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ABSTRACT

Testing Lazear's Jack-of-All-Trades View of Entrepreneurship with German Micro Data*

This paper tests the theory recently put forward by Edward Lazear that individuals with competence in many skills should have a higher probability of being self-employed than others. The empirical results for Germany support this jack-of-all-trades view.

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1. Motivation

In a recent paper that has the potential of becoming a pivotal element in the field Edward Lazear (2002) proposed the jack-of-all-trades view of entrepreneurship. Based on a coherent model of the choice between self-employment and paid employment Lazear shows that having a background in a large number of different roles increases the probability of becoming an entrepreneur. The intuition behind this proposition is that entrepreneurs must have sufficient knowledge in a variety of areas to put together the many ingredients needed for survival and success in a business, while for paid employees it suffices and pays to be a specialist in the field demanded by the job taken. Lazear used a data set of Stanford alumni to test this prediction of his model and found it to hold - those with more varied experience have much higher probabilities of starting their own business.

Stanford alumni might not be representative for the millions of people facing the choice between self-employment and paid employment. This note contributes to the entrepreneurship literature by empirically testing Lazear's jack-of-all-trades hypothesis using a large recent representative sample of the German working population. Section 2 gives information on the data used and descriptive statistics, section 3 discusses the results from the econometric investigation, and section 4 concludes.

2. Data and descriptive statistics

The empirical investigation is based on a representative 0.1 percent sample of the working population in Germany conducted between October 1998 and March 1999.¹

¹ The data from the study "Erwerb und Verwertung beruflicher Qualifikationen von Erwerbstaetigen - BIBB / IAB - Strukturhebung 1998/1999" are available for scientific (non-commercial) research for a nominal fee from the Zentralarchiv fuer Empirische Sozialforschung (ZA) at the University of Cologne, Germany. The archive

We restrict our analysis to all individuals between 18 years (the legal minimum age for running your own firm) and 65 years (the mandated age of retirement for paid employees). Among others, the survey asks whether the interviewee is self-employed. In our sample of 33.633 individuals the share of self-employed is 9.36 percent - a figure well in line with evidence from the regular *Mikrozensus*, an official one-percent sample of the German population.

Being self-employed or not is at the heart of our empirical investigation. Closely following Lazear (2002) we include sex, nationality and age as control variables, and we focus on the influence of knowledge in a variety of areas on the probability of becoming an entrepreneur. The breadth of experience of an interviewee is proxied by two variables. One variable is the number of different kinds of professional training after completing school (e.g., apprenticeships, degrees as a master craftsman, university degrees). Interviewees reported between zero and six kinds of professional training, although only a minor fraction had five (N = 34) or six (N = 5). The other variable is the number of times an interviewee changed her or his profession (never, once, twice or more).

[Table 1 near here]

Descriptive statistics for self-employed and others are given in table 1. The proportion on men is higher among self-employed than among paid employees, and self-employed are on average four years older. More important for the topic of this note is that on average self-employed have more kinds of professional training, and changed their profession more often.

number of the study is 3379. Interested researchers should contact Horst Weinen (E-mail: weinen@za.uni-koeln.de). To facilitate replication and extensions the STATA -do-files used to produce the results reported in this note are available from the author on request.

3. Testing the jack-of-all-trades view

The empirical model applied in the econometric investigation mimics Lazear's approach to test his jack-of-all-trades view. The dummy variable indicating whether an individual is self-employed or not is regressed on a set of control variables (sex, nationality, and age), the number of different kinds of professional training, and the dummy variables indicating whether the interviewee did change the profession once, or at least twice, respectively, using those who never changed the profession as the reference group. Probit estimates are reported in table 2 in the column headed 'Model A', while 'Model B' adds quadratic terms of age and number of different kinds of professional training to control for non-linearity.

[Table 2 near here]

Given that the quadratic terms added in model B are highly significant statistically we will focus on the results reported in the last column of table 2. To start with the control variables the probability of being self-employed is higher for men and foreigners, and it is increasing with age at a decreasing rate (note that the estimated maximum of the quadratic relationship between age and the probability of being self-employed is reached at the age of 65.685 years that is out of the range covered in the sub-sample used here).

As regards the number of different kinds of professional training the estimated coefficients point to an inversely u-shaped relationship with the probability of being self-employed. The estimated maximum of this function, however, lies at 3.96 kinds, and given the distribution of the number of kinds in our sample described above (with nearly no observations for five or six kinds of professional training) we have evidence that the probability of being self-employed increases with the number of different kinds of professional training at a decreasing rate. Furthermore, this probability is higher for individuals that changed their profession - the estimated coefficients of both dummy

variables are positive and statistically significant at a usual level. These empirical results support the jack-of-all-trades view of entrepreneurship put forward by Lazear (2002).

Discussion of the results hitherto was limited to the *statistical* significance of the estimated coefficients and the direction of influence conducted by the variables. Information on the extent of this influence, or on the *economic* significance, however, is even more important. Evidently, a variable that has no statistically significant impact can be ignored from an economic point of view, but the opposite is not true: A variable that is highly significant statistically might not matter at all economically - if the estimated probability for being self-employed increases by 0.00001 percentage points when an individual has four kinds of professional training instead of none the number of kinds of professional training can be ignored in the discussion of reasons for becoming an entrepreneur irrespective of any high level of statistical significance indicated by the prob-value.

Unfortunately, the estimated coefficients from the probit model can not easily be used for statements about the size of the *ceteris paribus* effect of a change of the value of an exogenous variable on the probability of being self-employed, because the size of this effect depends on both the value of the exogenous variable under consideration and on the values of all other variables in the model. A way to ease interpretation of the results is to compute the estimated probability of being self-employed for (hypothetical) individuals with different combinations of values of those exogenous variables that are at the center of interest. We follow this strategy: Based on the results reported for model B in table 2 we consider a 40 years old German male and compute the estimated probability for different combinations of the number of kinds of professional training and the number of changes of professions. Results of this exercise are reported in table 3.

[Table 3 near here]

The estimated probabilities for being self-employed clearly demonstrate that both the number of different kinds of professional training and the number of changes of professions do matter economically. To illustrate this, having one more kind of professional training increases the probability of being self-employed by more than three percentage points if the same person has one instead of zero, or two instead of one, and given that the percentage of self-employed in the sample is 9.34 percent this indicates a high impact of this variable. The impact of the number of changes of the profession is somewhat smaller, but still significant in an economic sense.

4. Concluding remarks

A theory that holds for graduates from a U.S. top university and for the German working population as a whole surely is a candidate for the box of tools economists use to investigate entrepreneurship. Further empirical tests with other data sets from other countries and time periods will help to decide whether it can be considered a swiss army knife in this field.

References

Lazear, Edward P., 2002, Entrepreneurship, National Bureau of Economic Research Working Paper 9109, August.

Table 1: Descriptive statistics

	Self-employed		Others	
	Mean	Std. Dev.	Mean	Std. Dev.
Sex (Dummy; 1 = Male)	0.67	0.47	0.55	0.50
German (Dummy; 1 = Yes)	0.96	0.19	0.96	0.20
Age (Years)	44.07	10.16	40.09	10.69
Number of different kinds of professional training	1.45	0.77	1.24	0.71
Number of changes of profession: One (Dummy; 1 = Yes)	0.31	0.46	0.24	0.43
Number of changes of profession: Two or more (Dummy; 1 = Yes)	0.12	0.32	0.09	0.29
Number of cases	3148		30485	

Table 2: Probit estimates for being self-employed

		Model A	Model B
Sex (Dummy; 1 = Male)	[estimated coefficient]	0.221	0.222
	[prob-value]	0.000	0.000
German (Dummy; 1 = Yes)		-0.092	-0.121
		0.070	0.018
Age (Years)		0.016	0.048
		0.000	0.000
Age squared			-3.66e-4
			0.000
Number of different kinds of professional training		0.156	0.271
		0.000	0.000
Number of different kinds of professional training squared			-0.034
			0.001
Number of changes of profession: One (Dummy; 1 = Yes)		0.130	0.120
		0.000	0.000
Number of changes of profession: Two or more (Dummy; 1 = Yes)		0.077	0.077
		0.020	0.019
Constant		-2.303	-2.988
		0.000	0.000
Number of cases		33663	33663

Table 3 Estimated probability for being self-employed¹

	Number of different kinds of professional training				
	Zero	One	Two	Three	Four
Number of changes of profession: None	0.060	0.094	0.126	0.148	0.155
One	0.076	0.116	0.153	0.177	0.186
At least two	0.070	0.108	0.143	0.166	0.174

¹ The estimates are based on the results reported for model B in table 2 for a 40 years old German male.

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