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Team composition in pushed and pulled spin-outs

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Abstract

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ABSTRACT

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INTRODUCTION

Diversity of the founding team is a determinant factor of the performance and the survival of the new venture (Ely, 2004; Steffens et al., 2012; Van Der Vegt et al., 2005). The recognition of the importance of the team dimension in entrepreneurship research has made it more conventional to associate entrepreneurship with team literature. While this has pushed entrepreneurial team research to focus on the link between the team demographics and the performance of the venture, little attention is given to the team itself and its formation process. Particularly there is scarce research investigating the circumstances shaping the composition of the entrepreneurial teams. Considering the distinct setup where teams of founders are allied in an organization, forming spin-outs, the state of the corporate has an explicit effect on the formation of these teams. In this spirit of employee entrepreneurship (spin-outs), Buenstorf (2009) and Bruneel et al., (2013) distinguish between pulled spin-outs raising from opportunities and pushed spin-outs representing necessity entrepreneurship.

The distinction in the nature of spin-outs based on the triggering factors exposes a variation in the performance and survival of these ventures (Andersson & Klepper, 2013; Rocha et al., 2015). A potential explanation to the observed survival gap is the human capital endowment when establishing the spin-out (Rocha et al., 2015a). Spin-outs are particular forms of entrepreneurship where the entrepreneurs benefit from the disposal of knowledge and human capital when founding the new firm. Referring to what has been mentioned above concerning the importance of the composition of the founding teams on the success of the venture; its investigation by disassociating the pulled from the pushed spin-out would reveal better understanding of the variation in the performance and survival.

The focus here is put on the investigation of the team composition in pushed and pulled spin-outs. The categorization of the nature of the spin-out is similar to Rocha et al., (2015) where necessity spin-outs are distinguished from the opportunity spin-outs by identifying adverse events striking the incumbent firm. The pushed spin-outs are then identified as new ventures formed by the former employees of a firm with discontinued activity. Forming these entrepreneurial groups is a social process involving individuals with respective attributes. In the study of team formation, both attributed (such as age and gender) and achieved (for example occupation and education) characteristics of the individuals are adopted to measure the diversity of the teams. The purpose of this paper is to investigate the significance of the triggering event in employee entrepreneurship on the differences in the teams' composition.

Empirically, 5,749 spin-outs founded by teams formed in 6,308 firms in Sweden during the period 2001-2012 are considered. The data is retrieved from the Swedish matched employer-employee database collected by Statistics Sweden and allows distinguishing the pushed from the pulled spin-outs accordingly with the definition mentioned above. As a first step, analyzing four dimensions of diversity (gender distribution, education standard deviation, position variance, and pay dispersion), an

event analysis is applied to inspect the recurrence of particular combination in each of the types of spin-outs. Second, estimating the treatment effect exposes the impact of an adverse event on the diversity of the formed entrepreneurial teams. The results of these two procedures confirm the conjecture about the increased heterogeneity in the teams forming a spin-out after the incumbent firm has ceased her activities. The observed outcome provide a partial explanation to previous confirmed evidence on the better performance of pushed spin-outs. Heterogeneous teams enjoy a greater span of skills and capabilities and therefore have an advantage over the homogeneous teams.

THEORETICAL CONTEXT

Pushed and pulled entrepreneurship

Employees' joint transition from paid employment to self-employment is a form of entrepreneurial activity. In cases where several founders leave one and the same firm to engage in such activity, the newly established ventures can be referred to as spin-outs. These spin-outs are then founded by a team of former employees sharing a common employer and common working space. Such a transition can be voluntary and trigged by a spotted opportunity or a necessity provoked by deteriorating working conditions (Bruneel et al., 2013; Buenstorf, 2009; Dick et al., 2013) allowing the distinction between pushed and pulled spin-outs. The opportunity (pulled) spin-outs emerge when employees acquire knowledge and skills that enable them to spot opportunities and openings on the market (Shane, 2000). The firm is not always capable to pursue these identified opportunities and therefore the alternative is left for the employees to apprehend. Necessity (pushed) spin-outs are the outcome of a deterioration of the working conditions reducing the attractiveness of the actual working place (Buenstorf, 2009; Klepper & Thompson, 2010) and hence reducing the opportunity cost related to a shift in employment. Necessity spin-outs are often triggered by adverse events such as a change in management, involuntary exit (Eriksson & Kuhn, 2006) and acquisitions (Klepper & Thompson, 2006).

Buenstorf's distinction between the two types of spin-outs builds on the nature of the factors setting the spinning out process in motion. Put differently, the nature of the activity is classified relying on the motivation encouraging it. In the initial phases of the spin-out process, the major difference separating necessity from opportunity spin-outs is the presence of adverse chocks pushing the employees to be pushed rather than pulled into entrepreneurship (Eriksson & Kuhn, 2006). Borrowing arguments from the behavioral literature, the ties and associations rising in these elementary stages are different for the pushed and pulled spin-outs. Consequently, the nature of the teams founding the new venture and the characteristics of the individuals are different in the two alternatives. As Wagner (2005) argues, necessity entrepreneurship engage individuals who are more risk adverse. Moreover, comparing the individual characteristics of the entrepreneurs suggests a significant difference between the pushed and the pulled entrepreneurs. This split suggests that the context defines the mechanism by which the ventures are created as well as the attributes of the involved entrepreneurs.

Formation of the entrepreneurial team

Entrepreneurship is not just a matter of individual characteristics and who becomes an entrepreneur but is also a process depending on the environment and its condition. The characteristics of the individuals prone to engage in entrepreneurial activities have long been discussed and explored. Equally, the conditions inspiring entrepreneurial activities have been settled. With teams of entrepreneurs, an identical reasoning applies though on a different level involving more than the characteristics of a single entrepreneur and hence the composition and the interactions of the members becomes a factor in the system.

While literature on team formation describes the process as random, difficult and emerging from already established networks (Vyakarnam et al., 1998), behavioral economists interpret the team

formation process from a profit maximizing perspective. Following the reasoning of this approach, when deciding the contingencies of entrepreneurship and the option of engaging in the process as a team, the entrepreneur is a rational agent basing her decisions on the predicted future outcome. The decision to form an entrepreneurial team rather than engaging in solo entrepreneurship becomes a trade-off between an increased collective profit and a limited ownership share (Martin Ruef, 2010).

A different aspect to entrepreneurial team formation is the sociological approach where the social networks have a crucial impact. The latter rationale implies that entrepreneurs define their teams building on demographic and network ties. Accordingly, Bird (1989) provides an illustration of team formation process based on interpersonal theory and identifies five scenarios bringing partners together. Partnership emerges from displayed positive attributes (such as physical appearance and skills), proximity (geographical and network), attractiveness (enjoying the company of the partner), homogeneity (similarities in attitudes and interest), and complementarity of personalities and skills. Being inspired by this social and demographic perspective, examining the formation of teams suggests that the context in which the teams upsurge defines its demographic composition (Hellerstedt, 2009). Taking the context of a complex set-up, Wiersema and Bantel (1993) report that teams formed in such a context are characterized by heterogeneity. Since the complexity of the environment reflects a climate where the individuals face a great number of input factors, it requires a better information processing and flexibility. Countering the heterogeneity of the environment, the teams formed in an organization under such circumstances are expected to gather members with diverse characteristics. The heterogeneity of the characteristics of the team members implies a wider range of skills and consequently the composition contributes to an improved management.

In Cooney's (2005) description of the process behind team formation, two scenarios can spark employee entrepreneurship and the formation of entrepreneurial teams. The formation of an entrepreneurial team can be the source of a perceived idea or a spotted opportunity. In this case, the individuals with the idea will form an optimal team for the implementation of the idea. A different team formation process is the situation where the entrepreneurial activity is pushed by a triggering event. Here the team is formed prior to the idea. Referring to the previous reasoning concerning the importance of the context, the scenario in which these teams emerge shape their diversity and their composition. Since entrepreneurship in general is described as risky activity associated with uncertainty, the teams in employee entrepreneurship are formed by members with similar characteristics as homogeneity dominates in uncertainty (Amason et al., 2006) and particularly for founding teams (Bird, 1989). However, when these teams are pushed into entrepreneurship; the complexity of the environment increases. The members of teams would then be more prone to cooperate with people with diverse background and skills. Hence, when the entrepreneurial activity is triggered by an event (pushed entrepreneurship), the entrepreneurial team exhibit more heterogeneity than the case of teams formed based on an idea (pulled entrepreneurship). In the later set-up, the individuals depart from more organized circumstances where communication and agreement is one of the crucial elements in the team (Bird, 1989). Moreover, there is a preference for homogeneity since with similarities individuals become more predictable and trust prevails more spontaneously. When it comes to pushed entrepreneurship, the entrepreneurs are under pressure and need to intercept the environment which results in the formation of heterogeneous teams increasing the information absorption capability and the range of skills.

Founders' characteristics in pushed and pulled entrepreneurship

As research within pushed and pulled spin-outs is still in need of a significant development, there is not much evidence distinguishing the personal characteristics of the founders of these firms. This is partly explained by the lack of appropriate data (Rocha et al., 2015). Yet, some attempts have been

made including the individual characteristics while studying the two types of spin-outs. Andersson & Klepper (2013) include individual traits when studying the determinant of pushed and pulled entrepreneurship. Their work does not provide a straightforward comparison between the attributes of entrepreneurs in pushed and pulled spin-outs, however their results suggest that while some characteristics of the founder such as age, university education and specialization seem to be decisive for the latter type of spin-out, they are insignificant for the formation of pushed spin-outs.

Although previous research does not shed much light on the distinctive characteristics of the entrepreneurs engaged in pushed and pulled spin-outs, it does provide evidence of its significance.

HYPOTHESES FORMULATION

Homophily theory suggests that people with similarities attract each other, implying that homogenous groups are more likely to be formed (McPherson et al., 2001; Ruef et al., 2003). A homogeneous distribution of characteristics and attributes is argued to facilitate the internal communication and prevent conflicts. The process of forming a homogeneous team gets less evident when the individuals only have access to "imperfect" information about their future team members (Parker, 2006). A similar scenario is defined when employees are pushed to spin-out. The derived main hypothesis is:

Founding teams are more heterogeneous in pushed than pulled entrepreneurship.

The heterogeneity of the teams is measured out of the different attributes of the members. From visible traits to background characteristics, pushed entrepreneurship is hypothesis to generate more heterogeneous combination of attributes compared to pulled entrepreneurship. Consistently with previous research in entrepreneurial team (studies such as Hellerstedt, 2009; Ruef et al., 2003; Martin Ruef, 2010; Steffens et al., 2012), the composition of the group of founders is investigated out of different diversity measures. As an apprehension for team composition diversity, three mechanisms (homophily, functionality, and status expectation) inspired by Ruef et al. (2003) are investigated using proxies such as gender, education, managerial position, and income.

The homophily view postulates that teams with similar ascribed characteristics will be formed. Gender is a common ascribed attribute identified as a driver of homophily in founding teams (Ruef et al., 2003) arguing that homogeneity in gender composition in founding teams is more likely to be observed than mixed gender teams. Referring to the reasoning distinguishing the team formation process in pushed and pulled entrepreneurship, the following is expected:

H1: Gender diversity increases with pushed spin-outs

In addition to gender as ascribed traits, achieved characteristics are considered when examining the diversity in team formation (c.f Hellerstedt, 2009). Such attributes are reflected for example in the educational background and the position of the individuals:

H2: Education background diversity increases with pushed spin-outs

H3: Managerial position diversity increases with pushed spin-outs

Finally, taking a sociodemographic dimension, it is argued within social psychology that status relationships are established between the individuals of a firm. The status categorizes the individuals in respective sociodemographic dimensions and attaches a certain expected behavior and performance to each group (Berger et al., 1972; Skvoretz & Fararo, 1996). Taking this to the context of the firm, a proxy for employees' status is their income. Connecting the status segregation with the entrepreneurial team formation process discussed earlier leads to the following fourth hypothesis

H4: Pay dispersion increases with pushed spin-outs

THE DATA AND VARIABLES

This paper engages the concepts of entrepreneurship with focus on teams and pulled and pushed spin-outs. Before the description of the data and the variables, definitions and delimitations of the concerned concept are presented.

The concept of entrepreneurship and team entrepreneurship

The definition of entrepreneurship is shadowed in the literature by the lack of a consensus (Shane & Venkataraman, 2000). Adoptions range from a scope putting the process as a central determinant (such as the definition provided by Gartner (1988)) to an approach where the individuals' behavior are the determinants of entrepreneurship (a view recognized for example by Davidsson (2005)). Entrepreneurship in this paper focuses on the process and therefore falls pretty close to the definition adopted by labour economists assimilating entrepreneurs with self-employed individuals. A similar definition is endorsed in several studies such as Evans & Leighton (1989), Hurst & Lusardi (2004) , and Blanchflower & Shadforth (2007) . Conformably to this perception of entrepreneurship, Simon Parker (2004) defines the entrepreneurs as *"… individuals who earn no wage or salary but who* derive their income by exercising their profession or business on their own account and at their own *risk."*. The advantage of recognizing such a definition of entrepreneurship is that it's a relatively easly measured and quantifiable proxy of the phenomenon. The process is the main determinant of entrepreneurship referred to in this study but with focus on the individual level and the characteristics of the individual entrepreneurs.

The same confusion and disagreement is confronted when dealing with the definition of entrepreneurial teams. It is common to interpreter team entrepreneurship as two or more individuals with common ownership (Kamm et al., 1990; Kamm, & Nurick, 1993; Ruef, et al., 2003), common management (Watson et al., 1995), common goals (Harper, 2008), or common fulltime working place (Eisenhardt & Schoonhoven, 1990). By analogy to the embraced definition of entrepreneurship, the definition of the entrepreneurial team in this study is at least two self-employed individuals operating in the same business.

Identifying pushed and pulled spin-outs

The identification of pulled and pushed spin-outs in this study is inspired by the procedure applied in Rocha et al. (2015).

First the spin-outs are localized in the data as new ventures were the founder shifted from paid-employment in t-1 to self-employment in t. Team entrepreneurship is recognized among these spin-outs as a venture formed by two or more individual sharing the same working place in t-1, shifting to self-employment in t, and founding a common venture. The next step distinguishes the pulled from the pushed spin-outs. The classification is identified by relating to the status of the incumbent firm at the time the concerned employees leave for self-employment. Table 1 illustrates the criteria separating the two forms of spin-outs.

INCUMBENT STATUS	TYPE OF SPIN-OUT	DESCRIPTION
Survival	Pulled	The survival status of the incumbent firm indicates that no changes are registered between t and t-1.

New	Pulled	The new status indicates that the firm is a newly established.
Shutdown	Pushed	The shutdown status of the firm indicates that the firm existed in t-1 but ceased its activity in t.

TABLE 1- Incumbent status and type of spin-out

The empirical analyses are applied to the register based Swedish employer-employee data collected by Statistics Sweden and covering observations over the period 2001-2012. This data is employed by previous studies in self-employment and labour mobility (such as Andersson & Klepper (2013); Broström & Baltzopoulos (2011); Lougui & Brostrom (2015)). This study tracks down 16,127 individuals employed in a total number of 6,308 firms and forming 5,749 spin-outs over the twelve studied years.

Dependent variables

The four attributes used as proxies for team diversity are based on Harrison & Klein's (2007) diversity constructs (separation, variety, and dispersion). The considered ascribed attribute is gender, constructed as the standard deviation inside the team and representing a separation measure. The first achieved characteristic accounted for is the managerial position of the team members and constructed as a team level standard deviation. Income and income disparity in the team is the coefficient of variation of average salaries (the average of three years' salary previous to the spin-out) following Harrison & Klein (2007):

$$\text{PayDispersion} = \frac{\sqrt{(\text{Salary}_{\text{ind}} - \text{Salary}_{\text{mean}})^2 / \text{n}}}{\text{Salary}_{\text{mean}}}$$

The final achieved characteristic studied in this paper is education background diversity. The educational background of the individuals covers their schooling discipline and is classified into 7 main divisions: Business administration, engineering, healthcare, humanity and art, natural science, social science, and other studies. The education background diversity is a blau index (following Harrison & Klein (2007)) where Education_i is the proportion of members in each category.

$$Educationbackgrounddiversity = 1 - \sum Education_i^2$$

Each construct (gender standard deviation, managerial position standard deviation, pay dispersion, and education background diversity) is an indicator of diversity in the team. Harrison & Klein (2007) define the three diversity types as difference in position or opinion (separation), difference in kind, source or category of knowledge or experience (variety), and difference in socially valued assets or resources (dispersion). Accordingly, gender and managerial position reflect separation while education background is a sign of variety and pay dispersion measures dispersion.

Independent variables

The diversity in the team of founders is compared in necessity (pushed) and opportunity (pulled) spin-outs. The triggering event is therefore the main explanatory variable in this study. As exposed above, the distinction is based on the status of incumbent firm. Two options describe the status of the firm:

survival or shutdown where a shutdown represents an adverse event and survival the absence of such a change. Hence, shutdowns are proxies for pushed spin-outs while survivals are representatives for pulled spin-outs.

The firm status is a binary variable taking the value "1" for a shutdown and the value "0" for a survival.

EMPIRICAL STRATEGY

The empirical approach in this paper is two-fold. To start, using an event analysis, the frequency of particular team combinations is presented for both pushed and pulled entrepreneurship. Second, a treatment effect is employed to establish the impact of an adverse event on the composition of the emerging entrepreneurial teams.

a. Event analysis

Dealing with structure of founding teams exposes a number of combination and different set-ups. The alliances emerging can be shaped out of its environment and the conditions driving its formation. In this paper, the examination of the different observed combinations of pushed and pulled spin-outs with the expected combinations is inspired by an event analysis such as employed in Ruef et al. (2003) and is performed through a combinatorial analysis. The particularity of the event analysis is that it considers all possible combinations and not just the actually formed groups. A combinatorial analysis enumerates the number of possible teams corresponding to a certain set of attributes.

The probability of an occurrence is computed according to the following multinomial distribution:

$$P(E|r) = \frac{|N|!}{|n_1|!|n_2|!\ldots|n_k|!}\,[p(n_1)^{|n_1|} \times p(n_2)^{|n_2|} \times \ldots \times p(n_k)^{|n_k|} \qquad (1)$$

b. Treatment effect

As the purpose of the paper is to analyze the effect of an adverse event on the composition of the teams spinning out, the empirical methodology is similar to the approach applied in Oosterbeeket al. (2010). Using a treatment effect where firms generating pushed spin-outs receive a treatment (shutdown), four equations are considered to examine the significance of the treatment on the diversity of the founder teams.

$$Y_i = \alpha + \beta TR + \varepsilon_i \qquad (2)$$

The outcome Y is the diversity measurement of the team i (gender deviation, managerial position deviation, pay dispersion, and educational background diversity). The variable TR is the dummy representing the presence (1) or the absence (0) of the treatment.

A common encountered issue when investigating the alternation of outcome due to a treatment is the violation of the assumption of independence between the outcome and the treatment. The treatment effect estimators use covariates to assure the independence of the outcome and the treatment. Using propensity score matching estimators, the treated (shutdown) and non-treated (survival) firms are similar.

As covariates in the treatment effect estimation, size, industry and location of the incumbent firm as well as the year of observation are utilized.

RESULTS AND INTERPRETATION

The analyzed data contains a total number of 2 555 pulled teams and 3 194 pushed teams. A more developed description of this data is represented in table 2.

	Pulled spin-out	Pushed spin-out
Number of total teams	2555	3194
Team size		
Minimum	2	2
Maximum	29	28
Total number of individuals		
Female	2408	3164
Male	4732	5823
Number of teams by size		
Two members	2126	2639
Three members	287	389
Fours members	79	89
Five members	25	32
Five+ members	58	59
Gender diversity of the teams		
Number of homogeneous teams	1811	1939
Number of teams with equal number of male and female	172	256
Managerial position variation		
Number of teams with no variation in position	1993	2246
Number of teams with equal number of managers and non-mangers	118	180
Education variation		
Number of teams with no variation in education	970	917
Number of teams with equal number of educational background	923	1293
Income dispersion		
Mean	0,229	0,229
Standard deviation	0,212	0,215

TABLE 2- Descriptive statistics

a. Event analysis

The event analysis is based on the counting rules in a combinatorial analysis. The size of the teams varies from two to 29 members making the number of possible combinations up to $9{,}15769e^{30}$ when it comes to gender and managerial position and even more for education and income. The represented teams in the results are therefore restricted to team up to five members[1]. The purpose of the event

[1] The number of possible combination is computed following the rule applied in Martin Ruef (2002):

analysis is to give a representation of the diversity of the teams in the sample. For simplicity, only results for gender and managerial position are represented.

The number of observed teams with two, three, four and five individuals for the pushed spin-outs are 1986, 288, 661, 164 and 1629, 228, 512, and 117 for pulled spin-outs. Taking the case of teams founded by two individuals in pushed spin-outs as an illustrative example, the expected number of teams composed of one male and one female is computed as (2! / (1! x 1!)) ($0{,}35^1$ x $0{,}64^1$) (1986) = 906,07 (where 0,35 and 0,64 are the share of female and male in the sample of pushed spin-outs).

The ratio of realization for each type of spin-out reported in table 4 (in the appendix) is the ratio $\frac{Observed\ number\ of\ teams}{Expected\ number\ of\ teams}$. The ratio of realization is an indication of the prevalence of the different combinations.

The event analysis and the comparison of the pushed and pulled spin-outs show that for the case of dyads, the proportion of realized homogeneous teams is significantly higher for the pulled teams, specifically in the teams of two female. This is an indication pointing at higher homogeneity in teams of two formed after an opportunity has been spotted. As a contradiction, the teams of dyad formed by individuals switching into self-employment as a retreat from an unpleasant event are less homogeneous and dominated by heterogeneity. Female homogeneity also seems to be a more frequent combination in pulled entrepreneurship for the teams with three, four and five members. From the event analysis, it appears that pushed entrepreneurs are more prone to form heterogeneous teams. In general, the table hints that pulled entrepreneurship generates more homogeneous teams than expected compared with pushed entrepreneurship.

This first part is an explorative analysis hinting on the combination of teams and compares the deviation from statistical expectations in pushed and pulled spin-outs. The results are presented in table 4 in the appendix. In general, looking at the proportion of realized combination for both necessity and opportunity spin-outs, the number of homogeneous teams formed seems to surpass the statistically expected number. This trend is especially pronounced for teams where the majority of the entrepreneurs are women (for the combinations FFF and FFFF, the ratios for pushed and pulled are respectively 5,12 8,75 and 12,4 23,5). Compared with homogeneous female teams, the difference in ratio of realization is lower for the homogeneous teams with male entrepreneurs, yet taken separately this ratio is high for each category of spin-out indicating that the observed number of male homogeneous teams is above what is statistically expected (for pushed and pulled spin-outs MM= 1,44 and 1,55 and MMM= 2,33 and 2,51).

Opposing the ratios of realization in pushed and pulled spin-outs, the major differences are observed in teams where female individuals outnumber male members. For the cases of absolute homogeneous teams, teams with two females (the combination FF) has a realization ratio of 0,69 for pushed compared to 1 for pulled teams. The equivalent for the combination FFFF is 5,12 versus 8,75. Another clear distinction is at the level of teams of five female, the ratios of realization is 12,4 and 23,5 for pushed and pulled spin-outs. The ratio represents the relationship between the realized teams and the statistically expected teams. Hence, a high ratio indicates that the actual formed teams are more than what is statistically estimated. The results indicating that teams entirely formed by female have a higher ratio in pulled than pushed spin-outs is then an indication that female homogeneity is more frequent in pulled entrepreneurship.

$$s(H) = \sum_{r=2}^{r(H)} \frac{(r + |N| - 1)!}{r!\,(|N| - 1)!}$$

The teams with three to five members, where just one member is a female, are underrepresented in the sense that the actual formed teams in the data are less than what is statistically expected. This holds independently of the type of spin-out. These results reflect a context of tokenism where, in this particular case, females are the token putting them in a less favorable position compared to the dominant group (male). This is a possible explanation to why these combinations are less frequent in both pushed and pulled entrepreneurship.

Contraposing the managerial position of the individuals forming entrepreneurial teams in pushed and pulled spin-outs shows a stronger homogeneity in pulled spin-outs. This difference of homogeneity is particularly pronounced in the case of managers. In pulled entrepreneurship, the ratios of realization of teams with absolute managerial homogeneity (teams formed solely by individuals with a position of manager) are 5,37 33,14 16,87 and 305,7 for teams with two, three, four and five members. These ratios are significantly lower for the teams emerging out of an event pushing the individuals to shift into self-employment. The remaining possible combinations of teams with up to five members do not reveal any important difference between the ratios of realization in pulled and pushed entrepreneurship. These observations suggest that managers, in case of pulled entrepreneurship are more prone to team up with other managers than in the case of pushed entrepreneurship. Taking the particular case of spin-outs formed by managers in the incumbent firm, when being the result of a pulled spin-out, it is more likely to be a perceived opportunity related to the activity of the mother firm. Managers would then prefer to team up with other managers sharing the same knowledge and skills about a specific project or activity. The new venture formed by these managers is the result of an opportunity discovered in association with the work and tasks performed in the incumbent firm. The managers will spin-out together with other manager with same knowledge of the activity and with same perception of the opportunity. In the case of a pushed spin-out, the teams benefit from the variety of the skills and the managerial homogeneity is therefore not as clear as in pulled spin-out.

b. Treatment effect

In the treatment effect, the propensity scores are first estimated. The treatment effect being the adverse event (firm shutdown), the treated and non-treated are matched on size, industry, region of the incumbent firms and the period (year). The outcome of the regression on team gender standard deviation (model 1), position standard deviation (model 2), income disparity (model 3), and Blau index of education (model 4) are presented in the table below.

	MODEL 1	MODEL 2	MODEL 3	MODEL 4
Treatment	0,082** (0,02)	0,043** (0,01)	0,008 (0,011)	0,036* (0,015)

** Coefficient significant at 1% level

* Coefficicent significant at 5% level

TABLE 3 – Outcome of the treatment effect

These results confirm the hypotheses H1, H2, and H3 but fail to statistically approve the fourth hypothesis. The non-significance of the treatment on the pay dispersion is possibly caused by the nature of the characteristics. The income of the individuals is a discrete characteristic in the sense that it is not a physical attribute and the distinction based on income is not an evident task. When forming teams, the apparent characteristics will be the first to receive the attention of the individuals followed by the acquired skills.

The results from the applied treatment effect reveal that a positive and statistically significant impact of the treatment on the diversity of teams in terms of gender, position and education. Gender standard deviation of the team is a proxy for gender diversity implying that the higher the level of standard deviation, the wider the gender diversity of the teams. The results from the treatment effect in model 1 indicate that, although the coefficient is not very elevated (0,082), companies receiving the treatment will spur ventures with more gender diverse teams. The triggering event then, has a significant impact on the gender combination of the teams that would appear to be more gender heterogeneous when being pushed into entrepreneurship compared to the opportunity spin-outs.

The outcome of model 2 indicates that the closure of the incumbent firm has a significant and positive impact on the standard deviation in the managerial position of the individuals founding the entrepreneurial teams. With pushed spin-outs, the formed teams are more heterogeneous than the teams formed in pulled spin-outs. An adverse event would then increase the tendency of the employee to ally with individuals with different managerial positions when forming a new venture.

For the third model, where the effect of firm shutdown on the pay dispersion in the teams of spin-outs' founders is measured, the data does not reveal any statistical significance. Hence, the triggering event does not have a statistically significance on the pay dispersion in the formed team.

Finally, model 4 displays a statically positive impact (0,036) of the triggering event on the variety of the educational background of the members forming the entrepreneurial team. When being pushed into entrepreneurship, the individuals of the incumbent firm form teams with higher educational background diversity than the teams being pulled into entrepreneurship.

The increased diversity observed in pushed spin-outs compared to the pulled spin-outs can be explained both from the triggering event and the nature of the opportunity perspectives. In the case of opportunity leaves, the transition into self-employment is a potential chance for upward social mobility (Stanworth et al., 1989). The founders of the new venture would then value the coherence and the conformity of the founding teams. The higher homogeneity in the pulled teams reflects a composition of individuals with similar characteristics, backgrounds and ambitions. Such composition facilitates the communication in the group, reduces conflicts (Ely, 2004) and smoothens the process of reaching the common goals. With individuals being pushed into self-employment, the homogeneity of the founding team decreases as the communication and agreement between the members gets a lower priority and the need for a wide range of skills to counter the unexpected obstacles (Gartner, 1985) becomes of a greater concern. The increased heterogeneity in pushed compared to pulled teams, according to this argument, is the result of a strategic planning and the anticipation of the needs for a successful new venture. A different stream of argument from a social dimension could motivate the shift in team heterogeneity as a product of change in the working environment and hence the ties created in the incumbent firm. Adverse events in the organization have negative impact on the psychological wellbeing of the employees and their work commitment (Probst, 2003). The negativity of the employees creates faultlines in the organization gathering individuals with different characteristic but with a common aversion. New ties are formed and the old connections are weakened explaining an increase in the diversity of the founding teams when these spin-outs are pushed rather than pulled.

CONCLUSION

The composition of the team of founding entrepreneurs determines the performance of the ventures. The purpose of the paper is to investigate the composition of the teams in pushed and pulled spin-outs.

The first part of the analyses explores the combinations of teams in pushed and pulled spin-outs. Considering the gender of the team members, both types of entrepreneurship expose an exaggerated

homogeneity; particularly in the case of teams entirely formed by female. These results are in line with previous research on team formation suggesting the homogeneity of founder teams (Ruef, 2002; Steffens et al., 2012). The comparison of pushed and pulled entrepreneurship suggests that in general, homogeneity is more pronounced in teams formed after perceiving an opportunity and forming a pulled spin-out. Identical observations are made when considering the managerial composition of these teams. For the pulled spin-outs, the homogeneity in terms of managers is considerably more pronounced than it is in pushed spin-outs. This effect is however not that obvious in the case of homogeneous teams formed by non-managers.

The obtained results affirm the impact of the triggering event on the structure of the formed teams. Moreover, the study divulges the increase of heterogeneity in the teams of spin-outs being pushed into entrepreneurship compared to the pulled teams. The results accentuate the role of the environment on the formation of entrepreneurial teams. The process appears to be different depending on the triggering event and therefore contributes to the distinction between pushed and pulled spin-outs. Furthermore, the study provide an alternative explanation to the observed difference in the survival and performance of pushed and pulled spin-outs as discovered in Rocha et al. (2015) and Andersson and Klepper (2013). When controlling for entrepreneur's characteristics, among other factors, Rocha et al. (2015b) discover the absence of statistically significant difference in the survival of pushed and pulled spin-outs However, the comparison of the unconditional survival reveals that pushed spin-outs outlive the pulled. Following this reasoning, the present study partially proposes an explanation to the observed difference in the performance and survival of pulled and pushed spin-outs. Additionally, the team perspective is introduced in the discussion and the study of necessity and opportunity spin-outs and hence responding to calls for further research in the topic (Rocha et al., 2015b).

The current version of the paper presents a number of shortages. To start the triggering events are defined as a shutdown or survival. This is a rather strict and narrow demarcation and can be extended by adding organizational restructuring (measured in terms of annual lay-offs) and financial instability (measured as a continued decrease in the profitability over a certain period) as events pushing the employees to spin-out.

In addition, further individual characteristics can be added to the study. Certain characteristic that might be interesting to investigate is the previous entrepreneurial activity of the team members, their tenure in the firm, and number of years as co-workers.

As a final remark, the patterns can fluctuate from one industry to another. Knowledge intensive industries put more value in the knowledge embodied in the individuals. It could therefore be interesting to, in the future improved version of this paper, to have industry discrimination.

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APPENDIX

	PUSHED			PULLED		
Team combination	Expected number of teams	Observed number of teams	ratio of realization	Expected number of teams	Observed number of teams	ratio of realization
GENDER						
FF	246,16	170,00	0,69	185,28	187,00	1,01
FM	906,07	612,00	0,68	728,21	331,00	0,45
MM	833,76	1204,00	1,44	715,51	1111,00	1,55
FFF	12,57	17,00	1,35	8,75	15,00	1,72
FFM	69,39	23,00	0,33	5,73	13,00	2,27
FMM	127,70	64,00	0,50	11,26	33,00	2,93
MMM	78,34	183,00	2,34	66,37	167,00	2,52
FFFF	10,16	52,00	5,12	6,62	58,00	8,76
FFFM	74,76	160,00	2,14	52,07	87,00	1,67
FFMM	206,38	345,00	1,67	153,47	284,00	1,85
FMMM	253,21	32,00	0,13	201,06	25,00	0,12
MMMM	116,50	72,00	0,62	98,78	58,00	0,59
FFFFF	0,89	11,00	12,40	0,51	12,00	23,51
FFFFM	8,16	23,00	2,82	5,02	12,00	2,39
FFFMM	30,05	44,00	1,46	19,71	26,00	1,32
FFMMM	55,29	55,00	0,99	38,74	40,00	1,03
FMMMM	50,88	14,00	0,28	38,06	8,00	0,21
MMMMM	18,73	17,00	0,91	14,96	19,00	1,27
MANAGERIAL POSITION						
MM	81,54	327,00	4,01	24,58	132,00	5,37
MN	641,75	385,00	0,60	351,02	214,00	0,61
NN	1262,71	1274,00	1,01	1253,40	1283,00	1,02
MMM	2,40	24,00	10,02	0,42	14,00	33,14
MMN	28,29	28,00	0,99	9,05	8,00	0,88
MNN	111,31	59,00	0,53	64,64	50,00	0,77
NNN	146,01	177,00	1,21	153,88	156,00	1,01
MMMM	1,11	3,00	2,69	0,12	2,00	16,87
MMMN	7,64	8,00	1,05	3,39	2,00	0,59
MMNN	103,53	110,00	1,06	36,29	43,00	1,18
MNNN	118,34	120,00	1,01	172,76	67,00	0,39
NNNN	267,21	420,00	1,57	308,44	398,00	1,29
MMMMM	0,06	1,00	17,85	0,00	1,00	305,71
MMMMN	1,10	2,00	1,81	0,12	0,00	0,00
MMMNN	8,67	16,00	1,84	1,67	4,00	2,40
MMNNN	34,14	21,00	0,62	11,91	11,00	0,92
MNNNN	67,17	25,00	0,37	42,54	31,00	0,73
NNNNN	52,86	99,00	1,87	60,76	70,00	1,15

TABLE 4- Expected and observed combinations for teams with 2-5 members in pushed and pulled spin-outs