Ability, Experience, and Entrepreneurship: Which Scientists and Engineers Join Small Firms and Start-Ups?

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Overview:

A growing chorus of academics and policy-makers lauds entrepreneurship as an engine of economic growth and technological change, as a key to regional economic development, and as a pathway for groups facing discrimination to enter the economic mainstream, yet we still know relatively little about the factors that influence individuals' decisions to become entrepreneurs. In our study, we employ survey data from the National Science Foundation's Scientists and Engineers Statistical Data System (SESTAT) to examine the factors that influence scientists' and engineers' decisions to leave 'secure' employment in large firms, academic / research institutions, or government to join small, entrepreneurial firms. We investigate a number of theories that suggest a variety of different factors—including individual ability, compensation policies within large firms, exposure to opportunities, and the importance of acquiring general vs. specialist skills, among others—affect this choice. The richness of the SESTAT data set allows us to shed some light on conflicting findings in prior research and to extend them in a number of promising directions.

We report here a number of striking regularities or "stylized facts" that have emerged in our preliminary work. Our continuing research is aimed at deepening our understanding of the causes and potential theoretical explanations for these "stylized facts." We conduct our analysis using a panel of survey responses from B.A.- and M.A.-holding scientists and engineers collected every two years from 1993 to 1999, inclusive, and from Ph.D.-holding scientists and engineers collected every two years between 1993 and 2003, inclusive. To avoid some undesirable sources heterogeneity, we drop from the dataset individuals who were not in the labor force in all periods and individuals who worked part-time. The two panels we analyze consist of roughly 40,000 individuals for the short (4-episode) panel and 15,000 for the longer (6-episode) panel.

Prior work has come to conflicting results about the relationship between earnings in paid-employment and the transition to self-employment or other entrepreneurial activity. This relationship has been of particular interest since it sheds light on the question of whether different types of skills are required for paid vs. entrepreneurial employment, the importance of compensation differences across sectors, and the non-pecuniary benefits of being one's own boss. Evans and Leighton (1989) provide evidence that is consistent with a 'misfit' theory, suggesting that earnings in paid employment are negatively related to decisions to enter self-employment, while Anderson and Wadensjo (2006) find evidence that the self-employed are drawn both from the bottom and the top of the wage distribution. Others, including Rees and Shah (1986) and Bernhardt (1994), find a positive relationship between an estimated differential wages in self-employment vs. paid employment and entry into self-employment, suggesting that monetary considerations (not just non-pecuniary factors) are at work. Our early work on this relationship has three major findings. First, when all self-employment is considered, we observe for scientists and engineers a relationship similar to that reported by Anderson and Wadensjo (2006), i.e., those at the top end and those at the bottom end of the wage distribution are more

likely to enter self-employment. Second, we find major differences in the relationship between paid employment wages and decisions to enter self-employment as an incorporated business vs. as an unincorporated business. In particular, paid employment "stars" are more likely to transition into incorporated self-employment, whereas "misfits" are both more likely to transition into non-incorporated self-employment. Finally, we compare the determinants of entering self-employment to the determinants of leaving employment in a medium-sized or large firm to join a small firm (of size 100 or less) or a newly formed firm (founded within the prior five years). The relationship between paid-employment wage history and joining a small firm resembles the pattern of those entering non-incorporated self-employment, although "stars" do have a somewhat greater propensity to join small firms. On the contrary, the relationship between paid-employment wage history and joining a start-up resembles that of the incorporated self-employed; i.e., "stars" are more likely to join start-ups.

Prior research on the type of paid-employment work and the propensity to enter self-employment or entrepreneurial endeavors has been limited to studies of industry differences and gross differences in job categories. Using the SESTAT data, we find striking evidence that the type of firm an individual works for at time *t* and the likelihood of entering self-employment at time *t+1* are related. In particular, controlling for the fact that those employed in small firms change jobs more frequently, small firms are much more likely to generate entrepreneurs that large firms. Controlling for managerial or supervisory work under paid employment, while individually significant in explaining transitions to entrepreneurial endeavors, does little to reduce the strength of relationship between firm size and subsequent entrepreneurial activity. Experience in small firms, it seems, results in greater propensity for an individual to engage in entrepreneurial activity. In fact, much of the regional differences in certain types of self-employment are reduced or eliminated when one controls for prior employment in small firms.

The final section of the paper (in progress) attempts to determine the degree to which the empirical relationship described above is driven by selection, i.e., entrepreneurial "types" may shy away from large firm employment, or whether small firm experience causes individuals to be able to recognize and/or exploit entrepreneurial opportunities. The richness of the SESTAT data provides a number of promising avenues to distinguish between these hypotheses. In particular, we can examine persistence in self-employment, growth of self-employed enterprises, and earnings in self-employment as functions of individual characteristics, including experience. Additionally, we employ the Bayesian semi-parametric panel data selection framework developed by Chib and Hamilton (2002) that allows us to jointly model the choices of scientists to work in entrepreneurial/non-entrepreneurial firms and the outcomes associated with these choices (e.g., wages or self-employment income). We estimate the model by Bayesian Markov Chain Monte Carlo methods that allow for correlation in unobserved individual factors that influence choices and outcomes. The estimates obtained from the models allow us to answer the questions posed above. For example, if high ability wage workers tend to be successful entrepreneurs, then unobserved factors affecting returns in each sector will tend to be positively correlated.

References

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