cox proportional hazard model, hazard ratios. Italian motorcycle producers, 1893-1993.

VARIABLES	(1)	(2)	(3)	(4)	(5)
Parenting Event	0.7008**				1.0499
	(0.121)				(0.1867)
Parenting in Motorvalley		0.6264***			
		(0.1066)			
Parenting in Milan Area		0.6102***			
		(0.112)			
Parenting in Turin Area		1.5018***			
		(0.062)			
Parenting in Rest of Italy		0.3464*			
		(0.2039)			
Density at Parenting in Motorvalley			0.9618***	0.8773***	
			(0.0121)	(0.0433)	
Density at Parenting in Milan Area			0.9889***	0.9183**	
			(0.0042)	(0.0317)	
Density at Parenting in Turin Area			1.0154***	1.0925***	
			(0.0015)	(0.0097)	
Density at Parenting in Rest of Italy			0.84	0.8276	
			(0.154)	(0.2587)	
Parenting – Early Phase					0.5199***
					(0.1245)
Parenting – Late Phase					0.824
					(0.2433)
Spinoff	0.5068***	0.5109***	0.5087***	0.5084***	0.5001***
	(0.0873)	(0.095)	(0.0929)	(0.095)	(0.0878)
Experienced Entrepreneur	0.5905***	0.5816***	0.5798***	0.5811***	0.5915***
	(0.0415)	(0.043)	(0.0417)	(0.0419)	(0.0426)
Experienced Firm	0.4432***	0.4406***	0.4378***	0.4382***	0.443***
	(0.0408)	(0.0409)	(0.0404)	(0.0407)	(0.0411)
Parent Duration	0.9897***	0.9895**	0.9897**	0.9897**	0.9901**
	(0.004)	(0.0041)	(0.0041)	(0.0042)	(0.004)
Motorvalley	0.7254***	0.7185**	0.7278**	0.7344**	0.7249***
	(0.0887)	(0.0957)	(0.0959)	(0.0975)	(0.0879)
Turin area	0.9248	0.8963*	0.8922	0.89*	0.9286
	(0.0651)	(0.0581)	(0.0627)	(0.0626)	(0.0636)
Milan area	0.866	0.8689	0.8524	0.8597	0.8674
	(0.0913)	(0.0928)	(0.0957)	(0.0991)	(0.0899)
Regional GDP	1.0099***	1.0098***	1.0097***	1.0097***	1.01***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Industry density	1.0122***	1.0124***	1.0125***	1.0123***	1.0122***
	(0.0039)	(0.0041)	(0.0041)	(0.0041)	(0.0039)
Population	3.0977	1.9385	4.5225	5.7547	2.6685
	(10.152)	(5.574)	(14.94)	(19.35)	(8.513)
Related variety	0.9999***	0.9999***	0.9999***	0.9999***	0.9999***
	(2.84e-07)	(2.87e-07)	(2.84e-07)	(2.8e-07)	(2.83e-07)
Education	0.1946***	0.1983***	0.192***	0.1932***	0.1934***
	(0.058)	(0.0612)	(0.0599)	(0.0598)	(0.0573)
Entry before WW1	3.622***	3.6176***	3.6107***	3.6184***	3.6384***
	(0.4378)	(0.4451)	(0.4545)	(0.4478)	(0.4428)
Entry btw Wars	1.9866***	1.9539***	1.9669***	1.9787***	1.9835***
	(0.2475)	(0.2544)	(0.2633)	(0.2602)	(0.2476)
Entry before WW1 * T	0.9662***	0.9648***	0.967***	0.9684***	0.9659***
	(0.0087)	(0.0101)	(0.0095)	(0.0093)	(0.0088)
Entry btw Wars * T	0.9781**	0.9788*	0.9786*	0.9784*	0.9785**
	(0.0108)	(0.0109)	(0.011)	(0.0111)	(0.0106)
Number of firms	641	641	641	641	641
Number of failures	616	616	616	616	616
Number of observations	4997	4997	4997	4997	4997

Note: Standard errors clustered at the province level in parentheses. *** p < 0.01; ** p < 0.05; * p<0.1

Table 3. Cox proportional hazard model, coefficients. Italian motorcycle producers, 1893-1993.

VARIABLES	(1)	(2)	(3)		(5)
Parenting Event	-0.3556**				0.0487
	(0.1727)				(0.1778)
Parenting in Motorvalley		-0.4678***			
		(0.1702)			
Parenting in Milan Area		-0.494***			
		(0.1836)			
Parenting in Turin Area		0.4067***			
		(0.0413)			
Parenting in Rest of Italy		-1.0601*			
		(0.5884)			
Density at Parenting in Motorvalley			-0.0389***	-0.1309***	
			(0.0126)	(0.0494)	
Density at Parenting in Milan Area			-0.0111***	-0.0852**	
			(0.0043)	(0.0345)	
Density at Parenting in Turin Area			0.0153***	0.0884***	
			(0.0015)	(0.0089)	
Density at Parenting in Rest of Italy			-0.1743	-0.1892	
			(0.1833)	(0.3126)	
Parenting – Early Phase					-0.6541***
					(0.2394)
Parenting – Late Phase					-0.1936
					(0.2953)
Spinoff	-0.6797***	-0.6716***	-0.6759***	-0.6764***	-0.693***
	(0.1723)	(0.186)	(0.1826)	(0.1868)	(0.1755)
Experienced Entrepreneur	-0.5268***	-0.5419***	-0.545***	-0.5429***	-0.5251***
	(0.0702)	(0.074)	(0.072)	(0.0721)	(0.072)
Experienced Firm	-0.8137***	-0.8196***	-0.826***	-0.825***	-0.8142***
	(0.092)	(0.0928)	(0.0922)	(0.0929)	(0.0927)
Parent Duration	-0.0103**	-0.0106**	-0.0104**	-0.0103**	-0.01**
	(0.004)	(0.0041)	(0.0042)	(0.0043)	(0.0041)
Motorvalley	-0.3210***	-0.3306**	-0.3177**	-0.3088**	-0.3217***
	(0.1223)	(0.1333)	(0.1317)	(0.1328)	(0.1213)
Turin area	-0.0782	-0.1094*	-0.1141	-0.1165*	-0.074
	(0.0704)	(0.0649)	(0.0703)	(0.0703)	(0.0685)
Milan area	-0.1439	-0.1406	-0.1597	-0.1511	-0.1423
	(0.1054)	(0.1068)	(0.1123)	(0.1153)	(0.1036)
Regional GDP	0.0099***	0.0097***	0.0097***	0.0097***	0.01***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Industry density	0.0121***	0.0123***	0.0124***	0.0122***	0.0121***
	(0.0038)	(0.004)	(0.0041)	(0.004)	(0.0038)
Population	1.1307	0.6619	1.5091	1.75	0.9815
	(3.2771)	(2.8753)	(3.3035)	(3.3625)	(3.1901)
Related variety	-1.00e-06***	-1.01e-06***	-9.91e-07***	-9.83e-07***	-1.01e-06***
	(2.84e-07)	(2.87e-07)	(2.84e-07)	(2.8e-07)	(2.83e-07)
Education	-1.6366***	-1.6181***	-1.6504***	-1.644***	-1.6432***
	(0.298)	(0.3084)	(0.3119)	(0.3096)	(0.2964)
Entry before WW1	1.2870***	1.2858***	1.2839***	1.286***	1.2916***
	(0.1209)	(0.123)	(0.1259)	(0.1237)	(0.1217)
Entry btw Wars	0.6864***	0.6698***	0.6765***	0.6825***	0.6849***
	(0.1246)	(0.1302)	(0.1339)	(0.1315)	(0.1248)
Entry before WW1 * T	-0.0344***	-0.0358***	-0.0335***	-0.0321***	-0.0347***
	(0.009)	(0.0104)	(0.0098)	(0.0096)	(0.0091)
Entry btw Wars * T	-0.0222**	-0.0214*	-0.0217*	-0.0219*	-0.0217**
	(0.0111)	(0.0111)	(0.0113)	(0.0114)	(0.0108)
Number of firms	641	641	641	641	641
Number of failures	616	616	616	616	616
Number of observations	4997	4997	4997	4997	4997

Note: Standard errors clustered at the province level in parentheses. *** p < 0.01; ** p < 0.05; * p<0.1

FIGURES

Figure 1. Maximum number of firms active in one year in the motorcycle industry across Italian provinces.

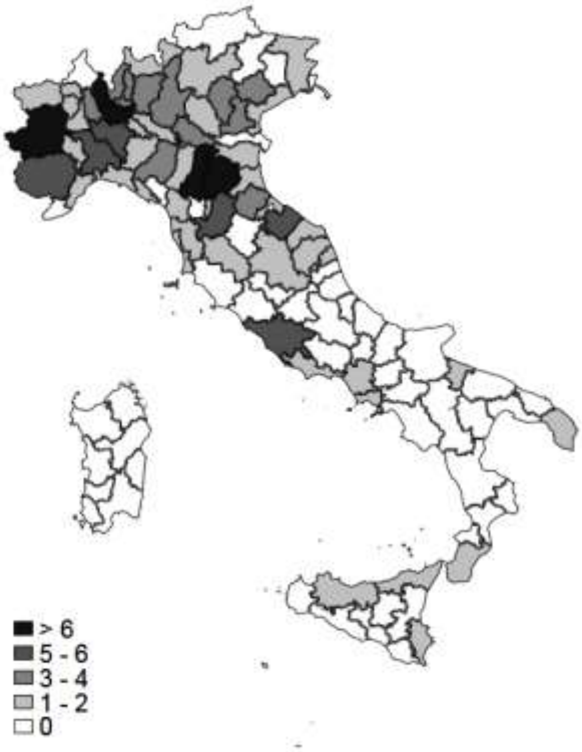


Figure 2. Kaplan-Meier survival functions of parenting and non-parenting firms, full sample.

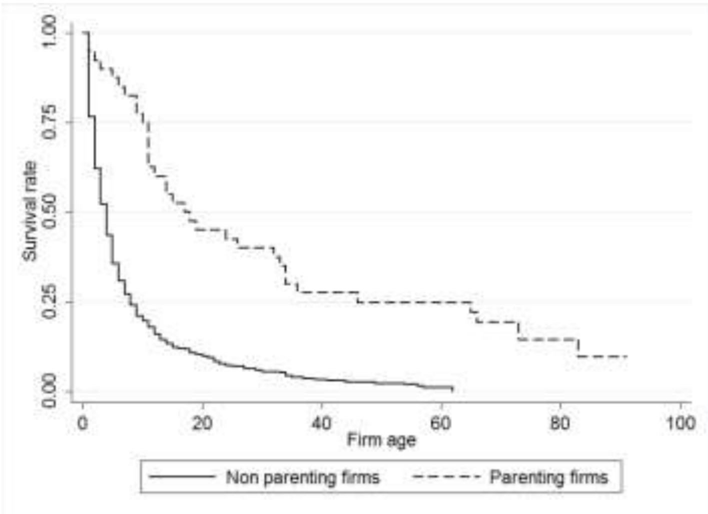


Figure 3. Kaplan-Meier survival functions of parenting and non-parenting firms, matched sample.

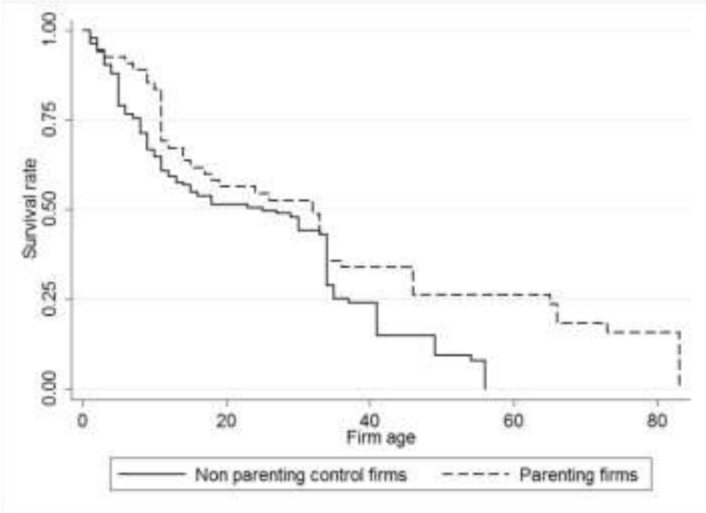


Figure 4. Kaplan-Meier survival functions of parenting and non-parenting firms after a parenting event, matched sample.

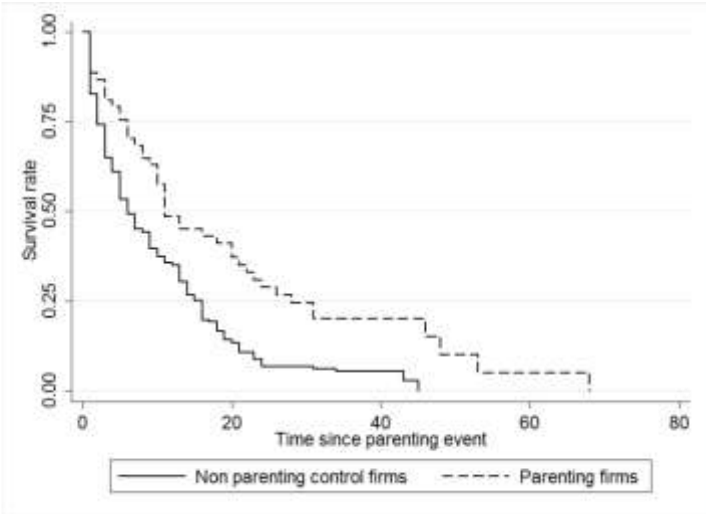
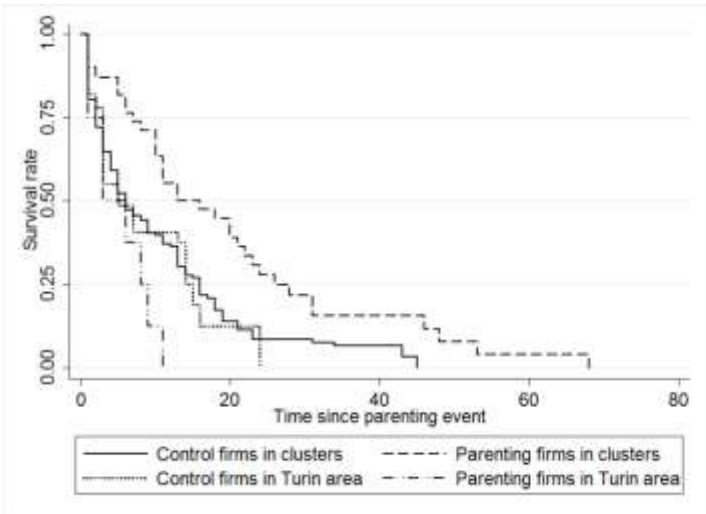


Figure 5. Kaplan-Meier survival functions of parenting and non-parenting firms after a parenting event across geographical areas, matched sample.



APPENDIX

Table A1. Descriptive statistics, expanded sample (4997 observations).

Variable	Observations	Mean	St. Dev.	Min	Max
Parenting Event	4997	0.0987	0.2982	0	1
Spinoff	4997	0.1485	0.3556	0	1
Experienced Entrepreneur	4997	0.3324	0.4711	0	1
Experienced Firm	4997	0.3108	0.4629	0	1
Inexperienced Entrant	4997	0.1669	0.3729	0	1
Parent Duration	4997	6.0442	17.8226	0	91
Motorvalley	4997	0.1783	0.3828	0	1
Milan area	4997	0.313	0.4638	0	1
Turin area	4997	0.1595	0.3662	0	1
Rest of Italy	4997	0.3492	0.4768	0	1
Regional GDP[a]	4997	119.5697	17.797	56	164
Industry density	4997	20.2277	13.8012	1	55
Population[b]	4997	0.0223	0.0128	0.0034	0.0662
Related variety	4997	166239.5	154034.1	3835	716415
Education	4997	1.1617	0.1499	0.677	1.622
Entry before WW1	4997	0.1739	0.3791	0	1
Entry btw Wars	4997	0.389	0.4876	0	1
Entry after WW2	4997	0.4267	0.4946	0	1

[a] Italy = 100; [b] Share of Italian population in a given year.

Table A2. Correlation coefficients, expanded sample (4997 observations)

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)	**Parenting**	1																	
(2)	**Spinoff**	0.143	1																
(3)	**Expentr**	-0.0326	-0.2947	1															
(4)	**Expfirm**	0.0098	-0.2804	-0.4738	1														
(5)	**Inexp**	-0.1175	-0.1869	-0.3158	-0.3006	1													
(6)	**Parentdur**	0.0325	0.8122	-0.2393	-0.2278	-0.1518	1												
(7)	**Motorvalley**	0.0528	0.0981	-0.0346	0.0035	-0.0403	0.0234	1											
(8)	**Milan area**	0.1327	0.1065	-0.1007	0.0391	-0.0567	0.0597	-0.3144	1										
(9)	**Turin area**	-0.0671	-0.1174	0.1405	-0.0752	0.0073	-0.1347	-0.2029	-0.294	1									
(10)	**Rest of Italy**	-0.1199	-0.0922	0.0178	0.0169	0.0819	0.0266	-0.3412	-0.4944	-0.3191	1								
(11)	**RegGDP**	-0.0246	-0.0382	-0.0355	0.0214	0.016	-0.0628	-0.2054	0.4003	0.0997	-0.301	1							
(12)	**Density**	-0.1072	-0.0009	0.0529	-0.0952	0.0055	-0.0481	-0.171	0.4344	0.1167	-0.375	0.5598	1						
(13)	**Population**	0.1219	0.0775	-0.0266	-0.0482	-0.0186	-0.0128	-0.2697	0.574	0.3314	-0.5962	0.3639	0.4026	1					
(14)	**Relvar**	-0.0983	0.0474	0.0129	-0.0441	-0.049	0.0968	-0.2186	0.4377	-0.144	-0.1396	0.6132	0.4285	0.1968	1				
(15)	**Education**	0.1048	-0.1076	0.0303	0.0019	0.0598	-0.1591	-0.3196	0.245	0.3092	-0.2192	0.1315	0.1621	0.3436	-0.2319	1			
(16)	**PreWW1**	0.0607	-0.0817	-0.0492	0.0033	0.1529	-0.1198	-0.1475	0.0456	0.1549	-0.0448	-0.0841	-0.144	0.0946	-0.2796	0.7236	1		
(17)	**BtwWars**	0.0609	0.1331	0.141	-0.2095	-0.0974	0.0316	-0.1508	0.1164	0.1603	-0.1153	-0.1211	0.2472	0.1961	-0.1541	0.0599	-0.3661	1	
(18)	**PostWW2**	-0.1239	-0.0598	-0.0959	0.1822	-0.0118	0.0678	0.2715	-0.1713	-0.2796	0.1634	0.1458	-0.1267	-0.2548	0.3488	-0.6087	-0.3958	-0.6884	1

Table A3. Cox proportional hazard model with time-varying regional covariates, hazard ratios. Italian motorcycle producers, 1893-1993.

VARIABLES	(1)	(2)	(3)	(4)	(5)
Parenting Event	0.691**				1.0078
	(0.1269)				(0.1972)
Parenting in Motorvalley		0.6518**			
		(0.1157)			
Parenting in Milan Area		0.5813***			
		(0.0859)			
Parenting in Turin Area		1.4882***			
		(0.0587)			
Parenting in Rest of Italy		0.3505*			
		(0.2019)			
Density at Parenting in Motorvalley			0.9641***	0.8863**	
			(0.0124)	(0.0451)	
Density at Parenting in Milan Area			0.9871***	0.9074***	
			(0.0034)	(0.0241)	
Density at Parenting in Turin Area			1.0137***	1.0872***	
			(0.0015)	(0.0091)	
Density at Parenting in Rest of Italy			0.8463	0.8487	
			(0.1519)	(0.2602)	
Parenting – Early Phase					0.5339***
					(0.1275)
Parenting – Late Phase					0.862
					(0.2725)
Spinoff	0.5416***	0.5452***	0.5434***	0.5413***	0.5354***
	(0.0813)	(0.0894)	(0.0861)	(0.0887)	(0.0808)
Experienced Entrepreneur	0.5707***	0.562***	0.5619***	0.5624***	0.5714***
	(0.0362)	(0.0378)	(0.0372)	(0.037)	(0.0368)
Experienced Firm	0.4361***	0.4336***	0.4303***	0.4311***	0.4357***
	(0.043)	(0.0426)	(0.0421)	(0.0427)	(0.0432)
Parent Duration	0.9882***	0.9879**	0.9881**	0.9883***	0.9886***
	(0.0039)	(0.0041)	(0.0041)	(0.0041)	(0.0039)
Motorvalley	0.7407***	0.7315**	0.7435**	0.7508**	0.7402***
	(0.0848)	(0.092)	(0.0915)	(0.0931)	(0.0842)
Turin area	0.9106	0.8818*	0.8762	0.8744*	0.9135
	(0.0683)	(0.0626)	(0.067)	(0.0664)	(0.06778)
Milan area	0.7944	0.7971	0.7821	0.7888	0.7935
	(0.1273)	(0.126)	(0.1321)	(0.1343)	(0.1269)
Regional GDP§	1.0028	1.0025	1.0027	1.0026	1.0029
	(0.0046)	(0.0045)	(0.0045)	(0.0045)	(0.0046)
Industry density§	1.0105*	1.0107*	1.0107*	1.0105*	1.0106*
	(0.0057)	(0.0058)	(0.0059)	(0.0059)	(0.0058)
Population§	27.1303	19.2281	46.5682	58.8987	24.041
	(116.2)	(73.94)	(203.68)	(257.97)	(101.12)
Related variety§	1.0000	1.0000	1.0000	1.0000	1.0000
	(5.35e-07)	(5.28e-07)	(5.35e-07)	(5.35e-07)	(5.35e-07)
Education§	0.2369***	0.2452***	0.2407***	0.2431***	0.2356***
	(0.0748)	(0.0823)	(0.0822)	(0.0828)	(0.0738)
Entry before WW1	3.8322***	3.8015***	3.7914***	3.8025***	3.849***
	(0.6106)	(0.6215)	(0.6286)	(0.6271)	(0.6187)
Entry btw Wars	2.0732***	2.0346***	2.0474***	2.0627***	2.0695***
	(0.271)	(0.2799)	(0.2858)	(0.2826)	(0.2711)
Entry before WW1 * T	0.9489***	0.9485***	0.9501***	0.9517***	0.9486***
	(0.0091)	(0.0104)	(0.0097)	(0.0096)	(0.0091)
Entry btw Wars * T	0.9689**	0.9697**	0.9698**	0.9696**	0.9693**
	(0.0122)	(0.0125)	(0.0125)	(0.0126)	(0.012)
Number of firms	641	641	641	641	641
Number of failures	616	616	616	616	616
Number of observations	4997	4997	4997	4997	4997

Notes: Standard errors clustered at the province level in parentheses. § Time-varying variable; *** $p < 0.01$; ** $p < 0.05$; * $p<0.1$