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Dirk Oberschachtsiek

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Mit der Reihe „IAB-Discussion Paper“ will das Forschungsinstitut der Bundesagentur für Arbeit den Dialog mit der externen Wissenschaft intensivieren. Durch die rasche Verbreitung von Forschungsergebnissen über das Internet soll noch vor Drucklegung Kritik angeregt und Qualität gesichert werden.

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Contents

Abstract

This paper addresses the ‘Jack-of-all-Trades’ hypothesis, which presumes that it is individuals’ variety of competencies/experience that drives entrepreneurship instead of their level of productivity (Lazear, 2005). The analysis focuses on two related dimensions of this variety argument: taste for variety (identified due to desire) and investment in ability (identified due to competence). First, the results show that it is important to distinguish between discrete and high level investments in the variety of experience. For instance, a high level of investment - which defines a ‘Jack-of-all-Trades’ - is less correlated with formal schooling than discrete investments. Second, the results indicate that both taste (desire) and ability (competence) correlate with the variety of experience, but the nature of the correlation differs. Particularly for males, the ‘Jack-of-all-Trades’-hypothesis predominately relates to competence and not to desire.

Zusammenfassung

Das vorliegende Papier untersucht die „Jack-of-all-Trades“-Hypothese. Diese unterstellt, dass nicht die Höhe der Produktivität eines Individuums ausschlaggebend ist für eine selbständige Aktivität, sondern deren Bandbreite an Fähigkeiten oder Erfahrung (Lazear 2005). Die Analyse konzentriert sich auf zwei mit diesem Argument zusammenhängende Dimensionen: a) Neigung zur Vielfalt und b) Kompetenz. Die Ergebnisse zeigen zunächst, dass es wichtig ist zwischen diskreten und sehr hohen Investitionen in die Bandbreite an Fähigkeiten zu unterscheiden. So ist Schulqualifikation weniger stark mit einem sehr hohen Investitionsniveau - definiert als „Jack-of-all-Trades“ - korreliert als mit diskreten Investitionen. Zentrales Ergebnis ist, dass sowohl die Neigung zur Vielfalt als auch die Kompetenzdimension mit der Brandbreite and Erfahrung korreliert sind, dass aber die Art der Korrelation unterschiedlich ist. Insbesondere bei Männern zeigt sich, dass die Bandbreite an Erfahrung vor allem mit der Kompetenzdimension verbunden zu sein scheint.

JEL classification: M13, J23, J24

Keywords: entrepreneurship, ‘Jack-of-all-Trades’, competence, desire

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1 Introduction

Comparative advantages in individuals' labor productivity are one important driving force of occupational choices. Recently, Lazear (2005) presented such a comparative advantage model for entrepreneurship related to the balancing property of an individual's skill set. Briefly, this concept emphasizes the importance of being multi-skilled to the ability to successfully run and manage a business (e.g., Chandler & Hanks, 1998; Brüderl et al, 1992).

Empirical investigations support this 'Jack-of-all-Trades' hypothesis (Lazear, 2005; Wagner, 2003, 2006 and Astebro & Thomson, 2008). However, recent investigations also present ambiguous findings. Two principal dimensions have been found as a part of the 'Jack-of-all-Trades' hypothesis: While Lazear (2005) focuses on the comparative advantage dimension of labor market productivity (ability), other studies emphasize the importance of unsteadiness, taste for variety or innate characteristics that associate with the 'Jack-of-all-Trades' hypothesis (Hyytinen & Ilmakunnas, 2007; Silva, 2007).

However, knowing more about the 'Jack-of-all-Trades' phenomenon is crucial for the understanding of the driving force behind self-employment activities and may also help political attempts to foster entrepreneurship. For instance, training schemes might be less supportive for entrepreneurship if the dominant dimension of the 'Jack-of-all-Trades' hypothesis relates to taste for variety.

The analysis at hand contributes to the existing literature by focusing on the two dimensions (taste for variety and investment in ability) of the 'Jack-of-all-Trades' hypothesis. The study defines 'Jacks-of-all-Trades' as individuals with a very high number of distinct fields of experience and explores the determinants of high level and discrete investments in variety of experience. Moreover, the study investigates the importance of the number of distinct fields of experience for self-employment competence (ability dimension) and the desire for a self-employment position (approximately capturing the taste dimension). The data used for the empirical analysis were specifically collected to analyze nascent entrepreneurship activities and permit a simple identification of the relevant dimensions.

The discussion of the investigation is organized as follows: Section 2 reports the underlying framework and the previous findings related to the 'Jack-of-all-Trades' hypothesis. Section 3 presents the data and briefly introduces the variables used. The empirical part is located in section 4 and contains a bivariate analysis of the profile of the 'Jack-of-all-Trades' as well as the multivariate estimations of the determinants of the variety of experience, entrepreneurship competence and the desire for self-employment. Finally, section 5 summarizes the results of the investigation and draws preliminary conclusions.

2 Framework

2.1 The 'Jack-of-all-Trades' Hypothesis

The basic idea of the 'Jack-of-all-Trades' hypothesis emphasizes the importance of having a broad skill set for an entrepreneur (Lazear, 2004 and 2005). To some extent, this idea was set forth previously in the o-ring theory of production (Kremer, 1993). The practical implications of both concepts mean that entrepreneurs and managers must be competent in a broad range of different fields: e.g., entrepreneurs must be able to evaluate business opportunities, challenges and the capabilities of employers; they must be competent to organize processes, choose marketing strategies and ensure financing. This is a complex set of tasks that require a broad range of competences.

In the model discussed by Lazear, self-employment activities offer an external market premium that works as a multiplying factor to the productivity of an entrepreneur. The liability of broad competences in running a business is that entrepreneurs will suffer in their productivity from a deficit in any skill that is necessary to run their business. This leads to an income function that depends on their most limited capability. In contrast, the market value (income) of wage workers will be related to their 'specialized' productivity. Given that multiplier, Lazear (2005) shows that an individual's occupational choice is exclusively determined by the balancing property of his skill set rather than the absolute level of his productivity.

Lazear (2005) assumes that the current skill balance should be related to the individual's investment in multiple fields of competence in the past. Investing in a variety of experiences will be rational as long as the marginal costs of increasing the balancing property remain lower than the potential self-employment premium.[1] Any investment in a distinctive skill will relate to an increase in the variety of experience and thus will enhance the balancing property. Empirically, this can be observed in the number of distinct courses completed in formal schooling, the number of fields of competence or the distinct number of company departments an individual has worked in.

In sum, the 'Jack-of-all-Trades' hypothesis has two major implications: 1. People with a more balanced skill set (reflected by their number of distinct competencies) have a greater likelihood to become self-employed, independent of their level of productivity; and 2. The income of an entrepreneur will be higher the more balanced his or her skill set and - instantly - the higher his or her level of productivity.[2] How-

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[1] The starting points of the skill set composition and the taste for independence are not taken into account. This is important since neither a taste- nor ability-driven causation of investing in the variety of experience is favored.

[2] The model proposed by Lazear (2005) also contains more detailed implications for the income distribution related to the individual's skill set. However, this subject is not discussed in this paper. For an application of the balanced and weighted skill set approach for income distribution, see, for example, Lee (2005).

ever, it remains unclear what induces an individual to invest in variety of experience - except that it should be related to the marginal cost argument.

2.2 The two dimensions – related empirical evidence

So far, several studies have addressed the 'Jack-of-all-Trades' hypothesis, and some also provide insight into its underlying dimensions.

Astebro et al. (2008), for instance, make use of different data sets, including cross-sectional and panel data. As found previously by Lazear (2005) and Wagner (2003, 2006), the cross-sectional analysis presents evidence for the 'Jack-of-all-Trades' hypothesis, whereas the results based on panel data show ambiguous findings. In particular, they do not find a positive relationship between the number of employers or occupations and the level of income, which they interpret as a predominance of non-pecuniary benefits that correlate with the investment in the variety of experience.

Astebro & Thompson (2008) found a positive correlation between experience in a variety of fields (occupations or industries) and the probability of a successful business commercialization, which supports the existence of the skill dimension of the variety argument. However, they found that a high diversity of experience is related to a decrease in household income, which also supports the findings of Astebro et al. (2008).

In contrast, Hyytinen & Ilmakunnas (2007) referred to the 'Jack-of-all-Trades' hypothesis in analyzing the aspiration for occupational switches, which is more or less focused on the taste dimension. The aspiration to become self-employed is measured by a specific question ('often thought about setting up a business') that is asked in reference to job search aspirations (defined as 'having searched for another job'). The results indicate that varying experience causes not only greater self-employment aspirations, but also greater job search activities and stronger job-switching intentions.

Finally, Silva (2007) made use of Italian panel data (Longitudinal Survey of Italian Families; ILFI) that allow identification of household members' labor market transitions. Similar to Lazear (2005) and Wagner (2003, 2006), the 'Jack-of-all-Trades' definition corresponds to the total number of task roles held by an individual measured at the start of each employment observation. However, the results show that the number of roles becomes insignificant in explaining a self-employment spell when controlling for individual unobserved heterogeneity. Consequently, Silva (2007) concluded that the relationship between the probability of becoming self-employed and the number of roles may be driven by innate abilities or characteristics rather than skill acquisition.

3 Data

3.1 Database

The data set used for the analysis is based on a computer-assisted telephone survey of individuals aged 18 to 64 years. The survey was conducted between June and August 2003 and addressed 12,000 adults in 10 selected regions in Germany (Lückgen & Oberschachtsiek, 2004). The focus of the survey was an analysis of regional differences in entrepreneurship activities (Regional Entrepreneurship Monitor). However, the selection of the regions accounted for population density, industrial structure and east-west assignment in order to mirror the structure of the population in Germany's regions.[3] In particular, the survey was linked to the concept of the Global Entrepreneurship Monitor (GEM, see Reynolds et al., 2004).

Besides information about the interviewees' educational and professional background and standard biographical characteristics, the survey also asked for different aspects of entrepreneurship activities, attitudes and dispositions: the type of entrepreneurial activity, the current employment status, the interviewees' attitudes toward self-employment, valuation of business opportunities and of the competencies to set up a business, and an assessment of the prestige of entrepreneurship.

Moreover, the questionnaire also asked for the number of different fields of job experience. This allows a simple identification of the role model related to the 'Jack-of-all-Trades' hypothesis suggested by Lazear (2004, 2005).[4]

3.2 Data Sampling and Variables

Students, retired people and individuals who are engaged in civil or military service (n = 2026) are not of interest and were excluded from the analysis. Additionally, following Wagner (2006), I dropped individuals who reported more than 13 distinct task roles (99th percentile, n = 352) in order to ensure robust estimates (see figure 1 in the appendix for an overview of the distribution). Finally, the analysis will be focused on the full-time working population[5] and on individuals who are not already running a firm (n = 1112). The final sample size consists of 5027 observations with full information.[6]

Similar to Lazear (2005) and Wagner (2006), I use the number of different task roles (used equally: distinct number of experiences/competences/task roles) to capture the 'Jack-of-all-Trades' dimension. In contrast to other studies, I also construct a classification that allows a simple identification of individuals who can be described

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[3] This data set was also used in Wagner 2006.

[4] The exact question: 'In how many distinct fields of competence have you ever worked?' Note that this is different to the number of job switches or changes of occupation (for details, see Table A1 in the appendix).

[5] Excluding part-time workers (n = 1852) mainly excludes individuals with a lower disposition to entrepreneurship, females and individuals with lower human capital.

[6] This excludes mainly individuals with a higher disposition to entrepreneurship.

as ‘Jacks-of-all-Trades’. Technically, I used the upper quartile for this classification, which means that ‘Jacks-of-all-Trades’ must be experienced in more than three fields of competence.

The analysis below relies on the identification of the ability and taste dimensions. These attributes are not directly observable in the data. What we observe is an interviewee’s statement of competence and a self-reported desire for self-employment. I use these elements to identify the ability and taste dimensions. This assumes that individuals know that entrepreneurs face a broad set of challenges and that they acknowledge this when they state that they are competent or desire self-employment activities.

Finally, the study also controls for socio-demographic information, qualifications, family background and a set of issues related to self-employment activities. Detailed information can be found in Table A1 (appendix). For descriptive information, see Table A2 (appendix).

4 Empirical investigation

The analysis was performed in three parts: First, I used the set of covariates at hand to describe the profile of ‘Jacks-of-all-Trades’. This was done by using mean t-tests of the characteristics of individuals who are classified as ‘Jacks-of-all-Trades’ and those who are not, supplemented with a probit model that allows controlling for potential correlations of the explanatory attributes. Second, I used a count model that fits the basic setup of the ‘Jack-of-all-Trades’ assignment. Comparing the probit and the count data analyses allows differentiating between discrete investments and very high level investments in the variety of experience. Finally, the third part focuses on testing the two dimensions of the ‘Jack-of-all-Trades’ hypothesis and is based on a regression of the two dichotomous indicators on the number of task roles and a set of covariates.

4.1 Bivariate profile

Table 1 presents the results of the t-tests, which give a first impression of the nature of a ‘Jack-of-all-Trades’. The analysis shows that individuals with a high number of different fields of experience differ from those who are less experienced. A ‘Jack-of-all-Trades’ is more often male, older, better educated (as shown by apprenticeship, being a master craftsman, or the interaction of apprenticeship and a university diploma) and has a family background with more self-employment experience.

Interesting results can be found for the variables that are usually thought to be associated with the entrepreneurship disposition (Bergmann, 2002). ‘Jacks-of-all-Trades’ are less afraid to start a business and see self-employment as more desirable. Furthermore, a ‘Jack-of-all-Trades’ seems to be much more confident at mastering the challenges of a start-up. In contrast, a great breadth of experience does not correlate with the economic valuation of setting up a business (business opportunities), the prestige associated with entrepreneurship or formal qualifications (schooling and holding a university diploma).

Table 1
Means tests of the covariates

	'Jack-of-all-Trades'		
	No (n = 3432)	Yes (n = 1595)	test of difference
Variable	Mean	Mean	| t |-value
gender (male)	0,48	0,58	6,907***
age	39,73	41,46	5,310***
years of schooling	10,51	10,49	0,443
apprenticeship training	0,68	0,74	3,845***
master	0,06	0,10	5,755***
university diploma	0,26	0,28	1,330
apprXdiploma	0,09	0,14	5,498***
household size > 2	0,52	0,48	2,767***
self-employed parents	0,42	0,48	4,369***
business opportunities	0,14	0,16	1,555
fear	0,55	0,48	4,818***
competence	0,39	0,57	12,413***
desire	0,46	0,50	2,591***
prestige	0,56	0,57	0,921

statistical significance: * p<0.10, ** p<0.05, *** p<0.01

The differences found in a bivariate test do not control for the influences of other covariates. Particularly, one may assume that the subjective measures related to entrepreneurship activities (business opportunities, fear, competence, desire, prestige) tend to be intercorrelated. I tested this using a factor analysis, which does not support the hypothesis that these attributes belong to one latent dimension. Most importantly, the correlation between the competence assignment and the view of self-employment as a desirable type of employment indicate orthogonality of both attributes (see Table A3 in the appendix).

4.2 Determinants of the variety of experience

Table 2 shows two statistical models covering probit[7] and Poisson regressions.[8] Since these models try to explain investments in variety of experience, I do not account for the importance of desire, prestige, competence, fear and business opportunities for reasons of endogeneity. The explanatory variables are simply linked to

[7] The probit model allows an estimation of the covariate effects on a dichotomous variable where the probit function relates to the cumulative distribution function of the standard normal distribution, which follows a sigmoid function ranging from zero to one.

[8] Note that the Poisson regression is sensitive to the assumption of the mean–variance equality. If the mean is lower than the variance, the model predicts an underdispersion of the number of counts compared to the observed situation. I also tested a negative binomial distribution, which is usually used in cases of overdispersion. However, the results did not change very much. Moreover, the Poisson model shows the best fit to the data in terms of the AIC and the BIC (Rodriquez, 2005).

the universe of attributes at hand. For both estimation strategies, Table 2 reports marginal effects (fixed at the medians of all other covariates).

The first column focuses on the assignment of individuals as 'Jacks-of-all-Trades' based on an above average number of different task roles. Males have an 8.5% higher probability of being a 'Jack-of-all-Trades' than females. This may reflect the fact that males are usually more likely to invest in careers and have a higher likelihood of changing employers or occupations, which certainly correlates with the number of competences. Likewise, the age effect is not surprising since one could expect that the breadth of experience increases with the extension of the individual's work history, also showing an inverse U-shaped pattern. As already found in the bivariate analysis, formal schooling (years of schooling, apprenticeship and university diploma) is not correlated with 'Jack-of-all-Trades' assignment. Moreover, the multivariate analysis reveals an insignificant effect of apprenticeship training. This emphasizes that formal qualification alone seems to be a poor predictor of a broad variety of experiences. In contrast, holding a master's degree or being trained and holding a university diploma (interaction term) raise the likelihood of being a 'Jack-of-all-Trades'. Both reflect combined practical and formal training and are per se related to a broader set of capabilities and skills.

The estimations show that combined practical and academic training increases the likelihood of being a 'Jack-of-all-Trades' by 12.2%, whereas a master's degree raises the probability by 9.7%. These are the two most important explanatory characteristics for explaining the variety of experience. Moreover, individuals who grew up with self-employed parents also reported a high variety of experience. This is not surprising if one assumes that many such individuals have taken part in training that will potentially ensure a successful takeover of the family business. In contrast, the likelihood of broad experience decreases with household size. However, this might not be surprising if one considers that adults with families (more than two people in the household) usually claim stable career paths.

The second estimation strategy (presented in column two) uses a count model that makes use of the discrete number of incidents. Technically, this regression model assumes that the response variable has a Poisson distribution with independent incidents. The marginal effects in a count model reflect a unit change of the counts, conditional on a discrete change in the covariate and holding all other variables constant.

Being male increases the difference in the log of expected count by 0.16 relative to being female, which is a 48.3% increase in the probability that the number of task roles increases by one. The intuition behind this rise remains the same as it is for the probit model. However, the magnitude of the effect is much larger in the count model. Similar effects can be found for a self-employed family background and a master's degree.

Table 2
Estimation results for the variety of experience

	'Jack-of-all-Trades' (0/1) probit regression	task roles (n) Poisson regression	median values
	marginals (se)	marginals (se)	
sex (d)	0,085*** -0,012	0,483*** -0,05	1,000
age	0,030*** -0,006	0,173*** -0,02	40,000
age (squared)	-0,000*** 0,000	-0,002*** 0,000	1600,000
years of schooling	-0,004 -0,007	0,003 -0,027	10,000
apprenticeship training (d)	0,027 -0,017	0,144** -0,07	1,000
crafts master (d)	0,097*** -0,023	0,289*** -0,108	0,000
university diploma (d)	-0,035 -0,026	-0,196* -0,108	0,000
apprXdiploma (d)	0,122*** -0,04	0,518*** -0,181	0,000
household size > 2 (d)	-0,053*** -0,016	-0,336*** -0,064	1,000
self-empl. Parents (d)	0,071*** -0,015	0,370*** -0,056	0,000
N	5027	5027	
ll	-3045,034	-9934,726	
chi2	241,594	300,699	
BIC	6183,816	19963,2	

(d) for discrete change of dummy variable from 0 to 1
(se) standard errors in parentheses; standard errors are cluster adjusted (regional districts; see Moulton, 1990)
* p<0.10, ** p<0.05, *** p<0.01

Further interesting findings relate to the variables that capture formal training. For instance, apprenticeship training becomes statistically significant in the count model, whereas it is insignificant in the probit model. This emphasizes that apprenticeship training indeed increases discrete investments, but not high level investments, in the variety of experience. In contrast, a university diploma causes a decrease in the expected number of task roles, which indicates a disposition of diploma holders to seek more specialized types of occupations.

4.3 The variety of experience, self-employment competence and non-pecuniary benefits

Whereas the previous section concentrated on a description of the nature of 'Jacks-of-all-Trades', the following section focuses on the two dimensions that relate to the variety of experience. A first graphical assessment of the differences in the distribution of the number of task roles for the populations under consideration (comparing people with and without competence and/or desire) can be found in figure 2 in the

appendix. It shows that self-assessed competence indeed increases with the number of reported task roles to a larger extent than does self-assessed desire.

Table 3 reports the estimation results based on a probit model specification and considers the same explanatory variables as before.[9] Again, the estimation results are presented in terms of marginal effects.

Competence and the variety of experience

The results show that gender plays an important role in self-assessed competence. However, some studies state that males are more confident than females and may tend to over-assess their capabilities (e.g., Bengtsson et al., 2005), which may cause a higher likelihood of self-reported competence in self-employment. In contrast, the importance of formal qualifications seems to reject this one-way perspective. A discrete change in years of schooling raises the probability of competence assignment by 2%, a crafts master certificate by 21.6%, and holding a university diploma by 6.6%.

The breadth of formal qualifications can be used as a first indicator of the importance of variety of skills for self-employment competence. Individuals who are trained both practically and academically (interaction term) more often report that they are competent in starting a business (+8.6%). Second, a family business background also increases self-employment competence (+13.6%), which again reflects the fact that a self-employed family background relates to training in a sufficient range of capabilities to ensure a successful transfer of the family business from one generation to the next.

The coefficients related to the number of task roles clearly support the relationship between the breadth of skills and self-employment competence. An increase in the number of task roles by one raises the probability of reporting self-employment competence by 7.1%. However, the negative term of the squared number of task roles indicates that competence assessment becomes less likely for a very broad set of experiences. It seems that it is not only the variety of experience per se, but having a sufficient breadth of experience and skills that is important.

Desire and the variety of experience

As found for variety and competence, males are more likely to be affected by non-pecuniary benefits than females (8.8% higher probability). More interesting results can be found for the relationship between age and desire. Contrary to the findings displayed in Table 2, age shows a U-shaped pattern, which indicates a high desire for self-employment at younger and older ages. Thus, middle aged individuals seem to perceive lower non-pecuniary benefits in starting a business. Additionally, this

[9] Note that the value of one indicates an affirmation of competence or of valuing self-employment as a desirable type of employment.

may also reflect higher opportunity costs of becoming self-employed for middle aged individuals.

An entrepreneurial background (self-employed parents) and the number of task roles have positive effects on the desire to become self-employed. This indicates that both competence and taste for variety are positively influenced by the number of task roles. However, both marginal effects are lower for desire than for self-employment competence.

Table 3
Estimation results for self-employment competence and desire

	competence (0/1) probit-regression	desire (0/1) probit-regression	median values
	marginals (se)	marginals (se)	
sex (d)	0,125***	0,088***	1,000
	-0,015	-0,016	
age	0,005	-0,032***	40,000
	-0,005	-0,005	
age (squared)	0,000	0,000***	1600,000
	0,000	0,000	
years of schooling (n)	0,020***	0,009	10,000
	-0,007	-0,007	
apprenticeship training (d)	0,006	0,017	1,000
	-0,019	-0,019	
master's degree (d)	0,216***	-0,016	0,000
	-0,033	-0,029	
university diploma	0,066**	0,039	0,000
	-0,028	-0,029	
apprXdiploma (d)	0,086***	-0,047	0,000
	-0,031	-0,031	
household size > 2 (d)	-0,002	-0,001	1,000
	-0,015	-0,013	
self-empl. parents (d)	0,136***	0,113***	0,000
	-0,016	-0,013	
number of task roles	0,071***	0,021**	3,000
	-0,011	-0,009	
no. of task roles (squared)	-0,003***	-0,001	9,000
	-0,001	-0,001	
N	5027	5027	
Ll	-3153,792	-3366,882	
chi2	673,564	240,75	
BIC	6418,378	6844,558	

(d) for discrete change of dummy variable from 0 to 1
(se) standard errors in parentheses, standard errors are cluster adjusted (regional districts; see Moulton, 1990)
* p<0.10, ** p<0.05, *** p<0.01

Regarding the number of task roles, a marginal effect of 2.1% was found for a unit change of desire, but 7.1% for an increase of the likelihood of stating self-employment competence. Moreover, the effect of task roles is limited to a linear relationship, whereas it shows a decreasing effect for competence at very high levels of broad experience.

4.4 Robustness of the results (gender effects)

In order to check the robustness of the results, I separated the results for all estimates presented above by gender. This analysis is intended to address the literature that has been emphasizing large differences between males and females in explaining entrepreneurial behavior or self-employment activities (e.g., Wagner, 2007).

Few differences can be found for the importance of the covariates for a very broad variety of experiences captured by the 'Jack-of-all-Trades' assignment. In this case, household size matters only for the female population, but not for males. However, this picture changes for discrete investments. As stated above, apprenticeship training, holding a crafts master's degree and the interaction of apprenticeship training and a university diploma are positively correlated with a marginal increase in the variety in experience (negatively: university diploma). The estimation shows that the qualification attributes matter most for the female population (master's degree and apprenticeship training are insignificant for males) and that the negative effect of a university diploma refers only to men and not to women.

In general, the effects for age and the relevance of self-employed parents are unaffected by gender for all estimates, except for the competence assignment. Age does not matter for explaining the interviewees' competence in setting up a business for males; nor does schooling. Holding a university diploma or being trained and holding a university diploma (interaction term) only matters for males. The effect of task roles remains the same for males and females, whereas it differs by gender for desire. The variety of experience does not correlate with taste for variety for males.

5 Summary and Conclusions

Previous studies related to the 'Jack-of-all-Trades' hypothesis have presented evidence for two different underlying types of causality for the correlation between the variety of experience and the likelihood of becoming self-employed. This is related to unclear findings concerning the question of whether the 'Jack-of-all-Trades' hypothesis is ability or taste driven.

This paper contributes to this causality dilemma. First, it shows that there are large differences between high numbers of task roles (identified as 'Jacks-of-all-Trades') and marginal increases in the number of task roles. Most importantly, formal qualifications show limited correlations with the 'Jack-of-all-Trades' assignment, while experience-related human capital attributes correlate strongly with this assignment. I found similar effects for discrete investments. However, age has a negative squared

effect, and the interaction of apprenticeship and holding a university diploma (indicating broad formal qualifications) is negative for the marginal increase of investments in variety. Most of these findings are robust for both genders. However, formal qualifications differ in explaining marginal investments in the variety of experience. Males seem to be more likely to invest in the variety of experience independent of their level of formal qualifications.

Second, this paper investigates the correlations between competence, taste for variety and the number of task roles. The ability dimension is captured by self-reported competence in setting up and running a firm. Taste for variety is measured by interviewees' responses to the statement that he or she values self-employment as a desirable type of employment. The results show that the breadth of experience correlates with both competence and desire. However, the results emphasize that the number of task roles is more related to competence than to taste for variety. Moreover, the variety of experience is uncorrelated with desire (which proxies taste) for males. Most importantly, I found an inverse U-shaped relationship between competence and the number of task roles, which indicates that it is not the variety itself but having a sufficient set of different skills that enhances self-employment competence. In contrast, taste is linearly correlated with the number of task roles.

The results of this study emphasize that there seems to be a predominant role of the competence dimension in the 'Jack-of-all-Trades' issue. This will support political attempts to make use of the balanced skill set approach in fostering entrepreneurship. However, further research requires longitudinal data for a better understanding of the causalities. In particular, we do not know anything about the quality of the observed variety of experience. Furthermore, it is worth investigating whether the 'Jack-of-all-Trades' hypothesis also correlates with opportunity creation, opportunity recognition and success.

Literature

Astebro, T.; Thompson, P. (2008): Entrepreneurs: Jacks of all Trades or Hobos? Working Papers of the Department of Economics, No 07-05 - this version: May 2008, Florida International University.

Astebro, T.; Jing Chen, J.;Thompson, P. (2008): Stars and Misfits: A Theory of Occupational Choice. Working Papers of the Department of Economics, No 0803, Florida International University.

Bengtsson, C.; Persson, M.; Willenhag, P. (2005): Gender and Overconfidence. Economics Letters, 199-203.

Bergmann, H. (2002): Entrepreneurial attitudes and start-up attempts in ten German regions. An empirical analysis on the basis of the theory of planned behaviour. Working Paper of the Department of Economic and Social Geography, No. 2002-01, University of Cologne.

Brüderl, J.; Preisendörfer, P.; Ziegler, R. (1992): Survival Chances of Newly Founded Business Organizations. American Sociological Review, 57, 227–242.

Chandler, G.N.; Hanks, S.H. (1998): An Examination of the Substitutability of Founders and Financial Capital in Emerging Ventures. Journal of Business Venturing, 13, 353–369.

Hyytinen, A.; Ilmakunnas, P. (2007): Entrepreneurial Aspirations: Another form of job search? Small Business Economics, 29, 63-80.

Kremer, M. (1993): The O-Ring Theory of Economic Development. The Quarterly Journal of Economics, 108 (3), 551-575.

Lazear, E.P. (2004): Balanced Skills and Entrepreneurship. American Economic Review, 94, 208-211.

Lazear, E.P. (2005): Entrepreneurship. Journal of Labor Economics, 23, 649-680.

Lee, S.-H. (2005): Generalists and Specialists, Ability and Earnings. Working Paper of the Department of Economics, No 05-02, University of Hawaii-Manoa.

Lückgen, I.; Oberschachtsiek, D. (2004): Regionaler Entrepreneurship Monitor (REM II 2003/2004). Zur Dynamik von Gründungsaktivitäten in Deutschland: Ausmaß und Ursachen. Projektbericht der Universität zu Köln, und Universität Lüneburg, Lüneburg.

Moulton, B.R. (1990): An Illustration of a Pitfall in Estimating the Effects of Aggregate Variables on Micro Units. Review of Economics and Statistics, 72 (2), 334-338.

Reynolds, P.D.; Bygrave, W.D.; Autio, E. (2004): Global Entrepreneurship Monitor 2003 – Executive Report. Babson College, London Business School, and Kauffman Foundation. Babson College.

Silva, O. (2007): The Jack-of-All-Trades entrepreneur: Innate talent or acquired skill? Economics Letters. 97, 118-123.

StataCorp (2007): Stata Statistical Software: Release 10.0. College Station, TX: Stata Corporation.

Wagner, J. (2003): Testing Lazear's Jack-of-All-Trades View of Entrepreneurship with German Micro Data. Applied Economics Letters, 10, 687-689.

Wagner, J. (2006): Are Nascent Entrepreneurs Jacks-of-All-Trades? A Test of Lazear's Theory of Entrepreneurship with German Data. Applied Economics, 38, 2415-2419.

Wagner, J. (2007): What a Difference a Y makes – Female and Male Nascent Entrepreneurs in Germany. Small Business Economics, 28, p. 1-21.

Appendix

A1: Definitions of the variables

variable	scale of measure-ment	description
gender (male)	D	1 = male
age	N	age at the time of the interview, measured in years
years of schooling	N	years of schooling (graduation with access to university equals 12 years of schooling)
apprenticeship training	D	1 = individual has graduated from apprenticeship training
master	D	1 = individual holds a crafts master's certificate
university diploma	D	1 = individual holds a university diploma
apprXdiploma	D	1 = apprenticeship training x university diploma (interaction term)
household size n > 2	D	1 = more than two individuals living in the same household
self-employed (s-e) parents	D	1 = parents have been self-employed
chance	D	1 = an individual has a positive valuation of the local macroeco-nomic situation to start a business
fear	D	1 = individual states that fear of failure is an obstacle to starting a business
competence	D	1 = individual states having the competence necessary to start and run a business. (question: 'You have the competence and the experience that is needed to start and to run a business.')
desire	D	1 = individual states that he/she values self-employment as a desirable type of employment. (question: 'From a personal perspective, becoming or being self-employed is a worthwhile thing.')
number (no.) of task roles	N	the number of distinct task roles related to previous periods of employment. The questionnaire asked for 'the number of distinct fields of competence' (question: 'In how many distinct fields of competence have you ever worked?' This question is supple-mented with the note that this does not mean different employ-ers, but different fields of activity).
'Jack-of-All-Trades'	D	1 = individual states having experience in more than 3 distinct fields of competence (4 equals the 75th percentile)

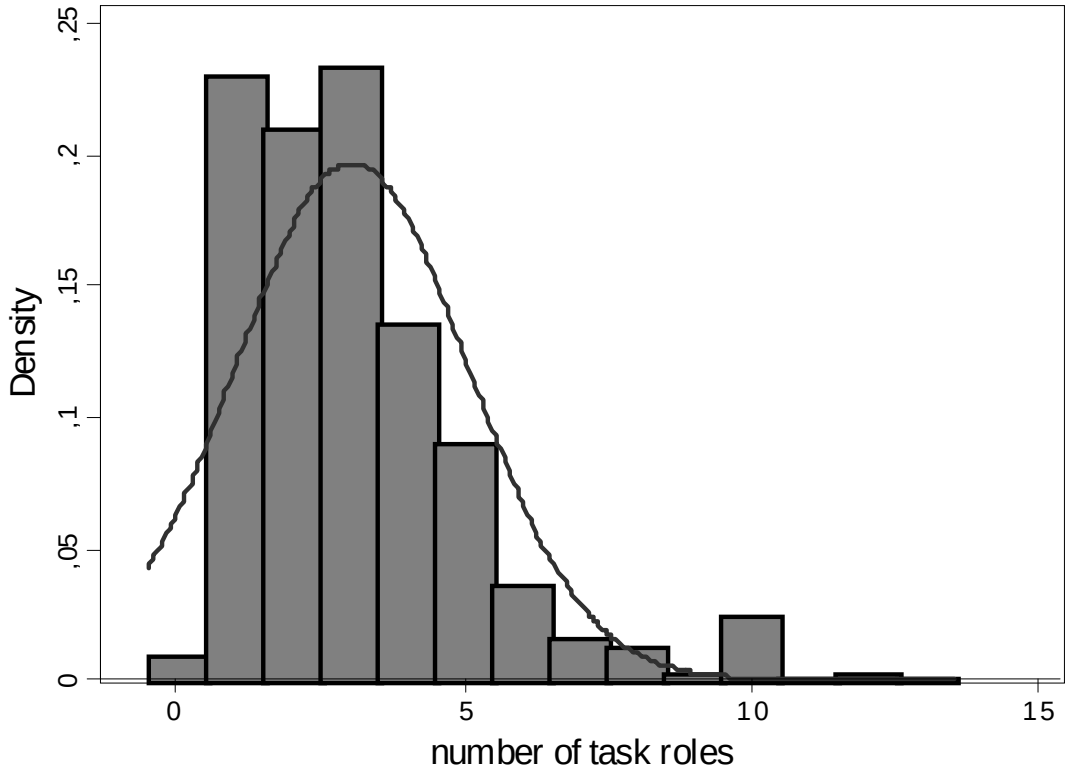
Table A2
Descriptive statistics

variable	obs.	mean	std. dev.	min	max
gender (male)	5027	0,51	0,500	0	1
age	5027	40,28	10,785	18	64
years of schooling	5027	10,50	1,364	0	12
apprenticeship training	5027	0,70	0,458	0	1
master	5027	0,07	0,255	0	1
university diploma	5027	0,26	0,441	0	1
apprXdiploma	5027	0,11	0,309	0	1
household n > 2	5027	0,50	0,50	0	1
self-employed (s-e) parents	5027	0,44	0,496	0	1
chance	5027	0,15	0,354	0	1
fear	5027	0,53	0,499	0	1
competence	5027	0,44	0,497	0	1
desire	5027	0,48	0,499	0	1
prestige	5027	0,56	0,496	0	1
no. of task roles	5027	3,05	2,02	0	13
‘Jack-of-All-Trades’	5027	0,32	0,46	0	1

Table A3
Table of correlations

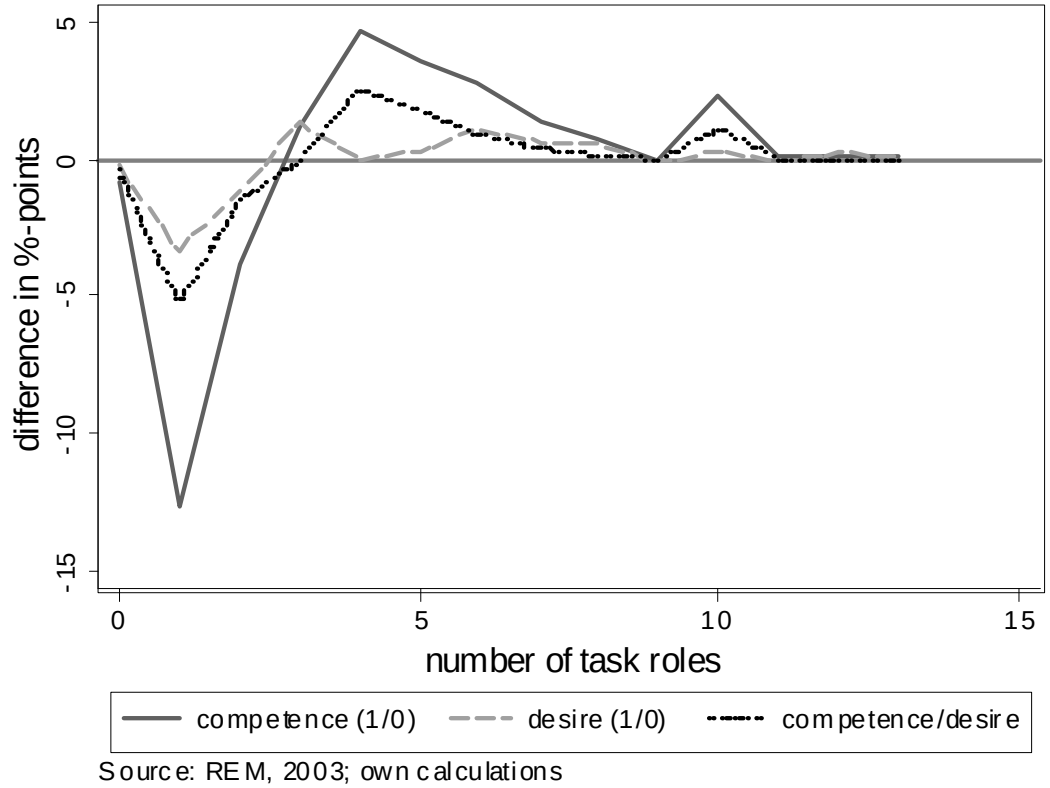
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
gender (male)	1	1,00															
age	2	0,02	1,00														
years of schooling	3	0,03	-0,10	1,00													
appr. training	4	-0,04	-0,04	-0,22	1,00												
master	5	0,13	0,06	-0,01	0,06	1,00											
university diploma	6	0,08	0,09	0,57	-0,39	-0,06	1,00										
apprXdiploma	7	0,04	0,07	0,29	0,23	0,03	0,58	1,00									
household n > 2	8	-0,01	-0,04	-0,03	0,01	0,04	-0,03	-0,02	1,00								
s-e parents	9	-0,05	-0,04	0,10	-0,02	0,03	0,07	0,02	-0,01	1,00							
chance	10	0,04	-0,03	0,08	-0,06	-0,01	0,07	0,01	-0,04	0,06	1,00						
fear	11	-0,11	0,00	-0,07	0,01	-0,05	-0,07	-0,07	0,00	-0,07	-0,07	1,00					
comp	12	0,16	0,11	0,10	-0,01	0,14	0,13	0,13	-0,01	0,14	0,09	-0,17	1,00				
desire	13	0,09	-0,11	0,05	-0,01	0,00	0,02	0,00	-0,03	0,12	0,13	-0,13	0,16	1,00			
prestige	14	0,10	0,05	0,10	-0,06	0,01	0,12	0,06	-0,02	0,13	0,10	-0,03	0,09	0,17	1,00		
no. of task roles	15	0,13	0,10	0,00	0,06	0,07	0,02	0,08	-0,06	0,07	0,02	-0,08	0,20	0,06	0,02	1,00	
‘Jack-of-All-Trades’	16	0,10	0,07	-0,01	0,05	0,08	0,02	0,08	-0,04	0,06	0,02	-0,07	0,17	0,04	0,01	0,78	1,00

Figure 1
Distribution of the number of task roles



Source: REM, 2003; own calculations

Figure 2
Differences in the distribution of the number task roles



Source: REM, 2003; own calculations

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