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**The Effect of Motivation on Self-employment Duration in Germany:
Necessity versus Opportunity Entrepreneurs***

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Early draft, comments welcome

Abstract

Using data from the German Socio-Economic Panel Study (GSOEP), we analyze whether necessity and opportunity entrepreneurs differ in terms of self-employment duration. We find that the two types of entrepreneurs differ regarding their duration in self-employment. Once controlled for educational variables however, this effect turns out to be no longer significant. We therefore conclude that the difference observed is no original effect but is due to selection. We then go on to discuss the implications of our finding for entrepreneurship-policy making. Suggestions to improve governmental start-up support programmes are given. Estimations are carried out with discrete time hazard rate models controlling for unobserved heterogeneity.

Keywords: Self-employment, Firm survival, Necessity entrepreneurs, Opportunity entrepreneurs, Hazard rates, GSOEP

JEL classification: J23, J24, M13, C41

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I. Introduction

It is a widely accepted goal of economic policy to increase the number of new businesses. Yet many new businesses do not survive very long. Only about 50% of newly established businesses in Germany survive longer than 5 years (Fritsch et al. 2006). From a policy perspective, it might therefore be interesting to know more about the determinants of survival of newly established businesses. In addition, financial institutions might also be interested to know more about the determinants of business survival. Any potential investor – whether a venture capitalist, a bank or a business angel – needs to calculate the expected return of his investment where business survival obviously is a crucial assumption. Any new information about the determinants might make this calculation more accurate and help to avoid systematic decision biases.

Apart from the general question about the determinants of business survival, this paper aims to provide new insights relating to the impact of motivation on business survival. More concretely, we analyze whether an individual who stepped into self-employment voluntarily (opportunity entrepreneur) remains substantially longer self-employed than an individual who started self-employment for necessity reasons (necessity entrepreneur). To elaborate the determinants of duration in self-employment, we estimated several hazard rate models with different specifications in a stepwise procedure. Employing this mode of analysis, we aim to determine whether any observable differences between the two groups are due to selection. In order to explore the validity of our results further, we compare the characteristics of necessity and opportunity entrepreneurs using univariate statistics and a multivariate probit model.

In line with prior beliefs, we found that opportunity entrepreneurs stay significantly longer in self-employment than necessity entrepreneurs. This effect, however, seems to be more likely due to selection rather than being an original effect. After controlling for whether the venture is started in a profession the entrepreneur has learnt, the hazard of leaving self-employment is not affected by the individual being a necessity entrepreneur anymore. This result opens an interesting debate regarding the economic impact of opportunity versus necessity entrepreneurs. It seems that necessity entrepreneurs are not *per se* less successful and therefore less desirable from an economic perspective as some literature suggests (e.g. Acs et al. 2005, Acs and Varga 2005). To some degree, this finding justifies governmental programmes of start-up support designed exclusively for necessity entrepreneurs. Their efficiency, however, might be further improved by including educational variables into the decision-making process.

The remainder of this paper is organized as follows: section 2 discusses the role of motivation regarding business survival from a theoretical perspective and provides a short literature review on the impact of other factors. Section 3 introduces our data and the econometric models we used. In section 4, the empirical findings are reported. Finally, section 5 provides implications from a policy perspective and gives ideas for further research.

II. Determinants of Survival in Self-employment

1. MOTIVATION: NECESSITY VERSUS OPPORTUNITY ENTREPRENEURS

Since 2001, the Global Entrepreneurship Monitor (GEM) has discussed two rather different types of entrepreneurship, notably necessity and opportunity entrepreneurship (e.g. Reynolds et al. 2002; Sternberg et al. 2006). The differentiation refers to the motivation of entrepreneurs to start their ventures. Opportunity entrepreneurs are viewed as entrepreneurs who start a business in order to pursue an opportunity, whilst necessity entrepreneurship is more requirement-based (e.g. Reynolds et al. 2005). Why should these two groups differ regarding their duration in self-employment? Some arguments are presented below:

Opportunity entrepreneurs start their venture voluntarily. More than necessity entrepreneurs, they have prepared their entry into self-employment on a solid basis. It seems also likely that they start their business in an area of their particular expertise. These factors should lead to a longer survival time of opportunity versus necessity entrepreneurs.

Some empirical studies have shown that entrepreneurship pays off for only a small subgroup of entrepreneurs (e.g. Hamilton 2000). Given their qualification, many entrepreneurs could earn more in a wage job. The fact that they stay nevertheless in self-employment is often interpreted as evidence for non-monetary returns of entrepreneurship such as greater autonomy, broader skill utilization and the possibility to pursue one's own ideas (Benz 2005; Benz and Frey 2003; Hundley 2001). However, almost by definition, this argument should not apply to necessity entrepreneurs. At least in the beginning of their venture, non-monetary returns seem unlikely to be their main driver for motivation. Regarding business survival we argue that non-monetary returns of entrepreneurship impact opportunity entrepreneurs more heavily than necessity entrepreneurs. This might enable them to cope better with problems of the new venture such as an economic downturn or customer dissatisfaction. On the other hand, once these non-monetary returns vanish (e.g. the entrepreneur finds herself being less independent as she originally assumed), they are more apt than necessity entrepreneurs to quit their businesses and look for new opportunities either in wage jobs or as serial entrepreneurs.

Another line of argument is based on selection issues. The basic argument postulates a higher education or a higher entrepreneurial skill set of opportunity versus necessity entrepreneurs. According to this argument, opportunity entrepreneurs should stay significantly longer in self-employment than necessity entrepreneurs. Once controlled for these skills, however, the difference between the two groups should vanish. Yet, due to their rather generalist nature (Lazear 2004; Wagner 2003), entrepreneurial skills are difficult to measure. In this empirical work, we refrain from this generalist aspect and compare the two groups only regarding formal education (variable schooling) and whether they were educated in the profession in which they start their venture (variable educated in this profession).

2. OTHER DETERMINANTS OF SURVIVAL

Several other determinants exist which might influence the duration of being an entrepreneur. We shall focus more on the person-specific determinants, but also include some context related factors in our analysis. A large part of this review is based on van Praag (2003) and Schwarz et al. (2005), who both summarize empirical evidence and theoretical underpinnings of these determinants in a more detailed and concise way.

Females are a minority of the self-employed in all developed countries (Fairlie and Mayer 1996). Prior empirical evidence suggests that the sex of an entrepreneur might influence business success. Firstly, ventures initiated by women are found to have different characteristics. For example, female entrepreneurs often start their ventures in industries with lower employment growth possibilities (Cooper et al. 1994; Fehrenbach 2002). Related to this finding is the fact that female entrepreneurs are more likely than male entrepreneurs to be part-time workers (Devine 1994). Secondly, female and male entrepreneurs have a differing motivation when starting an own business. Female entrepreneurs often stress the fact that self-employment better allows them to combine family and work issues than a regular wage job (Schwarz et al 2005). Both arguments let us propose an influence of the entrepreneur's gender on business survival in a way that ventures created by female entrepreneurs should survive less long than ventures created by male entrepreneurs.

In order to build a rationale for an effect of nationality on self-employment duration, we borrow an argument proposed by Light (1972) or Portes and Zhou (1996). There is some empirical evidence that foreigners are discriminated on the market for wage jobs. Due to this discrimination, some foreigners which otherwise would have rejected being self-employed are pushed into self-employment. Yet, they may lack sufficient entrepreneurial skills and drop out

of self-employment quickly. *Ceteris paribus*, a shorter duration in self-employment for non-German entrepreneurs than for their German counterparts should be observed.

Regarding a possible influence of the entrepreneur's age on her business success or her duration of being an entrepreneur the following reasoning applies (see also Schwarz et al. 2005): on the one hand, the age can be viewed as a proxy variable combining several aspects of experience and knowledge. As the entrepreneur becomes older, she accumulates job-specific as well as general experience and knowledge. It is therefore likely that an older entrepreneur is more prudent than a younger entrepreneur leading to better business decisions. Also, she might have built up a greater and more relevant social network and a greater stock of (financial) capital allowing her to stay in self-employment more easily. On the other hand however, an older entrepreneur might be reluctant to stay with her venture once substantial financial risks evolve. Such a growing risk aversion might arise due to family related obligations or due to the fear of losing the achieved standard of living. In a nutshell, we expect an inverse u-shaped relationship when considering the age of an entrepreneur, which is in line with previous literature (e.g. Schwarz et al. 2005; van Praag 2003).

Family-specific determinants are a subset of person-related factors. From these factors, we include the state of marriage and the number of children in our estimations. Although these variables might be already partially represented by the entrepreneur's age, they could constitute a unique effect based on the particular consequences a family's "bondage" has on the entrepreneur. We assume that a married entrepreneur or an entrepreneur with children is more risk-averse and hence her propensity to close down a (financially risky) own business should be greater. Thus, for family-bound entrepreneurs we expect a shorter duration of being self-employed.

For a successful venture, the education level of the entrepreneur might be of great importance. We propose the years of schooling as a proxy measuring the level of the business owners' formal education. A higher level of education of the business owner is found to be positively related to the venture's performance (Schiller and Crewson 1997). Correspondingly, we believe the entrepreneur's chances of survival in self-employment to be greater. On the other hand, better educated business owners have more alternatives than less educated ones what might shorten their stay in self-employment. Another argument concerns the fact of signalling on the market for wage jobs. Very much determined entrepreneurs do not consider a regular wage job as an alternative and therefore do not need a high level of formal education as a signalling device. They invest less (time and money) in formal education what should then lead

to a negative impact of education level on self-employment duration. For a further elaboration of this argument see Riley (1979). Overall, the effect of formal education on business survival remains unclear. In addition to formal education, another educational aspect might have a decisive influence. It should not only matter how much education, but also what type of education the entrepreneur has acquired. In other words: the closer the match between the entrepreneur's expertise and the type of education required in the management of the venture the better its performance, and, correspondingly its chances of business survival, should be. We measure the degree of matching with the variable "educated in this profession" (Table III).

The entrepreneur's endowment with capital might influence her propensity to stay an entrepreneur. That is because a higher given personal stock of capital leads to a greater independency from the venture's success. Being more independent, such an entrepreneur is more able to engage longer in entrepreneurship. To a lesser extent, she does not have to rely on revenues from her business to earn her living. On the other hand, this argument also helps to motivate the opposite case. Once the non-monetary returns from entrepreneurship diminish, a "richer" business owner can afford to stay away from entrepreneurship. In the light of these two conflicting arguments, the effect of the entrepreneur's capital endowment on business survival remains unclear. Whereas we do not know the initial capital stock of the entrepreneur when she engages in self-employment, we propose the fact of home-ownership as being a sufficient indicator for her personal financial situation (see also van Praag 2003). It should be made clear that by this way we only consider the entrepreneur's personal capital endowment. With our data, we are not able to measure the amount of capital invested in the particular business. Interested readers might turn to Cooper et al. (1994) who analyze in a detailed way the relationship between initial financial capital and venture performance.

As Schwarz et al. (2005), Fritsch et al. (2006) and van Praag (2003) point out, the industry in which the entrepreneur starts her venture has an important influence on both business success and business duration. Yet, as with some of the other variables, the effect remains a-priori undetermined. To give an example: industries with a small minimum efficient size and correspondingly low market entry barriers are commonly assumed to be associated with high survival rates (e.g. Audretsch 1995). On the other hand, it might be that a self-selection process occurs in advance in the way that particularly low-quality start-ups select into those industries. Furthermore, low market entry barriers permanently attract new business formations, thereby creating intensive competition resulting in high drop-out rates. We shall leave the

impact of industry on business survival undetermined. Nevertheless, we control for any effects by including 16 industry dummies measured on a 2-digit level.

As shown by Fritsch et al. (2006), regional effects prevail when starting a business. They also clarify that the time when a new venture is started should be considered. We control for both effects by including 15 or 14 dummy variables into our regression models.

III. Data and Econometric Models

Subsection 3.1 describes our sample and the variables used, whereas subsection 3.2 presents the econometric models we estimated.

1. DATA

We used the data of the German Socio-Economic Panel Study (GSOEP) at the German Institute for Economic Research (DIW), Berlin, to construct an unbalanced panel data set.³ The GSOEP is a longitudinal household survey conducted annually. Amongst a broad array of detailed information, it reveals the participant's occupational status (e.g. employee or self-employed). The first wave in the year 1984 included 12,245 individuals. Since then, the GSOEP expanded its sample size in several steps, interviewing 22,019 individuals in 2004. In order to construct our estimation sample, we made use of the waves from 1990 to 2003⁴, selecting those persons who were self-employed (in at least one wave) and studying how they stepped into self-employment. Those reporting to have left their previous job in paid employment on their own were classified as opportunity entrepreneurs, whereas those who were either dismissed by their employer or laid off due to a closing down of their workplace were classified as necessity entrepreneurs. We constrained our sample to those cases where the termination of the last job, voluntarily or involuntarily, occurred within two years before moving into self-employment. For serial entrepreneurs, we only considered their first entrepreneurial activity.⁵ Individuals working in a business of their family (which could be treated as an indirect mode of self-employment) were excluded completely.⁶

With regard to necessity and opportunity entrepreneurship, our sample comprises 184 necessity (28.8%) and 455 opportunity entrepreneurs (71.2%) (Table I). The share of necessity en-

³ For more detailed information about the GSOEP refer to Frick (2005). We basically use the same data as Block and Wagner (2006).

⁴ We excluded the six waves from 1984 to 1989, since only West German entrepreneurs would be included, leading to a systematic bias of the dependent variable "duration in self-employment".

⁵ See Alsos and Kolvereit (1999) for a discussion of start-ups by serial entrepreneurs.

⁶ See Parker (2004) for a problematization of unpaid family workers.

trepreneurs is consistent with survey data from other data sources, in particular the GEM or the Regional Entrepreneurship Monitor data (e.g. Lückgen and Oberschachtsiek 2004; Sternberg et al. 2006; Wagner 2005). Moreover, the descriptive statistics indicate a rather similar sample composition. For example, in line with Wagner (2005), necessity entrepreneurs tend to be older and they were longer unemployed before they entered into self-employment (Table II).

[Insert Table I and Table II about here]

Correspondingly, the way in which we constructed the dependent variable – duration in self-employment – is explained in more detail: survival time is determined as the number of succeeding years the individual received income from self-employment. Any interruption by a minimum of a year is interpreted as an exit from self-employment. Individuals without an indication of the year they entered self-employment (survival time is left censored) were excluded from our sample. Those individuals who survived in the status of self-employment beyond observation time (survival time is right censored) were included in the sample but marked with a censoring parameter (302 entrepreneurs or 47.26% of all entrepreneurs). Table III describes all variables used in this paper.

[Insert Table III here]

2. ECONOMETRIC MODELS

In order to compare necessity and opportunity entrepreneurs, we estimated a binary probit model. The model is estimated using maximum likelihood. The probability of an individual i with the related characteristic vector \mathbf{W}_i being an opportunity entrepreneur is

$$\Pr(y_i = 1) = \Pr(y_i^* > 0) \quad (1)$$

with
$$y_i^* = \alpha + \beta' \mathbf{W}_i + v_i, \quad (2)$$

where y_i is a dummy variable indicating an individual being an opportunity entrepreneur, β' is a vector of coefficients, α is an intercept and v_i is a disturbance term with a normal distribution.

To study the determinants of the individual duration in self-employment, we estimated several hazard rate models, which is the appropriate method to study durations of any kind (van Praag 2003). As the duration variable is measured in discrete time intervals (years), we specified a

discrete time model. In addition, we assumed that the cumulative distribution of all exit decisions over time is logistic, which is in line with the contributions of others (e.g. van Praag 2003).⁷ Duration dependence is specified as flexible piecewise constants, which implies that we do not need to assume that all individuals will exit self-employment as time approaches infinity. To estimate the model, we followed Jenkins (1995) and take advantage of the close relationship between generalized linear models and discrete time hazard rate models. Technically, the estimation is carried out with STATA's `xtlogit` command, applied to the survey data reorganized in person-period format.

We are interested in the probability of the participant exiting the status non-adopter at t , given that she did not adopt until t (hazard rate). The discrete time hazard rate function is specified as

$$(2) \quad h(s | X) = \frac{1}{1 + \exp(-\alpha_s \theta_s - \beta \bar{X} - \delta_i)} \quad (3)$$

where $h(s | X)$ is the hazard rate in period s with $t_{s-1} \leq t < t_s$ for $s=2, \dots, S$, θ_s is a vector of period indicator variables, α_s is the period-specific baseline hazard rate, β denotes the parameter vector relating to the individual vector of covariates X , and $i = 1, \dots, N$ denotes individuals in the sample.

The individual level error component δ_i controls for the potential influence of unobserved individual characteristics on the hazard rate. Following usual conventions, we model random individual effects and assume that δ_i is normally distributed with zero mean and independence of δ_i with all observable characteristics. Conveniently, this also allows us to measure the extent to which unobserved individual characteristics influence the timing of exit decisions. The relative importance of δ_i is measured as $\rho = \sigma_\delta^2 / (\sigma_\delta^2 + 1)$, which is the proportion of the total unexplained variance contributed by individual-specific effects (Wooldridge 2002).

IV. Estimation Results

Subsection 4.1 compares necessity and opportunity entrepreneurs by means of univariate t-tests on differences in means and a multivariate probit model. In subsection 4.2, the results

⁷ We also tested a Cox proportional hazards model, but found the results not to differ in a substantial way.

from the hazard rate regression models are reported. Subsection 4.3 discusses some of the empirical study's limitations.

1. CHARACTERISTICS OF NECESSITY AND OPPORTUNITY ENTREPRENEURS

Table II above compares necessity and opportunity entrepreneurs regarding potential differences in means. With both types of entrepreneurship, the proportion of men is higher compared to the proportion of women (68% or 66%), which is in line with other research (e.g. Fairlie and Meyer 1996; Wagner 2004). However with necessity and opportunity entrepreneurs, no significant difference in share of men is found. In line with Wagner (2005), we find necessity entrepreneurs to be significantly older than opportunity entrepreneurs (38.26 years vs. 35.35 years with $p < 0.001$). This particular fact might also explain the finding that necessity entrepreneurs are more likely to be home owner than opportunity entrepreneurs (44% vs. 36%). The share of persons living in East Germany is significantly higher for necessity versus opportunity entrepreneurs (45% vs. 25%), which might be the result of worse macroeconomic conditions (e.g. von Hagen et al. 2002).⁸ In addition, the proportion of those starting a business in a profession they were educated in is lower with necessity than with opportunity entrepreneurs (35% vs. 45%). Finally, necessity entrepreneurs earn significantly less than opportunity entrepreneurs (1,780€ vs. 2,256€ per month with $p = 0.001$). No significant differences were found in terms of schooling, nationality, actual working time, marital status and children. Two particular findings can be interpreted as supporting the way we operationalised necessity and opportunity entrepreneurship: firstly, necessity entrepreneurs are significantly less satisfied with their occupational situation than opportunity entrepreneurs (6.82 vs. 7.80 with $p < 0.001$)⁹, and, secondly, they were unemployed for significantly longer than opportunity entrepreneurs before stepping into self-employment (7.82 vs. 4.45 months with $p < 0.001$).

Table IV shows a multivariate probit model estimated to reveal differences between the two types of entrepreneurs.

[Insert Table IV about here]

With the exception of home ownership ($p = 0.160$), multivariate results showed the same variables to discriminate between the two groups of entrepreneurs. In addition, an F-test testing for the joint influence of time dummies turns out to be significant ($p = 0.011$). To our surprise

⁸ The high share of East Germans in our sample is also a result of deliberate oversampling in the GSOEP (Haisken-DeNew and Frick 2003).

⁹ The GSOEP asks the participants to report job satisfaction on a scale from 1 (totally unhappy) to 10 (totally happy). Frey and Benz (2003) discuss the scale in more detail.

however, an F-Test testing for the joint influence of industry dummies produced insignificant results ($p=0.318$).

2. DETERMINANTS OF SURVIVAL IN SELF-EMPLOYMENT

Table Va and Vb show descriptive statistics and correlations of the variables entered into the hazard rate models.

[Insert Table Va and Table Vb]

As tolerance levels indicate, multicollinearity seems to be a problem with most of the region and some of the industry dummies. Thus, we determined their joint influence by means of an F-test without reporting these coefficients in detail. Table VI presents five hazard rate models with different specifications. In all models, no significant unobserved heterogeneity could be found, indicated by ρ which is in all models not significantly different from zero. Hence, it seems that the duration in self-employment is comprehensively explained by the observed variables.

[Insert Table VI here]

What do the results of the hazard rate models tell us about the determinants of self-employment duration?

Regarding a difference between necessity and opportunity entrepreneurs, only the first model shows a significant result. Controlling for socio-demographic variables such as e.g. age, nationality and gender as well as time effects, opportunity entrepreneurs survive significantly longer in the status of self-employment than necessity entrepreneurs (model I). However, this effect turns out to be no longer significant when we control for educational variables (model II). Since no difference between the two groups is found in terms of formal education (Table II), we attribute this effect to the variable “educated in this profession”, which describes the degree of matching between the skills acquired by the entrepreneur and the skills needed in the venture. An inclusion of financial variables (model III), regional variables (model IV) or industry variables (model V) did not change this result. We therefore conclude that the mere fact whether an entrepreneur started a venture out of a necessity or an opportunity does not have any significant impact on the duration in self-employment. The univariate difference observed in duration (3.5 years for necessity vs. 4.3 years for opportunity entrepreneurs with $p=0.011$, Table IV) is likely to be due to selection. Or, in other words: two entrepreneurs with

the only difference in their characteristics being either a necessity or an opportunity entrepreneur show no difference regarding their duration in self-employment.

With regard to German versus non-German entrepreneurs, an interesting and comparable result emerges. As with necessity versus opportunity entrepreneurs, a t-test on the equality of means suggests a difference in duration between the two groups. German entrepreneurs have a mean spell length of 4.17 years, whereas non-German entrepreneurs have a mean spell length of 3.32 years ($p=0.029$). Also, non-German entrepreneurs are more likely to have exited from self-employment (56 % vs. 46%). A comparison of the different hazard rates models estimated yields a similar result as the comparison of necessity versus opportunity entrepreneurs. Controlling for motivation and socio-demographic status as well as time effects, German entrepreneurs survive significantly longer in the state of self-employment than non-German entrepreneurs (model I). Once having controlled for educational variables, this difference vanishes (model II). A further controlling for financial endowment as well as regional and industry aspects does not change this result (model III-V). For German and non-German entrepreneurs, our conclusion resembles the conclusion from the comparison of necessity and opportunity entrepreneurs. The significant difference in mean duration seems to be no original effect but rather being due to selection.

Regarding the other variables entered into the hazard regression model, the following results stand out: A higher age when starting the venture has a significant positive impact on the survival rate for entrepreneurs younger than 44 and a negative impact for entrepreneurs older than 44 (based on the coefficients of model V). Hence, the relationship between age and survival in the state of self-employment seems to be curvilinear with a minimum at age 44. Insofar, our expectations are met. The region in which the venture was started seems to have no significant impact on survival time as the result of the F-test demonstrates ($p=0.681$ in model V). It should be noted however, that we measured these regional effects only on the level of federal states – apparently a high aggregated level. The results might change when regional effects are measured on a more disaggregated level (see also Fritsch et al. 2006). In all hazard rate models, gender turned out to be a significant determinant. Male entrepreneurs survive significantly longer in self-employment than female ones. In the less specified models, time effects were significant (model I and II), whereas in the more specified models time effects turn out to be insignificant. Industry dummies have a significant effect as the result of the F-test suggests ($p<0.001$ in model V). Finally, an interesting interrelation between schooling and the venture's industry sector emerges. In model IV, more schooling has a positive impact

on the survival rate ($p < 0.1$), whereas this effect turns out to be insignificant in model V ($p > 0.1$) where industry effects are taken into account. It seems that individuals with more years of schooling enter into different industries than individuals with fewer years of schooling. Family variables such as being married or having children did not have any significant impact on the survival rate in any of the models.

3. LIMITATIONS

Although the data are of high quality, some shortcomings remain: industry dummies are only on a 2-digit level. Furthermore, the exact reasons for business dissolution remain unclear, and finally, important variables about the structure of the business (e.g. whether it was founded by a team start-up or its capital intensity) are missing. From an econometric perspective, estimating a competing risks model might be promising. However, employing this particular data in a competing risks model is hard to implement, since for this purpose the sample size needs to be larger and more information about the exact reasons of business dissolutions are needed. Another potential problem is the fact that our sample captures only a sub-group of all would-be entrepreneurs. Those who try to establish a venture but never succeed are not taken into account.

V. Policy Implications and Further Research

The German state provides monetary incentives to engage in start-ups. Some of these subsidies are open for every kind of start-up, some only for particular types. The federal employment agency (*Bundesagentur für Arbeit*), for example, hands out subsidies exclusively for entrepreneurs who have been unemployed before, e.g. payments under the so-called “Ich-AG”.¹⁰ These programmes seem to be better suited for necessity than for opportunity entrepreneurs. The size of these programmes becomes clear when considering that in 2004 more than half of all German start-ups were supported by the federal employment agency (Niefert and Tchouvakhina 2006). In 2005, about 320,000 start-up entrepreneurs received payments from either “Ich-AG” or “Überbrückungsgeld” (Bundesministerium für Wirtschaft und Technologie 2006). Based on our empirical results, two particular policy implications stand out: Firstly, it makes sense to support necessity entrepreneurs. Once controlled for educational variables, their survival chances in self-employment are not worse than those of opportunity

¹⁰ Under the “Ich-AG” programme, in 2005, a start-up entrepreneur who has been unemployed before was granted a monthly subsidy of 600€ in the 1st year, of 360€ in the 2nd year and of 240€ in the 3rd year of the start-up. The so called “Überbrückungsgeld” (bridging allowances) constitutes another subsidy designed exclusively for start-ups out of unemployment. See Hinz and Jungbauer-Gans (1999) or Pfeiffer and Reize (2000) for a detailed description of this programme.

entrepreneurs. Secondly, although these programmes do not necessarily follow only economic but also social goals (in the sense that those who receive benefits are no longer unemployed), their economic efficiency can be improved without losing on the social goals. As we have demonstrated above, once a necessity entrepreneur starts a venture in a profession of her expertise, her survival chances increase substantially. It would seem therefore a promising approach to guide necessity entrepreneurs towards fields within their particular expertise. The inclusion of such criteria in the decision-making process of who receives support by either “*Ich-AG*” or “*Überbrückungsgeld*” in November 2004 was therefore a right decision.¹¹

The empirical results also demonstrate that financial investors should not put too much weight on the fact whether a potential entrepreneur is a necessity or an opportunity entrepreneur. Instead of focusing on whether the potential entrepreneur has left her previous job voluntarily or involuntarily, they should focus more on industry aspects, gender, education and age. Our results do not *per se* justify a higher risk premium for necessity versus opportunity entrepreneurs.

These implications however, have to be interpreted cautiously as we do not have micro data on governmental benefits granted, or risk premiums charged by financial investors in our data set. Such micro data would allow a better assessment of the impact of governmental start-up programmes or a more grounded statement regarding the justification of higher risk premiums. Also, we only analysed only one element of entrepreneurial success, namely the individuals’ duration in self-employment.¹² Data on the size and the growth of the developing ventures would be needed to gain further insights.

Regarding further research it should be noted that we find notable differences between necessity and opportunity entrepreneurs that should receive further investigation. These groups differ mainly regarding their demographic as well as regional aspects, but not necessarily their economic success. In the GEM-related research, the discussion on necessity and opportunity entrepreneurship often proposes that a high rate of opportunity entrepreneurs is preferable whereas a high rate of necessity entrepreneurs is less desirable (e.g. Acs et al. 2005; Acs and Varga 2005). The results of our econometric analyses, however, do not lead to such a clear answer. Controlling for educational variables, no significant difference between the two groups regarding self-employment duration is found. Following this counterintuitive result,

¹¹ See Bundesministerium für Wirtschaft und Technologie 2006 for more information about the adjustments made in November 2004.

¹² Block and Wagner (2006) analyzed another aspect, the entrepreneurial wage.

further (empirical) research might address the following questions: are necessity and opportunity entrepreneurs really homogenous groups? Are there important sub-groups that should receive closer attention? Do either necessity or opportunity entrepreneurs create more jobs? Do the determinants of success differ between the two groups? From a theoretical perspective, a framework addressing the consequences of the differing motivation of these two groups is needed.

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Table I: New Entries into Self-employment per Year: Necessity vs. Opportunity Entrepreneurs

Year	Entrepreneurs		Σ
	Nec.	Opp.	
1990	6	20	26
1991	13	43	56
1992	12	46	58
1993	15	44	59
1994	4	30	34
1995	13	26	39
1996	11	29	40
1997	16	27	43
1998	8	24	32
1999	13	21	34
2000	21	47	68
2001	12	35	47
2002	14	38	52
2003	26	25	51
Total	184	455	639
	28.8%	71.2%	100%

Note: The GSOEP has increased its sample size since its first survey in 1984. The number of successfully interviewed persons by sample were in 1990: 13972, in 1991: 13669, in 1992: 13397, in 1993: 13179, in 1994: 13417, in 1995: 13768, in 1996: 13511, in 1997: 13283, in 1998: 14670, in 1999: 14085, in 2000: 24586, in 2001: 22351, in 2002: 23892 and in 2003: 22592 2003 (Frick 2005).

Data source: GSOEP 1990-2003

Table II: Necessity vs. Opportunity Entrepreneurs

Variable	Nec.		Opp.		Nec. vs. Opp.
	Mean	SD	Mean	SD	<i>p</i> -Values
Exit (1=yes)	0.492	(0.501)	0.466	(0.499)	0.549
Duration (years)	3.524	(2.970)	4.254	(3.434)	0.011
Working time (h/week)	44.682	(16.732)	45.937	(17.452)	0.444
Job satisfaction (0 – 10)	6.827	(2.325)	7.804	(1.931)	0.000
East Germany (1=yes)	0.449	(0.499)	0.248	(0.432)	0.000
German (1=yes)	0.882	(0.323)	0.867	(0.339)	0.609
Age at time of entry (years)	38.257	(9.495)	35.347	(9.044)	0.000
Male (1=yes)	0.677	(0.469)	0.662	(0.474)	0.701
Schooling (years)	12.720	(2.880)	12.720	(2.850)	0.996
Educated in this profession (1=yes)	0.348	(0.478)	0.447	(0.498)	0.019
Earnings (1000€/month)	1.780	(1.298)	2.256	(2.095)	0.001
Unemployment duration (months)	7.824	(10.677)	4.454	(11.174)	0.000
Home owner (1=yes)	0.439	(0.362)	0.362	(0.481)	0.070
Married (1=yes)	0.620	(0.487)	0.587	(0.493)	0.431
Children (1=yes)	0.484	(0.501)	0.503	(0.501)	0.656

Note: A *p*-value of less than 0.05 means that the null-hypothesis of equal means can be rejected at an error level of less than 5 percent. Calculations are in most cases based on first year observations of self-employment.

Data source: GSOEP 1989-2003

Table III: Description of Variables

Categorical variables	Description
Exit	Dummy for individual who left self-employment.
Opportunity entrepreneur	Dummy for entrepreneur who quitted her last job on her own.
Educated in this profession	Dummy for individual who is self-employed in the profession she has learnt; generated by GSOEP.
Male	Dummy for individual who is male.
German	Dummy for individual who is German by nationality.
Married	Dummy for individual who is married.
Children	Dummy for individual who has at least one child under age 16.
Home owner	Dummy for individual who owns an apartment or house.
East Germany	Dummy for individual who lives in East Germany.
Industry dummies	Dummies for agriculture, construction, car sale, wholesale, retailing, hotel and restaurant, transportation, banking and insurance, real estate, databases, consulting, education sector, health sector, culture and sports, other industry and other.
Region dummies	Dummies for Berlin West, Schleswig Holstein, Hamburg, Lower Saxony, Bremen, North Rhine-Westphalia, Hesse, Rhineland-Palatinate, Baden-Wuerttemberg, Bavaria, Berlin East, Mecklenburg-Western Pomerania, Brandenburg, Saxony Anhalt, Thuringia and Saxony.
Year dummies	Dummy for year 1990...2003 where individual enters into self-employment.
Duration dummies	Dummies for 1 st , 2 nd , 3 rd etc. year in self-employment.
Continuous variables	Description
Duration	Years a person has been in self-employment.
Gross earnings	Monthly gross earnings from self-employment (in €); generated by GSOEP.
Working time	Actual working time per week (in hours); generated by GSOEP.
Job satisfaction	Job satisfaction on a scale from 1 (totally unhappy) to 10 (totally happy).
Age	Current age of individual in years.
Schooling	Years of schooling; generated by GSOEP.
Unemployment duration	Months that individual has been unemployed in her entire working life before entering into self-employment.

Table IV: Estimated Probability of Being Opportunity Entrepreneur
(Dependent Variable: Opportunity Entrepreneur)

Variable	Probit estimates	Std. err.
Unemployment duration (months)	-0.011 [†]	(0.006)
Age (years)	-0.014 [*]	(0.007)
Schooling (years)	0.006	(0.023)
East Germany (1=yes)	-0.720 ^{***}	(0.132)
German (1=yes)	0.112	(0.180)
Male (1=yes)	-0.127	(0.131)
Educated in this profession (1=yes)	0.205 [†]	(0.124)
Home owner (1=yes)	-0.173	(0.123)
Married (1=yes)	0.022	(0.144)
Children (1=yes)	0.108	(0.126)
Industry dummies	16 categories ($p = 0.318$)	
Year dummies	13 categories ($p = 0.011$)	
No. of individuals	639	
Wald Chi ² (p-value)	92.69 (<0.001)	
McFadden R ²	0.129	
Log pseudolikelihood	-334.25	

Note: Heteroskedasticity-robust standard errors in parentheses.

Significance levels: [†] $0.05 < p < 0.1$; ^{*} $0.01 < p < 0.05$;

^{**} $0.001 < p < 0.01$; ^{***} $p < 0.001$.

Data source: GSOEP 1989-2003

Table Va: Descriptive Statistics

Variables	Mean	Std. dev.	Min.	Max.	Tolerance level
Opportunity entrepreneur	0.712	0.453	0	1	0.884
Male	0.670	0.471	0	1	0.793
German	0.870	0.336	0	1	0.777
Age	36.285	9.251	18	75	0.727
Married	0.599	0.490	0	1	0.637
Children	0.501	0.500	0	1	0.754
Schooling	12.729	2.867	7	18	0.694
Educated in this profession	0.419	0.494	0	1	0.816
Home owner	0.383	0.487	0	1	0.825
Berlin West	0.028	0.166	0	1	0.304
Schleswig Holstein	0.025	0.156	0	1	0.332
Hamburg	0.022	0.147	0	1	0.351
Lower Saxony	0.067	0.251	0	1	0.160
North Rhine Westphalia	0.178	0.383	0	1	0.076
Hesse	0.074	0.261	0	1	0.150
Rhineland and Saarland	0.056	0.231	0	1	0.183
Baden Wurttemberg	0.124	0.329	0	1	0.100
Bavaria	0.105	0.307	0	1	0.113
Berlin East	0.033	0.178	0	1	0.271
Mecklenburg-Western Pomerania	0.036	0.186	0	1	0.257
Brandenburg	0.047	0.212	0	1	0.215
Saxony Anhalt	0.050	0.218	0	1	0.202
Thuringia	0.061	0.240	0	1	0.174
Saxony	0.081	0.274	0	1	0.140
Agriculture	0.022	0.147	0	1	0.822
Construction	0.124	0.329	0	1	0.485
Car sale	0.014	0.118	0	1	0.858
Wholesale	0.016	0.124	0	1	0.850
Retail	0.124	0.329	0	1	0.532
Transportation	0.061	0.240	0	1	0.649
Hotel and restaurant	0.055	0.228	0	1	0.667
Banking and insurance	0.050	0.218	0	1	0.716
Real estate	0.011	0.104	0	1	0.902
Consulting	0.088	0.283	0	1	0.574
Databases	0.030	0.170	0	1	0.753
Education	0.025	0.156	0	1	0.797
Health	0.069	0.253	0	1	0.597
Culture and sports	0.014	0.118	0	1	0.823
Other industry sectors	0.116	0.320	0	1	0.539
Other sectors	0.061	0.240	0	1	0.671

N: 639

Data source: GSOEP 1989-2003

Table Vb: Correlations

Variables	1	2	3	4	5	6	7	8
1. Opportunity Entrepreneur								
2. Male	-0.013							
3. German	-0.020	-0.054						
4. Age	-0.135 ^{***}	-0.045	0.080 [*]					
5. Married	-0.033	-0.024	-0.050	0.348 ^{***}				
6. Children	0.029	0.018	-0.079 [*]	-0.042	0.397 ^{***}			
7. Schooling	-0.002	-0.093 ^{**}	0.238 ^{***}	0.213 ^{***}	0.024	-0.061		
8. Educated in this profession	0.085 [*]	0.064	0.093 ^{**}	0.144 ^{***}	0.080 [*]	-0.027	0.251 ^{***}	
9. Home owner	-0.067 [†]	-0.049	0.152 ^{***}	0.214 ^{***}	0.218 ^{***}	0.111 ^{***}	0.087 [*]	0.113

Significance levels: [†] 0.05 < p < 0.1; * 0.01 < p < 0.05; ** 0.001 < p < 0.01; *** p < 0.001
N: 639

Data source: GSOEP 1989-2003

Table VI: Random Effects Hazard Rate Regression Results (Dependent Variable: Status of Self-employment in Year t)

Variables	Model I		Model II		Model III		Model IV		Model V	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Motivation at the start										
Opportunity entrepreneur	-0.241 [†]	(0.144)	-0.195	(0.145)	-0.211	(0.145)	-0.208	(0.152)	-0.113	(0.160)
Socio-demographic variables										
Male	-0.471 ^{***}	(0.134)	-0.493 ^{***}	(0.136)	-0.500 ^{***}	(0.136)	-0.497 ^{***}	(0.139)	-0.514 ^{***}	(0.160)
German	-0.396 [*]	(0.187)	-0.239	(0.193)	-0.164	(0.197)	-0.155	(0.208)	-0.009	(0.220)
Married	0.158	(0.160)	0.151	(0.161)	0.192	(0.161)	0.141	(0.164)	0.169	(0.172)
Children	0.061	(0.148)	0.029	(0.149)	0.040	(0.148)	0.088	(0.151)	0.091	(0.159)
Age	-0.206 ^{***}	(0.046)	-0.174 ^{***}	(0.048)	-0.171 ^{***}	(0.048)	-0.179 ^{***}	(0.049)	-0.136 ^{**}	(0.051)
Age ²	0.0021 ^{***}	(0.0006)	0.0021 ^{***}	(0.0006)	0.0021 ^{***}	(0.0006)	0.0022 ^{***}	(0.0006)	0.0016 [*]	(0.0006)
Education variables										
Schooling			-0.052 ^{**}	(0.026)	-0.054 [*]	(0.026)	-0.050 [†]	(0.027)	-0.014	(0.030)
Educated in this profession			-0.404 [*]	(0.137)	-0.391 ^{**}	(0.137)	-0.270 ^{**}	(0.139)	-0.307 [*]	(0.148)
Financial variables										
Home owner					-0.273 [†]	(0.143)	-0.270 [†]	(0.147)	-0.314 [*]	(0.153)
Region dummies										
							15 categories		15 categories	
							(p=0.881)		(p=0.681)	
Industry dummies										
									16 categories	
									(p<0.001)	
Time dummies										
		14 categories								
		(p=0.048)		14 categories		14 categories		14 categories		14 categories
				(p=0.089)		(p=0.101)		(p=0.161)		(p=0.107)
Duration dummies										
		14 categories								
				14 categories		14 categories		14 categories		14 categories
N obs.		2,614		2,614		2,614		2,614		2,614
N individuals		639		639		639		639		639
Minus log likelihood		851.85		851.85		850.02		845.54		806.04
ρ		<0.001		<0.001		<0.001		<0.001		<0.001
LL-ratio test of $\rho = 0$		1.00		1.00		1.00		1.00		1.00

Note: Some individuals were excluded due to missing values.

Significance levels: [†] 0.05 < p < 0.1; * 0.01 < p < 0.05; ** 0.001 < p < 0.01; *** p < 0.001
 Data source: GSOEP 1989-2003