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**“I Want to, But I Also Need to”:  
Start-Ups Resulting from Opportunity *and* Necessity**

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## ABSTRACT

### **“I Want to, But I Also Need to”: Start-Ups Resulting from Opportunity *and* Necessity**

When unemployed persons go into business, they often are characterized as necessity entrepreneurs, because push factors, namely their unemployment, likely prompted their decision. In contrast to this, business founders who have been previously employed represent opportunity entrepreneurs because pull factors provide the rationale for their decision. However, a data set of nearly 1,900 business start-ups by unemployed persons reveals that both kind of motivation can be observed among these start-ups. Moreover, a new type of entrepreneur emerges, motivated by both push and pull variables simultaneously. An analysis of the development of the businesses reflecting three different motivational types indicates a strong relationship between motives, survival rates and entrepreneurial development. We find in particular that start-ups out of opportunity *and* necessity have higher survival rates than do start-ups out of necessity, even if both types face the same duration of previous unemployment.

JEL Classification: D81, J23, M13

Keywords: entrepreneurship, push and pull motives, survival and failure, job creation

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# 1 Introduction

Nascent Entrepreneurs start their own businesses for a variety of reasons. The Global Entrepreneurship Monitor classifies them according to their motivations in two opposite classes, as either opportunity or necessity entrepreneurs. The crucial point is: Opportunity entrepreneurs seem likely to enjoy better development than necessity entrepreneurs. In this context, ongoing discussion debates whether start-ups by unemployed individuals are inherently born out of necessity (Bosma and Harding, 2007). They might not start a business because they find a good market opportunity but rather because they have no better or no other choice to avoid unemployment (e.g. Evans and Leighton, 1990, Storey, 1991 or more recently Masuda, 2006). Necessity entrepreneurs therefore may suffer a high risk of failure (see Carrasco, 1999, Pfeiffer and Reize, 2000, or Andersson and Wadensjö, 2007), or, if they survive, they may produce only marginal businesses (Vivarelli and Audretsch, 1998), invest insignificant amounts of capital (Santarelli and Vivarelli, 2007), fail to create further jobs (Shane, 2009), and earn minimal incomes (Hamilton, 2000, and Andersson and Wadensjö, 2007).

This study investigates whether these basic judgements actually hold. First we analyze which reasons drive unemployed persons to become an entrepreneur, that is, we explore the extent to which these start-ups are motivated by “push factors”, such as the termination of unemployment, or perhaps by positive “pull factors”, such as the perception of a market opportunity or the desire to be their own boss. We find that both types of motivations can be observed among previously unemployed entrepreneurs. Based on this observation, we define three groups, those driven only by pull motives, those driven only by push motives and a third type, namely those who become self-employed out of opportunity *and* necessity (called push-and-pull types hereafter). In a second step, we investigate whether the connotations associated with push and pull variables also result in the expected impact on entrepreneurial development in terms of survival and job creation *among* these three groups of previously unemployed business founders. More specifically, we examine whether necessity start-ups suffer more negative prospects than opportunity entrepreneurs and which of the two motives prevail among those who are driven by push and pull variables.

Using a large, representative sample of more than 1,850 unemployed male business founders from West Germany, we got access to a unique panel data set that combines administrative and survey data. The survey data contain information about personal, business-related, and motivational characteristics which enable us to conduct a differentiated analysis of several subgroups. To the best of our knowledge, this study is the first which collected the motivation for start-up efforts by unemployed persons and which systematically analyzes their motivation in relation to their subsequent entrepreneurial development.

The rest of this article is organized as follows. Section 2 provides a background of the related literature and describes various motivations for becoming an entrepreneur, along with our research questions. Section 3 contains our description of the data set and the empirical design of our approach, as well as some descriptive results. In Section 4, we analyze the impact of motives on entrepreneurial development, and in Section 5, we

discuss the results and policy implications. Section 6 clarifies the limitations of the study and Section 7 concludes.

## 2 Prior Research and Research Questions

Prior research has investigated why people decide to run their own business. Using a questionnaire with 23 different items, Shane, Kolvereid, and Westhead (1991) extracted four factors, labeled recognition, independence, learning, and roles. Birley and Westhead (1994) instead identify seven factors: need for approval, need for independence, need for personal development, welfare considerations, perceived instrumentality of wealth, tax reduction, and following role models. On the basis of these findings, Carter, Gartner, Shaver, and Gatewood (2003) have developed five categories of entrepreneurship reasons, namely, innovation, independence, recognition, roles, and financial success, with self-realization added as a sixth factor.<sup>1</sup>

We adopt a more parsimonious approach, inspired by the General Entrepreneurship Monitor (see Bosma and Harding, 2007), which differentiates between only two classes of motivation: those who initiate entrepreneurial activities voluntarily and those who are pushed into such activities to address their unemployment. However, a quick review of the existing categories of motivation reveals that much less information pertains to push factors than to pull factors. In this section, we therefore provide an overview of typical rationales for these two classes of motivation and describe why they are associated with opposite expectations with respect to entrepreneurial development.

### 2.1 Opportunity and Necessity Entrepreneurs

Characteristic pull motivations include the perception of a market opportunity or an innovative idea, such that the entrepreneur searches for new or better solutions than those given in the actual (market) environment (see McClelland, 1961; Shane et al., 1991; Birley and Westhead, 1994). An entrepreneur also might recognize an existing network that he or she could try to exploit. Such networks might contain initial customers or provide production capabilities, both of which help ensure market orders.

According to the taxonomy suggested by Carter et al. (2003), other pull motivations relate to categories such as independence, recognition, self-realization, or financial incentives. Independence involves the willingness to be free of any external control or to become one's own boss. Self-realization, recognition, and financial incentives all reflect motivational factors pertaining to the aspiration to gain approval for entrepreneurial activities, whether through the realization of goals (see Fischer, Reuber, and Dyke, 1993), through other people (Nelson, 1968), or through financial success (Birley and Westhead, 1994).

Less research considers why necessity entrepreneurs choose to get into business. Prevailing opinion in entrepreneurship research suggests that necessity entrepreneurs lack

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<sup>1</sup>Other discussions relate to which motivational factors are crucial for starting a business when comparing entrepreneurs with non-entrepreneurs (see, e.g., Carter et al., 2003), or how to model the intentional process between motivations and entrepreneurial development (see, e.g., Krueger, Reilly, and Carsrud, 2000, who proposed two competing models of such entrepreneurial intentions).

other or better alternatives to unemployment (see for instance Storey, 1991, or Clark and Drinkwater, 2000). Unemployed persons who face the termination of their unemployment benefits may also feel a sense of necessity to become self-employed if they have no other income options. A third reason—in contrast to the previous ones—is that external parties advise the unemployed persons to try self-employment as an alternative option (see Caliendo and Kritikos, 2009). In all cases, the opportunity cost of deciding to become an entrepreneur is significantly lower than the opportunity cost for those who make this decision while they are employed (see also Amit, Muller, and Cockburn, 1995).

## 2.2 The Influence of Motivational Factors on Start-up Success

A common understanding of entrepreneurship developed in previous research makes clear why opportunity entrepreneurs raise positive and necessity entrepreneurs raise negative expectations. Entrepreneurial activities appear as crucial for economic development for three main reasons. First, entrepreneurs create their own jobs in terms of self-employment (e.g., Evans and Leighton, 1989). Second, entrepreneurs likely invest substantial amounts of capital and create further job opportunities as they build their growing company (e.g., Parker and Johnson, 1996). Third and maybe most important, entrepreneurs are expected to be innovative (see, e.g., Arrighetti and Vivarelli, 1999), which makes them the essence of future economic growth (see, e.g., Audretsch, 2007).

By combining expectations about entrepreneurial activities with the motivations of the two classes of entrepreneurs, we can easily understand why opportunity entrepreneurs seem preferable to those that start a company out of necessity. According to the various pull motives opportunity entrepreneurs should establish their own jobs, invest significant sums of capital into their entrepreneurial activities, create new and further jobs, and (in the best cases) be innovative. In contrast it seems reasonable to expect that necessity entrepreneurs simply employ themselves. Their lack of pull motives implies that they will create neither further jobs nor innovative ideas. Because they are pushed into running a business by their lack of alternative wage employment opportunities, these entrepreneurs may not be really prepared to launch a business.

Thus, opportunity entrepreneurs appear to meet two or even all three of the expectations raised by entrepreneurship research, whereas necessity entrepreneurs might be able to achieve just one expectation or may return to unemployment after a short period of time using up all the scarce resources devoted to their entrepreneurial adventure.

However, little empirical analysis considers the actual characteristics of previously unemployed business founders, their survival rates, direct job creation, and other key variables. Moreover, existing analyses generally are based on small data sets, so this discussion still lacks empirical evidence.<sup>2</sup> We instead use a panel data set which asks unemployed respondents why they decided to get into business at the initial stage of their start-up process. In so doing we investigate the following research questions:

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<sup>2</sup>For some evidence in different European countries, see, Storey and Jones (1987), Evans and Leighton (1990), Storey (1991), Audretsch and Vivarelli (1995), Hinz and Jungbauer-Gans (1999), Pfeiffer and Reize (2000), and Andersson and Wadensjö (2007).

- (i). Are start-ups by unemployed persons motivated only by push variables or do there exist start-ups by unemployed being motivated by pull variables?
- (ii). Are there any further variables allowing us to characterize different motivational types among the population of start-ups by unemployed persons?
- (iii). Does the expected relationship between motivation, entrepreneurial development, and survival rates hold *among* start-ups by previously unemployed? In other words, do opportunity entrepreneurs have a higher probability of survival and create larger businesses than do necessity entrepreneurs even if they start out of unemployment?

### 3 Data Set and Descriptives

#### 3.1 Sample

Labor market reforms in Germany in 2002/2003 (the “Hartz reform”) expanded support for business start-ups by formerly unemployed persons substantially. As a consequence, between 2003 and 2006, more than one million unemployed persons made use of public support schemes and became self-employed. Simultaneously, an evaluation project launched to collect a unique, representative data set. We use this data set, which consists of a random sample of more than 1,850 previously unemployed male participants, for our analysis. They became self-employed in West Germany in the third quarter of 2003 at which point there existed in Germany two different public support programs, the bridging allowance (BA, *Überbrückungsgeld*) and the start-up subsidy (SUS, *Existenzgründungszuschuss*). The observed members of the data set received support from either of the two programs. Both programs aimed to cover the basic costs of living and social security contributions during the initial stage of self-employment, when businesses might not be able to yield adequate income.<sup>3</sup>

The data set combines administrative information from the Federal Employment Agency (FEA) with survey data, collected at two points in time. In the first interview, during the initial phase of the start-up, the respondents indicated the reasons why they decided to start their business. They also reported basic characteristics about their businesses, such as their start-up capital, the chosen industry, and their previous work experience in this area. In a second interview, approximately 2.5 years after the business formation, they reported on the development of their businesses, such as their employment status (to measure survival rates) and direct job creation.

#### 3.2 Motivation to Become an Entrepreneur

To examine their motivation the first interview asked respondents the following question: “Which motivations were crucial for your decision to start your own business?”. Multiple

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<sup>3</sup>For more details on the two programs and on business development, see Caliendo and Kritikos (2009); for an impact analysis of the support programs, see Baumgartner and Caliendo (2008).

answers (“apply” or “does not apply” for each motive) were allowed, as the six possibilities in Table 1 exemplify.

INSERT TABLE 1 ABOUT HERE

Conventional wisdom in entrepreneurship research suggests that three of the six possible answers (“being my own boss”, “had first customers”, and “perceived a market opportunity”) are associated with pull motives, whereas the other three answers (“termination of unemployment”, “exhaustion of unemployment benefits”, and “advice from the labor agency”) relate to push motives. This categorization of motives is confirmed by principal components factor analysis (Figure A.1 in the Appendix shows the rotated factor loadings and unique variances). Only the variable “had first customers” loads on both factors, but it is stronger for pull motives. Thus, the two factors support previous suggestions about push and pull motives, and we base out further analysis on this distinction.<sup>4</sup>

In Table 1, we report the shares of respondents for each variable. Approximately 80% of all persons were driven by the central push factor, “termination of unemployment”, and little more than 60% of the business founders state that they had “first customers”, whereas little less than 60% were guided by the main independence motive of “being their own boss”.<sup>5</sup> The pull motive with the lowest share is “first customers” (with 30%). The other push motives are less important, such that exhaustion of unemployment benefit entitlements appears in only 30% of the cases, and advice from the labor agency in 15%.

According to these motives, we divided the entrepreneurs into three categories: those who indicated in the survey that they were driven only by one or more pull motives but no push motive (i.e. pull types), those for whom only push motives were the reason to become self-employed (push types), and a third category of entrepreneurs who chose a mix of push *and* pull motives as motivational drivers (push-and-pull types)<sup>6</sup>. Among these categories, we aim to identify the share of each type, as well as determine whether pull types have a higher probability of business survival than do push types, and which of the two motives has a prevailing influence on survival rates for push-and-pull types.

Our data reveal that less than 30% of the population is driven by clearly delimitable push or pull factors. Most entrepreneurs are motivated by both pull *and* push motives (see Table 1), which leads to our first observation:

**Observation 1:** A minority of 13% of all start-ups by unemployed persons are driven by push motives alone, and 16% are guided merely by pull motives. The remaining share, a majority of more than 71% of all unemployed persons starting their own business, are guided by both pull and push motives.

Not every start-up by an unemployed person therefore implies a necessity entrepreneur. Table 1 further shows which reasons are predominant for the three categories.

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<sup>4</sup>More details about the factor analysis are available on request from the authors.

<sup>5</sup>Recent research by Benz and Frey (2008) also shows that independence can be an important motivation of becoming self-employed.

<sup>6</sup>It is certainly straightforward to speak of push or pull types if people chose only one type of motive. Those who choose both motivations repeatedly also are clearly mixed. However, those who choose only one motive of a conflicting type are more challenging. To control for this problem, we conducted several sensitivity tests throughout the analysis.

### 3.3 Descriptive Characteristics

In this section, we examine the extent to which the differing motives are reflected in basic socio-economic characteristics on the one hand, and on the other hand in the sizes of the entities developed by each of the three types where size is measured as amount of capital invested and number of jobs created. For our initial picture, Table 2 provides the sample means of selected variables that describe the characteristics of the three types of business founders. We add results from a t-test of mean equality to reveal any differences among these types.

INSERT TABLE 2 ABOUT HERE

A first glance at basic socio-economic variables shows that pull types are significantly younger (on average, 35.8 years) than push types (40.9 years), and push-and-pull types are about the same age as push types (39.0 years). Similar differences emerge in the school degree. The share of respondents with an upper school degree is highest among pull types (47%), followed by push-and-pull types (36%) and push types (32%), such that the differences are significant for pull types in comparison to the other two. For the share of individuals with a low-level school degree, the ranking almost reverses. The same picture develops when comparing previous durations of unemployment. While pull types on average have been unemployed for less than four months and more than half of them for less than three months, it takes push-and-pull types and push types on average around eight months of unemployment before they decide to become self-employed. Differences are significant again only between pull types and the other two types.

INSERT TABLE 3 ABOUT HERE

A further difference across all three types becomes obvious when we note pre-start characteristics, such as previous working experience and efforts for business preparation. Having gained working experience in the sector in which founders aim to start their business likely is a crucial prerequisite for entrepreneurial success (c.f., e.g., Cooper, Woo, and Dunkelberg, 1989, Cressy, 2006, Colombo, Delmastro, and Grilli, 2004). Among pull types, as we show in Table 3, there is the highest share of respondents with working experience from regular employment in the same industry (79%), followed by push-and-pull types (68%), whereas only 61% of all push types claim to have such experience. Of those with no previous relevant working experience, the ranking reverses, such that the most push types have no experience (26%). The highest share of push-and-pull types occurs for those who have gained working experience during secondary employment opportunities, or in their leisure time.

Another difference pertains to the nonfinancial support, in the form of professional assistance during start-up preparation. Push-and-pull types use significantly more coaches and consultants (almost 30% of the cases) than pull types or push types, who both use consulting 23% of the time. There is also a high share of push-and-pull types who are able to rely on support from others (e.g., friends, family, fellow firm owners): 53% of all

push-and-pull types do so, as do a similar share of pull types, but only 40% of push types use their networks.

Considering the business characteristics (see also Table 3), we find no important differences with respect to the choice of the business line, but several differences with respect to the size of the created businesses. Pull types invest the highest amounts of capital into their venture—greater than €10,000 by 44% of pull types, 25% among push-and-pull types and 23% among push types.

The observations with respect to the amount of invested capital also correspond to (or could be influenced by) the risk-taking behavior of the three types of business founders. The respondents indicated their willingness to take risks on an 11-point scale ranging from “0” (complete unwillingness) to “10” (complete willingness). Pull types are willing to take significantly more risks (6.21 points) than push-and-pull types (5.92 points) and than push types (5.66 points).

**Observation 2:** Pull-type entrepreneurs, compared with push type entrepreneurs tend to be younger, and more educated, and have experienced shorter unemployment and more relevant work experience; they also are less risk averse and invest more capital when they decide to start their own venture. Entrepreneurs guided by both kind of motives are remarkably similar to push type entrepreneurs, though they ask for more support and consulting services.

### 3.4 Survival and Job Creation

Focussing at the entrepreneurial development of the start-ups in terms of survival and employees, Figure 1 plots the Kaplan-Meier survival function for the three types of business founders. The development in the first six months is quite similar, but it starts to diverge in the next six months. After one year survival rates already differ significantly. Whereas approximately 92% of the pull types are still in business after twelve months, only 79% of the push types are. The push-and-pull types again fall in between, with a rate of 84%. Ongoing development increases these differences. Whereas for the pull types, business survival remains quite steady, more than 20% of the push types exit self-employment by the end of our observation period.<sup>7</sup> Of the 1,855 start-ups, we observe 616 failures corresponding to an overall failure rate of 33.2%. We also conducted a log-rank test in which we contrasted the expected number of failures for each start-up type with the observed number of failures. For pull types, we expect 111 failures and observe only 66; for push types, it is the other way around, that is we expect 69 and observe 97. Finally, for push-and-pull types we expect 436 and observe 453 failures, so we can conclude that the survivor functions are significantly different across the three groups.

INSERT FIGURE 1 ABOUT HERE

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<sup>7</sup>A likelihood ratio test of homogeneity in the survival rates for the three groups is clearly rejected ( $\chi^2(2) = 30.62, p = 0.000$ ).

We summarize the situation at the end of our observation period in Table 4. Some of the business founders who failed with their business idea take second chances, such that among pull types we observe 22.4% failures but a share of 80% in self-employment after 2.5 years. That is, approximately 2.4% of the unsuccessful founders have tried again to start a business. When analyzing return to unemployment as a proxy for business failure,<sup>8</sup> we find an unambiguous connection between types and unemployment rates; returns to unemployment are lowest among pull (5.9%) and highest among push types (17.9%), whereas 13.6% of the push-and-pull types are unemployed again. The observation of a relatively high return to unemployment among push-and-pull types likely reflects diverging returns to regular employment (a rough indicator of business closure): 16.6% of push types conclude their self-employment activities and return to regular employment, whereas push-and-pull types and pull types have both a rate of return of only 11.7%.

INSERT TABLE 4 ABOUT HERE

Table 4 also contains information about the share of businesses with at least one employee after 2.5 years. The differences are substantial. Nearly 37% of the pull types create further jobs, but among push-and-pull types and push types, the shares are around 23%. Among business founders who decide to employ additional persons in the business, pull types create an average of 4.2 additional jobs, push-and-pull types 3.5 and push type business founders create 2.8.<sup>9</sup>

**Observation 3:** Among start-ups by previously unemployed entrepreneurs, pull-type entrepreneurs have higher survival rates, enjoy lower failure and closure rates, and create larger businesses in terms of additional jobs than do push type entrepreneurs. Entrepreneurs guided by both kind of motives are in-between push and pull types in terms of business survival and in terms of the average size of the created business, even if with respect to business size push-and-pull types are more similar to push type entrepreneurs.

## 4 Empirical Analysis

To test whether the various motivations for starting a business affect entrepreneurial development, in particular survival rates of entrepreneurs and the probability of hiring employees, we use both parametric and non-/semi-parametric methods. We start with binary logit models to analyze the exit probability and the probability of hiring employees, before we examine the same outcome variables with semi-parametric propensity score matching methods that provide a more efficient and accurate effect estimate. Finally, we use discrete-time duration modeling to analyze the effect on the survival rates, explicitly taking the time of exit into account.

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<sup>8</sup>For a discussion of the difference between business failure and closure, see Headd (2003) and Bates (2005).

<sup>9</sup>Previous research on the overall start-up activities shows that during this time, 30% of all start-ups (irrespective of their previous employment situation) created on average between three and four additional jobs, (see, e.g., Piorkowsky, 2008).

## 4.1 Binary Logit Estimations for Exit and Employees

In our first regression, we aim to find out which variables affect the exit probability of self-employed persons (with exit defined as the sum of failures and closures). The outcome variable equals 1 if the person is no longer self-employed during our observation period (business exit) and 0 if the person is still self-employed. With this outcome variable, we can use a binary logit model for the estimation. We employ a set of explanatory variables, as already explained in the descriptive analysis in Section 3.3. We thus aim to determine whether pull and push motives have the expected influence, controlling for many other characteristics. We provide the results in columns (1) and (2) of Table 5.

INSERT TABLE 5 ABOUT HERE

The push-and-pull types serve as the base category for this regression. We already observed 616 exits in total, corresponding to an exit rate of 33.2%. The marginal effects in column (2) can be directly interpreted in relation to this overall exit rate: pull types have a significantly lower exit probability by 8.4%-points; that is their exit probability is 25% lower than that of push-and-pull types. For push types though, we find a significantly higher exit probability of 6.8%-points. To test the sensitivity of our results to the definition of the three types, we conduct two sensitivity tests. First, we drop all respondents whose motivational factors consist of three pull (push) motives and one push (pull) motive. The resulting change in the shares of the three types appears in Table 1. Second, we re-assign those respondents who indicate three push and one pull motive as push types (and vice versa), then re-estimate the model with these new definitions. The results (see Tables A.1 and A.2 in the Appendix) confirm our previous findings.

Moreover, we observe several influences of other variables on entrepreneurial development, in line with prior research. With respect to age, we use the group “18-29 years” as the reference category and find that older respondents, in the “30-39 years” group (which also contains the most entries) have a significantly lower exit probability. Formal education is essential to self-employment success (Cooper, Gimeno-Gascon, and Woo, 1994), and we find that exit rates decrease with the educational level, such that skilled workers and entrepreneurs who have earned tertiary education fail significantly less often than do unskilled workers. Moreover, unemployment history plays an indirect role. In our data, while unemployment duration has no significant influence on exit, we find a significantly negative correlation between the amount of remaining unemployment benefit entitlements (measured in months) and the exit rate.

The amount of the invested capital has a highly significant influence on survival rates; compared with the the baseline category “no capital”, respondents who invested more than €10,000 have lower exit rates. This observation indicates that start-ups with more capital adopt a more long-term perspective on their business and probably have planned their businesses more carefully.<sup>10</sup> Start-ups in the craft and construction sectors have sig-

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<sup>10</sup>This observation does not allow for the conclusion that simply investing more capital into a business increases its survival probability.

nificantly higher survival rates than the base-category of “other industries”.<sup>11</sup> In accord with prior entrepreneurship research, we find another decisive variable for success and exit, namely, the entrepreneur’s work experience. This variable significantly decreases exit probabilities when entrepreneurs have experience in the specific business segment in which they conduct their start-up activities. A new business segment increases the exit probability. Finally, we find a negative influence, in that immigrants to Germany (often accentuated because of their higher-than-average entrepreneurship rates compared with the broader German population) suffer significantly higher exit rates.

We also analyze the success of the entrepreneur in terms of the number of employees hired. Therefore, we construct an outcome variable that takes a value of 1 if the entrepreneur has at least one employee at the time of the interview and 0 otherwise. We again use a binary logit model for the estimation; the results are in columns (3) and (4) in Table 5. The overall share of start-ups with at least one employee is 25.2%. The probability of employing others decreases with age and unemployment duration; it also decreases if people have previous experience earned through leisure time or specialize in the IT sector. It increases with start-up capital and readiness to take risks. With respect to the three types, we do not find a significant difference between push- and push-and-pull types. However, the probability of hiring at least one person is 8.1%-points higher for pull types, which corresponds to an increase of nearly one-third. We replicate the sensitivity analysis for this outcome variable and find stable effects (even slightly increasing to 8.6%- and 8.8%-points).

**Result 1:** A parametric analysis confirms the observations in the descriptive analysis. Controlling for a large set of characteristics that are relevant for entrepreneurial outcomes, we show that pull types have a lower and push types a higher exit probability than do push-and-pull types. Moreover, pull types have a higher probability of creating additional jobs in their venture compared with the other two types.

## 4.2 Propensity Score Matching Estimation

We observed in Section 3.3 that the three types of start-ups differ significantly in many socio-demographics and business-related characteristics. In the previous parametric analysis, we control for these differences in a linear way. However, huge discrepancies in the distribution of the covariates might bias the results. Matching methods provide a simple and intuitive tool for adjusting the distribution of covariates among samples from different populations, and they are widely used in evaluation research to estimate treatment effects (see, e.g., Imbens and Wooldridge, 2009). The basic idea is to compare only similar individuals and thus make the different samples comparable on all relevant characteristics, which influence the selection process into the sample and the outcome variables. Given that these relevant characteristics are observed (“selection on observables” or “unconfoundedness”

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<sup>11</sup>The positive impact of the construction sector should be highlighted: Recently observed positive developments in this sector (after high exit rates in previous years) seem to have decreased the exit probabilities of the new businesses, too.

assumption), the distribution of an outcome variable  $Y$  between two groups of units can be compared, after taking into account the confounding effects of observed covariates  $X$ . Let  $W$  be a binary variable that indicates membership in a particular population of interest. Then

$$\tau = E[Y | W = 1] - E[E[Y | X, W = 0] | W = 1]. \quad (1)$$

In evaluation research,  $\tau$  takes a causal interpretation as the average treatment effect on the treated (ATT). We do not claim such a strict causal interpretation but use this method to make the different samples comparable and obtain a more accurate picture of the effects. Matching on  $X$  can become hazardous when  $X$  is of a high dimension (curse of dimensionality) and sample sizes are small. Therefore, we rely on Rosenbaum and Rubin (1983), who show that under unconfoundedness, it is sufficient to condition on balancing scores  $b(X)$  instead of  $X$ . The propensity score  $P(X)$ , that is the probability of belonging to a group, is a possible balancing score.

In the Appendix (Table A.3), we provide the results of three binary logit estimations for a pairwise comparison across the three types of start-ups. For example, in column (1) we have estimated the probability of being a pull type for those persons who are either pull or push types. The probability of being a pull type increases with education, previous experience, and preparation but decreases with age and immigrant status. We plot the predicted probabilities in Figure A.2 in the Appendix; the pull types are depicted in the upper half and the push types are in the lower half. The distribution is quite different; therefore with our matching we attempt to find for every member of one group, one (or more) similar member(s) of the other group. Similarity is proximity in terms of the propensity score. Columns (2) and (3) of Table A.3 contain the remaining two pairwise estimations, and the related distributions are depicted in the lower parts of Figure A.2. At first glance, pull types are clearly very different from the other two groups, whereas the overlap between push-and-pull and push types is much closer.

Several different matching algorithms have been suggested by previous research (e.g., Imbens, 2004, Caliendo and Kopeinig, 2008). The results in Table 7 are based on a kernel matching algorithm with an epanechnikov kernel function, a bandwidth of 0.02, and the imposition of common support. The latter means, that observations for which no similar counterpart can be found in the opposite group are dropped from the analysis. The results are not sensitive to the choice of the matching algorithm, and standard errors are based on 100 bootstrap replications.<sup>12</sup> The upper half of Table 7 refers to the outcome variable exit probability, and in the first row we compare pull and push types.

Due to the common support requirement we must drop 56 members of the pull type group because we can find no comparable member of the push types group. This highlights one advantage of matching estimators in contrast to standard regression estimations. The standardized bias in the covariates before matching was 21.6%, but it diminishes by 68%, which corresponds to a satisfactory bias of 6.9% after matching.

Pull types have a 18%-point lower exit probability compared with push types. This effect is highly significant and larger than our results from the parametric regression. When

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<sup>12</sup>Sensitivity analysis are available on request from the authors.

comparing pull and push-and-pull types, we obtain an estimate of 6%-points. Comparing the two bottom groups leads to an estimate of 12%-points in favor of the push-and-pull types.

With respect to the second outcome variable, pull types have a 12%-point higher probability of hiring at least one employee compared with push types; the effect is still as much as 8%-points when we compare against push-and-pull types. These effects are significant at the 10% level, but the remaining bias after matching for the first comparison is quite high. We do not find significant differences when we compare the two bottom groups, which might be due to the fewer observations available for this type of analysis.

**Result 2:** The propensity score matching estimation confirms our previous findings: Pull-type entrepreneurs have the highest survival rates and largest businesses developments, followed by push-and-pull types, and then push types. Moreover, the matching procedure of similar types reveals that in their survival rates push-and-pull types are much more different from push types than they are with respect to the size of the businesses. The comparisons get more difficult for the job creation variable, because the distribution of the characteristics is quite different across the three subgroups (expressed as a relatively high remaining bias after matching).

### 4.3 Survival Analysis

This far we have analyzed exit probabilities without taking the timing of the exit into account. Therefore, we turn to a discrete-time duration model that can analyze the determinants of entrepreneurial survival and integrate the timing issue. Our sample of respondents  $i = 1, \dots, N$  entered self-employment at time  $t = 0$ . For each respondent we observe the time  $T_i$  spent as an entrepreneur. If they remain self-employed for the whole observation period, the data are right-censored. That is, in the last moment, several spells have finished, while others continue (Table 4 indicates that between 58% and 78% in the three groups remain self-employed for the whole observation period). The exit function is given by  $P(T \leq t) = F(t)$ , and the survivor function is  $P(T > t) = 1 - F(t) \equiv S(t)$ . We assume that the hazard rate for respondent  $i$  at time  $t > 0$  takes the proportional hazard form  $\lambda_{it} = \lambda_0 \cdot \exp[X'_{it}\beta]$ , where  $\lambda_0(t)$  is the baseline hazard at time  $t$ ,  $X_{it}$  is the vector of (possibly time-variant) explanatory variables for respondent  $i$ , and  $\beta$  is the vector of parameters we are interested in. In our data, we only observe the month of the transitions, not the exact date. In principle, the transitions could occur at any time during the observed intervals. We assume that transitions occur only at the boundaries of the intervals (e.g., Narendranathan and Stewart, 1993). For the discrete time model, the probability of a spell being completed by time (interval)  $j + 1$ ,<sup>13</sup> given that it was still continuing at interval  $j$ , is given by (Meyer, 1990):

$$h_{ij} = P(J_i < j + 1 | J_i \geq j) = F(\gamma(j) + X_i(j)'\beta), \quad (2)$$

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<sup>13</sup>To distinguish the continuous time case from the discrete time case, we use time index  $j$  for the latter.

where  $F(\cdot)$  is the extreme value cumulative distribution function, and  $\gamma(j)$  captures the additive duration dependence (specific for each  $j$ ). Therefore,

$$h_j(X_{ij}) = 1 - \exp(-\exp(X_{ij}'\beta + \gamma_j)). \quad (3)$$

If we define an indicator variable  $c_i$  equal to 1 if the spell is completed at  $j$ , and 0 if it is censored, the contribution of the  $i$ th respondent to the log-likelihood is given by (see Carrasco, 1999):

$$L_i = c_i \left( \sum_{j=1}^{J_i-1} \log[1 - h_i(j)] + \log h_i(T_i) \right) + (1 - c_i) \left( \sum_{j=1}^{J_i} \log[1 - h_i(j)] \right). \quad (4)$$

To account for unobserved heterogeneity between individuals, we incorporate a Gamma distributed random variable  $\epsilon_i$  with unit mean and variance  $\sigma^2 \equiv \nu$ , such that the hazard function corresponding to Equation (3) is:

$$h_j(X_{ij}) = 1 - \exp(-\exp(X_{ij}'\beta + \gamma_j + \log(\epsilon_i))). \quad (5)$$

We estimate the model with and without unobserved heterogeneity; Table 6 contains the results.<sup>14</sup> To account for duration dependence, we test the flexible parametric specifications for the baseline hazard. Because the results are not sensitive to specification choice, we present only the piecewise constant specification.<sup>15</sup>

INSERT TABLE 6 ABOUT HERE

Column (1) in Table 6 represents the case without unobserved heterogeneity, whereas in column (2) we include it. Because we estimate the hazard of leaving self-employment, positive coefficients for the duration dependence indicate that the exit probability increases in time but drops after 19 months. More start-up capital, greater skills and previous experience in the business sector again decrease the hazard associated with exiting self-employment. Most important, the hazard is significantly lower for pull types and significantly higher for push types. Including unobserved heterogeneity in column (2) improves the log-likelihood, and the  $p$ -value for the likelihood ratio test is virtually 0, which indicates the existence of unobserved heterogeneity. The results do not change much, but the regression coefficients of the two types are increasing; however, the coefficient for the push types is only marginally significant (at 11%) compared with that for the push-and-pull types.

**Result 3:** The discrete-time duration model analysis confirms our previous findings that pull types—compared to push and push-and-pull types—have a higher probability of survival. This finding holds true even when we allow for unobserved heterogeneity. For the comparison between push types and to push-and-pull types, the effect points in the same direction and is marginally significant.

<sup>14</sup>The estimations use the `pgmhaz8` Stata module.

<sup>15</sup>Full estimation results are available on request by the authors.

## 5 Discussion

Disclosing the different motivational factors that drive people to start their own businesses offers a promising approach, in that it provides important information about subsequent developments as entrepreneurs. Prior research uses these factors to classify two opposite types, opportunity and necessity entrepreneurs, and suggests that necessity entrepreneurs are mainly previously unemployed persons. To test these claims, we exploit a large and unique sample of previously unemployed entrepreneurs who started business activities in 2003 in Germany. The sample was constructed as a panel data with information about motivational and basic socio-economic variables of these start-ups (collected in the beginning of their business venturing), as well as information about their later entrepreneurial development in terms of survival and size. In this section, we discuss the results of our analysis and offer some suggestions for using information about motivational factors for ongoing entrepreneurship training approaches.

Using economic reasoning and factor analysis, we show that different motivations constitute two broad categories, in support of prior research on push and pull motives. We reveal that both types of motivation can be observed among start-ups by unemployed persons, such that pure opportunity and pure necessity entrepreneurs both exist in the surveyed population. We also identify a new type of entrepreneur that accounts for as much as 70% of all entrepreneurs coming out of unemployment; they are driven by push *and* pull motives. Their main reasons for starting a venture are termination of unemployment, having first customers and being their own boss. Our analysis reveals that classifying push and pull motives may work for a distinction of motivational factors, but it cannot discriminate between just two types of entrepreneurs, because most of them resemble a third type. Our observation contradicts the usual stereotype that start-ups by unemployed persons are nothing else than necessity entrepreneurial acts.

The motivation to begin an entrepreneurial career proves significant for predicting entrepreneurial developments, such as size of the businesses, and entrepreneurial success, calculated in terms of survival. Having classified three different types of entrepreneurs, we compare them and find that with push types (without any clear cut-off values), pull types on average are younger, are better educated, face much shorter periods of unemployment before they decide to venture into their own business, and have gathered more work experience in the field they are entering. The survival rates of pull-type entrepreneurs also are significantly higher, increase over time, and amount to 22%-points after 2.5 years. Pull types create larger businesses in terms of invested capital and additional jobs. These findings generally have been presumed by previous research, but this study is the first to confirm that the differences are induced by differing unique motivational factors, not by differences in basic characteristics. To reinforce these results, we use three econometric approaches to identify type effects: binary logit estimations, propensity score matching to compare push with similar pull types, and discrete-time duration models. All methods are based on different identifying assumptions, such as those regarding the influence of unobserved factors, but their results strongly point in the same direction: Motives matter for entrepreneurial development. Differences in motivation have a strong and highly

significant influence on survival and exit rate, as well as on the sizes of created businesses.

Considering these unambiguous results, it becomes crucial to understand which of the two motives has a prevailing influence on exit rates and sizes for the new type of start-ups, that is the push-and-pull types. With respect to the basic characteristics we find they are much more similar to push types than to pull types. Differences between push types and push-and-pull types appear increasingly important for comparisons of their efforts in terms of business entry preparation and previous work experience. Push-and-pull types have more previous work experience than push types, and they ask more often for third-party support. This observation indicates that push-and-pull types take business entry more seriously than push types and need more support than pull types.<sup>16</sup>

In terms of survival and exit, we show that motivation matters for all three types, and differences are substantial and stable across different econometric analysis and sensitivity tests. Push-and-pull types remain significantly more often in business than push types, even though they face the same amount of unemployment experience (on average, eight months). Therefore, we do not find support for the simple assumption of a linear positive relationship between unemployment duration and exit rates: Start-ups out of opportunity *and* necessity have lower exit rates than do start-ups out of necessity, even if both types face the same duration of unemployment.

The exit rates of push-and-pull types are higher than those of pure pull types though. In the descriptive analysis and binary logit estimation, we find a clear ranking: Pull types do best in terms of survival and exit rates, followed by push-and-pull types, which are followed by push types. In contrast, the pairwise matching of all three types shows that the difference in exit rates becomes more pronounced between push-and-pull and pure push types. Therefore, when trying to determine which of the two motives has a stronger influence on the survival and exit rates of push-and-pull types, the analysis of the matched data indicates that push motives seem to have a somewhat reduced influence.

We also contrast the size of the created businesses of all three types; push-and-pull types again fall in between pull and push types. However, when it comes to the decision to develop a larger business, push-and-pull types are more similar to necessity entrepreneurs. Therefore, motivational factors may have varying influences on the development of the newly found entrepreneurial type. Pull motives prevail with regard to survival rates, but push motives seem to have a stronger influence on the business size. The creation of additional jobs is more similar between push-and-pull and push types.

Because push-and-pull types ask for more third-party support, our observations have implications for the development of entrepreneurship training. Training and coaching for these entrepreneurs should focus not only on survival strategies but also growth options for businesses. Third-party support could include the analysis of market opportunities and their potential for business growth. Moreover, push-and-pull type entrepreneurs should be trained to manage larger capital investments and staff. Evidence on existing support programs suggests that such deficits in training and coaching are existing. In qualitative interviews we find no indication of assistance in identifying motivational factors, and thus no adaptation to the different needs of the various entrepreneurial types. The training

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<sup>16</sup>Push types probably need more support than pull types as well, but they ask less often for it.

offers are restricted to the period before the entrepreneurs formally declared the start of their businesses, which suggests that they lacked support after their businesses started. However, at this point it seems crucial to entrepreneurial development to receive systematic feedback about how to develop growth strategies. In the current system, training about entrepreneurial knowledge prevails, and as important as this training might be, it also implies an important caveat. These forms of support simply are not helpful when it comes to task solving and decision making in a new business.

## 6 Limitations and Further Research

There might be some concerns with respect to our approach. First, previous research has used more variables to analyze motivational factors for entrepreneurs. We use six items; prior factor analysis has been based on more than twenty items. We compensate for this trait by gaining access to a large and unique, representative data set with more than 1,850 observations and rich additional information about the respondents and their process for starting a business. Moreover, we believe that our parsimonious approach of focusing on two opposite (push and pull) factors justifies the restricted number of motivational items.

Second, we were able to collect an almost complete set of characteristics for which we control for in our quantitative analysis. One important issue, which, however, we neglected in our analysis and which might play an important role in affecting survival and post-entry performance, is the propensity of the entrepreneurs for innovation.

Third, our analysis focused only on men in West Germany. We could not include women or persons from East Germany in our analysis, because the labor market conditions in the regions are different and merit separate analysis, as does the self-employment behavior of women. Because the samples of women and East Germans are rather small, we refrain from including them here.

Last but not least, our analysis is explicitly restricted to start-ups by persons who have been unemployed. This means that we are not able to make any direct comparison between previously unemployed entrepreneurs and other kinds of entrepreneurs. Therefore, additional research should focus on the other groups of entrepreneurs, such as nascent entrepreneurs who have been employed, those with previous self-employment experience, or those from other origins. It would be interesting to investigate to what extent push motives exist among these groups, as well as whether the different motivational variables have the same impacts.

## 7 Conclusion

In this longitudinal study, we provide evidence that the reasons formerly unemployed persons offer for going into business matter for their subsequent entrepreneurial development. Pull and push motives are helpful variables for developing corresponding factors. However, these two factors alone cannot transform straightforwardly into a simple classification of opportunity and necessity entrepreneurs. Moreover, the stereotype that suggests all start-

ups by previously unemployed persons are necessity based does not hold. Our results are remarkable for several reasons. First, our approach enables us to show that the two classes of motivation have strong influences on entrepreneurial survival. Second, we reveal differences between push and pull types *among* start-ups by unemployed persons. Third, the survival rates of push-and-pull type entrepreneurs are significantly higher than those of push types, though both types exhibit very similar socio-economic characteristics.

It seems as if among people who hope to end their unemployment, a self-selection process appears to take place, such that most of those individuals who go into business instead of looking for another employed position, both *have* to and *want* to become self-employed. With respect to this newly identified class of entrepreneurs, we suggest the need to create training and coaching approaches that focus not only on basic questions, such as how to help a business survive, but also on more elaborated concepts, including how to develop a business and ways to integrate a growth perspectives.

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## Tables and Figures

Table 1: Motivation to Become Self-Employed

	All	Only Pull	Push and Pull	Only Push
Observations	1,855	295	1,329	231
Share		0.159	0.716	0.125
What was your motivation to become self-employed?				
1. I always wanted to be my own boss	0.565 (0.496)	0.742 (0.438)	0.625 (0.484)	0.000 (0.000)
2. Termination of unemployment	0.813 (0.390)	0.000 (0.000)	0.968 (0.177)	0.961 (0.194)
3. Exhaustion of unemployment benefit entitlement	0.304 (0.460)	0.000 (0.000)	0.362 (0.481)	0.359 (0.481)
4. Advice from the labor agency	0.150 (0.357)	0.000 (0.000)	0.186 (0.389)	0.134 (0.342)
5. I already had first customers	0.632 (0.482)	0.637 (0.482)	0.741 (0.438)	0.000 (0.000)
6. I perceived a market opportunity	0.304 (0.460)	0.346 (0.476)	0.348 (0.476)	0.000 (0.000)
Sensitivity Analysis <sup>(a)</sup>				
Drop Individuals who state 3:1				
Observations	1,726	295	1,200	231
Share		0.171	0.695	0.134
Change Individuals who state 3:1 to 3:0				
Observations	1,855	388	1,200	267
Share		0.209	0.647	0.144

*Note:* Numbers are shares unless stated otherwise; standard deviations are in brackets. Multiple answers were allowed. Those who identify one (or more) of reasons 1/5/6 but not 2/3/4 were assigned to the “Only Pull” group, those stating one (or more) of 2/3/4 but not 1/5/6 the “Only Push” group. Other respondents were assigned to the “Push and Pull” group.

<sup>(a)</sup> In sensitivity analysis 1, we drop those who state three pull (push) motives and one push (pull) motive. In sensitivity analysis 2, we re-assign respondents who state three pull and one push motive to the “Only Pull” group (and vice versa).

Table 2: Selected Socio-Demographic Characteristics and Labor Market History

	Only Pull	Only Push	$p$	Push and Pull	Only Push	$p$	Only Pull	Push and Pull	$p$
N	295	231		1328	231		295	1328	
Age (in years)	35.82	40.89	0.000	39.05	40.89	0.005	35.82	39.05	0.000
Age in years: 18-29 (Reference)	0.261	0.130	0.000	0.165	0.130	0.180	0.261	0.165	0.000
30-39	0.420	0.320	0.019	0.362	0.320	0.220	0.420	0.362	0.062
40-49	0.264	0.346	0.042	0.332	0.346	0.672	0.264	0.332	0.024
50-64	0.054	0.203	0.000	0.141	0.203	0.014	0.054	0.141	0.000
Health restrictions	0.027	0.052	0.140	0.069	0.052	0.330	0.027	0.069	0.006
Non-German	0.176	0.312	0.000	0.311	0.312	0.983	0.176	0.311	0.000
Married	0.512	0.641	0.003	0.556	0.641	0.016	0.512	0.556	0.171
Number of children									
No children	0.664	0.615	0.239	0.669	0.615	0.110	0.664	0.669	0.888
One child	0.122	0.182	0.056	0.148	0.182	0.182	0.122	0.148	0.257
Two or more children	0.214	0.203	0.778	0.184	0.203	0.478	0.214	0.184	0.237
School Degree									
No degree	0.003	0.026	0.025	0.026	0.026	0.974	0.003	0.026	0.017
Lower secondary schooling	0.241	0.385	0.000	0.391	0.385	0.874	0.241	0.391	0.000
Middle secondary degree	0.288	0.268	0.617	0.224	0.268	0.136	0.288	0.224	0.018
Upper secondary schooling	0.468	0.320	0.001	0.360	0.320	0.246	0.468	0.360	0.001
Months in Unemployment	3.864	7.142	0.000	8.381	7.142	0.031	3.864	8.381	0.000
< 3 months	0.525	0.277	0.000	0.238	0.277	0.202	0.525	0.238	0.000
3 months - < 6 months	0.227	0.264	0.328	0.224	0.264	0.178	0.227	0.224	0.897
6 months - < 1 year	0.217	0.286	0.070	0.345	0.286	0.079	0.217	0.345	0.000
1 year - < 2 years	0.031	0.173	0.000	0.194	0.173	0.467	0.031	0.194	0.000
Unemployment benefits (in €per day)	36.76	34.43	0.117	31.05	34.43	0.001	36.76	31.05	0.000
Remaining benefit entitlement (in months)	8.69	6.39	0.000	5.50	6.39	0.037	8.69	5.50	0.000
Qualification:									
Unskilled workers	0.119	0.147	0.337	0.224	0.147	0.009	0.119	0.224	0.000
Tertiary education	0.217	0.186	0.385	0.175	0.186	0.695	0.217	0.175	0.096
Technical college education	0.088	0.121	0.216	0.091	0.121	0.151	0.088	0.091	0.872
Skilled workers	0.576	0.545	0.480	0.510	0.545	0.317	0.576	0.510	0.039

*Note:* Numbers are shares unless stated otherwise. The p-values refer to t-tests of mean equality in the variables between the groups.

Table 3: Business and Founders' Characteristics

	Only Pull	Only Push	$p$	Push and Pull	Only Push	$p$	Only Pull	Push and Pull	$p$
N	293	231		1328	231		293	1328	
Experience before Self-Employment									
Yes, from regular work	0.795	0.610	0.000	0.678	0.610	0.045	0.795	0.678	0.000
Yes, from secondary work	0.215	0.121	0.005	0.258	0.121	0.000	0.215	0.258	0.122
Yes, from leisure time	0.276	0.169	0.004	0.337	0.169	0.000	0.276	0.337	0.047
No	0.068	0.260	0.000	0.120	0.260	0.000	0.068	0.120	0.010
Preparation before Start-Up									
Self-consulted potential customers	0.481	0.329	0.000	0.523	0.329	0.000	0.481	0.523	0.200
Attendance of informative meetings	0.553	0.429	0.005	0.447	0.429	0.598	0.553	0.447	0.001
Use of coaching and consulting offerings	0.239	0.234	0.891	0.289	0.234	0.084	0.239	0.289	0.083
Support by others	0.519	0.403	0.008	0.533	0.403	0.000	0.519	0.533	0.656
Miscellaneous	0.276	0.199	0.040	0.273	0.199	0.019	0.276	0.273	0.893
No certain preparation	0.055	0.199	0.000	0.095	0.199	0.000	0.055	0.095	0.027
Industry/Sector of Start-Up	0.215	0.229	0.694	0.179	0.229	0.071	0.215	0.179	0.154
Craft	0.123	0.091	0.244	0.120	0.091	0.206	0.123	0.120	0.881
Construction	0.106	0.126	0.482	0.126	0.126	0.993	0.106	0.126	0.345
Retail	0.150	0.208	0.086	0.146	0.208	0.017	0.150	0.146	0.858
IT	0.130	0.078	0.057	0.110	0.078	0.143	0.130	0.110	0.335
Other Services	0.276	0.268	0.838	0.319	0.268	0.124	0.276	0.319	0.152
Start-Up Capital: 0 €	0.314	0.459	0.001	0.419	0.459	0.263	0.314	0.419	0.001
Up to 2,500 €	0.078	0.087	0.738	0.114	0.087	0.224	0.078	0.114	0.078
2,500 - 10,000 €	0.164	0.221	0.099	0.219	0.221	0.955	0.164	0.219	0.035
more than 10,000 €	0.444	0.234	0.000	0.248	0.234	0.649	0.444	0.248	0.000
Readiness-to-risk (Scale from 0-10)	6.208	5.658	0.003	5.919	5.658	0.092	6.208	5.919	0.034
Readiness-to-risk: Low (0-3)	0.113	0.173	0.047	0.134	0.173	0.114	0.113	0.134	0.325
Medium (4-6)	0.369	0.424	0.196	0.432	0.424	0.821	0.369	0.432	0.046
High (7-10)	0.519	0.403	0.008	0.434	0.403	0.378	0.519	0.434	0.008

*Note:* Numbers are shares unless stated otherwise. The p-values refer to t-tests of mean equality in the variables between the groups.

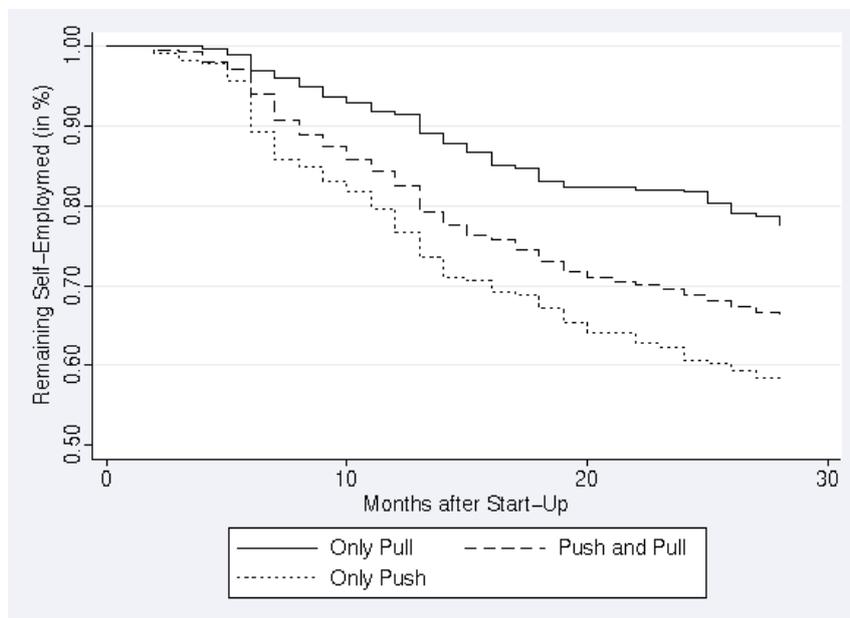
Table 4: Labor Market Status and Share with Employees at Interview

	Only Pull	Only Push	$p$	Push and Pull	Only Push	$p$	Only Pull	Push and Pull	$p$
N	290	223		1297	223		290	1297	
Employment Status at Interview									
Self-employed	0.800	0.583	0.000	0.683	0.583	0.003	0.800	0.683	0.000
Regular employed	0.117	0.166	0.114	0.117	0.166	0.042	0.117	0.117	0.998
Unemployed	0.059	0.179	0.000	0.136	0.179	0.091	0.059	0.136	0.000
Other	0.024	0.072	0.010	0.063	0.072	0.632	0.024	0.063	0.009
Business exits	0.224	0.417	0.000	0.339	0.417	0.025	0.224	0.339	0.000
At least one employee <sup>(a)</sup>	0.365	0.232	0.007	0.225	0.232	0.854	0.365	0.225	0.000

*Note:* Numbers are shares unless stated otherwise. The p-values refer to t-tests of mean equality in the variables between the groups.

<sup>(a)</sup> Measured for those who are still running a business at the time of the interview. The business founders who have at least one employee, employ on average 4.3 employees (Only Pull, SD: 6.9), 3.6 (Push and Pull, 209/4.9) and 2.8 (Only Push, 33/2.9).

Figure 1: Kaplan Meier Survival Function



*Note:* Number of total failures: 616. Likelihood-ratio test statistic of homogeneity for the three groups:  $\chi^2(2) = 30.62, p = 0.0000$ .

Table 5: Logit Estimation Results: Exit Probability and Share with Employees

	Failure Probability		At least one Employee	
	Coeff. (1)	Marg. Eff. (2)	Coeff. (3)	Marg. Eff. (4)
Push and Pull (Reference)				
Only Pull	-.416**	-.084***	0.439**	0.081**
Only Push	0.303*	0.068*	0.049	0.009
Married	0.043	0.009	0.266	0.045
Health restrictions	0.079	0.017	0.042	0.007
Non-German	0.39***	0.086***	0.084	0.015
Children (yes/no)	0.07	0.015	0.181	0.032
Age in years: 18-29 (Reference)				
30-39	-.320**	-.068**	-.008	-.001
40-49	-.138	-.030	-.199	-.034
50-64	-.318	-.065	-.717**	-.106***
School Degree: Low (Reference)				
Middle	-.147	-.031	-.149	-.025
Upper	-.201	-.043	-.322	-.054
Qualification: Unskilled workers (Reference)				
Skilled workers	-.295**	-.064**	0.043	0.007
Technical college education	-.338	-.069	0.263	0.048
Tertiary education	-.399*	-.082**	0.399	0.073
Months in Unemployment	-.001	-.0003	-.023*	-.004*
Unemployment benefits	0.008*	0.002*	0.003	0.0005
Remaining benefit entitlement	-.019*	-.004*	0.015	0.003
Start-Up Capital: 0 € (Reference)				
Up to 2,500 €	0.022	0.005	-.514	-.078*
2,500 - 10,000 €	-.104	-.022	0.239	0.043
more than 10,000 €	-.708***	-.142***	0.771***	0.143***
Industry/Sector of Start-Up				
Craft	-.731***	-.139***	-.095	-.016
Construction	-.410**	-.083**	-.112	-.019
Retail	0.143	0.031	0.203	0.036
IT	-.051	-.011	-.484	-.075*
Other Services	-.238	-.050	0.25	0.044
Experience before Self-Employment				
Yes, from regular work	-.346**	-.076**	0.205	0.034
Yes, from secondary work	-.352**	-.073***	-.007	-.001
Yes, from leisure time	-.072	-.016	-.281	-.047*
No	-.004	-.0009	0.047	0.008
Preparation before Start-Up				
Self-consulted potential customers	0.373***	0.08***	-.101	-.017
Attendance of informative meetings	0.294**	0.063**	-.328**	-.056**
Use of coaching and consulting offerings	-.100	-.021	0.163	0.029
Support by others	-.135	-.029	0.63***	0.108***
Readiness to take risks: Low (0-3, Reference)				
Medium (4-6)	0.085	0.018	0.077	0.013
High (7-10)	0.053	0.011	0.504**	0.088**
Obs.	1853	1853	1318	1318
R <sup>2</sup>	0.073	0.073	0.103	0.103
Log-Likelihood	-1091.189	-1091.189	-665.987	-665.987

*Note:* Logit estimation results for the dependent variable “Y=1 if failure” in columns 1 (coefficients) and 2 (marginal effects). Logit estimation results for the dependent variable “Y=1 if at least one employee” in columns 3 (coefficients) and 4 (marginal effects).

\*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels.

Table 6: Survival Analysis of Self-Employment Duration (with and without unobserved heterogeneity)

	Without UH (1)	With UH (2)
Push and Pull (Reference)		
Only Pull	-.378***	-.513***
Only Push	0.237*	0.271
Married	0.002	0.028
Health restrictions	0.049	0.146
Non-German	0.275***	0.368***
Children (yes/no)	0.068	0.09
Age in years: 18-29 (Reference)		
30-39	-.225*	-.291
40-49	-.094	-.118
50-64	-.181	-.146
School Degree: Low (Reference)		
Middle	-.091	-.113
Upper	-.180	-.132
Qualification: Unskilled workers (Reference)		
Skilled workers	-.270**	-.398**
Technical college education	-.323*	-.505**
Tertiary education	-.360**	-.673***
Months in Unemployment	-.002	-.004
Unemployment benefits	0.007*	0.012**
Remaining benefit entitlement	-.014	-.021*
Start-Up Capital: 0 € (Reference)		
Up to 2,500 €	0.032	-.002
2,500 - 10,000 €	-.094	-.154
more than 10,000 €	-.594***	-.867***
Industry/Sector of Start-Up		
Craft	-.623***	-.891***
Construction	-.313*	-.404*
Retail	0.115	0.197
IT	-.041	-.081
Other Services	-.197	-.304*
Experience before Self-Employment		
Yes, from regular work	-.285**	-.408**
Yes, from secondary work	-.281**	-.414***
Yes, from leisure time	-.073	-.089
No	0.003	0.217
Preparation before Start-Up		
Self-consulted potential customers	0.286***	0.392***
Attendance of informative meetings	0.254***	0.334***
Use of coaching and consulting offerings	-.107	-.136
Support by others	-.089	-.122
Duration Dependence (1-6 months)		
Months 7-12	0.722***	1.043***
Months 13-18	0.745***	1.395***
Months 19-24	0.024	0.879***
Months 25-28	0.166	1.130***
Readiness to take risks: Low (0-3, Reference)		
Medium (4-6)	0.058	0.067
High (7-10)	0.011	0.033
Obs.	42723	42723
Log-Likelihood	-3089.2	-3081.287
e(gammav)		1.984***
e(lltest)		15.982
e(lltest-p)		0.00003

Note: Estimations in column (2) use the Stata module `pgmhaz8`.

\*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels.

Table 7: Matching Results, Outcome: Failure Probability and Share with Employees

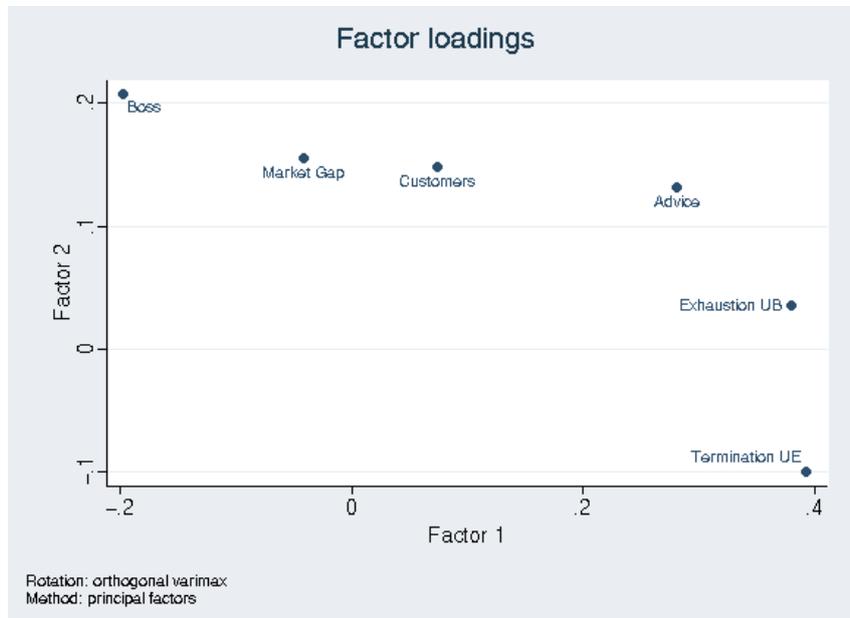
Outcome	effect	se	t-val	offsup	biasbef	biasaft	tn	nt	biasrem	biasred
Outcome Variable: Failure Probability										
Pull vs. Push	-0.18	0.07	-2.59	56	21.58	6.94	294	231	32.17	67.83
Pull vs. Push and Pull	-0.06	0.03	-1.98	5	17.95	1.73	294	1328	9.66	90.34
Push and Pull vs. Push	-0.12	0.04	-3.12	32	13.59	3.99	1328	231	29.39	70.61
Outcome Variable: At least one Employee										
Pull vs. Push	0.12	0.07	1.70	58	22.39	8.87	241	142	39.63	60.37
Pull vs. Push and Pull	0.08	0.05	1.72	5	17.83	3.46	241	935	19.40	80.60
Push and Pull vs. Push	0.00	0.04	0.04	23	17.06	9.31	935	142	54.59	45.41

*Note:* We apply kernel (epanechnikov) matching with common support; for the bandwidth we use 0.02. Standard errors are based on 100 bootstrap replications. Extensive sensitivity analyses are available on request by the authors; results are not sensitive to the kernel or bandwidth choice. Estimations are done using the PSMATCH2 package by Leuven and Sianesi (2003).

Matching Quality: We depict the mean standardized bias before and after matching, as well as the bias reduction and the remaining bias. The abbreviations tn and nt are the number of observations in the respective groups; offsup is the number of individuals outside the common support.

## A Appendix

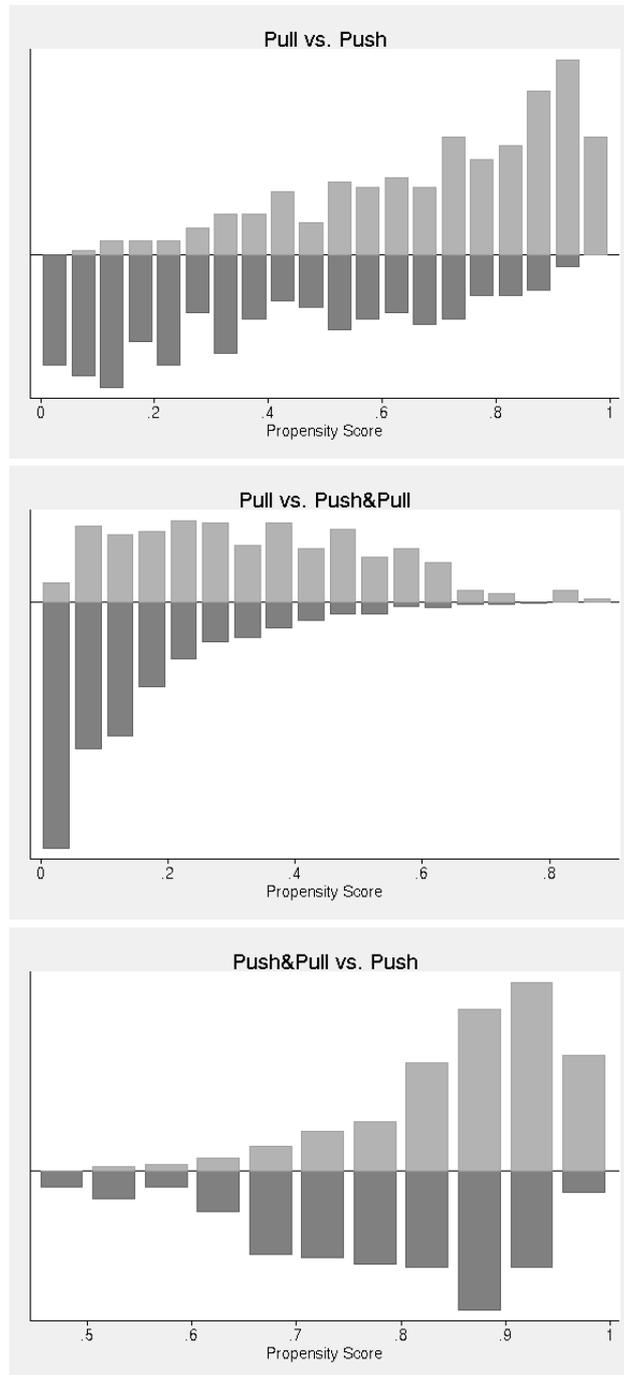
Figure A.1: Factor Loadings - Motivation to Become Self-Employed



Note: Rotated factor loadings (pattern matrix) and unique variances:

Variable	Factor1	Factor2	Uniqueness
Boss	-0.1980	0.2076	0.9177
Termination of UE	0.3931	-0.0992	0.8357
Exhaustion of Benefits	0.3806	0.0357	0.8538
Advice	0.2818	0.1323	0.9031
Customers	0.0744	0.1481	0.9725
Market Gap	-0.0411	0.1552	0.9742

Figure A.2: Propensity Score Distribution



*Note:* Propensity score estimation results can be found in Table A.3. The first stated group can be found in the upper half, the second stated group in the lower half.

Table A.1: Logit Estimation Results: Failure Probability and Share with Employees (Sensitivity Analysis 1)

	Failure Probability		At least one Employee	
	Coeff. (1)	Marg. Eff. (2)	Coeff. (3)	Marg. Eff. (4)
Push and Pull (Reference)				
Only Pull	-.458***	-.093***	0.48***	0.088**
Only Push	0.281*	0.063*	0.066	0.011
Married	-.009	-.002	0.234	0.039
Health restrictions	0.115	0.025	0.197	0.035
Non-German	0.423***	0.094***	0.132	0.023
Children (yes/no)	0.119	0.026	0.21	0.036
Age in years: 18-29 (Reference)				
30-39	-.348**	-.074**	-.047	-.008
40-49	-.170	-.036	-.148	-.025
50-64	-.333	-.069	-.771**	-.110***
School Degree: Low (Reference)				
Middle	-.109	-.023	-.303	-.049
Upper	-.183	-.039	-.470**	-.077**
Qualification: Unskilled workers (Reference)				
Skilled workers	-.294**	-.064**	0.069	0.012
Technical college education	-.290	-.060	0.292	0.053
Tertiary education	-.382*	-.079*	0.471	0.086
Months in Unemployment	-.0007	-.0002	-.033**	-.006**
Unemployment benefits	0.009**	0.002**	0.006	0.0009
Remaining benefit entitlement	-.016	-.004	0.014	0.002
Start-Up Capital: 0 € (Reference)				
Up to 2,500 €	0.035	0.008	-.461	-.069
2,500 - 10,000 €	-.124	-.026	0.287	0.051
more than 10,000 €	-.665***	-.135***	0.738***	0.134***
Industry/Sector of Start-Up				
Craft	-.843***	-.158***	-.141	-.023
Construction	-.470**	-.095**	-.172	-.028
Retail	0.127	0.028	0.277	0.049
IT	-.081	-.017	-.572*	-.084**
Other Services	-.268*	-.057*	0.218	0.038
Experience before Self-Employment				
Yes, from regular work	-.408**	-.090**	0.197	0.032
Yes, from secondary work	-.305**	-.064**	-.061	-.010
Yes, from leisure time	-.061	-.013	-.319*	-.052*
No	-.074	-.016	0.055	0.009
Preparation before Start-Up				
Self-consulted potential customers	0.352***	0.076***	-.084	-.014
Attendance of informative meetings	0.306***	0.066***	-.262*	-.044*
Use of coaching and consulting offerings	-.054	-.012	0.117	0.02
Support by others	-.134	-.029	0.663***	0.111***
Readiness to take risks: Low (0-3, Reference)				
Medium (4-6)	0.089	0.019	0.012	0.002
High (7-10)	0.04	0.009	0.413*	0.071*
Obs.	1724	1724	1223	1223
R <sup>2</sup>	0.074	0.074	0.113	0.113
Log-Likelihood	-1017.821	-1017.821	-608.318	-608.318

*Note:* In this sensitivity analysis, we drop respondents who state three pull (push) motives and one push (pull) motive. Logit estimation results for the dependent variable “Y=1 if failure” in columns 1 (coefficients) and 2 (marginal effects). Logit estimation results for the dependent variable “Y=1 if at least one employee” in columns 3 (coefficients) and 4 (marginal effects). \*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels.

Table A.2: Logit Estimation Results: Failure Probability and Share with Employees (Sensitivity Analysis 2)

	Failure Probability		At least one Employee	
	Coeff. (1)	Marg. Eff. (2)	Coeff. (3)	Marg. Eff. (4)
Push and Pull (Reference)				
Only Pull	-.515***	-.104***	0.469***	0.086***
Only Push	0.327**	0.073**	0.124	0.022
Married	0.034	0.007	0.278	0.047
Health restrictions	0.083	0.018	0.015	0.003
Non-German	0.382***	0.084***	0.089	0.016
Children (yes/no)	0.073	0.016	0.171	0.03
Age in years: 18-29 (Reference)				
30-39	-.328**	-.069**	-.021	-.004
40-49	-.155	-.033	-.210	-.035
50-64	-.354	-.072*	-.743**	-.109***
School Degree: Low (Reference)				
Middle	-.142	-.030	-.162	-.027
Upper	-.198	-.042	-.340*	-.057*
Qualification: Unskilled workers (Reference)				
Skilled workers	-.304**	-.066**	0.035	0.006
Technical college education	-.362	-.073*	0.266	0.048
Tertiary education	-.414**	-.084**	0.41	0.075
Months in Unemployment	-.002	-.0005	-.022	-.004
Unemployment benefits	0.008*	0.002*	0.003	0.0005
Remaining benefit entitlement	-.017*	-.004*	0.015	0.003
Start-Up Capital: 0 € (Reference)				
Up to 2,500 €	0.021	0.005	-.506	-.077*
2,500 - 10,000 €	-.113	-.024	0.24	0.043
more than 10,000 €	-.694***	-.140***	0.761***	0.14***
Industry/Sector of Start-Up				
Craft	-.723***	-.137***	-.087	-.015
Construction	-.413**	-.083**	-.093	-.016
Retail	0.139	0.03	0.219	0.039
IT	-.063	-.014	-.462	-.071*
Other Services	-.236	-.050	0.265	0.047
Experience before Self-Employment				
Yes, from regular work	-.351**	-.077**	0.219	0.037
Yes, from secondary work	-.352**	-.073***	-.008	-.001
Yes, from leisure time	-.065	-.014	-.295*	-.049*
No	-.020	-.004	0.061	0.011
Preparation before Start-Up				
Self-consulted potential customers	0.382***	0.082***	-.108	-.018
Attendance of informative meetings	0.298***	0.064***	-.323**	-.055**
Use of coaching and consulting offerings	-.089	-.019	0.15	0.026
Support by others	-.147	-.032	0.645***	0.11***
Readiness to take risks: Low (0-3, Reference)				
Medium (4-6)	0.102	0.022	0.064	0.011
High (7-10)	0.079	0.017	0.482**	0.084**
Obs.	1853	1853	1318	1318
R <sup>2</sup>	0.077	0.077	0.105	0.105
Log-Likelihood	-1086.78	-1086.78	-665.012	-665.012

*Note:* In this sensitivity analysis we re-assign individuals who state three pull and one push motive to the “Only Pull” group (and vice versa). Logit estimation results for the dependent variable “Y=1 if failure” in columns 1 (coefficients) and 2 (marginal effects). Logit estimation results for the dependent variable “Y=1 if at least one employee” in columns 3 (coefficients) and 4 (marginal effects).

\*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels.

Table A.3: Propensity Score Estimation Results

	Pull vs. Push (1)	Pull vs. Push and Pull (2)	Push and Pull vs. Push (3)
Married	-.319	-.343*	-.160
Health restrictions	0.072	-.002	0.204
Non-German	-.597**	-.454**	-.027
Children (yes/no)	0.011	0.249	-.073
Age in years: 18-29 (Reference)			
30-39	-.657*	-.564***	-.051
40-49	-1.112***	-1.011***	-.083
50-64	-2.746***	-1.823***	-.483
School Degree - Low			
Middle	0.609**	0.439**	-.042
Upper	1.249***	0.707***	0.271
Qualification: Unskilled workers (Reference)	0.624	0.081	0.585*
Skilled workers	0.587	0.284	0.167
Technical college education	-.270	-.049	-.071
Tertiary education			
Months in Unemployment	-.087***	-.115***	0.023*
Unemployment benefits	0.014	0.016***	-.007
Remaining benefit entitlement	0.062***	0.048***	0.006
Start-Up Capital: 0 € (Reference)			
Up to 2,500 €	-.143	-.128	0.198
2,500 - 10,000 €	-.127	-.105	-.047
more than 10,000 €	0.846***	0.69***	0.172
Industry/Sector of Start-Up			
Craft	0.572	-.051	0.42
Construction	0.09	-.274	0.192
Retail	0.04	0.119	0.014
IT	0.021	-.158	0.274
Other Services	0.213	-.169	0.303
Experience before Self-Employment			
Yes, from regular work	0.893**	0.301	0.278
Yes, from secondary work	0.745**	-.080	0.703***
Yes, from leisure time	0.38	-.237	0.563**
No	-.442	-.407	-.279
Preparation before Start-Up			
Self-consulted potential customers	0.61***	-.129	0.663***
Attendance of informative meetings	0.654***	0.512***	-.007
Use of coaching and consulting offerings	-.438	-.496***	0.164
Support by others	0.199	-.295**	0.411***
Readiness to take risks: Low (0-3, Reference)			
Medium (4-6)	0.077	-.096	0.235
High (7-10)	0.384	0.204	0.242
Obs.	525	1622	1559
R <sup>2</sup>	0.287	0.193	0.092
Log-Likelihood	-256.656	-619.859	-593.929

*Note:* Estimations use a logit model. The propensity score distribution can be found in Figure A.2.

\*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels.