

Individual, Organizational, and Environmental Drivers of Job Creation in New Firms

(abridged version)

Marc Gruber

Ecole Polytechnique Fédérale de Lausanne
Odyssea 2.02, Station 5, CH-1015 Lausanne, Switzerland
marc.gruber@epfl.ch

John C. Dencker

University of Illinois at Urbana-Champaign
215 LIR Building, 504 E. Armory Avenue, Champaign, IL 61820 USA
dencker@uiuc.edu

Sonali K. Shah

Foster School of Business
University of Washington
Box 353200, Seattle, WA 98195
sonali@alum.mit.edu

All authors are equal contributors.

ABSTRACT

We build on and extend research in several disciplines to develop a multi-level framework to investigate drivers of job creation in new firms. Using survey data from individuals who transitioned from unemployment to self-employment, we find that a founder's leadership experience has a positive effect on job creation. Yet, as labor requirements of the business opportunity increase, founders with leadership experience are able to make do with relatively fewer employees. We also find that environmental factors, particularly those related to risk of firm failure, have a curvilinear relationship with job creation. Implications for theory and public policy are discussed.

INTRODUCTION

Governments around the world address critical public policy challenges in starkly different ways, often relying on market based approaches, as in Great Britain and the United States, or on regulatory and institutional approaches, as in Continental European nations (cf. Guillén, 2001). Nevertheless, common problems have led to similar policy solutions, such as programs designed to support the transition of the unemployed into self-employment that have been established in Australia, Belgium, France, Germany, Greece, Great Britain, Ireland, Luxembourg, the Netherlands, Norway, Portugal, Sweden and the United States (Benus, 1994; OECD, 1995). Research shows that these programs have had some success in many countries, and that they are cost effective in terms of the long-term survival of the newly founded firms relative to the population of start-up firms (cf. Blanchflower 2004; Caliendo, 2008; Hinz & Jungbauer-Gans, 1999; Pfeiffer & Reize, 2000). Yet, little is known about whether such programs can generate important spillover effects. In particular, we need to better understand whether these new firms create jobs for others (in addition to the founder) – which would reduce unemployment even further – and which factors influence this job creation process. As the current dearth of research on the effects of policy programs limits the ability of government officials to design, implement, and find public support for new programs (Osterman, Kochan, Locke, & Piore, 2002), increasing our knowledge of the social and economic processes leading to job creation in new firms would offer vital policy implications, such as helping policymakers to establish new labor market institutions to replace the previous paradigms that are often no longer effective in contemporary societies.

Assessing how new firm founders create jobs presents a number of conceptual challenges. Even though several theoretical perspectives offer critical insights into the factors influencing job creation in start-up firms, there are key gaps in knowledge in many of these perspectives. Human capital theory indicates that founders endowed with greater amounts of knowledge and experience will create more jobs than founders with lower levels of human capital, with capital specific to self-employment playing a more important role. Yet, we know little about the types of human capital relevant for job creation, and even less about the specific mechanisms linking different forms of human capital to job creation. Entrepreneurship theory argues that the characteristics of the business opportunity being exploited will have a profound effect on job creation, even controlling for founder's human capital (Shane, 2003). However, although this notion has been received favorably in the entrepreneurship literature, empirical research testing this argument is still scant. Moreover, as these opportunity characteristics likely operate in conjunction with a founder's human capital, it is important for researchers to consider the interactions between individual and organizational determinants of job creation. Finally, open-systems theory suggests that the environment within which a firm is located will play a role in employment outcomes (Scott, 2000; Thompson, 1967), but research in this broad tradition often focuses on understanding how broader factors destroy jobs and firms, rather than create them (Haveman & Cohen, 1994).

In short, the factors influencing job creation operate at a number of different and often linked analytic levels, doing so in ways that are not fully understood conceptually, or empirically. Even though research on job creation in new firms allows scholars the opportunity to “make contributions by relating micro-level change to societal level outcomes,” it is an under-researched dependent variable in entrepreneurship research (Ireland, Reutzell, & Webb, 2005 p. 561, citing Davidson 2004, p. 159) – a point also high-

highlighted by Shane (2003) in his review of the literature. Thus, it is critical not only to fill in gaps in knowledge of the different research streams, but also to develop new theory that shows how distinct insights can be brought together to provide a more comprehensive understanding of the job creation process in new firms.

In this study, we develop a multi-level framework of factors influencing job creation (in addition to the founder's job) in newly founded firms. We do so by drawing on, refining, and extending human capital, entrepreneurship, and open-systems theories. In particular, at the *individual level*, we argue that leadership experience provides founders with the human capital to hire and manage a greater number of employees than founders without such experience. Yet, in addition to this baseline effect, leadership experience provides founders with the ability to be more effective job creators in situations where *organizational level* characteristics increase labor requirements. Finally, at the *environmental level*, we incorporate notions from relative bargaining power theory to highlight that organizational life chances affect a firm's ability to attract employees, and thus have important consequences for job creation (Phillips, 2001; Sørensen, 1994).

We examine the validity of our multi-level framework using detailed data collected from individuals participating in a program administered by the German Federal Employment Agency that was designed to support the establishment of new firms by the unemployed. A number of key findings arise from our analyses. We find that individual-, organizational-, and environmental-level factors all have a significant influence on job creation, with some of these factors operating in combination. Our results also show that founders with leadership experience create more jobs for others than those without such experience. In addition, we find that as labor requirements inherent in the business opportunity increase rates of job creation, founders with leadership experience make more efficient use of employees (i.e., are able to create fewer jobs) than founders without leadership experience. Finally, the analysis reveals that environmental factors, particularly those related to risk in the new business venture, influence the ability of founders to create employment for others. However, these factors do so primarily by influencing the life (survival) chances of these new firms, albeit in a curvilinear fashion, with declining life chances leading to higher rates of job creation up to a point where the risk of failure is so strong that it precludes job creation.

We proceed with a discussion of the prior literature and the theoretical background of this study. We then develop our hypotheses, describe the estimation methodology and the data, and present our empirical results. Finally, we discuss the implications of our results for public policy, as well as for entrepreneurship, organizational, and labor market theories.

LITERATURE REVIEW AND THEORETICAL BACKGROUND

Extant research on job creation can be divided into two general sets of studies. The first set focuses largely on the macro-level outcomes of job creation by firms of different sizes – rather than the factors driving job creation – examining issues such as whether large or small firms are drivers of employment growth. For example, Birch's (1987) pioneering analysis showed that small firms with fewer than 20 employees accounted for 88% of overall employment growth in the United States. His findings have had a large impact on policy and research, although they have been criticized for their calculation methods

(see Davis, Haltiwanger, & Schuh, 1996). In more recent research, Spletzer (2000) finds that firm births and deaths account for approximately 19% of all job creation from 1990-1995. Neumark, Zhang and Wall (2006) examine the relative importance of firm births and deaths, firm expansion and contraction, and in- and out-of-state migration on employment growth and decline in California. They find evidence that the birth of new businesses and the expansion of existing businesses are the primary drivers of employment growth, with business relocation playing a negligible role.

The second set is more closely aligned to the spirit of this study and examines the factors that influence the ability of new firm founders to create jobs. For example, Burke, FitzRoy and Nolan (2000) uncover in their study on different new firm performance outcomes that, among self-employed British citizens, having a university education was a significant predictor of the employment level, as was inheritance from parents (albeit in a non-monotonic way). These findings already indicate the usefulness of individual-level factors in predicting job creation outcomes. In addition, studies by Pfeiffer and Reize (2000) and Hinz and Jungbauer-Gans (1999) compare job creation in firms founded by unemployed individuals to other start ups, showing that they are similar in terms of their ability to create jobs. (...)

In sum, even though research provides initial insights into the patterns of job creation, it leaves many questions unanswered: while we have some evidence suggesting that the birth of new firms does in fact generate new jobs for others, our understanding of the factors influencing the ability of newly founded firms to create jobs and whether these factors have a differential impact on the creation of different types of jobs is largely incomplete (Ireland et al., 2005; Shane, 2003). Our hypotheses are based on the question:

What individual, organization, and environmental factors increase the ability of firms founded by previously unemployed individuals to create jobs?

HYPOTHESES DEVELOPMENT

There is little existing theoretical or empirical work on the drivers of job creation in new firms. In developing our framework, we thus draw from research on entrepreneurship (Aldrich & Ruef, 2006; Brüderl, Preisendörfer, & Ziegler, 1992; Shane, 2003), human capital theory (Becker, 1964) and relative bargaining power theory (Phillips, 2001; Sørensen, 1994) to generate predictions on the effects of individual, organizational and environmental factors on job creation.

Individual Level: Human Capital Specific to Self-Employment & Job Creation

A fundamental individual characteristic in the context of job creation is the founder's human capital. Human capital refers to knowledge embodied in people, with higher levels of knowledge (measured, for example, by years of education or work experience) associated with higher levels of cognitive abilities, leading to more productivity and efficiency at particular tasks (Becker, 1964). As knowledge is one of the central resources upon which firm founders can draw, a considerable body of research has examined effects of different types of knowledge in the context of new firm formation (Aldrich & Ruef, 2006; Blanchflower, 2004; Delmar & Shane, 2003; Le, 1999).

Hence, against a backdrop of sparse prior research, we ground our theory development on one particular factor that arguably has the most direct relevance in this area – the leadership experience of the

founder – while controlling for other general and specific human capital endowments that potentially play a role in the job creation process.

(...)

Hypothesis 1. Founders' prior leadership experience will have a positive effect on job creation in new firms.

Organizational Level: Characteristics of the Business Opportunity & Job Creation

Firms can be characterized along a number of different dimensions, with extant research on entrepreneurship suggesting that organizational characteristics such as the size of the initial financial investment, the new firm's innovativeness, its legal form, geographic market scope and strategic focus impact new firm performance outcomes (e.g. Audretsch & Mahmood, 1995; Brüderl et al., 1992; Durand & Coeurderoy, 2001; Feeser & Willard, 1990). In this paper we focus on one key aspect that seems most likely to impact job creation, namely the characteristics of the business opportunity (i.e., the labor requirements of the business opportunity), while controlling for the effect of other key organizational-level characteristics such as initial financial investment, firm innovativeness, and general business strategies.

Different business opportunities have different requirements in terms of employment levels (Shane, 2003). Some opportunities do not necessarily compel a founder to hire employees. For instance, start-up firms in which a founder offers certain types of services, such as consulting or bookkeeping/tax planning, can easily be run out of a home office without the support of employees. By contrast, other types of business will require that the founder hires additional employees to become operational. For example, opening a restaurant entails that the founder not only finds a location and purchases necessary equipment, but also hires a variety of different types of employees, such as a chef, waiters, busboys, and dishwashers. Thus, depending on the labor requirements of the specific business opportunity, one would expect a founder to hire a certain number of employees in order to start-up her business.

(...)

Hypothesis 2a. The labor requirements inherent in the business opportunity will be positively related to job creation.

Extending this discussion of opportunity characteristics, we draw on the notion that individual and organizational determinants interact (a concept termed the “individual-opportunity nexus” in entrepreneurship research; Shane, 2003). We argue that – given a particular business opportunity – the rate of job creation will be modified by the human capital of the founder. Specifically, we claim that founders possessing prior leadership experience will make more efficient use of employees than founders without such experience, all else equal. (...)

Hypothesis 2b. The positive effect of prior leadership experience on job creation will be declining in increasing labor requirements of the business opportunity.

Environmental Level: Organizational Life Chances & Job Creation

Open-systems theory suggests that the environment within which a firm is located will play a role in shaping employment outcomes (Scott, 2000; Thompson, 1967). (...) The relationship between a firm's life chances and employment outcomes is captured in relative bargaining power theory which, in general, argues that the higher a firm's relative bargaining power, the greater its ability to control the employment relationship (Sørensen, 1994).

(...)

Based on these arguments, we claim that the effects of bargaining power on employment outcomes will be strong in the context of newly founded firms. In particular, we argue that organizational life chances will have a strong effect on job creation rates in start-up firms: rates of job creation will be increasing in declining life chances because an increasing risk of failure will pressure founders to create jobs in the desire to increase survival chances by growing the size of the firm (Audretsch & Mahmood, 1995). In contrast, firms with high life chances are relatively more immune to the pressures stemming from increased likelihood of failure. For these firms, job creation will be driven primarily by labor market conditions and founders' considerations of the non-trivial costs associated with additional employment (Sørensen, 1994).

An important contingency in the link between life chances and job creation is that this relationship does not seem to be a linear one, but rather curvilinear when taking into account firms with the lowest life chances. In this vein, Phillips (2001) shows that the rate of promotion was increasing in decreasing life chances, but this pattern shifted for firms that were "near death": at a certain point, life chances of an organization become so low that it is unable to adjust employment practices. In our context of new firm creation, these findings would suggest that the pressure to create jobs should increase in increasing failure rate of the firm, up to a point – firms with very low life chances are likely unable to create jobs.

In sum, we argue that a firm's life chances within the environment will have a critical influence on the job creation practices of founders. Following the arguments offered by research on relative bargaining theory, we hypothesize a curvilinear relationship between an organization's life chances and job creation:

Hypothesis 3: Job creation rates in new firms will have a curvilinear relationship with organizational life chances, as they increase in decreasing life chances until the risk of failure becomes so strong that job creation is precluded.

METHOD

We examine job creation in start-up firms using data from a population of firms founded by unemployed individuals receiving government assistance to support their transition to self-employment. We collected data through a survey distributed in early 2005 to the entire 2001 cohort of such firm founders, allowing us to trace their entrepreneurial experiences for three full business years. In all, data from 451 completed surveys were analyzed.

RESULTS

Discrete-Time Event History Analyses: New Firm Failure

Table X (omitted in abridged version) provides results from discrete time event history analyses of new firm failure, and represents the model used to create the measure of a firm's life chances that were included in our analyses of employment counts. Findings are largely consistent with those of prior studies of new firm failure (cf. Brüderl et al., 1992).

Discrete-Time Event History Analyses: Negative Binomial Models Predicting Job Creation

Table 1 shows results from negative binomial models predicting yearly employment counts in the start-up firms over a three year period beginning at time of founding. The baseline Model 1 provides results for control variables. Model 2 introduces the main hypothesized individual level variable of interest. Consistent with Hypothesis 1, results show that founders with leadership experience have higher rates of job creation than founders who lacked such experience. In particular, with other variables held at mean levels, founders with leadership experience create jobs at a rate 1.84 times larger than for founders without leadership experience ($\exp(.61)=1.84$). In other words, founders with leadership experience come close to doubling job creation rates of founders without such experience.

Model 3 of Table 1 investigates the effect of organizational factors on job counts. Consistent with Hypothesis 2a, results reveal that job creation increases significantly in increasing labor requirements of the business opportunity. That is, if the employment size of the business opportunity in the founder's five-digit industry increases by one unit (employee), the founder's job creation rate will increase by a factor of 1.67, holding all other variables at their mean levels ($\exp(.51)=1.67$). Thus, founders are creating jobs at roughly two-thirds the rate of the average firm in the respective industry. Both leadership and labor requirements measures were strong when we included the measure of organizational life chances in our analyses, as indicated in Model 8, *see Table 1*.

Model 4 of Table 1 examines the interaction between leadership experience and business opportunity characteristics. We find support for Hypothesis 2b, as results indicate that founders with leadership experience create significantly fewer jobs the higher are the labor requirements of the firm compared to founders without leadership experience. That is, as the employment size of the business opportunity in a given five-digit industry increases by one unit (employee), rates of job creation for founder's with leadership experience will decrease by a factor of 0.66, holding other variables constant ($\exp(-.42)=0.66$). Hence, a founder with leadership experience can not only create more jobs than a founder without leadership experience, but is also more efficient at the job creation process as the number of employees needed in a given start-up firm increases.

Model 5 of Table 1 introduces the measure of a firm's life chances that was created from the model predicting firm failure (Table 4). Consequently, higher values of this variable correspond to lower life chances. Our results show that job creation is decreasing significantly in decreasing life chances, a pattern similar to the one observed in Phillips' (2001) study of promotion patterns. Model 6 of Table 2 introduces the squared life chances term. Consistent with Hypothesis 3, results show that the effect of life chances on job creation is non-linear: job creation rates increase in decreasing life chances of the firm, up to a point where risk of failure becomes so high as to curtail job creation.

In order to assess robustness of Hypothesis 3, we created spline measures of life chances (using the MKSPLINE command in STATA) that grouped founders into three equally spaced life chances groups: above average, average, and below average. The coefficients on these three measures capture the rate of job creation within these three groups (e.g., the coefficient the “average life chances” group captures the effect of decreasing life chances on job creation within than group). We entered these measures in Model 7 of Table 1, with results consistent with our predicted non-linear relationship between life chances and employment.

DISCUSSION

Summary of Key Findings

We refine and extend theories of human capital, entrepreneurship, and relative bargaining power to develop a multi-level framework to investigate the individual, organizational and environmental drivers of job creation in new firms, a critical but little explored topic in the extant literature. We tested predictions from our framework using a unique event-history data set of firms founded by the unemployed individuals. Several key results arise from our analyses. At the individual level, we find that founders with leadership experience create more jobs for others than those without such experience. At the organizational level, results show that as labor requirements inherent in the business opportunity increase rates of job creation, founders with leadership experience make more efficient use of employees than founders without leadership experience. At the environmental level, our analysis indicates that the survival chances of the new firm influence the number of jobs a founder creates, albeit in non-linear ways, with declining life chances leading to higher rates of job creation up to a point where the risk of failure is so strong that it precludes job creation. Taken together, these results show that factors at multiple levels have unique and joint effects on job creation.

The findings presented in this study are potentially relevant to most industrialized countries seeking to reduce unemployment, and for public policy programs designed to help the unemployed start a business. In particular, a key component of our study is that we show that formerly unemployed founders have the ability to create jobs for others, an important positive spillover effect of these policy programs. Our detailed analyses of the effects of this common initiative thus offer novel insights for public policy research and government officials designing and implementing such programs in many countries worldwide.

Theoretical Implications

The factors influencing job creation operate at a number of different and often linked analytic levels, doing so in ways that are not fully understood conceptually, or empirically. The systematic linkages that our analysis has revealed indicate ways in which we can better explain and predict job creation outcomes. Perhaps most importantly, the framework highlights the necessity of examining factors at multiple levels of analysis as well as interaction effects across these levels.

We also contribute insights that serve to extend and refine human capital theory, entrepreneurship theory, and bargaining power theory. Human capital theory argues that founders endowed with greater amounts of knowledge and experience should be able to create more jobs than founders with lower levels of human capital. We offer empirical support for the idea that, with respect to job creation, leadership

experience is a critical human capital characteristic, and put forth a theoretical argument (mechanism) for why this effect occurs. Leadership experience provides founders with the human capital to hire and manage a greater number of employees than founders without such experience. In addition to this baseline effect, leadership experience gives founders the ability to be more efficient job creators in situations where the opportunity requires a larger labor force.

As a contribution to research on entrepreneurship, we offer one the first studies using job creation as a dependent variable, thereby improving our understanding of how entrepreneurship impacts wealth creation at a societal level (MacMillan, 2005). In particular, we extend prior work that has mainly focused on understanding the relationship between (some of) the factors studied in this paper, and processes and outcomes such as opportunity identification (cf. Shane & Venkataraman, 2000), survival (cf. Brüderl et al., 1992), and sales (cf. Delmar & Shane, 2006).

In addition, our findings support the notion that firm creation processes are influenced by the interaction between individual and organizational level variables (Shane, 2000; Shane, 2003). Yet, although the notion of the “individual-opportunity nexus” has been received favorably in the entrepreneurship literature, empirical evidence testing this argument is scant. In this vein, the results presented in this paper show that a founder’s individual characteristics (leadership experience) and the characteristic of the opportunity (labor requirements) interact to influence the job creation process.

Finally, our findings offer important evidence in support of relative bargaining power theory, which predicts that a firm’s life chances will affect its ability to attract employees and hence firms with lower life chances must do more to attract employees (Phillips, 2001; Sørensen, 1994). There have been few empirical studies on relative bargaining power theory and those that do exist have examined promotion decisions. Our study shows that relative bargaining power theory can be usefully applied in the context of entrepreneurship, and influences outcome measures besides promotion, namely rates of job creation.

Conclusion

Governments around the world are struggling with the question of how to re-integrate the unemployed into the labor force. The support program studied in this paper has interesting implications for public policy in that we have reason to believe that an increasing number of unemployed individuals seek self-employment over time as more and more countries face cost-cutting and downsizing in large firms due to competitive and shareholder pressures

The framework presented in this paper can be viewed as an important step in uncovering the systematic link between the micro-level and the societal macro-level outcomes in job creation. It allows us to have a better understanding of what determines the extent and the nature of job creation in newly founded firms, providing future studies critical information on the trail to a more general theory of job creation.

TABLE 1**Discrete Time Event History Negative Binomial Estimates of Yearly Employment Counts**

Variables	Model 1	Model 2	Model 3	Model 4
Human capital				
Secondary school degree (Haupts.)	.13 (.28)	.16 (.28)	.16 (.28)	.21 (.28)
Secondary school degree (Reals.)	-.09 (.26)	-.07 (.25)	-.06 (.24)	-.04 (.24)
Vocational degree	-.03 (.23)	-.06 (.24)	-.05 (.23)	-.09 (.22)
Master-craftsman certificate	-.06 (.46)	.07 (.47)	.05 (.46)	.02 (.47)
University degree	-.49† (.26)	-.52* (.27)	-.58* (.26)	-.59* (.25)
PhD	.33 (.34)	.38 (.32)	.28 (.34)	.16 (.32)
Years of prior work experience	-.03* (.02)	-.04* (.02)	-.04* (.02)	-.05* (.02)
Duration unemployed	-.18** (.06)	-.18** (.06)	-.15** (.06)	-.14* (.06)
Hours worked per week	.22** (.08)	.23** (.08)	.25** (.07)	.27*** (.07)
Prior self-employment experience	-.24 (.29)	-.22 (.29)	-.29 (.27)	-.37 (.29)
Prior knowledge of business	.20** (.07)	.16* (.07)	.15* (.07)	.15* (.07)
Individual demographics				
Age	.16 (.11)	.20† (.11)	.18† (.11)	.17 (.10)
Gender (male=1)	.32 (.22)	.26 (.22)	.17 (.22)	.14 (.22)
Individual personality characteristics				
Conscientiousness	.07 (.12)	.10 (.11)	.05 (.11)	.06 (.11)
Agreeableness	.11 (.13)	.08 (.13)	.08 (.12)	.05 (.12)
Emotional stability	-.02 (.13)	-.01 (.14)	-.01 (.13)	-.02 (.13)
Openness to experience	.09 (.12)	.10 (.12)	.08 (.11)	.06 (.11)
Extraversion	-.18 (.14)	-.12 (.13)	-.14 (.13)	-.13 (.13)
Support from family and relatives				
Hands-on	-.05 (.08)	-.03 (.08)	-.02 (.08)	-.02 (.08)
Emotional	.21* (.10)	.17† (.10)	.19† (.10)	.18† (.10)
Organizational/industry characteristics				
Number of founding partners	.30** (.12)	.29** (.11)	.29** (.11)	.28* (.11)
Follower business	.56 (.37)	.51 (.36)	.47 (.36)	.42 (.36)
Customer types	-.42 (.27)	-.39 (.26)	-.40 (.26)	-.42 (.26)
National market scope	.15 (.27)	.15 (.26)	.17 (.26)	.19 (.26)
Legal form (trade)	2.17*** (.52)	2.14*** (.54)	2.16*** (.54)	2.20*** (.54)
Legal form (commercial)	1.40** (.53)	1.45** (.55)	1.52** (.56)	1.55** (.54)
Innovativeness of business venture	-.19† (.11)	-.20* (.10)	-.19† (.10)	-.18† (.10)
Amount of capital invested	.36*** (.05)	.35*** (.05)	.36*** (.05)	.37*** (.05)
Average industry wage	-1.04** (.34)	-1.12** (.34)	-1.04** (.34)	-1.04** (.34)
Period effects				
Second year of self-employment	.45*** (.08)	.45*** (.08)	.29** (.10)	.34** (.10)
Third year of self-employment	.80*** (.10)	.79*** (.10)	.46** (.16)	.56** (.17)
Hypothesized Measures				
Leadership experience (H1)		.61*** (.19)	.64*** (.19)	1.41*** (.30)
Labor requirements (H2a)			.51** (.18)	.41** (.09)
Leadership * Labor req. (H2b)				-.42*** (.13)
Life chances				
Life chances squared (H3)				
Life chances spline (high)				
Life chances spline (average)				
Life chances spline (low)				
Constant	-1.88 (1.17)	-1.75 (1.16)	-2.32* (1.15)	-2.77 (1.16)
Chi-square	299.26	308.263	312.24	315.04
Df	31	32	33	34
Log-likelihood	-1232.6	-1222.9	-1216.9	-1209.3

Note: Robust standard errors are in parentheses. †p<.10; *p<.05; **p<.01; ***p<.001. Two tailed tests.
N = 1303 person years (451 founders) for all models.

Note that life chances are the fitted values obtained from Table 4, thus higher values of the life chances variable indicate a higher likelihood of failure.

TABLE 1 (CONTINUED)

Variables	Model 5	Model 6	Model 7	Model 8
Human capital				
Secondary school degree (Haupts.)	.26 (.28)	.18 (.28)	.21 (.28)	.19 (.28)
Secondary school degree (Reals.)	-.04 (.25)	-.08 (.24)	-.09 (.25)	-.10 (.24)
Vocational degree	-.27 (.23)	-.08 (.24)	-.11 (.26)	-.13 (.26)
Master-craftsman certificate	-.20 (.47)	.04 (.48)	.01 (.50)	-.02 (.51)
University degree	-.61* (.25)	-.60* (.25)	-.59* (.25)	-.59* (.25)
PhD	.11 (.32)	.22 (.32)	.23 (.32)	.32 (.34)
Years of prior work experience	-.03* (.01)	-.04* (.02)	-.04* (.02)	-.03† (.02)
Duration unemployed	-.11† (.06)	-.13* (.06)	-.13* (.06)	-.13* (.06)
Hours worked per week	.22** (.07)	.25** (.08)	.24** (.08)	.21** (.08)
Prior self-employment experience	-.36 (.29)	-.36 (.28)	-.38 (.28)	-.30 (.27)
Prior knowledge of business	.12† (.07)	.14† (.07)	.15* (.07)	.15* (.07)
Individual demographics				
Age	.13 (.10)	.14 (.10)	.14 (.10)	.15 (.10)
Gender (male=1)	.25 (.22)	.21 (.23)	.14 (.24)	.22 (.24)
Individual personality characteristics				
Conscientiousness	.14 (.11)	.07 (.12)	.08 (.12)	.09 (.12)
Agreeableness	.04 (.12)	.06 (.12)	.07 (.12)	.10 (.12)
Emotional stability	.01 (.13)	-.01 (.13)	-.01 (.13)	.01 (.14)
Openness to experience	.05 (.11)	.06 (.11)	.06 (.11)	.08 (.11)
Extraversion	-.17 (.13)	-.17 (.12)	-.16 (.12)	-.16 (.12)
Support from family and relatives				
Hands-on	-.02 (.08)	-.04 (.08)	-.04 (.08)	-.04 (.08)
Emotional	.05 (.11)	.15 (.11)	.13 (.11)	.12 (.11)
Organizational/industry characteristics				
Number of founding partners	.35** (.11)	.35** (.12)	.36** (.12)	.40** (.11)
Follower business	.67† (.38)	.62 (.41)	.64 (.42)	.72† (.42)
Customer types	-.24 (.26)	-.42 (.27)	-.39 (.27)	-.33 (.27)
National market scope	.22 (.26)	.12 (.26)	.14 (.26)	.14 (.26)
Legal form (trade)	2.06*** (.52)	2.10*** (.53)	2.14*** (.53)	2.11*** (.54)
Legal form (commercial)	1.30* (.53)	1.42** (.53)	1.42** (.55)	1.36* (.56)
Innovativeness of business venture	-.22* (.10)	-.19† (.10)	-.19† (.10)	-.21* (.10)
Amount of capital invested	.34*** (.05)	.35*** (.05)	.35*** (.05)	.32*** (.05)
Average industry wage	-.89** (.32)	-.95** (.32)	-.93** (.32)	-.92** (.32)
Period effects				
Second year of self-employment	.48*** (.11)	.37** (.12)	.38** (.13)	.37** (.13)
Third year of self-employment	.86*** (.20)	.63** (.21)	.68** (.24)	.66** (.24)
Hypothesized Measures				
Leadership experience (H1)	1.28*** (.29)	1.30*** (.28)	1.28*** (.28)	.55** (.18)
Labor requirements (H2a)	.30** (.09)	.38*** (.09)	.36*** (.12)	.45* (.21)
Leadership * Labor req. (H2b)	-.39** (.12)	-.39*** (.12)	-.39*** (.12)	
Life chances	-8.44* (3.32)	15.27* (7.19)		
Life chances squared (H3)		-163.79* (63.22)		
Life chances spline (high)			-8.67 (33.2)	-23.3 (33.1)
Life chances spline (average)			16.4* (7.69)	16.0* (7.88)
Life chances spline (low)			-16.6*** (3.53)	-17.7*** (3.57)
Constant	-1.93 (1.22)	-2.71* (1.25)	-2.50† (1.34)	-1.79 (1.32)
Chi-square	323.70	334.47	360.12	351.29
Df	35	36	37	36
Log-likelihood	-1205.4	-1195.8	-1194.7	-1203.1

Note: Robust standard errors are in parentheses. †p<.10; *p<.05; **p<.01; ***p<.001. Two tailed tests. N = 1303 person years (451 founders) for all models.