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Why do Employees Leave Their Jobs for Self-Employment? – The Impact of Entrepreneurial Working Conditions in Small Firms

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Abstract: Based on the finding that entrepreneurs who found new firms tend to work as employees of small rather than large firms prior to start-up, we test how different working conditions, which enhance entrepreneurial learning, affect their decision to become entrepreneurs when moderated by firm size. Based on data of the German Socio-Economic Panel (SOEP), we find a significant relationship between entrepreneurial learning (extracted in an orthogonal factor analysis based on twelve working conditions as proxy for entrepreneurial human capital and work experience) and firm size when predicting the probability of leaving paid employment for self-employment. We think, that this is a special kind of knowledge spillover. We also control for other aspects such as gender, age, wage, etc. – factors that may potentially influence the decision to become self-employed. Thus, our analysis sheds new light onto the black box of SMEs as a hotbed of new start-ups.

Keywords: Entrepreneurship, Occupational Choice, Working Conditions, Human Capital

JEL Classification: M16 M13, M54, J24, J28, C33

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Introduction

Recent research has shown that entrepreneurs who found new firms tend to work as employees of small rather than large firms prior to start-up (Boden, 1996; Wagner, 2004; Hyytinen and Malirante, 2006). A common explanation for this empirical regularity is that small firms seem to have a comparative advantage in furnishing their employees with productive experience conducive to entrepreneurship, e.g. contacts with customers or contact with the owner, who serves as a role model (e.g. Wagner, 2004; Parker, 2007). To date, though, there has been neither much theoretical discussion nor direct empirical evidence demonstrating this to be the case. Our paper attempts to fill this gap in entrepreneurship literature. We test whether transitions of employees into self-employment are related to prior job characteristics, including measures of experience, diverse job tasks, and working conditions that enhance entrepreneurial learning from our point of view. We then examine how these job characteristics (as a learning and human-capital factor) interact with an indicator variable for small firm status to identify if this kind of learning is significantly related to small firm size. In doing so, we draw upon a large representative dataset from Germany: The Socioeconomic Panel (SOEP). The SOEP is a longitudinal household survey conducted annually since 1984. Among a broad array of detailed information, the SOEP reveals changes in respondents' occupational status (e.g. employee or self-employed). For our analysis, we make use of the survey wave of 2001

because this wave contains a special set of questions dealing with different working conditions to which the respondent is exposed in paid employment.

Using these data, in a first step our findings replicate previous findings that working as an employee in a small firm enhances one's chances of becoming self-employed rather than working in a large company (see e.g. also Hyytinen and Maliranta, 2006; Parker, 2007) In a second step, we find support for our hypothesis that working in a small firm tends to provide employees with more relevant experience for starting a new business than working in a large firm would provide. That is, in our paper we provide evidence that entrepreneurial learning in small firms affects entrepreneurial activity. Entrepreneurial learning in general (extracted in an orthogonal factor analysis) is significantly positively related to entrepreneurship transitions when interacted with an indicator variable for small firm status.

The paper is structured as follows: In the next section we briefly discuss the principal findings of previous empirical studies relating to our research question. Second, we outline a theoretical framework for our empirical analysis and test our propositions using multivariate analysis. Finally, we conclude with a discussion of our main results, some limitations in our analysis and questions for future research.

What triggers individuals to become self- employed? A brief literature overview

It is a stylized fact in entrepreneurship literature that human and financial capital constraints, demographic and psychological aspects (here especially risk aversion), gender and regional conditions affect the general decision to become an entrepreneur (e.g. Evans and Leighton, 1989; Evans and Jovanovic, 1989; Dunn and Holtz-Eakin, 2000; or Parker, 2004, pp. 68-107 for an overview; van Praag and van Ophem, 1995; Delmar and Davidsson, 2000; van Praag *et al.*, 2005). This phenomenon, however, should not be analyzed in isolation. Existing firms, for example, are argued to be an important source of new entrepreneurs (Hellman, 2007). In fact, in most countries around 50 to 70 percent of newly started businesses are founded by former employees (EIM, 2003). That is, the majority of new entrepreneurs launch their new venture following a period of employment in established companies (Burton *et al.*, 2002; Gompers *et al.*, 2005). This fact has sparked a growing interest in recent entrepreneurship literature in the role of the work environment in employees' entrepreneurial decision-making (e.g. Hellmann, 2007; Nanda and Sorensen, 2008; Parker, 2007; 2009).

In course, recent literature has tried to identify several prominent firm attributes that have a significant effect on the rate at which an established company spawns new entrepreneurs.

Gompers *et al.* (2005) show that the decision to switch into self-employed from paid employment is strongly affected by a firm's age (the younger the company, the higher the probability that an employee there will become self-employed), location and diversification strategies of the employee's firm. Further work in this tradition has also shown that firm-specific attributes such as labor income and the length of job tenure significantly affect employees' decisions to become self-employed (Evans and Leighton, 1989; Andersson and Wadensjö, 2006; Parker, 2009). Another strand of literature emphasizes how structure and hierarchy in small organizations shape the rate of entrepreneurial activity among employees (see for ex-

ample Rajan and Zingales, 2001; Sorensen, 2007). Hellmann (2007), for example, examines optimal corporate strategies toward employee innovation. Based on intellectual property rights and the availability of outside resources, he develops a model that explains the environmental conditions under which employees are more likely to become entrepreneurs. Ganco (2009) can show that the rate at which employees leave the semiconductor industry to become self-employed rises apace with the level of technological interdependence they find in their former work environment. Thus, they leave to exploit opportunities identified while working for the current employer. The study by Nanda and Sorensen (2008) shows that the likelihood of entrepreneurial activity by employees depends strongly on the prior career experiences of the employee's co-workers (e.g. co-workers who were entrepreneurs previously). In this case, peer effects might play an important role in the decision-making process, as Backes-Gellner and Moog (2009) have already shown for students, and as Gompers, Lerner and Scharfstein have shown for working colleagues (2005: 612). Agarwal *et al.* (2004; 2009) theorize and provide empirical data to show that spinouts occur when parent firms have under-exploited knowledge of the employees due to a lack of dual capability development relating to market-opportunity identification and technological capabilities. Thus, the most capable employees will leave the company and start businesses of their own using knowledge about underexploited opportunities in the parent firm.

Another important factor seems to be experience and knowledge: Early on, Romanelli (1989) points out that industry experience gained working in an established organization gives individuals access to detailed information that can help them identify valuable business opportunities. Put differently, opportunity recognition is strongly mediated by specific workplace characteristics to which the employee is exposed (i.e. interpersonal contact, job variety, ability to determine how work is done). Using a large representative sample of the German population, Wagner (2004) illustrates the general importance of work experience in small and young

firms for nascent entrepreneurship (see also Blanchflower and Mayer, 1994 or Boden, 1996). Helfat and Lieberman (2002) argue that the experiences gained through previous employment allow founders to bring specific knowledge regarding a wide range of issues to their new firm, e.g. knowledge of customer demand, products, technology, suppliers and competitors. Wennberg (2008) finds empirical evidence that knowledge from prior employment in the financial and technological industries facilitates the survival of new financial-services ventures. Ganko (2009) or Agrawal *et al.* (2009) show the importance of knowledge gained by working experience in regard to opportunity recognition in connection with finding a business idea with which to successfully launch a company of one's own. However, there is still little evidence as to just how experiences affect entrepreneurial activity, and just what these experiences are like.

All these aspects are important (specific) driving forces in the process of employee entrepreneurship events. Rather than one general factor, many studies show that a firm's small size has a strong impact on an employee's decision to become self-employed:

Using a large linked employee-employer dataset from Finland, Hyytinen and Maliranta (2006) find evidence, for example, that smaller firms spawn new entrepreneurs more frequently than larger firms. As part of a first step, Parker (2007) provides a theoretical analysis of the relationship between new firm creation and the size of the incumbent firm. According to him, one possible explanation why small firms produce a disproportionate number of entrepreneurs is that individuals possess different degrees of risk aversion, with less risk-averse individuals self-selecting into small firms and entrepreneurship at different stages in life. An alternative explanation that contrasts with the self-selection story is that workers in small firms can more easily gain productive experience conducive to entrepreneurship. Parker notes that empirical research is needed to test these alternative explanations. He emphasizes that

'Likewise, the hypothesis that small firms promote entrepreneurship by giving their employees useful experience can be tested by checking whether transitions to entrepreneurship are related to job characteristics including measures of experience, exposure to customers, diverse job tasks and length of job tenure. If the hypothesis that small firms transit experience is correct, one would expect these job characteristics when interacted with indicator variables for small firm status to be significantly positively related to entrepreneurship transitions.' (Parker, 2007: 7)

The study that comes closest to our analysis is that of Parker (2009), who finds first evidence for the small firm hypothesis as well as some general support for the experience effect in small firms where tenure is concerned. Still, there is only little evidence in this study as to what really happens in small firms versus large firms in terms of entrepreneurial learning to trigger a self-employment decision on the part of employees.¹ To sum up, to date little attention has been paid to the question how “soft” workplace attributes (e.g. job enrichment and job enlargement which enhances entrepreneurial learning) affect an employee’s decision to leave paid employment for self-employment. This neglect is somewhat surprising since prominent theories in entrepreneurship emphasize the importance of opportunity recognition in the entrepreneurial process (e.g. Shane and Venkataraman, 2000).

To sum up the literature to date, then, little evidence has been offered that different working conditions are important, despite theoretical arguments that it is primarily employment experience that spawns new entrepreneurs. These explanations include the possibility that workers in small firms gain productive experience more easily, or enjoy close proximity to inspirational business owners’ co-workers, from whom they can learn how to be effective entrepreneurs themselves.

In the next sections, we analyze how important these factors are for entrepreneurial learning in small firms.

Theoretical framework and hypotheses

In the following section we develop a theoretical framework dealing with entrepreneurial learning and experience as well as firm size. We focus on this learning effect (of human capital) on the (current) black box of working conditions in SMEs and big companies. Learning and experience are generally recognized as a kind of informal human capital:

First, we assume that individuals – when working already in a first or second job – learn about their abilities and accumulate more and other human capital due to work experience which might change their occupational preferences and their expected utility from work and their investment in human capital. Thus, with this changed stock of human capital the utility function of individuals might change as well, making them more willing to become self-employed. Parker (2009), for example, refers to “transfer theoretical” reasons of workers’ entrepreneurial transition activity. In our framework, the idea of such transformation effects is quite relevant to explain why more employees switch from SMEs into self-employment. While entrepreneurial learning opportunities occur in all kinds of companies (i.e. big ones and small ones), we argue that the flat hierarchies found in small companies make these learning effects stronger and the accumulation of entrepreneurial human capital higher. That is, the chances of working under these conditions are greater in small companies than they are in big companies.

Human Capital Theory

When perusing the general entrepreneurship literature, one can observe a positive correlation between the amount of human capital an individual has invested, and his or her entrepreneurial willingness and entrepreneurial occupational choice. (For example: Davidsson and Honig, 2003; Peña, 2002; Anderson and Miller, 2003). Now, this might have to do with the rational

choice of individuals to sort themselves into the best working position where they can earn the highest amount of money or derive the highest utility. As a host of studies have demonstrated, human capital has a strong influence on entrepreneurial success and therefore on income or utility (Hamilton, 2000; Benz and Frey, 2004; Blanchflower and Oswald, 1998; Blanchflower, 2000, Hundley, 2001; Kawaguchi, 2002). Thus, knowing about the advantages regarding human capital investments, it seems rational to decide to become self-employed (Florin, Lubatkin, and Schulze, 2003).

To find an explanation as to why employees of small companies are more likely to become entrepreneurs than employees of big companies, we follow the idea of Parker (2007) that employees might have the chance to gain knowledge helpful and transferable into self-employment. Thus, we have to speak here about experience (informal knowledge) in the sense of Mincer (1970; 1974) and Becker (1962), which might be very useful in starting a business, i.e. which is transferable from one occupation (here: paid employment) into another (here: self-employment) in the sense of general human capital as understood by Becker (1962). There are many studies analyzing success factors for young entrepreneurs, one can derive the kind of knowledge and experience individuals should have to survive in the market as self-employed or to grow. This kind of entrepreneurial human capital should enhance individuals' productivity in entrepreneurship as the following examples show:

Lazear (2005) and Erikson (2002) both show the positive effect of multi-skilled entrepreneurs – being a “Jack of all trades” (Lazear 2005) – on their success. Self-employed individuals – especially when starting a business – should be able to deal with a lot of different challenges and thus should have multiple experiences. People working in SMEs might be more likely to have that opportunity – to learn the ropes in this way, to acquire lots of different experiences and contacts (to potential clients and customers), and to learn more about potential, unsatisfied market needs. This might enhance entrepreneurial willingness and decision-making as

well as productivity in terms of entrepreneurial activity (Hyytinen and Maliranta, 2006). Hence, Thurik (2002:277) defines entrepreneurial human capital as a

'...heterogeneous resource, consisting of a set of complementary human capacities'.

But how can potential entrepreneurs learn this and then know what it takes to succeed? They might learn when working under specific working conditions. Working conditions featuring job variety or diversity and on-the-job acquisition of skills can be expected to spawn entrepreneurial activity - as candidates for self-employment gain enough knowledge in a wide variety of areas to combine the many ingredients needed to succeed in a new business. Lazear's approach has been supported by Wagner (2003, 2004), Baumol (2004), Silva (2006).

We also know from a review of the literature that successful self-employed people should be able to learn new things quickly – meaning that they should have a high absorptive capacity. In this direction, Jovanovic (1982) as well as Lenox and King (2001) argue that people with more, and more diversified, education learn faster and have a higher 'absorptive capacity' with which to discover and learn from new things. This can be attained through learning on the job in general, being involved in important company decisions, and through learning quickly to deal with stress.

The ability to determine how work is done, to vary working hours based on the volume of work and work stress at hand should be positively related to the decision to become self-employed because most self-employed have high work paces at different working hours. Because they often need to meet very tight deadlines, work has to be performed at a high speed. Thus, experience with high-speed work (working under stress) and efficient task organization are skills vital to the success of a new venture (Herron and Robinson, 1993; Chell, 1984).

Being involved in important company-specific decisions should affect the decision to become self-employed positively because an individual (a) will learn how to act and feel in this situa-

tion, (b) will learn how to cope with it, and (c) will discover that this kind of situation is manageable. Moreover, he or she will recognize whether he or she likes to work this way and that it might be a very good feeling succeeding in this situation (Lerner and Malmendier, 2007; Nanda and Sorensen, 2008).

When we focus on the relationship of these success factors (based on experience and knowledge) and typical working conditions of entrepreneurs, we can finally summarize key words such as autonomous work style, decision-making, independent work, flexible working hours (with a positive or negative connotation), stress resistance, working under time restrictions, working under pressure (time, capital, etc.), and being a jack-of-all-trades (multitasking and working in an operative and strategic way).

We will find these ‘entrepreneurial’ working conditions in all kinds of companies – big ones and small ones. But in small companies where hierarchies are flat, employees might be more likely to have the chance to work under these conditions than they would in big companies. Thus, the kind of informal human capital we are talking about is gained while working (learning by doing). Most of the chances to acquire this knowledge are based on nothing other than the inherent working conditions involved, which entail e.g. job variety. Most high-skilled workers wish to work under such conditions, but in a small company we can find those conditions more often (Werner, 2004). We thus conclude that company size matters because of differences in learning effects!

Out of this discussion we develop our main hypothesis:

Small firms promote entrepreneurship by giving their employees useful experiences related to specific job characteristics.

Data and descriptive statistics

As mentioned above, this paper employs data from the German Socio-Economic Panel Study (GSOEP) conducted by the German Institute for Economic Research (DIW). The GSOEP is a representative longitudinal panel study of private households in Germany which began in 1984 and is carried out annually. The data set contains information on socio-demographic characteristics (e.g. sex, age, education, fields of professional experience), a number of firm-specific characteristics (e.g. firm size, industry, job tenure) and a number of items related to respondents' surroundings (region, years). Households in East Germany were included in the survey starting in 1990. Our analysis makes use of the survey wave of 2001 as it contains a special block of questions dealing with different working conditions to which respondents in paid employment are exposed. While the questions about the different working conditions to which the employees are exposed are only asked in 2001, other questions – such as those regarding a respondent's occupational status (e.g. employee or self-employed) – are asked annually. In order to construct our estimation sample, we therefore make use of the survey waves from 2001 to 2003. Our sample is restricted to full-time employees (blue-collar and white-collar workers) working in the private sector in the year 2001. Our sample excludes the self-employed, public-sector employees and people out of the labor force. We then study if they stepped into self-employment in subsequent years. We assume that employees should decide within the next two years (i.e. 2002 and 2003) to actually transit into self-employment if they were exposed to working conditions pushing or pulling them into self-employment in 2001.

Given these assumptions, our sample comprises 5,178 employees, of whom 63 left their jobs for self-employment in the following two years. This share of new entrepreneurs (1.22 %) is consistent with survey data of other data sources, in particular the Global Entrepreneurship Monitor (GEM) (Sternberg *et al.*, 2006). In the empirical model discussed below,

we regress the observed decision whether to leave paid employment for entrepreneurship or not on the basis of socio-demographic variables, the size and industry of the firm, and a set of working conditions to which the interviewee is currently exposed. While the selection of elements included in our estimation models is in part data-driven, we are confident that we have included those determinants most salient to the decision to switch into self-employment.

Working Conditions

All together, we use a large set of variables (twelve items) to account for variations in working conditions in the workplace. Six of these twelve items are the entrepreneurial working conditions discussed in the last section, i.e. *job variety/diversity, on-the-job learning, autonomous workplace decisions, variation of working hours according to work load, high-stress job, and participation in important business decisions*. The other six working conditions cover poor working conditions (e.g. risk of work-related accidents) and overall work climate (e.g. conflicts with superiors). Respondents are asked to indicate whether these workplace characteristics do not apply, apply in part or apply completely to their jobs. To determine how these items relate to one another and condense them into a few interpretable combined variables, a principal component factor analysis with orthogonal varimax rotation is used (Lewis-Beck, 1994). The results of the factor analysis are presented in Table 1.

>table 1 around here<

Entrepreneurial learning

Fortunately, we find that six of the original twelve items used in our factor analysis load best on one distinctive factor,² and, as discussed above, it is reasonable to assume that these six working conditions relate to productive experience conducive to entrepreneurship. Taken together, it is reasonable to assume that these six working conditions capture the latent construct

of *entrepreneurial learning* in paid employment quite well. Thus, a standardized scale based on an average of these six items is constructed (Cronbach's Alpha $\sim .73$).

To sum up, in the econometric analysis we expect, first, that individuals already able to gain experience in firms with working conditions approximating those of the self-employed show a higher level of entrepreneurial activity; and secondly, that these effects will be moderated by firm size.

Controls

On top of this entrepreneurial learning variable, we follow the results and discussion of recent literature regarding the control variables we will include in the empirical models.

- Other firm-specific experience factors

We include the following variables with regard to some firm-specific experience factors:

- *Small firms* (a dummy variable taking the value one if the firm has 20 employees or fewer, zero otherwise). We defined size classes using a classification scheme common in German official statistics, i.e. 1 to 20 employees, 21 to 49 employees, 50 to 99 employees, 100 to 249 employees, 250 to 499 employees, and 500 employees and more (Wagner, 2004). Firms with 20 employees or fewer are considered to be small firms.

- *Job tenure* (measured in years). Firms usually devote resources to familiarizing new employees with their organization. Many workers increase their productivity by learning these new skills and perfecting old ones on the job. According to Becker (1964), much of this on-the-job training is specific, i.e. it increases productivity more in the firms providing it than in other firms or, as in our case, in entrepreneurship. Since the skills are firm-specific, the com-

pensation that the training firm can offer always exceeds that which any outside option can offer. Thus, it can be expected that job tenure is associated with a higher probability of remaining in paid employment rather than leaving the firm to become self-employed.

- *Gross monthly wage* (measured as current log gross monthly wage in paid employment). It is often argued that entrepreneurs face capital constraints when trying to acquire necessary financial resources during the start-up process (see for example Parker and van Praag, 2006; Backes-Gellner and Werner, 2007). Information is often asymmetric, and banks often fail to perfectly distinguish the quality of the entrepreneur's loan application. Reasons include the lack of a track record for new nascent ventures and prohibitive costs of acquiring reliable information about them. One way for new entrepreneurs to overcome credit rationing, though, is to save enough assets in paid employment and self-finance their new venture (Parker, 2004). On the other hand, some employees may earn too little to permit them to build up enough savings to enter self-employment. Thus, we expect that employees with higher relative wages to be the ones more likely to have saved the capital needed to self-finance their new venture.

- *Industry* (a set of dummy variables taking the value one if the interviewee is employed in agriculture, hunting and forestry; electricity, gas and mining; manufacturing; construction; wholesale and retail trade; hotels and restaurants, transport, storage and communication; financial intermediation and business and personal service activities; zero otherwise). Furthermore, we enlarge our specification with a large set of dummy variables that control for industry-specific effects.

Further sociodemographic controls

With regard to the individual characteristics we include the following response variables as controls:

- *Sex* (a dummy variable taking the value one if the interviewee is female, zero otherwise).

We include *sex* as a control because in Germany, as in many other countries, fewer women than men start new businesses. Explanations as to why fewer women choose to start new businesses usually include capital deficiencies, liquidity constraints, difficulties in combining work with family responsibilities, and women's higher aversion to risk (Werner and Kay, 2006; Wagner, 2007). We expect a positive sign for the estimated coefficient of the dummy variable.

- *Age* (measured in years). Various arguments imply both negative and positive relationships of the impact of an individual's age on the decision to step into self-employment (Parker, 2004 for an overview). Age can be seen as a proxy variable of personal wealth, i.e. accumulated capital available to set up a business more cheaply or overcome capital constraints. One might expect older people to be more likely to become entrepreneurs because of the human capital requirements often unavailable to younger workers. Offsetting these factors, the older may be more risk-averse than the young and less capable of working the long hours often undertaken by entrepreneurs. Given these opposite influences of age on entrepreneurial activity, it is an empirical question whether one dominates the other or whether both net out.

- *Foreign* (a dummy variable taking the value one if the interviewee has a foreign citizenship, zero otherwise). It is a stylized fact about ethnic minority entrepreneurship that entrepreneurship can offer a route out of the discrimination perpetrated either by employers in the labor market, banks in the capital market, or consumers in the product market (Parker, 2004). Put differently, to succeed in the host country and overcome impediments to good jobs and to upward occupational mobility, immigrants may be more prone to self-employment (Constant and Zimmermann, 2003). Still, minorities may also face discrimination that hinders their ability to practice entrepreneurship. Here, too, given these opposite influences it is an empirical question whether one dominates the other or whether both net out.

- *Parents self-employed* (a dummy variable taking the value one if either parent of the interviewee is self-employed, zero otherwise). A number of studies investigate and confirm the phenomenon that children of self-employed parents are more likely to become self-employed (see e.g. Dunn and Holtz-Eakin, 2000; Fairlie and Robb, 2003). Self-employed parents can provide social networks as well as the human and financial resources conducive to self-employment. Growing up in a self-employed family may also lead to a positive attitude towards entrepreneurship, desire for independence or autonomy (Mueller, 2006). Additionally, children may be motivated to become entrepreneurs if this entitles them to inherit the family business. Thus, we expect a positive impact of contact with such a role model.

- *Married* (a dummy variable taking the value one if the interviewee is married). Marital status plays a role in self-employment, and from two conflicting directions. On the one hand, being married can give emotional support and stability to those wanting to become self-employed and it has been shown that married men in particular are more productive as a result of division of labor and household production. Also, a spouse might help provide enough start-up capital or use his or her income as insurance against risky income in entrepreneurship; and once in business, a spouse can provide labor at below-market wages. On the other hand, married people may be unwilling to take risks, especially with children or when their household depends on their income. Hence, we expect the impact of marital status to be unresolved.

- *Education* (measured in years). We include years of schooling to control for differences in the initial stock of human capital. Previous research suggests that if human capital can be used productively within paid employment, the likelihood of switching into self-employment is lower (Moog, 2004). Yet, if human capital can also be used productively within entrepreneurship, the overall impact on occupational choice is ambiguous. According to Becker (1964), it is reasonable to assume that education in years is generally productive. Thus, we expect a

worker's years of education to make no difference in terms of the decision to become self-employed.

The distribution of answers to all response variables and their hypothesized effects on entrepreneurial activity are shown in Table 2. See Table 3 for pair-wise correlations between key variables.

> *table 2 around here* <

> *table 3 around here* <

Dependent variable:

The ceteris paribus role played by entrepreneurial working conditions (moderated through small firm size) in determining the probability of leaving paid employment to become self-employed is investigated in an econometrical model. The dependent variable is a dummy endogenous variable taking the value one if the employee has switched into self-employment and zero otherwise.

Results of the econometric study

As already mentioned above, starting a new business is a rare event. Thus, application of standard textbook logit or probit methods to estimate the empirical models may not be appropriate here. Therefore, Rare Events Logistic Regression is applied here – a version of the logistic model to compute unbiased estimates for situations such as this (for an example of application in entrepreneurship research, see e.g. Wagner, 2004).

In the econometrical analysis, two different specifications of the empirical model were estimated. All specifications include the identical set of control variables, but they differ in the way entrepreneurial learning is included. Model A includes *entrepreneurial learning* and the control variables (*small firm, job tenure, gross monthly wage, industries, sex, age, nationality, family status, parental self-employment, and years of education*). Model B additionally includes an interaction specification for entrepreneurial learning in small firms (*entrepreneurial learning * small firm*) (see Table 4).

> table 4 around here <

In model A, as expected, the results show that small firm size and job tenure are statistically significantly different from zero at any conventional level. Employees in small firms and short job tenure have a higher probability of becoming self-employed, which is in line with prior research (e.g. Wagner, 2004; Mueller, 2006). The entrepreneurial learning variable has no significant effect on the probability of leaving paid employment for self-employment if these job characteristics are not interacted with indicator variables for small firm size. Age, foreign citizenship, marriage and years of education have no influence on the probability of

switching into self-employment from paid employment, whereas the estimated coefficients of sex, parental self-employment, small firm size, job tenure and gross monthly wage show a significant effect. As expected, males and individuals with self-employed parents are more likely to enter into entrepreneurship. A respondent's years of education have no effect on the rate of entrepreneurship.³

Model B, on the other hand, gives a different picture. The interaction term indicating entrepreneurial learning in small firms is positive and highly significant. That is, the effect of entrepreneurial learning on the decision to become self-employed is exercised by small firms of up to 20 employees, not by large firms. Thus, the data deliver results in support of the hypothesis that entrepreneurial learning occurs much more in small than in large firms due to different kinds of working conditions.

To give a better and more intuitive way of understanding how the moderated effect works, we have plotted the predicted outcomes. Figure 1 provides insights into how the predicted outcomes change for small and large firms with high and low levels of entrepreneurial learning, i.e. evaluated at the multivariate means of the control variables (for details see e.g. Long and Freese, 2001) and thus gives us information on the extent of the economic importance for entrepreneurship of entrepreneurial learning in small firms.⁴

> *figure 1 around here* <

Figure 1 shows that for high levels of entrepreneurial learning, employees in small companies are more likely to become entrepreneurs than employees in large companies are. Furthermore, the probability of leaving paid employment for self-employment *increases* with entrepreneurial learning conditions in small firms at an *increasing* rate. For example, the estimated prob-

ability that an “average” employee (employee one) who is working for a large company and is exposed to a high level of entrepreneurial working conditions of, say, 2.5 points on the constructed entrepreneurial learning scale will switch into self-employment in the next two years is 0.38 percentage points. If we consider a second employee (employee two) identical to employee one, but who has worked in a small firm, the estimated transition probability is 1.96 percentage points. The difference is even greater if we examine the highest level of entrepreneurial learning (i.e. if we plot the estimated probabilities at 3.0 points on the entrepreneurial learning scale). Here, the estimated probability for employee 1 is 0.25 percentage points and for employee 2 is 3.8 percentage points, and the difference is 3.55 percentage points. All things considered, the predictions show that, when being exposed to entrepreneurial working conditions, it makes a difference, both statistically and economically, if an employee works in a small company.⁵

Additional Analysis and Robustness Checks

Our analysis is based on the idea that small firms promote entrepreneurship by giving their employees useful experiences related to specific job characteristics. Yet, a (somewhat) different explanation could be that individuals self-select in small firms prior to self-employment either because they know about these working conditions *ex ante*, or because of some other reasons such as the individual attitude to risk. Parker (2009), for example, proposes that less risk-averse individuals who select into entrepreneurship will also be more willing to work for small firms.⁶

Still, the models used so far mainly focused on the role of entrepreneurial learning conditions in small firms to estimate the probability of switching into self-employment, ignoring employees' decisions about whether or not to apply for a job in such a small company prior to the self-employment decision. It is also arguable that such an approach might not be appropriate unless both decisions are independent. That is, taking selection into account, it can be argued that the probability of switching into self-employment from paid employment is a conditional probability, which depends on the individual's prior decision to work for a small company. Put differently, the correlation of errors between both equations may be likely because entrepreneurial learning conditions in SMEs may have prompted specific individuals to select into small firms prior to switching into self-employment. In such cases, where hiring and transition decisions are not independent and the correlation between the errors of the two equations is nonzero, estimating the transition probability as a univariate probit may provide incorrect estimates (Baum, 2006; Cameron and Trivedi, 2009). Fortunately, estimating a seemingly unrelated bivariate probit model can mitigate the problems described above. The bivariate probit model is based on the principle that the decision to work for a small company prior to the self-employment decision is not separate but perhaps interrelated.

>Table 5: bivariate Probit<

Table 5 shows the results of the bivariate probit estimations. In the first-stage equation, we use the controls described above. It can be argued that these variables are important to the decision to start with a small company (Parker 2009). The second equation, which is observed conditional on the outcome of the first, describes the probability of actual transition into self-employment. Here, we include the same set of variables as in Table 4, which we argued are important to the self-employment decision. In our estimated model, the potential correlation ρ is positive and significant (ROH), meaning that estimates of the y_1 equation will be biased unless we account for the selection described. In what follows, the main results of the bivariate probit model are compared with the results of the univariate probit model. In both models, the signs of the coefficients of our major explanatory variables (i.e. entrepreneurial learning, small firm size, and entrepreneurial learning * small firm size) are identical, meaning that entrepreneurial learning in small firms has a positive effect on the probability of transition to self-employment. However, the effects are somewhat greater for the univariate model than the bivariate probit model.⁷

To sum up, our main results seem to be quite robust. All models show a similar effect of entrepreneurial learning on the decision by employees to leave paid employment for self-employment when moderated by firm size. Thus, we can show strong effects of knowledge spill-over from small firms into newly started firms.

Conclusion and Contribution, Limitations and Future Research

The purpose of this study is to shed some light on the relationship between the decision to switch into self-employment from paid employment and the size of the firm the employee worked for. In contrast to most of the prior research, we extend the discussion of employee entrepreneurship to size-specific organizational procedures and routines. Based on the finding that entrepreneurs who found new firms tend to have worked as employees of small rather than large firms prior to start-up, we have focused on how entrepreneurial working conditions affect employees' decisions to become entrepreneurs when moderated by firm size. Accordingly, in our analysis we combine the discussion of firm size and entrepreneurial human capital with the decision to become self-employed by examining the two phenomena both in isolation and in their interactions. In other words, to gain greater insight into the occupational choice of employees to become self-employed we shed more light into the black box of small companies as hotbeds of new start-ups. Furthermore, we deliver some new theoretical insights as to why specific working conditions enhance entrepreneurial learning in small rather than in large firms, consequently triggering a worker's decision to become self-employed.

More specifically, first we were able to replicate previous findings that the small size of a business plays a role in the decision to become self-employed. Secondly, we hypothesized and found support for a strong interaction between entrepreneurial human capital (gained through specific working conditions) and small firm size, with positive effects for the decision to become self-employed. This effect remains strong even when controlling for a variety of other socio-demographic and firm-specific factors, as well as possible selection effects.

Hence, our research delivers some important insights into the relationship between employee entrepreneurship and knowledge spillovers by providing an initial verification of the proposi-

tion that the learning that occurs due to working conditions in small firms increases the probability of switching into self-employment.

It should be noted however, that our study has some limitations that should be kept in mind when considering our results. On the one hand, our data do not offer much information of the specific industry or market or the kind of business in which the former employee actually starts his or her own business. Thus, we cannot directly test whether and how he or she utilizes the knowledge gained at the former employer. Moreover, at this point of our research, we cannot postulate if it is actually bad or good news when small businesses lose some of their (best?) employees to self-employment due to the specific working conditions to which they are exposed in the firm. Most interestingly, we can show that in the case of large firms the entrepreneurial learning effect is significant and negative.

Even with these limitations in mind, though, we are quite confident that our results represent a contribution to research on entrepreneurship, occupational choice and strategy. For the entrepreneurship discussion we deliver initial evidence as to why a firm's size matters – not per se but as a function of specific entrepreneurial learning conditions. Moreover, we define what entrepreneurial learning is and how individuals can gain this knowledge, i.e. by being exposed to it via specific working conditions in small firms. Thus, people really wanting to invest actively in entrepreneurial human capital should choose small companies to work at prior to self-employment. We also contribute to the stream of research on occupational choice, showing that when “enough” is invested in entrepreneurial human capital, it might be more rational and lucrative to be self-employed than to work as an employee.

Last but not least, we contribute to the strategy discussion on work conditions and employee entrepreneurship by giving first evidence that while small firms tend to lose their employees by exposing them to entrepreneurial working conditions, large firms seem to retain these employees (i.e. in large firms they have a tendency or some kind of incentive to stay).

This opens up a new and interesting field of study for future research, e.g. why employees react differently to entrepreneurial working conditions in small versus large companies. In this context, one interesting avenue for exploration is whether employees in small firms have lower opportunity costs – i.e., that continued employment at these firms is less attractive. Another research question still unresolved is whether SMEs face a strategic dilemma when (productive) employees leave the company, whereas in big companies they stay. Thus, it might be interesting to determine if former employees network and cooperate with their ex-employers or become strong competitors in the same market. Furthermore, in light of our findings, future research could also further investigate how hierarchy structures, glass-ceiling effects or the rational choice argument influence the decision to earn more in self-employment, and how such working conditions can influence opportunity recognition.

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Table 1
Working Conditions. Principal Component Analysis. Varimax Rotation (Loadings below 0.3 denoted by Asterisk)

<i>Please answer the following questions by stating whether it applies to your work completely, partly or not at all</i>	<i>Factor 1 (Entrepreneurial Learning)</i>	<i>Factor 2 (Poor Job Circumstances)</i>	<i>Factor 3 (Work Climate)</i>	<i>Uniqueness</i>
Is your job varied?	0.7002	*	*	0.4775
Do you decide yourself how to complete the tasks involved in your work?	0.6650	*	*	0.5135
Do your working hours vary according to the work load in your company as a whole?	0.5238	*	*	0.6944
Do you have an influence on important company specific decisions like in determining whether employees receive more pay or promotion?	0.5149	*	*	0.6339
Do you often learn something new on the job, something which is relevant for your career?	0.6874	*	*	0.5005
Does your work involve a high level of stress?	0.4409	*	0.575	0.5346
Do you have hard manual labour at your work?	*	0.8150	*	0.3149
Is your work strictly monitored?	*	0.3734	*	0.7253
Are you exposed to hazardous working conditions?	*	0.8291	*	0.3097
Are you exposed to higher risk of accidents at your workplace?	*	0.8429	*	0.2800
Do you get along well with your colleagues?	*	*	-0.7134	0.4736
Do you often have conflicts and difficulties with your boss?	*	*	0.5679	0.6458
Eigenvalue	1.9362	2.7299	1.2335	
Proportion explained	23 %	16%	10 %	
Cronbach's Alpha	0.73	0.64	0.28	

Note: Own calculations with SOEP data. LR test: Independent v. saturated $\chi^2(66) = 1.1e^4$, $p < 0.000$. Cronbach's Alpha based upon loadings above 0.3.

Table 2**Description of Variables and their Expected Impact on Entrepreneurial Activity**

<i>Variable Name</i>	Variable Description	<i>Mean</i>	<i>Std.dev</i>	<i>Exp. Sign</i>
<i>Dependent Variable</i>				
New Entrepreneurs	Employee has switched into self-employment between 2001 and 2003 [Yes=1, No=0]	0.012	0.109	
<i>Working Conditions</i>				
Entrepreneurial Learning	Constructed (Cronbach's Alpha=0.73) [Min=1, Max=3]	2.046	0.409	+
<i>Other Firm Specific Experience Factors</i>				
Small Firm Size	Firm has less than 20 employees [Yes=1, No=0]	0.245	0.430	+
Job Tenure	Since when have you been working for your current employer [years]	9.814	9.253	-
Log Gross Monthly Wage	How high was your gross income from employment last month? [log Euros]	7.954	0.407	+
Industries	In which branch of business or industry is your company active for the most part? [9 Dummies]	---	---	/
<i>Controls</i>				
Female	Your sex? [0=Male; 1=Female]	0.293	0.455	-
Age	Your age? [Years]	40.06	10.32	/
Foreign	Your citizenship? [0=German; 1=Foreign]	0.121	0.326	/
Parents self-employed	Has either parent been in self-employment? [0=no; 1=yes]	0.081	0.273	+
Married	Are you married? [0=no; 1=yes]	0.639	0.480	/
Years of education	Generated variable [years]	11.90	2.41	/

Note: Own calculations with SOEP data.

Table 3
Pair-Wise Correlations Among Key Variables

		1	2	7	8	9	10	11	12	13	14
1	New Entrepreneurs	1									
2	Entrepreneurial Learning	0.037*	1								
7	Small Firm Size	0.059*	0.018	1							
8	Job Tenure	-0.046*	0.011	-0.170*	1						
9	Log Gross Monthly Wage	0.028*	0.362*	-0.281	0.235*	1					
10	Female	-0.028*	-0.083*	-0.085*	-0.098*	-0.379*	1				
11	Age	-0.008	0.015	-0.092*	0.498*	0.177*	-0.070*	1			
12	Foreign	-0.008	-0.218*	-0.034	0.016	-0.022	-0.032*	-0.025	1		
13	Parents self-employed	0.051*	0.055*	0.012	0.024	0.084*	-0.006	0.045*	-0.037*	1	
14	Married	-0.004	0.005	-0.071	0.226*	0.209*	-0.176*	0.371*	0.073*	0.002	1
15	Years of education	0.036*	0.368*	-0.053	-0.133*	0.345*	-0.002	-0.034*	-0.229*	0.068*	-0.059*

Note: Own calculations with SOEP data. * Significant at 5% level

Table 4
Rare Event Logit Estimates for Switching into Self-Employment

	<i>Model A</i> Coef. (Robust SD)	<i>Model B</i> Coef. (Robust SD)
Working Conditions (Constructed)		
➤ Entrepreneurial Learning	0.12535 (0.37241)	-0.81696* (0.42498)
Interaction		
➤ Entrepreneurial Learning * Small Firm Size		2.13326*** (0.60581)
Other firm specific experience factors		
➤ Small Firm Size	0.94266*** (0.27543)	-3.71708*** (1.37724)
➤ Job Tenure	-0.06224*** (0.02067)	-0.06001*** (0.02074)
➤ Log Gross Monthly Wage	0.91013* (0.44466)	0.94003** (0.45219)
➤ Industries (9)	yes	yes
Controls		
➤ Female	-0.96444*** (0.35729)	-0.91349** (0.35762)
➤ Age	-0.00318 (0.01333)	-0.00015 (0.01333)
➤ Foreign	-0.00031 (0.43788)	-0.03889 (0.44057)
➤ Married	0.01469 (0.29499)	0.00923 (0.29453)
➤ Parents Self-Employed	1.01951*** (0.31597)	0.99516*** (0.31289)
➤ Years of Education	0.03138 (0.05862)	0.04967 (0.05662)
No. of cases	5,178	5,178

Note: Own calculations with SOEP data. ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level

Table 5
Seemingly Unrelated Bivariate Probit Estimates for Switching into Self-Employment

	<i>Equation 1</i> Coef. (Robust SD)	<i>Equation 2</i> Coef. (Robust SD)
Working Conditions (Constructed)		
➤ Entrepreneurial Learning		-0.29348** (0.14081)
Interaction		
➤ Entrepreneurial Learning * Small Firm Size		0.87133*** (0.22231)
Other firm specific experience factors		
➤ Small Firm Size		-2.66508*** (0.58222)
➤ Job Tenure	-0.01569*** (0.00302)	-0.02802*** (0.00671)
➤ Log Gross Monthly Wage	-0.91737*** (0.06982)	-0.02036 (0.20808)
➤ Industries (9)	yes	yes
Controls		
➤ Female	-0.13392*** (0.04999)	-0.40044*** (0.12979)
➤ Age	-0.00081 (0.00239)	-0.00113 (0.00465)
➤ Foreign	-0.07047 (0.06813)	-0.06511 (0.15305)
➤ Married	0.02209 (0.04671)	0.03139 (0.10241)
➤ Parents Self-Employed	0.16043** (0.07517)	0.39277*** (0.12685)
➤ Years of Education	-0.00469 (0.01003)	0.01718 (0.02028)
No. of cases	5,178	
Wald chi2	898.36***	
Log pseudolikelihood	-2,726.95	
ROH	0.65171***	

Note: Own calculations with SOEP data. ***Significant at 1% level; **Significant at 5% level; *Significant at 10% level

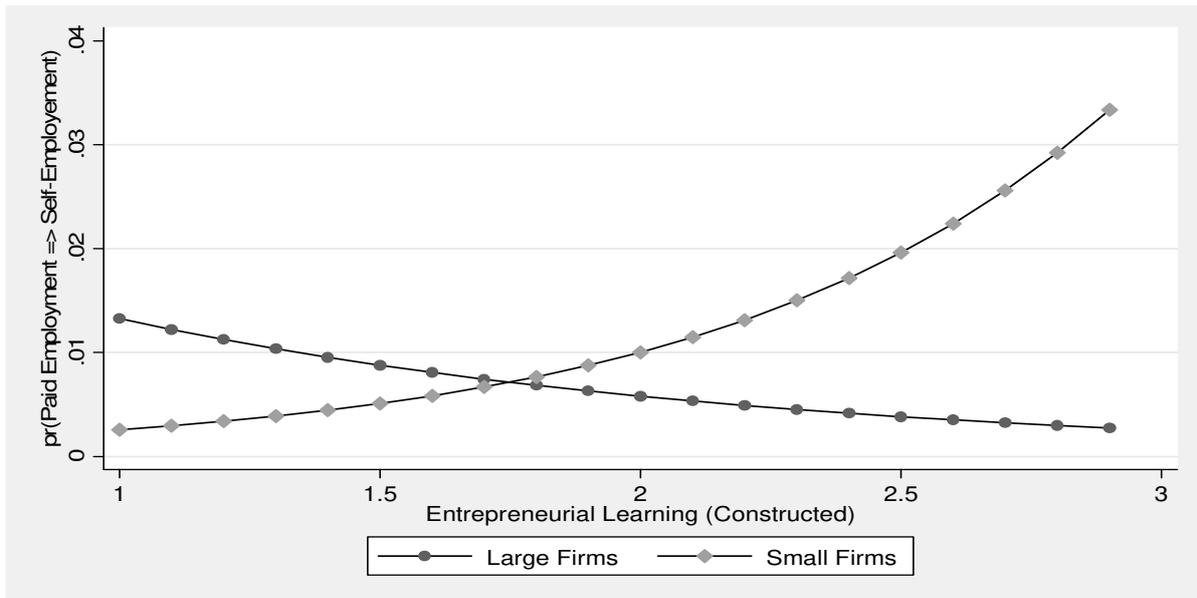


Figure 1. Entrepreneurial Learning (constructed) in Small Firms and the Probability of Switching into Self-Employment (moderated effects)

¹ The study of Parker (2009) is the first to test the size effect of a company when interacted with firm specific factors to explain why people change more often from SMEs into self-employment compared to big companies. Yet, Parker does not find evidence for this hypothesis. We believe that this is in large parts due to a lack of data. Due to data restrictions, the study only covers proxies like tenure, wage, managerial experience, or being a union member to test the knowledge transfer hypothesis. We think that these proxies may catch a variety of different specific facets of the work place environment (see for example our discussion of the control variables above), but from our point of view, they are not really suitable for covering the concept of entrepreneurial learning conditions in firms.

² We find that each item in the factor analysis has the highest loading on the factor to which it conceptually belongs, and no item (save workplace stress level) has a loading of 0.3 or more on any other factor. Note that the other underlying factors of poor job circumstances and work climate are not part of the analysis of this paper.

³ Yet, as further analysis (not documented here) shows, the estimated coefficient of years of education becomes insignificant as soon as we control for log gross monthly wage. Put differently, the education variable seems to pick up part of the income effects (i.e. is significant) if wage is excluded.

⁴ Noting that the estimated probabilities in a nonlinear model strongly depend on the contribution of the other covariates (Mitchel and Chen, 2005; Long and Freese, 2006), we also estimated the model with different values of the covariates. Second, keeping in mind that estimations of interaction effects in nonlinear models may not be equal to the effect of changing just the interaction term, i.e. the sign of the coefficient of the interaction term may be different for different observations, we applied the *inteff* routine in STATA to check if this is a problem in our estimations (Norten *et al.*, 2004). Fortunately, all results show that the described main finding, i.e. the effect of entrepreneurial learning on the decision to become self-employed is performed by small firms up to 20 employees, is robust.

⁵ Note that for low levels of exposure to entrepreneurial working conditions (up to a threshold of 1.75 points, i.e. the 20th percentile), the predicted probability of an “average” employee working in a small firm is lower than for an identical employee working in a large company.

⁶ Parker (2009) argues that the owners of large firms actually ‘insure’ their workers by offering them a smoothed wage. Wages in small companies as well as payoffs in entrepreneurship, on the other hand, are more variable which attract less risk-averse individuals.

⁷ To probe the analysis with regard to possible selection problems further, we also estimated a binominal probit with selection model (Van de Ven and Van Praag, 1981). In this model, which is closely related to the bivariate probit, the decision to switch into self-employment from paid-employment is conditional on the individuals’ likelihood of (a) working for a small company and (b) working for a larger company (i.e. if the selection equations are 1). The results show that In the subset of the workers that selected into small firms the entrepreneurial learning variable is highly significant and positive whereas in the subset of the workers that selected into larger firms the entrepreneurial learning variable is significant and negative.