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Competitive Pressures and Transition to Entrepreneurship. Empirical Evidence from Female Workers

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Abstract

This paper investigates whether the likelihood of entrepreneurial activity is associated with the competitive pressures for promotion within a firm. We argue that competitive pressures increase the relative attractiveness of entrepreneurship as a career option. We test our prediction using a comprehensive matched employer-employee longitudinal data set from Denmark. To mitigate endogeneity concerns, we exploit variation in the gender composition of established firms as women are systematically found to be less competitive than men. We find that workers are more likely to become entrepreneurs if they start working in organizational settings with strong competitive pressures. Furthermore, this competitive effect is more pronounced in firms that are entrepreneurially prominent, i.e. firms that spawn more entrepreneurial ventures, suggesting that combining different sources of incentives to entrepreneurship has a positive non-linear effect. Our results have strong implications for managers, prospect entrepreneurs and policy makers.

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Abstract

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Key words: competitive pressures, entrepreneurship, entrepreneurial prominence, gender.

1. Introduction

“Competition is one of the dominant characteristics of modern capitalist economies; competition is the force providing work incentives” (Nalebuff and Stiglitz, 1983 :21). Competitive environments are contests in which agents exert costly efforts while competing over the distribution of a scarce resource (Krueger, 1974). A salient example is represented by the competition for promotions in a firm. In this setting, competition enhances firm performance because it induces employees to exert a higher work effort (Charness et al., 2013). The most common tool employers use to create incentives is paying and promoting employees based on relative performance rather on pure piece rate. The theoretical foundation of this compensation system lays in tournament theory (Lazear and Rosen, 1981) which models promotion as a relative game, being the reward for employees whose performance exceeds that of their peers(Lazear and Shaw, 2007). Substantial experimental evidence supports this theory by showing that this compensation scheme provides strong incentives to outperform (Delfgaauw et al., 2013, Nalbantian and Schotter, 1997, Orrison et al., 2004).

The competitive pressure within a firm generated by relative performance pay systems may also have unintended consequences which are costly for the employer (Barron and Gjerde, 1997, Lazear, 1989). For example, the performance feedback may induce peers to engage in unethical activities to increase the odds of getting promoted. This phenomenon has been referred to as sabotage and it is increasingly documented in the literature (Carpenter et al., 2010, Charness, Masclet and Villeval, 2013, Harbring and Irlenbusch, 2011). A further downside of competition is that it can affect turnover. Studies of social comparison processes suggest that individuals respond to perceptions of inequitably pay with the decision to leave the job (Larkin et al., 2012, Zenger, 1992).

How do career competitive pressures affect worker decision's to become entrepreneur? This is an important question as it provides a deeper understanding of the role of individual motivation and incentives in driving the decision to become entrepreneur. Also, it is of major importance for established firms if the turnover triggered by career competitive pressure includes entrepreneurial workers. Such individuals are acknowledged to be important drivers of change and innovation within firms (Freeman, 1986). If this is the case, a trade-off emerges between incentives plan and retention policies.

This research question remains largely under-investigated. Entrepreneurship scholars have provided substantial evidence that existing firms are a prominent source of entrepreneurial opportunities (Shane and Venkataraman, 2000) which is synthesized in the notion of entrepreneurs as organizational products (Freeman et al., 1986). Less clear appears to be the mechanisms through which parent firms affect employees' decision to become entrepreneurs. Most research in this vein focuses on knowledge transfer as key mechanism (Agarwal et al., 2004) although direct empirical evidence is rather thin (Dahl and Sorenson, 2013). Sorensen and Fassiotta (2014) caution against this theoretical imbalance and encourage considering the parent firm as a structural context that shapes the parameters involved in career decision making.

Along this vein, empirical evidence seems to suggest an association between organizational features shaping the internal career prospects, i.e. wage ceiling (Sorensen and Sharkey, 2014), wage dispersion (Carnahan et al., 2012) and hierarchy (Tåg et al., 2013) and entry into entrepreneurship. Although highly valuable, these contributions are inherently static providing little appreciation for the role of competitive dynamics inside the firm. Considering workplace peers might shed some lights into this aspect. However, to the best of our knowledge, only one

study (Nanda and Sørensen, 2010) looks at the role of peers in entrepreneurship and finds that co-workers with prior entrepreneurial experience increase entrepreneurial activity.

This paper contributes to this literature by providing a first attempt to uncover the association between competitive pressures and transition to entrepreneurship. We contend that career pressures may trigger entrepreneurship, for three main reasons. First, it is well established that some individuals have a preference for competition (Eriksson et al., 2009). However, the same forces that make people select into competition may lead other people to opt out of employment settings where competition is high. Individuals that are reluctant to compete may be more intrinsically rather than extrinsically motivated. Extrinsically motivated individuals engage in an activity to achieve a goal while intrinsically motivated individuals engage in an activity for the inherent pleasure of pursuing it (Deci and Ryan, 1985). For intrinsically motivated individuals not only competition is irrelevant as incentive (Lazear and Oyer, 2007) but it may also be detrimental. In contexts where competition is high, intrinsically motivated individuals may feel hampered in pursuing their otherwise greatly valued work activities. Entrepreneurship may represent a relatively attractive career option under these circumstances since it allows them to keep on pursuing the activity they are personally interested in. The competitive pressure may be perceived as lower because competition is moved outside firm boundaries.

Second, competition may lead to perceptions of inequitable pay or inequitable promotions, arising from social comparison (Festinger, 1954; (Festinger, 1954, Larkin, Pierce and Gino, 2012). The individual may perceive that the principal does not fully reward his/her effort and abilities. This effect is a by-product of the information asymmetry between the agent (employee) and the principal (employers) with regards to the worker's unobservable part of the ability. This problem is particularly severe at the early stage of an employment relation where the

quality of the match is yet to be fully revealed. The perceived inequity resulting from the social comparison with peers may lead to turnover (e.g. Nickerson and Zenger, 2008, Schwarzwald et al., 1992, Zenger, 1994). A move to entrepreneurship may alleviate this concern as principal and agent are collapsed into the single figure of the entrepreneur (Lazear and Rosen, 1981). More important, entrepreneurship may represent an effective response to perceptions of inequality because in entrepreneurship the link between pay and performance is the tightest (Zenger, 1994).

A third related mechanism is that entrepreneurship may represent an attractive outside option when the individual fails to secure promotions. This episode may generate frustration and increase job dissatisfaction in the employee. Prior research has largely reported that these elements are positively associated with employee turnover (Shaw, 2011). We argue that entrepreneurship compared to general turnover, allows gratifying the career aspirations in a quicker way compared to the wage sector. Individuals pursue entrepreneurial opportunities because in that situation they seem like the best way to get ahead (Sørensen and Sharkey, 2014).

Our conjectured influence of competitive pressures on transition to entrepreneurship arises through a process of sorting out of the competition context and it is based on preference and motivation-based sorting. This effect may be moderated by whether the individual is characterized by being a stayer or a mover, where a mover is defined as an individual who changes job more often than average. Movers have been shown to be more likely to select into entrepreneurship (Åstebro et al., 2011). A key explanation behind this finding is that movers have a higher taste for variety (Astebro and Thompson, 2011) which implies a preference for the entrepreneurial role. This preference may act as a substitute for competition as main motivation behind the decision of entry into entrepreneurship. Therefore, we expect the positive association between competitive pressures and entrepreneurial entry to be weaker among movers compared

to stayers. The turnover tendencies among movers will not be influenced by competition pressures. Moreover, movers have generally lower switching costs and therefore prone to change affiliation regardless. Also, the switching costs for entrepreneurship may be lower since the individual can tailor the setting to fit their capabilities and strengths (Campbell et al., 2012). Accordingly, stayers with higher switching costs may find this transition more attractive as oppose to alternative wage setting compared to movers.

The association between competitive pressures and move into entrepreneurship may also depends on other features of the parent firm organization. Organizational settings characterized by high levels of spinouts and spinoffs attract and produce more entrepreneurially minded employees (Gompers et al., 2005). Following Burton et al. (2002) notion of entrepreneurial prominence we identify firms which are a major source of entrepreneurial ventures. We expect the positive effect of competition on entrepreneurship to be stronger in highly entrepreneurial prominent contexts because in these settings peers leaving the firm act as role models (Nanda and Sørensen, 2010). Also, these settings have attracted entrepreneurial individuals wherefore their destination when moving out of a wage context is more likely to be entrepreneurship rather than an alternative wage setting as opposed to similar individuals in low entrepreneurial environments.

We test our claims on a unique matched employer – employee panel data set from Denmark. We find support for our idea that competitive pressures is positively associated with the likelihood of entrepreneurial entry. Moreover, we also find that in highly entrepreneurial environments the effect of competition is more pronounced.

Our study is closely related to recent research on entrepreneurship. Although individuals may certainly have predispositions, the episodic nature of entrepreneurship makes stable

attributes an unlikely explanation for people's decision to become entrepreneurs (Carroll and Mosakowski, 1987). By showing that competitive pressures can act as a treatment that induces employees to become entrepreneurs we contribute to the call by Sorensen and Fassiotta (2011) to conceptualize the parent firm as source of incentives. In particular, we complement emerging evidence on structural characteristics of the parent such as hierarchy, wage ceiling and wage dispersion (e.g. Carnahan et al., 2012), by focusing on a dynamic feature of the parent firm, i.e. the extent of competitive pressures. We show that motivation influences whether to enter in the activity and how long to persist in pursuing that activity (Deci and Ryan, 1985). Moreover, we add to the emerging literature on peers effects in entrepreneurship, by showing that peers influence entrepreneurial intentions not only via vicarious learning processes (Kacperczyk, 2013, Nanda and Sørensen, 2010) but also via competition. Last, we add to the literature on gender and entrepreneurship by offering a complementary explanation for the low rate of female entrepreneurship (Minniti, 2009) – female workers select in environments which exhibit lower competition rates. Our paper also contributes to the management literature examining the downsides of competitive incentives. While it is well recognized that peer pressure can encourage additional work effort from coworkers, there are costs associated with peer pressure for employers (Barron and Gjerde, 1997). An important category of these costs are those related to sabotage (Carpenter, Matthews and Schirm, 2010, Charness, Masclet and Villeval, 2013, Harbring and Irlenbusch, 2011). We add to this literature by focusing on another negative implication of competition: the turnover of entrepreneurial minded employees. This is a critical issue considering the role that these individuals play in the firm innovation activity. Last, while prior research focuses on how the differential response to competitive pressure influences the decision to enter competitions and the performance in the competition (Niederle and Vesterlund,

2011 for a review), we focus on how this may also influence exit from competition providing further evidence that female exit competition at a faster rate (Hogarth et al., 2012).

2. Data

Data and Sample construction.

We draw on the IDA database (“Integreret Database for Arbejdsmarketsforskning”) which is a matched employer-employee datasets covering the entire Danish labor market. The dataset is assembled and maintained by Statistics Denmark for the purpose of research and making informed policy recommendations. The dataset is longitudinal since it tracks the movements of individuals yearly across organizations. It has been utilized in numerous prior investigations on labor market dynamics (e.g. Dahl and Reichstein, 2007, Frederiksen, 2008, Kaiser and Malchow-Moller, 2011) and has proven useful for the purpose of investigating entrepreneurial venturing in particular (Dahl and Sorenson, 2012, Nanda and Sørensen, 2010, Sorensen, 2007). With this data, we track individuals’ career movements, labor market movements, characteristics, and the firms to which they are affiliated and hence the firm-employee relationships over time.

The Danish labor market is characterized by a model of “flexicurity” which means that it is comparable to the US labor market in terms of flexibility (Sorensen, 2007). In addition, it is characterized by a high level of social support, which mitigates concerns about the potential effect of the phenomenon of necessity entrepreneurship on the analyses.

We draw data on data from 1998 until 2008. However, we utilize the data from 1998 to 2002 as a foundation for prior labor market activities of the individuals providing measures with regard to their affiliations and career movements. We accordingly have a window of six years for the duration analysis (2003-2008) to investigate hazards to entrepreneurship given individual and

contextual characteristics. The initial sample consists of individuals employed in the year 2002 with information about their past employment history in the years 1998 to 2002. The total number of wage employees in 2003 for which it is possible to track firm-affiliation in the previous five years (1998 to 2002) amounts to 1,342,855 with 18,589 first transitions to entrepreneurship and 1,067,808 movements to a wage employment until 2008.

We couple the IDA data with the official register on newly founded firms which contain information on all newly registered firms in Denmark and an identifier for the founder. In fact, this register provides a link between firm identifiers and founder identifiers that are identical to the identifiers present in the labor market data and business register data. This data is used to identify entrepreneurs.

In order to attenuate potential left censoring bias, we follow the literature in only capturing first transitions to entrepreneurship and exclude serial entrepreneurs (defined as individuals who started a new firm between 1998 and 2002). Serial entrepreneurs may exhibit significantly different labor market movements than other individuals (Baron and Ensley, 2006, Hyttinen and Ilmakunnas, 2007). Furthermore, in order to discard individuals unlikely to be wage employees but rather business owners as of 2002, two groups of individuals are further excluded from the sample, namely workers whose occupation code supplied by Statistics Denmark corresponds to “self-employed” and workers affiliated to a firm with one employee in 2002. Moreover, industries such as the primary sector (namely agriculture, extractive industries, electricity and water services) are excluded, as well as the public sector, because entrepreneurial activities in these industries follow particular dynamics in these sectors (see for instance Ozcan and Reichstein, 2009). For this these reasons, the sample size drops to 665,890 individuals, with

13,151 transitions to entrepreneurship and 285,078 moves to new wage employment over the observation time interval.

The research question that we are addressing also calls for a particular attention on the size of the establishments. The reliability of the measure used for competition is in fact inversely related to the number of peers the focal individual interacts with. In order to mitigate concerns about the validity of the measure used, we restrict the analysis to firms up to 250 employees. Moreover, the group of smaller firms is more likely to implement performance-contingent pay structures (Zenger, 1994) a feature that might be reflected by lower measurement costs or higher efforts to differentially reward performance (Nickerson and Zenger, 2008). This implies that individuals in smaller firms are more aware of their self-assessment relative to their peers compared to employees in larger firms. Focusing on firms with less than 250 employees therefore provides an ideal setting for studying the effect of career pressure and linking it to the contextual effects, since it allows to mitigate concerns about potential confounding effects that might come into play in larger firms. This restriction results in a sample size of 430,678 individuals and 10,813 transitions to entrepreneurship and 258,078 transitions to new wage employment.

Finally, we strictly focus on individuals that were newly hired in 2002 to ensure that individuals are homogeneously followed from the point in time in which they are first at risk of leaving their parent firm. We thereby assume that no individual is at risk of leaving a job before they in fact have started working in the new position. This may be a strong assumption since some individuals may choose to venture into a job only temporarily. However, we believe this to be the exception rather than the rule and hence only be a source of limited bias if any at all. The final sample consists of workers newly hired in the year 2002, who exhibit the same onset of risk

to transition to self-employment. The final number of individuals amounts 63,445 (with 51,589 transitions to a new employer and 1,565 transitions to entrepreneurship).

3. Methodology

Empirical Strategy

Examining the effect of career competitive pressure on entrepreneurship poses important empirical challenges. An observed positive association between competition and entry into entrepreneurship may reflect unobserved differences in individual dispositions that drive both the choice of employer and eventual entry into entrepreneurship. Specifically, workers may select into employers which are highly competitive based on preferences and skills which may positively correlate with the likelihood of moving to entrepreneurship. To convincingly isolate our competition mechanism from the selection mechanism, we exploit variation in gender composition of the parent firms to consider whether women in female-dominated firms respond to higher competitive pressure with higher likelihood of moving to entrepreneurship. This empirical setting significantly weakened the sorting explanation because it produces a conservative estimation. In doing that, we exploit two well-documented empirical regularities respectively in labor economics and entrepreneurship: (1) women are less willing to compete than men (e.g. Gneezy and Rustichini, 2004, Niederle and Vesterlund, 2011); (2) women are less likely to move to entrepreneurship than men (Koellinger et al., 2013, Langowitz and Minniti, 2007). Moreover, recent experimental evidence reveals that women are more willing to compete with other women (Datta Gupta et al., 2013, Niederle et al., 2013). Hence, we use proportion of female as proxy for the extent of competition in the parent firm. By examining the effect of competition on women entrepreneurship we expect our estimates of the effect of competition on

entrepreneurial entry to be, if anything, downward biased. Our main prediction is that the effect of competition is positive. If proportion of female captures more than competition, it is likely to understate, rather than overstate, the positive relation. If there is a bias, we are therefore likely to underestimate the negative effect of competition for entrepreneurial minded individuals, resulting in a conservative identification strategy. Although we do not have the benefit of random assignment of workers in a firm or a natural experiment in our study, our identification strategy allows us to alleviate that concerns of spurious correlation would drive our results.

Variables

Dependent Variable. The dependent variable accounts for first-time transitions to self-employment. It takes the value 1 if the first movement out of the parent firm is for an individual identified as founder of a new firm in the years 2003 to 2008 identified through the new business register. Entrepreneurship is hence defined as establishment of a new firm. We also acknowledge that wage earners may have other outside options than entrepreneurship. For this reason, we also consider a dependent variable, which takes on three different values: 0 for staying in current wage employment (129,404 individual-year), 1 for moving into entrepreneurship (1,565 individual-year), and 2 for moving into a new wage employment (51,589 individual-year). Alternative wage employment is by far the more dominant destination for movers out of an employment setting.

Independent Variables. Extant literature suggests that females are exceedingly competitive with their own gender while not competing to the same extent with co-workers of the opposite sex (Datta Gupta, Poulsen and Villeval, 2013, Niederle, Segal and Vesterlund, 2013). These finding thereby suggests that female employees compared to their male counterparts are exposed to a greater degree of career competition in work environment

characterized by a high share of females. We hence measure career competition as the interaction between a female dummy and a variable measuring the share of women in the work place.

We tracked the job histories of the subjects backwards in time until 1998 and counted their number of different affiliation. Number of firms is hence the count of the various firm affiliations for each individual in the period covering 1998 to 2002. If the focal individual is employed in firm “A” in 1998, and then moves to firm “B” in 2000 and further to firm “C” in 2001, the variable will assume value 3. Therefore, this variable will assume a maximum of 5 (and since all the individuals are new hires in 2002, the minimum number of firms affiliations in the period 1998 to 2002 will be 2).

Firm entrepreneurial prominence captures the entrepreneurial activity taking place in the different firms and industries, following Burton et al. (2001). It consists of the average number of entrepreneurs departing from each firm normalized for the total number of employees in the firm in the period 1998 to 2002.

Controls. We control for whether the individual is female drawing on the IDA data, which contains a gender variable. Prior contributions suggest a substantial gender bias in terms of transition into entrepreneurship (Koellinger et al., 2011, Langowitz and Minniti, 2007). We also control for the Proportion of females measured by the number of female employees in each firm in 2002 normalized by the total number of employees in the firm in that year. The variable used for the estimations is standardized. These two first control variables are those that enter into the interaction term, which indicate the competitive career pressure. The proportion of females measure accounts for a context effect that suggest that females tends to move into settings that are more of less entrepreneurial.

Parent firm employees is the number of workers employed in each firm in 2002. This variable is an important control for the analysis since it captures – although in a relatively crude way – some of the contextual effects influencing the transition to entrepreneurship for the employees, such as the level of the firm’s beaurocratization (Sorensen, 2007).

Apart from the firm entrepreneurial prominence we also control for industry entrepreneurial prominence which captures the entrepreneurial activity that take place across industries. Again we follow Burton et al. (2001) by measuring it by the average share of entrepreneurs in each industry normalized by the total number of entrepreneurs the years 1998 to 2002. This measure is particularly fine-grained as it is computed for each industry defined as 3 digit NACE industry codes. The inclusion of the context variables in the analysis is particularly apt to capture some of the contextual effects that impact the transition to entrepreneurship (Ozcan & Reichstein, 2009). These measures are even more important to include in a gender based investigation since female workers have the tendency to select into lower-wage jobs in firms characterized by relatively higher rate of job separations (Frederiksen, 2008).

In addition, the following individual controls have been included in the analysis. Married, which takes value 1 if the civil status classification provided by Denmark Statistik relative to the focal individual is “married” as of 2002. Children is a dummy taking value 1 for individuals with at least one child in 2002. The education attainment for the subjects in the sample is measured with the dummy bachelor, which equals 1 for individuals who completed at least a bachelor program in 2002. Furthermore wage experience measures the experience in the labor market for each of the subjects in the final sample. This variable accounts for labor market tenure and covers the whole period in which an individual has been in the labor force until 2002. It enters the estimation at the standardized values. Similarly, Wage experience squared is the

squared term of the wage experience variable which accounts for a (potential) non-linear effect of labor market experience on the dependent variable. Wage earnings represents the wage earnings of each individual in 2002 (it is a value expressed in 2002 Danish Kroner). Lastly, unemployment is a dummy that describes whether individuals experience a spell of unemployment. It takes value 1 if the length of registered unemployed period exceeds the half of 2002 and 0 otherwise. Moreover, in order to capture industry trends, two digit NACE codes industry dummies are included in the analysis (a total of 36 dummies).

Method.

We use a duration specification to investigate the effect of career competition on entrepreneurial tendencies. We thereby predict the individuals' tendency to transition to entrepreneurship given the contextual setting. Given that such transitions might happen at any point in time during the year, and because the data capture this event on a yearly interval only, we adopt discrete time hazard models in order to be able to account for this feature of the data. One way to implement such discrete time hazard models would be through logistic regression. However, this model would present a notable drawback since it would make it impossible to distinguish between transition to entrepreneurship from the 2002 employment and subsequent transitions to entrepreneurship from other parent firms. In other words, it would be impossible to distinguish between the following two cases: 1) a transition to entrepreneurship directly out of the wage employment as of 2002; and 2) a transition to entrepreneurship subsequent to a move to a different wage-employment compared to 2002. This would make it problematic to capture the effect of the contextual effects since these indicate the setting to which the subject was affiliated in 2002. Instead, we use a multinomial logistic regression specification, which enables us to distinguish the first transitions from the parent firm at the beginning of the sample. By carefully

coding the dependent variable, a multinomial logistic models is apt to account for the first of the transitions out of the wage work in 2002: either to entrepreneurship (outcome 1) or to a new wage employment (outcome 2), whereas the baseline model is stability in the same occupation. Accordingly, the estimations presented in the tables are the result of multinomial logistic models. Coefficients reported correspond to the marginal effects, and robust standard errors are displayed in the tables.

Since we are using a duration specification for the analysis, we also include year dummies. These may capture the average variation in transition tendencies across years. They can be considered time fixed effects since all observed subjects are at risk at the same time – namely 2002.

4. Results

Descriptive Statistics

Table 1 presents the summary statistics and the correlation matrix. Individuals in the sample have on average been in 2,64 different firms in the years 1998 to 2002 and have been working in a firm with an average of about 53 employees. About 35% of the sample consists of females, which is reflected in the average proportion of women in the firms which is roughly 0.35. Moreover individuals in the sample have an average age of 38.3 years and have been in the labor market for about 16.¹ Table 2 shows the same summary statistics by splitting the sample between movers i.e. individuals who have at least changed one or more jobs in the period considered, and stayers i.e. those who have maintained the same firm affiliation along the whole pre-sampling period.

¹ Age is not present in the models and in the correlation table since it is highly collinear with wage experience (pairwise correlation coefficient of around 0.8). Summary statistics report the standardized value of wage experience

*** INSERT TABLE 1 ABOUT HERE ***

*** INSERT TABLE 2 ABOUT HERE ***

It can be noted that the proportion of entrepreneurs in the sample of movers is higher than in the one of stayers; this fact aligns with the stylized fact that a job-history of mobility is associated with higher rates of transition to entrepreneurship. Movers also tend to work in industries with higher concentration of entrepreneurial activity as showed by the value of Industry entrepreneurial prominence, takes value of 0.009 for movers and 0.007 for stayers (t-test statistically significant at 5%). Further, the average wage earnings of movers are lower than for stayers (283,000 Danish Kroner yearly vs. 304,000), confirming the general finding of the literature on labor economics pointing out that movers experience penalties in terms of wages compared to stayers (unreported t-test confirms the significant difference between the two groups with p-value <0.05).

Figures 1a and 1b depict Kaplan-Meier univariate survival curves for different subpopulations considering females versus males. The curves in Figure 1a provide initial indications suggesting that the career competition matters for the tendency to transition to entrepreneurship. Visually, there seem to be a tendency for the difference between males and females transition pattern to be greater when the career competition is higher in the work context than when it is low. Indeed, when the career competition for females is high, we see an overlap in the confidence intervals of the curves for men and women suggesting that females are equally like to transition in such context. This is not the case in settings in which the career competition for females is low.

*** INSERT FIGURE 1A AND 1B ABOUT HERE ***

Figure 1b provide a similar pattern looking at the firm entrepreneurial context. Firms with higher percentage of women transitioning to entrepreneurship seem to affect women more, as the confidence intervals of the two curves overlap and thus no statistical significant distinction can be perceived between males and females. This suggests that the transitions to entrepreneurship on behalf of females have increased in this type of firms and are not different than the quantity of male transitions. Figure 1c depicts the analysis on the sample of stayer versus movers. In this case it is shown that for the sub-sample of movers a slightly higher rate of transition to entrepreneurship is happening, although the two figures do not pinpoint significant qualitative differences for movers and stayers.

Regression Statistics

Table 3 reports the estimates of discrete-time event history models estimated using multinomial logistic regression, where the dependent variable is transition to entrepreneurship (columns 1 & 3) and transition to different wage work (columns 2 & 4). Reported coefficients correspond to the marginal effects, and the table also displays robust standard errors. All the various specifications include industry controls defined at a two-digit NACE codes (which result in 36 industries) therefore by providing a fine-grained control for the various industry peculiarities at a fine-grained level.

The coefficients for the interaction term between proportions of female and the female dummy is positive and statistically significant at 5%. This provides evidence suggesting that

career competition pressure is positively associated with a higher hazard to entrepreneurship. In other words, for the group of female workers a transition to entrepreneurship can therefore be seen as the response to an increase in the pressure experienced on the job. This result shows that that an increase in the share of women produces an effect on the transition to entrepreneurship for females. The association is limited to the group of workers who indeed experience an increase in competition, i.e. female workers, since the main term of proportion of female is insignificant.

*** INSERT TABLE 3 ABOUT HERE ***

As already suggested from the summary statistics in tables 1 and 2, column 1 of table 3 confirms that a higher number of firm affiliations is associated with higher probability of becoming entrepreneur (the coefficient for Number of firms is positive, with p-value <0.001). This result supports the idea that frequent job-hopping is associated with higher chances of starting up a new firm. In general the relationship between transition to entrepreneurship and work tenure is negative (Wage experience's coefficient negative and significant at the 99% level). Furthermore the coefficient parent firm employees (negative, with p-value <0.001) gives support for the notion highlighted in previous studies that large parent firms are home to a lower number of entrepreneurial individuals, and that conversely entrepreneurial rates in smaller firms are higher (Elfenbein et al., 2010). The coefficient for female is negative (and remains so across the four columns of table 3, i.e. before and after the inclusion of the interaction of the female dummy with the variable proportion of females). This result is aligned to prior studies that

document how entrepreneurial activities are more frequent among males compared to females (Koellinger, Minniti and Schade, 2011, Langowitz and Minniti, 2007).

Table 4 is split sample representations of column 3 regression results in Table 3. Columns 1 and 2 in Table 4 considers movers and stayers respectively while columns 3 and 4 considers low entrepreneurial context and high entrepreneurial contexts. Even if the regression results are from multinomial regression models, we nevertheless only report the marginal effects for the transition to entrepreneurship.

*** INSERT TABLE 4 ABOUT HERE ***

The second hypothesis predicts that the positive association between career competitive pressure is stronger among stayers compared to movers. The results shown in columns (1) and (2) of table 4 however only provide mild evidence of the difference between movers (individuals with a past experience of job-hopping) and stayers (workers who experience a pattern of stability before 2002). The coefficient estimations for the interaction term is not significant for movers but is for stayers. The coefficients are, however, overlapping. The lack of significance in this representation may suggest that the career competition effects to some degree plays a role in the general movements of females and not only to entrepreneurship since the effect disappears in the split sample. That we do find a significance for stayers only may, however, suggest that the movers would keep mobbing regardless of career competition dynamics and equally so transition to entrepreneurship.

The results reported in columns (3) and (4) of table 4 reports significance on the career competition effect only to hold in high entrepreneurial settings. This suggests that the positive

association between career competition and entrepreneurship exist only in highly entrepreneurial contexts and not in low entrepreneurial contexts. It is consequently the interplay between career competition and entrepreneurial settings that precipitates the transition to entrepreneurship. Indeed, looking at the wage equation of the multinomial logistic regression (not reported) we see that opposite pattern for transition to wage work. Here the competitive pressure tends to precipitate transition to wage work in low entrepreneurial contexts while not so in high entrepreneurial contexts. There is hence a profound interplay between the two context effects; career competition and degree of entrepreneurial tendencies.

5. Supplementary Analysis

In order to further investigating the associations between the variables presented, we have plotted the marginal effect of the coefficient for the probability of a transition to entrepreneurship as a function of female proportion comparing males and females. Each displayed association is represented splitting between males and females (left) and their contrasted margins (right).

As displayed in Figure 2, the effect of an increase in competition on the probability to make a transition to entrepreneurship is stable for male employees, but is increasing with higher level of competitions for female employees. Indeed, the contrasted depiction indicates that the marginal effect between males and females can be considered equal at higher level of career competition for females.

*** INSERT FIGURE 2 ABOUT THERE ***

Figure 3 reports the plot of marginal effects for the various levels of proportion of females for the sub-sample of individuals labeled as movers, i.e. the group of workers affiliated

to different firms for the observation period before 2002, while figure 4 is for the sub-sample of stayers.

*** INSERT FIGURE 3 ABOUT THERE ***

*** INSERT FIGURE 4 ABOUT THERE ***

Figure 3 shows an increase in the propensity to leave to self-employment for the female movers working in firms with higher proportion of females. This pattern is similar in figure 4 and although the effect for stayers is more precise (the confidence intervals are narrower) it cannot be concluded that the increased competition affects differently the transitions to entrepreneurship on behalf of stayers compared to movers.

Finally, Figure 5 reports the effect of a transition to entrepreneurship as a function of proportion of females for the sub-sample of low entrepreneurial firms, while figure 6 shows the sub-sample of higher entrepreneurial firms. The left side of figure 5 shows a sharp increase of

*** INSERT FIGURE 5 ABOUT THERE ***

transitions to entrepreneurship performed by female workers in the case where the proportion of females is higher. Interestingly, for the highest values of the competitive pressure (as proxied by proportion of females), the rate of entrepreneurial exits from the parent organization overlaps with that of males. This is also clearly shown by the contrasted margins, as the difference in between men and women becomes insignificant when looking at the context with higher female worker proportion.

*** INSERT FIGURE 6 ABOUT THERE ***

The strength of career pressure on the transition to entrepreneurship seems to be contingent on the context, as shown by figure 6. For the firms with low entrepreneurial prominence, the role of proportion of females does not seem to be systematically associated to noticeable differences in the rate of entrepreneurship for the female workers. Although a weakly positive trend can be observed from the left side of figure 6, the contrasted margins show that in this kind of organizations the women's decision to leave to entrepreneurship relative to men does not seem to be affected by career pressure as much as in higher entrepreneurial contexts

6. Discussion and Conclusions

The results of this study provide support for the claim that an increase in the competitive pressure is associated to an increase in the transitions to entrepreneurship. When the competitive pressure increases, i.e. in a context in which the share of female coworkers increases relative to the firm size, the group of female workers is subject to more competition and as a result their exit towards self-employment increases. The extent to which these dynamics are a function of the job-hopping tendencies of the focal workers remain unclear. The analyses do not suggest a strong and full support for the negative moderation of job-hopping experience on the transition to entrepreneurship as a function of competitive pressure. However, the effect of a more competitive context is found to be moderated by another characteristic of the parent organization, namely the entrepreneurial prominence, i.e. the ability of the organization to spawn entrepreneurs. In a context in which the entrepreneurial prominence is low, the dynamics of career competitions do not contribute to raise departures to entrepreneurship, while instead the effect is more pronounced in the more entrepreneurial parent firms.

Our findings have some limitations. First, because we do not have a “natural experiment” we cannot completely rule out the possibility that our results are biased due to potential omitted variables. This can be the case if there are unobservable characteristics of the setting which drives both entrepreneurship and share of females. However, we argue that the likelihood of this bias is relatively small since it only operates on women and since we have added a number of contextual control variables in our regression models.

Second, we have provided three explanations for why career competitive pressure is associated with entry into entrepreneurship: distaste for competition and intrinsic motivation, tight link pay-performance, and finally, loss of the competition for promotion. Future work may develop an empirical strategy to test these mechanisms with the aim to disentangle their relative importance.

This study contributes to extant research at the nexus of entrepreneurship and labor market sorting. For the entrepreneurship literature, this paper contributes to identify and explain a new dimension of the contextual effect influencing the supply of entrepreneurs, namely the competitive pressure faced by workers. Previous studies such as Nanda and Sørensen (2010), pointed to the fact that the clarification and understanding of the entrepreneurial process cannot be thought as disconnected from considerations on the characteristics of the employees and their peers. This paper contributes to the debate by showing that career dynamics within firms may be conducive to entrepreneurship for individuals facing more competition, even though the a priori likelihood of a transition to entrepreneurship might be low as in the case of female workers. Furthermore, the paper also contributes to the literature on the triggers of entrepreneurship by showing that the motivation for choosing entrepreneurship can be detached from considerations about individuals’ psychological traits whereas the effect of the career pressure also exerts a

noticeable influence. Lastly, the results also speak to the literature on female entrepreneurship by showing that female employees who are confronted to a highly competitive environment will increase their propensity to become entrepreneurs.

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Table 1 summary statistics and correlation table

	Mean	S.D.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Entrepreneur	0.01	0.099	0	1	1													
(2) Female	0.349	0.477	0	1	-0.029	1												
(3) Prop. of Females*Female	0.095	0.518	-1.719	1.806	-0.003	0.25	1											
(4) Proportion of females	0.347	0.272	0	1	-0.022	0.596	0.65	1										
(5) Number of Firms	2.643	0.799	2	5	0.019	-0.034	-0.004	-0.044	1									
(6) Parent Firm Employees	53.416	59.402	2	250	-0.02	0.008	-0.079	0.04	-0.024	1								
(7) Firm Ent. Prom.	0.009	0.038	0	0.75	0.016	-0.012	0.021	-0.035	0.028	-0.129	1							
(8) Industry Ent. Prom.	0.019	0.018	0	0.054	0.032	-0.068	0.034	-0.126	0.089	-0.198	0.082	1						
(9) Married	0.52	0.5	0	1	-0.002	0.008	-0.005	0.007	-0.163	0.017	-0.023	-0.055	1					
(10) Children	0.884	0.32	0	1	0.011	-0.022	-0.009	-0.028	-0.041	-0.007	-0.001	-0.004	0.22	1				
(11) Education	0.02	0.138	0	1	-0.002	0.063	-0.002	0.063	0.055	0.006	-0.001	0.002	-0.063	-0.031	1			
(12) Wage Experience	-0.254	0.892	-1.835	2.128	-0.024	-0.132	-0.05	-0.101	-0.26	0.025	-0.033	-0.071	0.352	0.087	-0.15	1		
(13) Wage Expeience, sq.	0.86	0.857	0	4.527	-0.012	0.022	0.028	0.088	0.105	-0.005	0.001	-0.002	-0.145	-0.118	0.175	-0.1	1	
(14) Wage Earnings	2.80E+05	1.70E+05	0	1.19E+07	0.03	-0.235	-0.103	-0.11	-0.114	0.1	-0.008	-0.041	0.145	0.068	-0.048	0.223	-0.136	1
(15) Unemployed	0.018	0.132	0	1	-0.002	0.039	0.023	0.03	0.028	-0.02	0.012	0.009	-0.021	-0.018	-0.015	-0.022	0.014	-0.154

Table 2 Summary Statistics - Movers vs. Stayers

	Movers				Stayers			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
Entrepreneur	0.01	0.102	0	1	0.007	0.085	0	1
Female	0.333	0.471	0	1	0.37	0.483	0	1
Entrepreneur*Female	0.074	0.504	-1.679	1.806	0.09	0.514	-1.719	1.806
Proportion of females	-0.563	0.946	-1.753	1.806	-0.465	0.949	-1.753	1.806
femaleprop02	0.334	0.266	0	1	0.362	0.267	0	1
Number of Firms	3.326	0.555	3	5	2	0	2	2
Parent Firm Employees	55.826	60.588	2	250	56.098	60.288	2	250
Firm Ent. Prom.	0.009	0.038	0	0.5	0.007	0.036	0	0.75
Industry Ent. Prom.	0.019	0.018	0	0.054	0.017	0.017	0	0.054
Married	0.479	0.5	0	1	0.618	0.486	0	1
Children	0.883	0.322	0	1	0.899	0.302	0	1
Education	0.024	0.154	0	1	0.01	0.101	0	1
Wage Experience	-0.401	0.851	-1.835	2.128	0.021	0.874	-1.835	2.128
Wage Experience, sq.	0.886	0.821	0	4.527	0.764	0.848	0	4.527
Wage Earnings	2.83E+05	1.62E+05	0	5.24E+06	3.04E+05	1.78E+05	0	1.19E+07
Unemployed	0.016	0.127	0	1	0.01	0.097	0	1
Number of Firms	36.639	9.072	25	60	40.969	9.543	25	60
Parent Firm Employees	14.109	8.378	0	39	18.26	8.6	0	39

Table 3: Transition to Entrepreneurship. Results of discrete time duration models

	To entrepreneurship	To wage	To entrepreneurship	To wage
	(1)	(2)	(3)	(4)
Female	-0.00184*** (0.00020)	-0.021*** (0.003)	-0.002*** (0.000)	-0.015*** (0.003)
Proportion of females	0.00024* (0.00011)	0.009*** (0.002)	0.000 (0.000)	-0.002 (0.002)
Prop. of Females*Female	- -	- -	0.001* (0.000)	0.025*** (0.003)
Number of Firms	0.00026** (0.00009)	0.049*** (0.001)	0.000** (0.000)	0.049*** (0.002)
Parent Firm Employees	0.00536*** (0.00116)	0.014 (0.028)	0.005*** (0.001)	0.002 (0.028)
Firm Ent. Prom.	0.03365*** (0.00698)	0.345*** (0.097)	0.034*** (0.007)	0.356*** (0.098)
Industry Ent. Prom.	-0.00001*** (0.00000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Married	0.00037* (0.00014)	-0.021*** (0.002)	0.000** (0.000)	-0.021*** (0.002)
Children	0.00097*** (0.00018)	-0.001 (0.003)	0.001*** (0.000)	-0.001 (0.003)
Education	-0.00086 (0.00062)	0.004 (0.008)	-0.001 (0.001)	0.006 (0.008)
Wage Experience	-0.00114*** (0.00015)	-0.025*** (0.001)	-0.001*** (0.000)	-0.025*** (0.001)
Wage Experience, sq.	-0.00060*** (0.00013)	0.016*** (0.001)	-0.001*** (0.000)	0.016*** (0.001)
Wage Earnings	0.00000*** (0.00000)	-0.000*** (0.000)	0.000*** (0.000)	-0.000*** (0.000)
Unemployed	0.00075 (0.00058)	0.079*** (0.009)	0.001 (0.001)	0.080*** (0.009)
Constant	-5.489*** (0.294)	-0.791*** (0.048)	-5.542*** (0.296)	-0.015*** (0.003)
Industry	yes	yes	yes	yes
Year	yes	yes	yes	yes
Observations	182,434	182,434	182,434	182,434
Pseudo R2	0.046	0.046	0.046	0.046
Chi2	76212.824	76212.824	76370.503	76370.503
Prob> Chi2	0.000	0.000	0.000	0.000
Log likelihood	-111743.300	-111743.300	-111705.242	-111705.242

Table 4 . Multinomial logistic regression on the transition to entrepreneurship. Only Outcome 1 “transition to entrepreneurship” is reported

	Transition to entrepreneurship			
	Movers	Stayers	Low entrepreneurial prominence	High entrepreneurial prominence
	(1)	(2)	(3)	(4)
Female	-0.002** (0.001)	-0.001*** (0.00)	-0.001** (0.000)	-0.002*** (0.000)
Proportion of females	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Prop. of Females*Female	0.001 (0.000)	0.000+ (0.000)	0.000 (0.000)	0.001* (0.000)
Number of Firms	-0.000 (0.000)	- (0.000)	0.000+ (0.000)	0.00009 (0.000)
Parent Firm Employees	0.007* (0.003)	0.003** (0.001)	0.031* (0.013)	0.004*** (0.001)
Firm Ent. Prom.	0.023 (0.015)	0.028*** (0.007)	-0.000** (0.000)	0.006 (0.008)
Industry Ent. Prom.	-0.000* (0.000)	-0.000** (0.000)	0.000+ (0.000)	-0.000** (0.000)
Married	0.001* (0.000)	0.000 (0.000)	0.001* (0.000)	0.000 (0.000)
Children	0.001* (0.001)	0.001*** (0.000)	-0.001 (0.001)	0.001** (0.000)
Education	-0.001 (0.001)	-0.001 (0.001)	-0.001** (0.000)	-0.000 (0.001)
Wage Experience	-0.001** (0.001)	-0.001*** (0.000)	-0.000* (0.000)	-0.001*** (0.000)
Wage Experience, sq.	-0.001* (0.000)	-0.000*** (0.000)	0.000** (0.000)	-0.001*** (0.000)
Wage Earnings	0.000** (0.000)	0.000*** (0.000)	0.001 (0.001)	0.000*** (0.000)
Unemployed	-0.000 (0.001)	0.001+ (0.000)	-0.001** (0.000)	0.000 (0.001)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Observations	73,745	108,689	119,542	62892
Pseudo R2	0.0464	0.0307	0.0506	0.0455
Chi2	37783.21	122688.12	59517.85	98725.65
Prob> Chi2	0.000	0.000	0.000	0.000
Log likelihood	-49139.546	-62316.162	-71576.306	-39742.615

FIGURES

Figure 1a. Percentage of individuals stable in their 2002 occupation compared to those who transition to entrepreneurship for the firms with proportion of females lower (left) and higher (right) than the mean

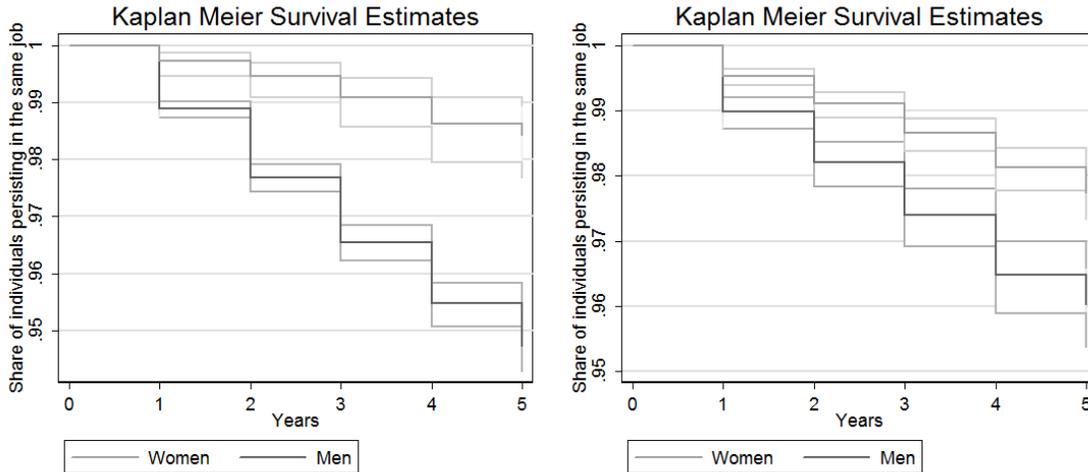


Figure 1b. Percentage of individuals stable in their 2002 occupation compared to those who transition to entrepreneurship for the firms with proportion of females higher than the mean and entrepreneurial prominence equal to zero (left) and Larger than Zero (right)

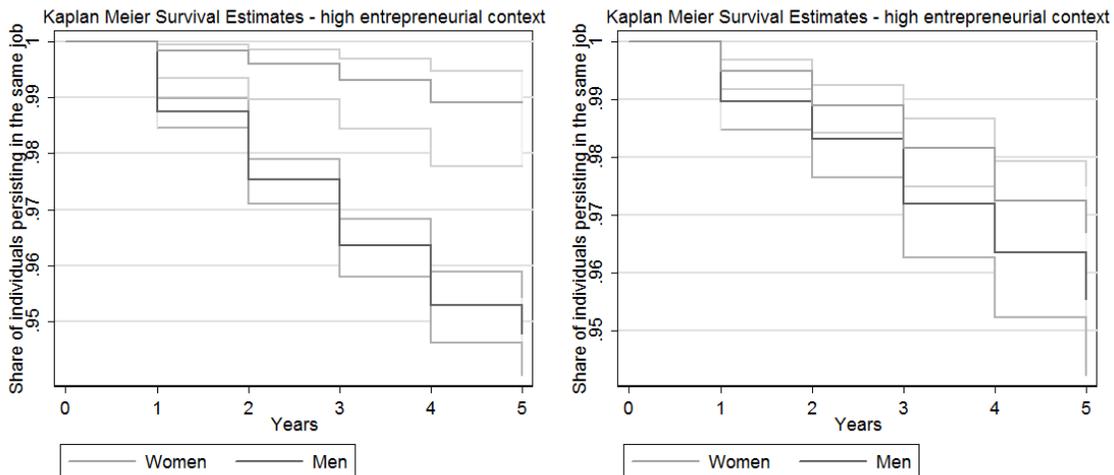


Figure 1c. Percentage of individuals stable in their 2002 occupation compared to those who transition to entrepreneurship for the group of stayers (left) and movers (right)

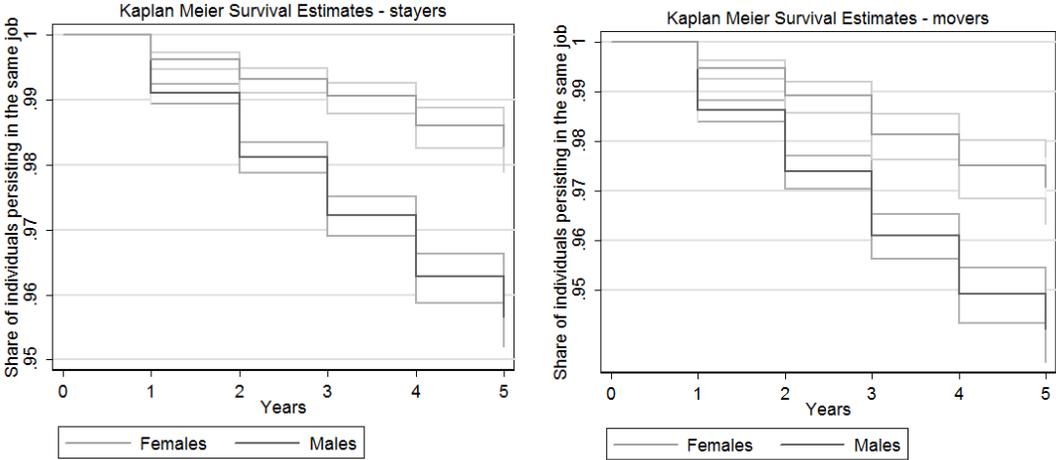


Figure 2: Marginsplot of gender on transition to entrepreneurship at different levels of proportion of females in context (left are margins by gender and right are the contrasted margins)

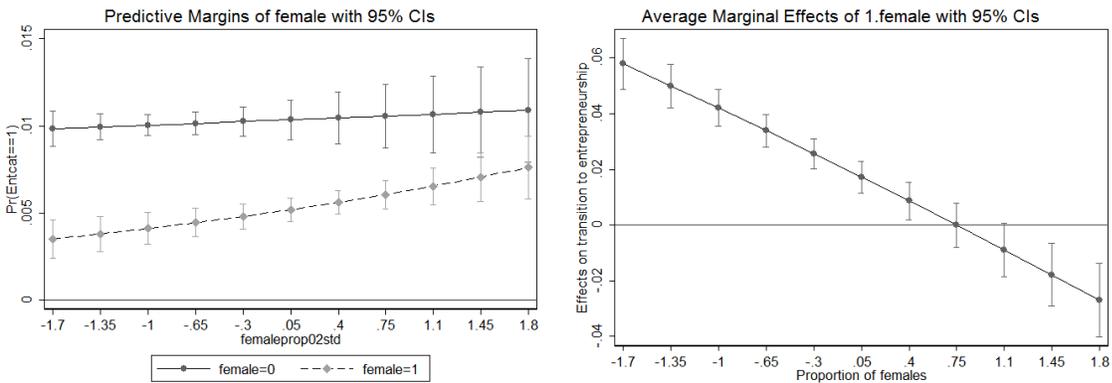


Figure 3: Marginsplot of gender on transition to entrepreneurship at different levels of proportion of females in context among movers (left are margins by gender and right are the contrasted margins)

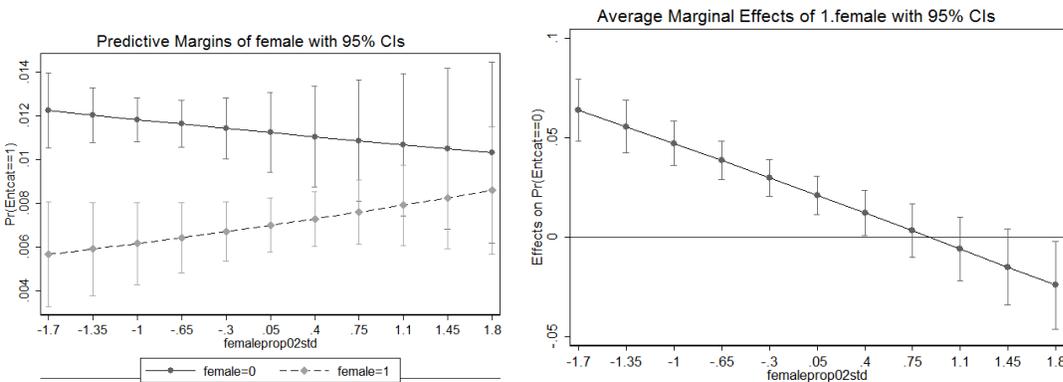


Figure 4: Marginsplot of gender on transition to entrepreneurship at different levels of proportion of females in context among stayers (left are margins by gender and right are the contrasted margins)

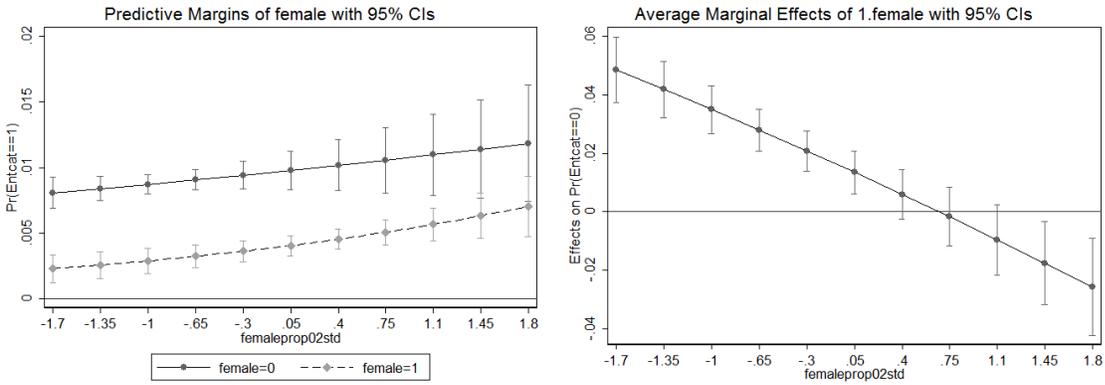


Figure 5: Marginsplot of gender on transition to entrepreneurship at different levels of proportion of females in contexts characterized by high levels of entrepreneurship (left are margins by gender and right are the contrasted margins)

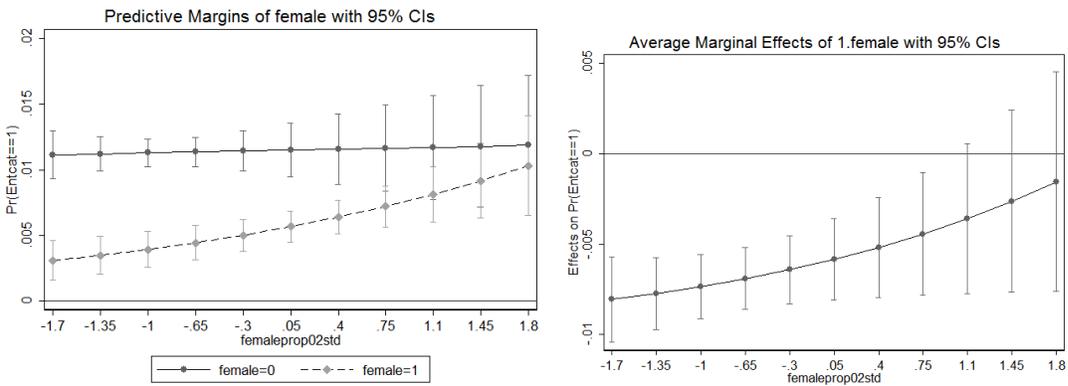


Figure 6: Marginsplot of gender on transition to entrepreneurship at different levels of proportion of females in contexts characterized by low levels of entrepreneurship (left are margins by gender and right are the contrasted margins)

