Competence and Commitment:

Employer Size and Entrepreneurial Endurance[•]

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Abstract

We develop and test a theory of entrepreneurial endurance, or the likelihood that an entrepreneur will continue an entrepreneurial venture from one period to the next. Conceptualizing entrepreneurial endurance as a function of the entrepreneur's competence in and commitment to the entrepreneurial role, we argue that both factors should be shaped by the entrepreneur's prior employment. We focus on the effects of employer size on the prospective entrepreneur, and argue that employer size has a negative effect on both entrepreneurial competence and commitment. This implies that entrepreneurs from small firms should have superior economic performance and, for a given level of performance, be less likely to exit entrepreneurship. We find support for these predictions in analyses of entrepreneurs in a unique dataset characterizing the Danish labor market.

Organizational sociology has made substantial progress over the past two decades in understanding the determinants of organizational performance survival. The dominant emphasis in this literature has been on the impact of structural characteristics of the organizations (such as size, age, etc.) or of the features of the organizational environment. The role of individual entrepreneurs in determining survival outcomes, by contrast, is typically neglected by organizational sociologists, if not avoided. As Brüderl, Preisendorfer and Ziegler (1992: 228) noted, "Modern organizational sociology is skeptical of endeavors that associate organizational outcomes like success or survival with the attributes of individuals." The source of this skepticism may lie in the apparent difficulty of developing sociological (i.e., structural) explanations for how individuals determine organizational outcomes, as opposed to accounts that emphasize dispositional factors or individual preferences. Indeed, in their own paper, Brüderl, Preisendorfer and Ziegler (ibid.) "use human capital theory to examine the potential effects of individuals" -- an approach that would seem to do little to overcome any skepticism about the ability of sociology to explain the impact of individuals on organizational performance.

Organizational sociology focuses primarily on understanding the effects of structural features of organizations and environments, and so the central challenge lies in identifying how such structural characteristics shape individuals in ways that influence organizational outcomes. In recent years, substantial progress has been made in this direction with theories emphasizing the role of individual career histories in shaping entrepreneurial and organizational outcomes. The structural characteristics of existing organizations are transmitted to new organizations in part through individual career histories, as work experiences in established firms shape the

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attitudes and abilities that individuals bring to new organizations. This work has led to a number of important insights about how individuals shape organizational outcomes through their career histories (Boeker 1997; Sørensen 1999; Burton, Sørensen and Beckman 2002; Shane and Khurana 2003; Phillips 2002; Phillips 2005; Dobrev and Barnett 2005; Wezel, Cattani and Penings 2006; Beckman and Burton 2007).

In this paper, we extend this line of work by developing and testing a structural theory of "entrepreneurial endurance" -- the likelihood that an entrepreneur will continue a venture from one period to the next. While entrepreneurial endurance is heavily influenced by the munificence of the resource environment and competition (e.g., Carroll and Hannan 2000), it also depends on two key characteristics of entrepreneurs -- the individual's entrepreneurial competence, on the one hand, and his or her commitment to the entrepreneurial role, on the other hand. Some entrepreneurs can do more with the same available resources than others; similarly, for a given level of performance, some entrepreneurs are more likely to persist than others (Gimeno et al. 1997). The key to understanding how the structural characteristics of existing organizations shape individual variation in entrepreneurial endurance, we argue, lies in understanding how organizations shape entrepreneurial competence and commitment. In particular, we emphasize the importance of workplace characteristics, and thus follow recent work in organizational and sociological theory that has considered the role of workplace characteristics in entrepreneurial behavior and outcomes (e.g., Burton, Sørensen and Beckman 2002; Dobrev and Barnett 2005; Phillips 2002; Phillips 2005; Sørensen 2007a). As Freeman (1986: 37) noted, "The current employer provides the potential entrepreneur with much that is required to start a new firm."

We focus on how the size of an entrepreneur's prior employer shapes entrepreneurial outcomes. While a wealth of workplace characteristics are potentially relevant to the development of entrepreneurial competence and commitment, focusing on employer size has a number of advantages. The first advantage is practical: organizational size is (relative to other workplace characteristics) easily and reliably measured in large-scale samples. The importance of this advantage should not be underestimated: Given the very low rate at which individuals transition to entrepreneurship, large samples of individuals (and their employers) are essential for generating reliable statistical conclusions. It is particularly important to include representative samples of individuals who do *not* transition to entrepreneurship, in order to address sample selection concerns (Heckman 1979). Yet such large samples make it prohibitively difficult to collect richer data on workplace characteristics.

Second, organizational size has strong and robust effects on individual rates of entrepreneurship: employees of small firms are substantially more likely to become entrepreneurs than employees of large firms (Gompers, Lerner and Scharfstein 2005; Dobrev and Barnett 2005; Sørensen 2007a). Sørensen (2007a) shows that the effect of size is causal and cannot be attributed to self-selection by prospective entrepreneurs into small firms. In light of this, a focus on the relative fates of entrepreneurs from large and small employers will help shed greater light on the entrepreneurial process. In particular, we can consider whether the higher entry rate from small firms is rational in the sense of being a response to superior entrepreneurial prospects, or whether employment in small firms generates entrepreneurial overconfidence (Camerer and Lovallo 1999; Moore, Oetsch, and Zietsma 2007).

Finally, employer size provides a parsimonious way to link individual career processes to the macro-structure of organizational populations. In particular, an understanding of how size

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influences entrepreneurial outcomes will shed greater light on how variations in corporate demography across regions and industries influence economic development and growth (e.g., Saxenian 1994). For example, while regions and industries with more large firms will experience lower rates of entrepreneurship, the net impact of such a firm size distribution depends on how well entrepreneurs from large firms perform.

We analyze the relationship between employer size and entrepreneurial endurance by utilizing a unique dataset characterizing the entire Danish labor market. This data set allows us to identify all individuals who entered into entrepreneurship in a particular year and identify their prior organizational affiliation, as well as the characteristics of their prior employer. Furthermore, because we also have information on those individuals who *did not* enter entrepreneurship, we are able to address potential selectivity issues by controlling for the selection process that generates the sample of entrepreneurs.

Employer Size, Competence and Commitment

Established firms often define the context in which the decision to enter entrepreneurship is reached, as prior work experiences shape many of the skills and attitudes that individuals bring to their entrepreneurial activities. A number of studies have focused on how work environments shape the likelihood of entrepreneurial entry (Gompers, Lerner and Scharfstein 2002; Barnett and Dobrev 2005; Sørensen 2007a). In these studies, work environments are held to influence entrepreneurial activity through a number of different mechanisms, including skill development (e.g., Lazear 2005), work attitudes and personality (e.g., Halaby 2003), incentive structures (Hvide 2005; Hellman 2007) and opportunity recognition (e.g., Saxenian 1994). This literature shows convincingly that simple structural characteristics of organizations, such as age and size,

influence individual rates of entrepreneurial activity, and thus shape the supply of entrepreneurs, as well as the demand for them (Sørensen 2007a).

A second strand of research, which we extend in this paper, examines how employment histories with established firms shape the characteristics and performance of entrepreneurial ventures. For example, Burton, Sørensen and Beckman (2002) found that the past employment affiliations of venture founders in Silicon Valley influenced their ability to pursue riskier strategies and secure venture capital funding. Phillips (2002) examined how founders of law firms inherit organizational routines from their previous employers, and the impact of this process on survival, while Phillips (2005) showed that new firms inherit the gender hierarchies of their founders' previous employers. Beckman and Burton (2007) found that the functional backgrounds of founding team members shape the subsequent evolution of the venture's managerial demography.

While studies vary in the breadth of prior employer characteristics they sample, among the most commonly examined characteristics is organizational size (Cooper 1985; Sørensen 2007a; Phillips 2002; Gompers, Lerner and Scharfstein 2005). This is no surprise, as size has long allowed for clear and available hypothesis testing on the relationship between organizational structures and processes and individual outcomes (e.g., Baron 1984). Not only is size typically the most observable characteristic for hypothesis testing, but its strong relationship to less observable characteristics such as structural complexity has been long noted (Blau and Schoenherr 1971). Our focus on organizational size thus not only allows us to conceptually and empirically link our work to some of the key understandings within organizational sociology, but our use of a relatively more observable indicator enhances the opportunity for other scholars to build upon the model and results we provide here.

Employer Size and Entrepreneurial Competence

One of the most commonly noted concomitants of increased organizational size is an increase in the division of labor. As organizations grow larger, tasks get subdivided into more specialized roles, and an increasing proportion of jobs in the organization are devoted to coordinating between the increasingly elaborate division of labor. Larger organizations tend to have narrowly defined jobs (Baron, Davis-Blake and Bielby 1986) with less worker autonomy (Kalleberg and Van Buren 1996). Moreover, large firm employees also have fewer opportunities to develop skills that meaningfully affect the strategic direction of the firm. This is especially the case with decisions and skills that expose the firm to considerable risk, such as research and development (Arrow 1983). As a consequence, the average worker in a large firm has less overview over what all of the organization's vital routines are and how they fit together. Nor are they provided with the skills for the integration of the large firm's differentiated skills.

These characteristics of jobs in large firms suggest that most employees of large firms will be less likely to have the appropriate skills for entrepreneurial success. At the same time, experience in a smaller firm is thought to have many advantages. By virtue of their small size and less formal division of labor, employees of small firms are more likely to acquire the breadth of skills necessary for entrepreneurial success. Smaller organizations offer more opportunities for employees to upgrade their skills (Kelley 1990). Lazear's (2005) jack-of-all-trades model suggests that individuals are more likely to transition into entrepreneurship and succeed if they are able to integrate a wide range of skills. These skill generalists are more competent as entrepreneurs, while skill specialists are better suited as employees. To the extent that employees of small firms are more likely to be asked to perform a variety of different tasks, this

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suggests that employees of small firms should be more competent (and thus successful) when they become entrepreneurs.

Prior employers should also serve as important organizational models or templates for prospective entrepreneurs (Phillips 2002, 2005; Freeman 1986). In articulating a genealogical approach to the relationship between entrepreneurs and their prior employers, Phillips (2002) argues that the departure of an employee to launch a new venture involves the transfer of routines and resources from the parent organization to the new entity. A genealogical or learning (Klepper 2001) perspective on how organizational size affects entrepreneurial performance would seem to suggest a tradeoff, however. Larger and more established firms are likely to have better developed routines and practices than small ventures. However, the routines that employees learn in these large firms may not be suited to entrepreneurship, which typically requires flexibility and adaptation. In March's (1991) terms, the routines of large established firms are typically oriented toward the exploitation of established organizational competencies, rather than the exploration of new possibilities. New and smaller ventures, however, typically need to experiment a great deal in order to find the recipe for success. This suggests that employees from large firms might be at a disadvantage when entering entrepreneurship.

A second result of increases in organizational size is that an increasing proportion of jobs are devoted to internal coordination and control functions. The average employee in a large firm has less exposure to external actors, such as competitors, buyers and suppliers. In addition, given the increased role specialization, those who do interact with external actors are more likely to do so in highly circumscribed roles. This reduction in external exposure should make it more difficult for the employee of a large firm to form an accurate picture of the entrepreneurial opportunities available. Gompers, Lerner and Scharfstein (2005) argue that this pattern can

explain the lower rates of entrepreneurship in larger firms. We argue that even conditional on entry into entrepreneurship, employees of large firms are likely to be disadvantaged because their former structural position makes it difficult for them to accurately assess the value of entrepreneurial opportunities. Thus we expect that entrepreneurs from large firms are more likely to make entry mistakes. Cooper's (1985) investigation of "incubator organizations" nicely summarizes the hypothesized impact of small firms on entrepreneurial skills and vision:

> In small companies, employees learn about technologies or markets that can be exploited by small firms. They also develop broad experiences and can see what is involved in managing a small firm. (p. 78).

These arguments leadus to our first hypothesis concerning the relationship between employer size and entrepreneurial competence:

> Hypothesis 1: The size of an entrepreneur's previous employer should have a negative effect on entrepreneurial income.

Employer Size and Entrepreneurial Commitment

Our arguments linking firm size to entrepreneurial skills and vision emphasize how organizational context shapes the material or economic aspects of entrepreneurial opportunities. Ample evidence suggests, however, that the motivation for entrepreneurship is, for many individuals, not solely economic. Rather, entrepreneurship may in many cases be seen as an enactment of non-pecuniary goals (such as the desire for autonomy) and identity fulfillment. Evidence for the importance of non-pecuniary returns to entrepreneurship can be found in the fact that entrepreneurs generally receive inferior returns to their entrepreneurial labor (Hamilton 2000) and investments (Moskowitz and Vissing-Jørgensen 2002). Similarly, Xu and Ruef (2004) found that nascent entrepreneurs were more likely to emphasize the importance of challenging themselves and establishing a personal legacy through their careers than non-

entrepreneurs. In addition, such identity fulfillment goals were emphasized more heavily than pecuniary motivations.

Such non-pecuniary motivations are important, as they introduce a potential disconnect between the economic performance and survival of entrepreneurial ventures (Gimeno et al. 1997); entrepreneurs with high levels of commitment to the role are more likely to continue their ventures in the face of poor economic performance. Employer size may affect entrepreneurial commitment in two ways. First, in small firms, employees are more likely to be regularly exposed to the leader and founder of the firm, who may as a consequence serve as a role model for entrepreneurial activity. Evidence suggests that role modeling is an important source of the entrepreneurial impulse. For example, exposure to self-employed parents appears to shape the job values of children later in life (Halaby 2003), even if those children are only exposed to parental self-employment early in life (Sørensen 2007b).

Second, employment in a small firm may serve as a realistic preview of the challenges and stresses of leading an entrepreneurial venture. Entrepreneurs from large firms may be less accepting of the non-pecuniary costs of entrepreneurial activity, and hence less committed to their ventures for a given level of economic reward. These arguments lead to our second hypothesis:

> Hypothesis 2: The size of an entrepreneur's previous employer should increase the entrepreneur's likelihood of exiting entrepreneurship, holding constant the entrepreneur's financial performance.

Alternative explanations and inferential challenges

One of the challenges of past work on the success of entrepreneurial spinoffs and organizational progeny (Klepper 2001; Phillips 2002) has been in providing robust evidence of

the effects of prior organizations as well as the underlying explanatory mechanisms.

Accordingly, we consider two key (but often not addressed) methodological challenges involved in clarifying the effect of firm size on entrepreneurial performance and survival.   The first challenge arises from the fact that individuals self-select into entrepreneurship, and that the unobserved factors that lead them to do so may be correlated with the measure of interest, in this case firm size, as well as entrepreneurial outcomes. The second challenge arises from the possibility that individuals also self-select into employment in firms of different sizes (Sørensen 2007a) in ways that correlate with entrepreneurial skills. Both challenges raise the possibility that any observed effects of firm size on entrepreneurial outcomes may be spurious.

To the first challenge, many existing studies examine the performance of a sample of entrepreneurs or entrepreneurial ventures. However, the findings from studies restricted to samples of entrepreneurs may be called into question because they ignore the self-selection process into entrepreneurship (Heckman 1979). This selection problem is particularly salient in the context of this study, since it is reasonable to expect that entry thresholds for prospective entrepreneurs differ systematically by firm size. Large, established firms have higher survival rates than small firms, and thus offer (other things being equal) greater job security for their employees. They also pay more than small firms, and are more likely to offer opportunities for internal advancement.   This suggests that the opportunity cost associated with pursuing an entrepreneurial opportunity will generally be higher for employees of large firms. Because of this, the value of the entrepreneurial opportunity needs to be higher to induce entry, suggesting that employees of large firms who enter entrepreneurship will pursue more valuable opportunities on average. If not controlled for, this unobserved selectivity may lead to upwardly biased estimates of the effects of firm size on performance, and downwardly biased estimates of

the effects of size on exit rates. In order to address this first challenge, we include information on non-entrepreneurs and estimate sample selection models.

A second inferential challenge lies in the fact that individuals with entrepreneurial propensities and skills may choose to work for smaller firms. Such a sorting process could spuriously generate an association between firm size and entrepreneurial outcomes. Accounting for this sorting process is not straightforward.[1] We speak to the issue indirectly by examining whether observable individual characteristics influence the effects of firm size systematically. First, we consider whether there are differences in the effects of firm size for individuals whose parents have self-employment experience. Numerous studies have shown that children of the self-employed are more likely to become self-employed themselves (Altonji & Dunn, 1991; Aldrich, Renzulli & Langton, 1998; Dunn and Holtz-Eakin 2000), either because they acquire entrepreneurial skills in the family business, receive better information about opportunities from their parents, or because they come to attach greater value to the non-pecuniary benefits of self-employment. If the effect of employer size on entrepreneurial outcomes is a spurious consequence of sorting processes, we would therefore expect that the effects of firm size should be attenuated for children of self-employed parents. Second, we address the sorting issue by considering whether the effects of firm size depend on the entrepreneur's tenure with the employer. If work environments exert a causal influence by shaping entrepreneurial skills, for example, we would expect the effect of firm size is greater for longer-tenured individuals. If the effect of firm size does not vary by an individual's tenure, we should be concerned that it is spurious.

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[1] A common way to address concerned about the effects of unobserved individual traits is to include person-specific fixed effects in the model. Since the individuals in our sample only enter entrepreneurship once, the person-specific fixed effect is collinear with the measure of the prior employer's size.

Data and Measures

Our data for analysis come from the Integrated Database for Labor Market Research (known as IDA in Danish), which is a register-based employer-employee data set covering the labor market in Denmark and maintained by Statistics Denmark. IDA is a uniquely valuable resource for the study of entrepreneurial outcomes, for a number of reasons. First, it is comprehensive, covering all persons legally residing in Denmark since 1980, and includes annually updated information on individual demographic characteristics, family structure and labor market outcomes. This allows for the construction of representative samples of entrepreneurial ventures and includes a wealth of data on the prior labor market histories of entrepreneurs. By contrast, many studies of entrepreneurial ventures rely on idiosyncratic samples of new ventures for which it is difficult to construct career histories (e.g., Burton, Sørensen and Beckman 2002) or are limited to specific sub-populations of (prospective) entrepreneurs (Phillips 2002; Shane and Khurana 2003). Furthermore, IDA is longitudinal: the entire population is tracked on an annual basis as people move between firms and into and out of entrepreneurship. This allows us to address the key inferential challenges posed in the study of entrepreneurial performance more convincingly than is possible in cross-sectional surveys or short panels. Finally, IDA contains information on the characteristics of each individual's employer; by contrast, it is impossible to measure employer characteristics in many large-scale, representative samples of the labor market (such as the Panel Study of Income Dynamics or the National Longitudinal Study).

Counterbalanced against these advantages are some limitations of IDA. Primary among these is that while the range of measured individual characteristics exceeds that of most if not all

prior studies of the effects of individuals on entrepreneurial outcomes (e.g., Gimeno et al. 1997; Brüderl, Preisendorfer and Ziegler 1992), the information on employer characteristics are more limited. Thus we are constrained in our ability to examine the broader impact of workplace characteristics on entrepreneurial competence and commitment, even though we believe that a variety of factors (such as corporate culture, human resource practices, etc.) are likely germane. This also means that we are limited in our ability to differentiate between the different mechanisms through which our chosen variable of interest – size – might exert its influence.

A second potential disadvantage of the IDA data, at least in the eyes of some, is that the data refer to entrepreneurial behavior and outcomes in Denmark, a less familiar empirical context that the typical study of (U.S.) entrepreneurs. With its long history of a strong welfare state and active labor market policies, it is natural to be concerned that one cannot draw general lessons about the entrepreneurial process from a study of Danish data. While it is impossible to fully allay these concerns without performing comparative research (which would often require intensive data collection efforts in other countries), we see two reasons why this should not be an over-riding concern. First, we know of no clear theoretical argument for how specific institutional features of the Danish context should be correlated both with entrepreneurial outcomes and with the size distribution of entrepreneurs' prior employers. Yet specifying such a correlation is needed to generate bias in our estimates of the effects of employer size. Second, while many imagine that a strong welfare state is synonymous with rigid labor markets, in fact the Danish labor market is generally characterized as flexible and dynamic, comparable to the United States in its levels of labor market protection (Bingley and Westergård-Nielsen 2003). Furthermore, there are few formal barriers to entry into entrepreneurship (such as licensing

requirements), and the vast majority of entrepreneurship is opportunity driven (Hancock and

Bager 2001).

For our analyses of entrepreneurial outcomes, we have constructed a sample of the entire

population consisting of new entrepreneurial ventures formed in the years 1988, 1990 and 1992.

We restrict our analyses to individuals who enter into entrepreneurship for the first time, as the

dynamics of serial entrepreneurship are likely different. These years were chosen somewhat

arbitrarily, but reflect our desire to balance the constraints imposed by left-censoring (in 1980)

on the one hand, and right-censoring (in 1997) on the other. Left-censoring creates problems

because it truncates career histories prior to 1980, and thus makes it impossible to eliminate

people who were entrepreneurs prior to 1980. By sampling entrepreneurs in the chosen years,

and restricting the sample to entrepreneurs under the age of 45 at entry, we minimize the left-

truncation problem. Conversely, sampling entrepreneurs several years before the date of right-

censoring allows us to gather longer histories of entrepreneurial performance and survival. In

addition to these sample restrictions, we exclude all individuals who entered into industries in the

primary (agricultural and extractive) sector, as well as individuals who entered into industries

dominated by the public sector. We also exclude individuals from the sample if they were

unemployed before entering entrepreneurship, as firm size is missing for these individuals.

Entrepreneurs are identified by the occupation codes assigned by Statistics Denmark,

which distinguished between employed and self-employed workers. Statistics Denmark

differentiates between two types of self-employed workers, employers and individuals who are

self-employed but have no employees. We include both in our sample, as the distinction

between the two rests on whether or not the entrepreneur employs individuals at the time IDA

samples information (week 48 of each year). Nonetheless, the distinction between the two types

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of entrants is salient, as employers are actively engaged in establishing an organization and not simply becoming independent contractors.[2] For this reason, we expect that the skills acquired from the prior employer will have a greater impact on entrepreneurs who are employers than those who are self-employed. We therefore distinguish between these two types of entrants in our regression models.

We analyze two different entrepreneurial performance outcomes: entrepreneurial income and the entrepreneurial exit rate. Statistics Denmark does not directly measure income from entrepreneurial activities; however, this income is included in the gross income reported in IDA. A first approximation to entrepreneurial income is therefore their non-salary income, or reported gross income less reported salary income. The gross income measure, however, includes income from passive investments (such as bank interest income, etc.). We therefore measure entrepreneurial income by comparing the non-salary income in entrepreneurship to the non-salary income reported in the year prior to entry into entrepreneurship.[3]

In addition to modeling income, we analyze the exit rate from entrepreneurship, controlling for that entrepreneur's income. Statistics Denmark records each individual's occupational status on a yearly basis. We consider someone to have exited from entrepreneurship if Statistics Denmark no longer assigns them a self-employment code. This measurement strategy is imperfect, as some apparent transitions may be due to entrepreneurs deciding to incorporate their ventures. Incorporation events should not generally be considered exits. Because of this, we only consider transitions to be exits from self-employment if one of the following additional criteria were met: 1) they were no longer employed; 2) they were

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[2] Unfortunately, due to restrictions in data availability, we are not able to include in our sample those individuals who found incorporated ventures. The vast majority of new ventures, however, are unincorporated.
[3] Our analyses are robust to different specifications of the dependent variable, including using the unadjusted non-salary income, as well as changes in wealth levels.

employed by a pre-existing firm; or 3) they were employed in a different industry from their entrepreneurial venture.

Our regression models for entrepreneurial income and exit exploit the richness of the IDA data to include a wide variety of control variables. In addition to basic demographic variables, we include measures of: educational attainment (vocational degree, academic high school degree, or university degree; excluded category is compulsory education); debts and assets; tenure with the previous employer; as well as salary and non-salary income prior to entry. Salary income prior to entry may be considered a measure of unobserved ability, since the models already control for basic human capital characteristics. We also control for whether the entrepreneur entered the same industry as their prior employer. All models include industry fixed effects, with industry measured at the three-digit level. These fixed effects help capture time-invariant features of the competitive environments faced by the new ventures.

Results

Table 1 presents analyses of the two entrepreneurial outcomes of interest: entrepreneurial income and exit rates. The models in this table are estimated on panel data covering entire histories of entrepreneurial involvement; in other words we use data on all years an individual was involved in entrepreneurial activity until the time of exit or data censoring. For our analysis of entrepreneurial income we estimate panel data regression models with random effects, while our models of exit are estimated using logistic regression. (Since the size of the prior employer does not vary within persons, we cannot estimate fixed effect models.) The models in Table 1 do not account for selection into entrepreneurship; we return to this issue in subsequent tables. These analyses should therefore be thought of as "descriptive regressions," telling us what we

would expect the entrepreneurial outcomes would be if we picked a self-employed person at random and knew the size of their prior employer (and other covariates).

The first two columns of Table 1 provide random effects estimates of the determinants of entrepreneurial income. Entrepreneurial income is expressed in tens of thousands Danish kroner for ease of presentation.[4] Estimates in both columns show that income increases with the length of time spent in entrepreneurship. This is to be expected, in part because entrepreneurs may learn on the job, and in part because of attrition from the sample by those who do not succeed in entrepreneurship. Women and immigrants have lower entrepreneurial incomes, while education has a positive effect. The dummy variable "currently an employer" tracks whether an entrepreneur has employees in a given year; as might be expected, this is associated with higher incomes. Individuals who enter the same industry as their prior employer garner higher earnings as well, consistent with the notion that they are exploiting industry-specific knowledge and skills (Klepper 2001).[5]

The first column of Table 1 provides support for our initial hypothesis: entrepreneurs who emanate from larger established firms have lower entrepreneurial incomes. This effect is statistically significant and substantial. An entrepreneur emerging from a firm with 100 employees can expect an average entrepreneurial income that is 2,600 Danish kroner less than an entrepreneur whose prior employer had 5 employees. This is a four percent reduction in income relative to the median income across all years (approximately 61,000 DKK). In the second column of Table 1, we interact the size of the prior employer with whether or not the entrepreneur currently is managing employees. This analysis suggests that in fact the effect of

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[4] All monetary values are deflated to 1980 values.
[5] We have explored interactions between firm size and the same industry dummy, and found no significant interaction effects in any specifications.

firm size is restricted to entrepreneurs who are employers, as the main effect of firm size (i.e., the effect for independent contractors) is not statistically distinguishable from zero. For employers, the effect of firm size is effectively double that observed in the first column of table 1, suggesting that an entrepreneur from a firm with 100 employees can expect an income 5,600 Danish kroner less than an entrepreneur from a firm with 5 employees. This is an almost seven percent penalty relative to the median income for employers.

The fact that we only observe an impact of firm size for entrepreneurs who are employers suggests that firm size primarily shape the organizational skills of the prospective entrepreneur. If firm size were related to entrepreneurial vision, or the ability of prospective entrepreneurs to accurately assess entrepreneurial opportunities (see Saxenian 1994; Gompers, Lerner and Scharfstein (2005), then firm size should have lowered income among the independent self-employed as well.

The last two columns of Table 1 shed light on the process generating entrepreneurial exit. In these models, we control for our measure of entrepreneurial income. Because of this, the estimates of other variables in the model capture the differential willingness of entrepreneurs with the same incomes to continue their ventures. The estimates in the third column of Table 1 imply that entrepreneurs from large employers are less committed than entrepreneurs from small employers; for the same level of income, entrepreneurs from large firms are more likely to quit. The magnitude of this difference is again substantial; an entrepreneur whose prior employer had 100 employees is 8% more likely to exit entrepreneurship than an entrepreneur from a firm with 5 employees. In the last column of Table 1, we see that the effect of firm size on commitment is greater for entrepreneurs who are employers, but the effect is still statistically significant for independent contractors. The employer who emerged from a firm with 100 employees now has a

18% higher rate of exit than the employer from a firm with 5 employees. We interpret this

pattern of results to mean that the work environment, specifically firm size, influences the non-

pecuniary motivations of prospective entrepreneurs.

As noted earlier, the estimated effects of firm size are potentially biased by self-selection

into entrepreneurship, to the extent that unobserved factors correlated with firm size influence

both entrepreneurial entry and performance. We address this issue in two ways, both of which

lead to the conclusion that the selection process does not induce significant bias. In Table 2, we

re-estimate the models presented in Table 1 and include an estimate of the inverse Mills ratio, or

non-selection hazard for entry into entrepreneurship.[6] Higher values of the inverse Mills ratio

thus indicate that an entrepreneur's entry was unexpected given their observable characteristics,

and thus more likely to be due to unobservable factors. As might be expected, the estimates in

Table 2 indicate that higher values of the inverse Mills ratio are associated with higher

entrepreneurial incomes and lower probabilities of exit from entrepreneurship, although these

effects are not statistically significant. More importantly for our purposes, however, there is no

evidence that the selection process produces meaningful bias in our estimates of the effects of

firm size. Our conclusions from Table 1 regarding the effects of firm size remain unchanged.

Our tests in Table 2 for selection effects are imperfect, since there are no well-established

methods for correcting for sample selection bias in panel data models (Woolridge 1995). As an

alternative, we estimated traditional Heckman selection models on a sample where the second-

stage outcome measures (i.e., income or exit) were restricted to the first year of entrepreneurial

activity (for the exit models these were estimated using probit selection models). We suspect

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[6] We compute this estimate from a 50% sample of the employed, non-entrepreneurial population under the age of
45. Using this sample, we estimate a probit model of entry into entrepreneurship as a function of parental self-
employment, assets and debts, salary and non-salary income, demographic variables, tenure with the employer, and
firm size.

that selection processes might manifest themselves most strongly in the first-year outcomes. Despite this, our analyses supported the same conclusions as in Table 2, with no statistically significant effect of selectivity and no apparent bias. We thus feel confident that the size effects cannot be attributed to selection biases.

We also consider whether the observed effects of employer size on entrepreneurial outcomes might be due to unobserved sorting processes. We test for this alternative explanation in two indirect ways. First, we consider whether the effects of employer size are attenuated for individuals who have self-employed parents, which we would expect if the size effect is due to sorting. Results of this analysis are presented in Table 3. Our measure of parental self-employment is a dummy variable indicating whether an individual's parent was ever self-employed between 1980 and the time of the sample. As can be seen in Table 3, the children of the self-employed have higher entrepreneurial incomes and lower rates of exit. Along with the fact that children of the self-employed are more likely to work in small firms (as shown in Sørensen 2007a for the same population), this pattern validates the use of parental self-employment as a check on sorting processes. Yet the results in Table 3 show no evidence that the size effect can be attributed to sorting. The effect of firm size on entrepreneurial income does not vary significantly by parental self-employment status. Furthermore, while the interaction between size and parental self-employment is significant in the models of exit, the positive sign of the coefficient indicates that the firm size effect is strengthened, not attenuated, among children of the self-employed.

Table 4 presents an alternative test of the sorting argument, relying on variation among entrepreneurs in their length of attachment to the prior employer. A pure sorting process would imply that the effects of employer size should be the same regardless of how long an individual

worked for the employer. By contrast, a causal effect of firm size on competence (skills) and commitment suggests that the effect of employer size increased the longer the entrepreneur had worked with the employer. To test this, we interact firm size with our dummy variables for tenure with the prior employer. The effects in Table 4 are consistent with the causal interpretation: the effect of size grows larger with prior tenure. For employees with tenures less than four years, employer size does not significantly influence entrepreneurial income, while the negative effect is quite strong for those who worked for the prior employer for six years or more. A similar pattern is observed for entrepreneurial exit.

Discussion

The evidence in this paper supports the conclusion that organizational size has far-reaching effects on the dynamics of entrepreneurship. As previous research has shown, larger organizations make their employees less likely to enter entrepreneurship (Gompers, Lerner and Scharfstein 2005; Dobrev and Barnett 2005; Sørensen 2007a). The results presented here indicate that large organizations lower entrepreneurial endurance as well, with lower levels of economic performance and shorter survival times. In other words, entrepreneurs emanating from large firms appear to be less competent than entrepreneurs from small firms, and also less committed to the entrepreneurial role. Furthermore, our tests suggest that this pattern of results is not solely due to the sorting of individuals with different entrepreneurial competencies and commitments into small firms; rather, employment in small firms appears to have a causal impact.

Our results thereby support our argument that the increasing complexity that accompanies increases in organizational size makes it more difficult for employees to develop

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the skills needed for entrepreneurial activity, and makes it more difficult for them to accurately perceive the environmental opportunities available. There is some evidence in our analyses to suggest that the primary impact of working in a small firm is on skill development as opposed to opportunity recognition. The performance of both independent entrepreneurs and those with employees depends on the value of the entrepreneurial opportunity, but for the latter group the entrepreneur's organizational skills are relevant as well. We found that size affected the incomes for entrepreneurs with employees – where organizational competencies are needed – but had no impact on the performance of independent entrepreneurs.

It is worth considering the effect of employer size on entrepreneurial skills more carefully. The negative effects of employer size on entrepreneurial income would at first glance seem to provide a simple explanation for the negative relationship between firm size and entrepreneurship found in earlier studies: lower rates of entry among large firm employees are rational responses to their lower entrepreneurial skills (Lazear 2005).[7] But this type of rational foresight should result in employer size having *no* effect of entrepreneurial performance once different thresholds for entry are controlled for in the selection models. The fact that the effects of employer size are consistently negative across specifications suggests that employees have difficulty accurately assessing the expected value of entrepreneurial entry, and that this difficulty is exacerbated for employees of large firms. In this sense, our results are consistent with the idea that overconfidence plays an important role in driving entrepreneurial entry (Sørensen and Sorenson 2003; Moore, Oesch and Zietsma 2007), or that entry decisions are driven by non-

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[7] Our discussion emphasizes quantitative or level differences in the "amount" of entrepreneurial skills. Our approach is also consistent with a conceptualization that emphasizes qualitative differences in entrepreneurial skills. Thus it may not be that entrepreneurs from large firms are less competent, but rather that they have the *wrong* competencies because they try to apply skills appropriate to the routines of large firms to small firms (Phillips 2002). We leave this as an issue for future research.

pecuniary considerations such as the desire for autonomy or identity fulfillment (Halaby 2003; Xu and Ruef 2004; Sørensen 2007b).

Perhaps the most novel feature of our analysis is the consideration of commitment to the entrepreneurial role, or the likelihood of exit controlling for entrepreneurial financial performance. Here we find that, irrespective of income, entrepreneurs from large employers are more likely to exit entrepreneurship. We have argued that the greater commitment among entrepreneurs from small firms results from their exposure to entrepreneurial role models, and from their more realistic expectations concerning the challenges and stresses of entrepreneurial activity. An alternative interpretation is that the pattern reflects the greater opportunity cost of entrepreneurship for former employees of large firms. Larger employers pay more; if large employers are more likely to hire a former employee of a large firm than a former employee of a small firm, then the cost of remaining in entrepreneurship is higher for entrepreneurs from large firms. While we cannot rule out this alternative interpretation, we note that it merely constitutes an alternative form of commitment to the entrepreneurial role, driven by the opportunity structure in the labor market. Future research should examine the nature and sources of greater entrepreneurial commitment among entrepreneurs from small firms. Does it reflect a positive embrace of the entrepreneurial role? Or does it result from constraint in a segmented labor market?

Conclusion

To date, sociological theories have been silent about the sources of what we have termed entrepreneurial endurance – the likelihood that an entrepreneur will persist in his or her venture in a given environment. This silence reflects an emphasis in sociological thinking about

entrepreneurship on the "demand side" of entrepreneurial activity, or the ways in which entrepreneurship responds to variations in the distribution of opportunities (Carroll and Hannan 2000). Implicit in existing sociological approaches is a theoretical simplification or agnosticism with respect to the behavior and characteristics of the individuals who create new organizations – entrepreneurs. In fact, some reviews of the sociology of entrepreneurship largely equate it with demand side approaches, treating the study of the supply side (e.g., who becomes an entrepreneur) as the province of economists and psychologists (see Thornton 1999). Yet we see no *a priori* reason why this is the appropriate scholarly division of labor.

Our goal in this paper has been to develop and test a structural theory of entrepreneurial endurance. Our theory is premised on the notion that the structural features of work environments shape individual entrepreneurial outcomes. Most entrepreneurs emerge from established organizations, so the workplace is an important context for the development of entrepreneurial intentions and abilities. In particular, we have argued that work environments shape entrepreneurial ventures through their impact on the entrepreneur's competence and commitment to the entrepreneurial role. While our focus has been on the effects of organizational size, future research could fruitfully address a wider range of organizational characteristics.

Our theory and analyses suggest two important conclusions for our understanding of entrepreneurship and population dynamics. First, different population structures produce entrepreneurs with different qualities, and these differences among entrepreneurs have consequences for the life chances of new ventures. This suggests, for example, that the size distributions of organizational populations matter in a way that has not been appreciated in previous work, which has focused on their implications for competition (Carroll and Hannan

2000). Second, our arguments and evidence point to the importance of genealogical or hereditary processes in organizational outcomes (Phillips 2002, 2005). As other research also has demonstrated (e.g., Beckman and Burton 2008), entrepreneurial ventures do not start with a blank slate; instead, they are shaped in important ways by the career experiences of their founders. This points to the importance of devoting greater attention to careers as a means of developing structural theories of the entrepreneurial process.

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Table 1: Entrepreneurial outcomes: Income and exit

Variable	Entrepreneurial Income		Exit	
	(1)	(2)	(1)	(2)
Constant	-21.413†	-21.784†	-1.093*	-0.998*
	(1.103)	(1.106)	(0.464)	(0.464)
2nd year	1.956†	1.951†	0.146†	0.146†
	(0.120)	(0.120)	(0.035)	(0.035)
3rd year	2.918†	2.909†	0.058	0.058
	(0.134)	(0.134)	(0.040)	(0.040)
4th year	4.154†	4.140†	-0.062	-0.060
	(0.146)	(0.146)	(0.046)	(0.046)
5th year	4.356†	4.343†	-0.149*	-0.147*
	(0.178)	(0.178)	(0.061)	(0.061)
6th year	5.494†	5.480†	-0.306†	-0.305†
	(0.190)	(0.190)	(0.071)	(0.071)
7th year	4.821†	4.802†	-0.315†	-0.313†
	(0.240)	(0.240)	(0.095)	(0.095)
8th year	5.864†	5.846†	-0.375†	-0.374†
	(0.253)	(0.253)	(0.104)	(0.104)
Female	-1.822†	-1.826†	-0.031	-0.030
	(0.171)	(0.171)	(0.032)	(0.032)
Danish	0.947†	0.968†	0.015	0.009
	(0.346)	(0.346)	(0.058)	(0.058)
Age	0.014	0.015	-0.016†	-0.016†
	(0.011)	(0.011)	(0.002)	(0.002)
Vocational	-0.195	-0.201	-0.119†	-0.118†
	(0.177)	(0.177)	(0.031)	(0.031)
Academic	0.379	0.343	-0.181†	-0.178†
	(0.290)	(0.290)	(0.051)	(0.051)
University	1.617†	1.607†	0.009	0.008
	(0.230)	(0.230)	(0.042)	(0.042)
Log assets	0.232†	0.232†	-0.016†	-0.016†
	(0.010)	(0.010)	(0.003)	(0.003)
Log debts	0.109†	0.109†	0.014†	0.014†
	(0.013)	(0.013)	(0.003)	(0.003)
Prior tenure: 2-4 years	0.344	0.341	-0.054	-0.054
	(0.200)	(0.200)	(0.034)	(0.034)
Prior tenure: 4-6 years	0.524*	0.522*	-0.223†	-0.222†
	(0.244)	(0.244)	(0.043)	(0.043)
Prior tenure: 6+ years	0.418*	0.421*	-0.286†	-0.286†
	(0.202)	(0.202)	(0.036)	(0.036)
Log previous salary	2.131†	2.143†	0.030	0.028
	(0.097)	(0.097)	(0.017)	(0.017)
Previous non-salary (0000)	-0.430†	-0.430†	-0.016†	-0.016†
	(0.013)	(0.013)	(0.003)	(0.003)
Any salary this year	-4.834†	-4.837†	0.698†	0.698†
	(0.118)	(0.118)	(0.031)	(0.031)
Currently an employer	1.646†	2.211†	-0.706†	-0.878†
	(0.117)	(0.189)	(0.031)	(0.050)
Same industry prior to entry	1.415†	1.374†	-0.427†	-0.417†
	(0.179)	(0.179)	(0.035)	(0.035)
Entrepreneurial income (0000)			-0.027†	-0.026†
			(0.002)	(0.002)
Log firm size prior to entry	-0.088†	-0.036	0.026†	0.015†
	(0.028)	(0.031)	(0.005)	(0.005)
Employer*Log firm size		-0.153†		0.040†
		(0.040)		(0.009)

Note: † p < 0.01; * p < 0.05. Models of entrepreneurial income are random-effects panel data models. Models of exit are logistic regression discrete-time event history models. Dummy variables for industry and year of entrepreneurial entry are included in the models but not shown.

Table 2: Entrepreneurial outcomes, controlling for selection: Income and exit

Variable	Entrepreneurial Income		Exit	
	(1)	(2)	(3)	(4)
Constant	-23.079†	-23.356†	-0.963	-0.876
	(2.321)	(2.320)	(0.587)	(0.587)
2nd year	1.950†	1.945†	0.147†	0.147†
	(0.121)	(0.121)	(0.035)	(0.035)
3rd year	2.893†	2.885†	0.059	0.059
	(0.136)	(0.136)	(0.040)	(0.040)
4th year	4.109†	4.097†	-0.060	-0.058
	(0.149)	(0.149)	(0.047)	(0.047)
5th year	4.327†	4.316†	-0.146*	-0.144*
	(0.182)	(0.182)	(0.061)	(0.061)
6th year	5.454†	5.443†	-0.302†	-0.302†
	(0.196)	(0.196)	(0.071)	(0.071)
7th year	4.778†	4.761†	-0.311†	-0.309†
	(0.247)	(0.247)	(0.095)	(0.095)
8th year	5.815†	5.799†	-0.371†	-0.370†
	(0.261)	(0.261)	(0.105)	(0.105)
Female	-1.949†	-1.945†	-0.017	-0.017
	(0.247)	(0.247)	(0.044)	(0.044)
Danish	0.848*	0.874*	0.025	0.019
	(0.366)	(0.366)	(0.063)	(0.063)
Age	0.024	0.024	-0.016†	-0.016†
	(0.014)	(0.014)	(0.002)	(0.002)
Vocational	-0.225	-0.232	-0.119†	-0.117†
	(0.177)	(0.177)	(0.031)	(0.031)
Academic	0.381	0.346	-0.177†	-0.174†
	(0.290)	(0.290)	(0.051)	(0.051)
University	1.590†	1.580†	0.010	0.009
	(0.230)	(0.230)	(0.042)	(0.042)
Log assets	0.237†	0.237†	-0.016†	-0.016†
	(0.011)	(0.011)	(0.003)	(0.003)
Log debts	0.112†	0.112†	0.014†	0.014†
	(0.014)	(0.014)	(0.004)	(0.004)
Prior tenure: 2-4 years	0.346	0.345	-0.052	-0.051
	(0.203)	(0.203)	(0.035)	(0.035)
Prior tenure: 4-6 years	0.462	0.462	-0.221†	-0.220†
	(0.245)	(0.245)	(0.044)	(0.044)
Prior tenure: 6+ years	0.356	0.363	-0.279†	-0.280†
	(0.226)	(0.226)	(0.040)	(0.040)
Log previous salary	2.112†	2.123†	0.031	0.029
	(0.097)	(0.097)	(0.017)	(0.017)
Previous non-salary (0000)	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Any salary this year	-4.845†	-4.847†	0.698†	0.698†
	(0.119)	(0.119)	(0.031)	(0.031)
Entrepreneurial income (0000)			-0.027†	-0.026†
			(0.002)	(0.002)
Currently an employer	1.668†	2.219†	-0.707†	-0.879†
	(0.118)	(0.189)	(0.031)	(0.050)
Same industry prior to entry	1.428†	1.387†	-0.428†	-0.418†
	(0.178)	(0.178)	(0.035)	(0.035)
Log firm size prior to entry	-0.129*	-0.075	0.029†	0.018
	(0.056)	(0.057)	(0.010)	(0.010)
Employer*Log firm size		-0.150†		0.040†
		(0.040)		(0.009)
Mills ratio	0.687	0.654	-0.056	-0.053
	(0.778)	(0.778)	(0.138)	(0.138)

Note: † p < 0.01; * p < 0.05. Models of entrepreneurial income are random-effects panel data models. Models of exit are logistic regression discrete-time event history models. Dummy variables for industry and year of entrepreneurial entry are included in the models but not shown.

Table 3: Effects of firm size on entrepreneurial outcomes, by parental self-employment: Income and exit

	Entrepreneurial Income		Exit	
Currently an employer	1.638†	2.154†	-0.703†	-0.900†
	(0.117)	(0.221)	(0.031)	(0.058)
Self-employed parent	0.570*	0.483	-0.234†	-0.262†
	(0.289)	(0.336)	(0.052)	(0.062)
Log firm size prior to entry	-0.071*	-0.025	0.018†	0.007
	(0.031)	(0.034)	(0.005)	(0.006)
Employer*Log firm size		-0.137†		0.044†
		(0.045)		(0.010)
Self-employed parent * Log firm size	-0.064	-0.034	0.029†	0.034†
	(0.061)	(0.071)	(0.010)	(0.012)
Employer * S-E Parent		0.202		0.102
		(0.419)		(0.109)
Employer * S-E Parent* Log firm size		-0.078		-0.017
		(0.100)		(0.022)

Note: † $p < 0.01$; * $p < 0.05$. Models of entrepreneurial income are random-effects panel data models. Models of exit are logistic regression discrete-time event history models. All models include the full set on variables in Table 1.

Table 4: Effects of firm size on entrepreneurial outcomes, by tenure with prior employer: Income and exit

	Entrepreneurial Income		Exit	
Prior tenure: 2-4 years	0.471	0.365	-0.124*	-0.152*
	(0.337)	(0.392)	(0.059)	(0.071)
Prior tenure: 4-6 years	1.190†	0.563	-0.289†	-0.237†
	(0.405)	(0.479)	(0.074)	(0.090)
Prior tenure: 6+ years	1.809†	0.809*	-0.456†	-0.302†
	(0.333)	(0.395)	(0.064)	(0.076)
Currently an employer	1.645†	1.482†	-0.704†	-0.777†
	(0.117)	(0.272)	(0.031)	(0.069)
(2-4 years tenure)*Employer		0.258		0.095
		(0.512)		(0.128)
(4-6 years tenure)*Employer		1.427*		-0.144
		(0.601)		(0.159)
(6+ years tenure)*Employer		2.102†		-0.436†
		(0.484)		(0.136)
Log firm size prior to entry	0.016	0.026	0.014*	0.013
	(0.038)	(0.042)	(0.006)	(0.007)
(2-4 years tenure)*Log size	-0.038	-0.039	0.018	0.018
	(0.071)	(0.081)	(0.012)	(0.014)
(4-6 years tenure)*Log size	-0.178*	-0.079	0.017	-0.004
	(0.083)	(0.098)	(0.014)	(0.017)
(6+ years tenure)*Log size	-0.326†	-0.185*	0.036†	-0.001
	(0.062)	(0.073)	(0.011)	(0.013)
Employer * Log size		-0.048		0.004
		(0.063)		(0.014)
(2-4 years tenure)*Log size*Employer		0.018		-0.003
		(0.115)		(0.026)
(4-6 years tenure)*Log size*Employer		-0.215		0.061*
		(0.134)		(0.031)
(6+ years tenure)*Log size*Employer		-0.287†		0.105†
		(0.098)		(0.023)

Note: † $p < 0.01$; * $p < 0.05$. Models of entrepreneurial income are random-effects panel data models. Models of exit are logistic regression discrete-time event history models. All models include the full set on variables in Table 1.