# Entrepreneurial skills and wage employment

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**Abstract**

Promotion of entrepreneurial skills among the population is often considered as an adequate policy to enhance job creation and economic growth. However, neither the definition of entrepreneurial skills, nor the costs and benefits of such a policy are clear. In this paper, we study which competencies enhance the likelihood of self-employment in Spain. Moreover, we analyze if they bring benefits outside self-employment. In particular, we investigate whether they are rewarded in wage employment. We use a sample of higher education graduates from the year 2000 interviewed in 2005 within the REFLEX survey. Results reveal that alertness to new opportunities, ability to work under pressure, ability to mobilize others and knowledge of other fields are the competencies that enhance self-employment in Spain. Yet, these skills are not rewarded in a salaried job. Therefore, benefits of policies fostering entrepreneurial skills do not extend to wage employment.

## 1. Introduction

Entrepreneurship has been continuously attracting all the more attention from both political elites (European Commission, 2009, European Commission, 2013) as well as the scientific community (Kuratko, 2005, Praag and Versloot, 2007, van Der Sluis et al., 2008). It gained interest in the context of the current economic crisis as it is commonly considered a motor of innovation and economic growth (Carlsson et al., 2009, Grossmann, 2009, Iyigun and Owen, 1999). Consequently, there is general support for those policies directed to enhance the entrepreneurial competencies of the population.[1] In this respect, entrepreneurial competencies have been added to the curricula of several studies, from secondary education to university studies (Martin et al., 2013). However, within the literature on entrepreneurship it is not clear what entrepreneurship education should embrace (Béchard and Grégoire, 2005, Fiet, 2001, Haase and Lautenschläger, 2011, O'Connor, 2013), neither whether it has a positive effect on entrepreneurial activity. While some evidence points towards an increase in entrepreneurial success due to entrepreneurship education (Martin et al., 2013), other studies find a null or negative relationship (von Graevenitz et al., 2010, Oosterbeek et al., 2010).

The objective of this paper is twofold. First, we want to identify which competencies are positively correlated with self-employment in Spain. This information should help in the design of entrepreneurship education. Second, we study whether these competencies are rewarded in wage employment. Although a general definition of entrepreneurship includes other than business founders and self-employed individuals, the literature has mostly considered entrepreneurship within the context of self-employment. We contribute to this literature by extending the analysis to wage employment.[2] If entrepreneurial competencies were rewarded in wage employment, the benefits of policies promoting them would go beyond their intended effects on self-employment. In contrast, if we find a non-positive effect on employees' wage, their potential benefits might have been over-estimated given that self-employment represents only a small proportion of the population.

Most papers on entrepreneurship agree that the core of entrepreneurial skills is the ability to create or recognize opportunities. There are different theories trying to discern how this process works. The most commonly accepted version is based on Kirzner's theory of alertness to new opportunities (Kirzner, 1973). Some authors argue that differences in alertness to new opportunities are the result of having different schema and pattern recognition (Baron and Ensley, 2006, Baron, 2004, Valliere, 2013). Gaglio (2004), instead, emphasizes the role of mental simulation and counter-factual thinking to develop opportunity alertness. Alertness proposed initially by Kirzner has been extended to creativity and self-consciousness (Kirzner, 1999 p. 12).

We use the REFLEX survey data. It includes self-reported information on 19 competencies, which range from alertness to new opportunities and ability to use time efficiently to ability to negotiate effectively or to write reports, among others. Three of these competencies can be linked to the entrepreneurial skills described in the literature. The level of competency on 'alertness to new opportunities' directly measures entrepreneurial skills as proposed by Kirzner (1973). The competency on 'ability to come up with new ideas and solutions' can be related to creativity

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[1] A competency is defined as the knowledge, skills, attitudes, values, and behaviors that people need to perform successfully a particular activity or task (Morris et al., 2013)

[2] A growing body of literature on corporate entrepreneurship, entrepreneurial employees and intrapreneurship is studying those employees that are key players in the development of new business activities within their firm (Sharma and Chrisman, 1999, Pinchot, 1985, Martiarena, 2013). We differ from this literature in that we consider the role of entrepreneurial skills for the average worker of the organization.

(Kirzner, 1999). Finally, the competency 'willingness to question your own and others' ideas' might reflect the counterfactual thinking emphasized by Gaglio (2004).

We estimate a Heckman selection model with wages in a salaried job as the main dependent variable and working in wage employment versus self-employment as the selection equation. Results reveal which competencies increase the likelihood of self-employment and which competencies are rewarded in wage employment when controlling for selection into such jobs.

Our study is related to two research fields: entrepreneurship and labor economics. Within the entrepreneurship literature, some papers study the decision to become an entrepreneur (Blanchflower and Oswald, 1998, Lazear, 2005, Poschke, 2013, Hartog et al., 2010, Arenius and Minniti, 2005, Doms et al., 2010). The external environment (resources and political and market forces) and individual characteristics (ability, risk-aversion, opportunity recognition, …) often influence the decision to become self-employed (Shane et al., 2003). Other papers study the earnings differentials between self-employment and wage employment (Hamilton, 2000, Hyytinen et al., 2013). Non-pecuniary rewards to self-employment are often necessary to explain the lower initial earnings and lower earnings growth in self-employment. Within the labor economic literature, many papers study returns to skills (Garcia-Aracil and Van der Velden, 2008, Mora et al., 2006, Heijke et al., 2003). All those papers coincide that skills which Heckman labels as "soft skills" (Heckman and Kautz, 2012) increase the individual productivity and, thus, wages. Drawing from the definitions of the entrepreneurial skills and considering them as part of productive human capital and, therefore increasing wages, we contribute with the present paper to both literatures. We expect to find that the entrepreneurial skills not only serve as a predictor of self-employment but also we want to see whether they are productive in a salaried job.

The paper is structured as follows. In the next section, we review the literature on entrepreneurial skills and returns to entrepreneurship. Then, we present the data and econometric methods employed in our analysis. Section 4 presents and discusses the results. In section 5, we conclude and derive some policy implications.

## 2. Literature review

The literature on entrepreneurship education and skills has grown rapidly during the last two decades. However, there is still little agreement on what entrepreneurial skills should mean. In the core of entrepreneurial skills, there is the ability to create or recognize opportunities. This is based on Kirzner's theory of alertness to new opportunities (Kirzner, 1973). A wider definition includes also the ability to evaluate these opportunities (Tang et al., 2012, Ardichvili et al., 2003).

There are different theories trying to discern how the process of opportunity recognition works. Personality traits such as creativity and optimism, counter-factual thinking, prior knowledge, cognitive ability, social networks and passion are some of the factors that have been associated to entrepreneurial alertness (Gaglio, 2004, Granovetter, 1973, Arenius and Clercq, 2005, Cardon et al., 2013, Shane et al., 2003). Other authors talk about the importance of different mental schema and pattern recognition in explaining opportunity recognition (Baron and Ensley, 2006, Baron, 2004, Valliere, 2013). According to them, individuals analyze reality via schemas. The richness of these schemas, the way to associate them to events and the sensitivity to changes determine the likelihood to identify new opportunities.

Basing on the human capital theory (Becker, 1993), we propose entrepreneurial skills to be considered part of the human capital stock. Therefore, we expect university graduates to receive a wage premium to entrepreneurial skills aside from their standard human capital components, such

as education, or labor market experience (Hanushek and Zhang, 2009, Heckman et al., 2003, Mincer, 1974).

To our best knowledge, there is no research on the returns to entrepreneurial skills in wage employment. Thus far, returns to entrepreneurship have been studied only as returns to self-employment. Typically, studies in this strand compare wages of entrepreneurs to wages of employees in Europe and the U.S. establishing that, controlling for human capital, entrepreneurs earn on average less than employees and their wage growth curves are flatter in Europe, whilst the converse was found true for the U.S. (van der Sluis and van Praag, 2004, van Der Sluis et al., 2008). Martínez et al. (2007) provide a descriptive analysis of higher education graduates' wages when in salaried employment, and compare them to wages of self-employed. In their study, entrepreneurs with university degree have higher incomes and more satisfaction from their jobs, even though they work longer hours than the employee graduates do. Finally, in a similar vein, Hamilton (2000) finds non-pecuniary returns to self-employment.

Aside from the entrepreneurship literature, our research is also close to the empirical labor economics of skills. Various papers from education economics and labor economics have demonstrated that skills in general enhance workers' productivity, thus leading to higher wages (Heijke et al., 2003, Teijeiro et al., 2013). However, there is not yet a clear classification of skills as of now. As Teijeiro et al. (2013) note, the definition of skills used by each researcher depends mostly on data availability. Moreover, according to Biesma et al. (2007), as long as there is no common data collection framework, there will be no agreement on which skills are more important in the labor market. So far, most studies on returns to skills (either through wages, higher job satisfaction or higher on-the-job training possibilities) come mostly from small scale data projects (Allen and Velden, 2001, Allen and Van der Velden, 2009, Garcia-Aracil et al., 2004, Garcia-Aracil, 2009, Garcia-Aracil and Van der Velden, 2008, Mora et al., 2006). All this research clearly demonstrates that skills and, particularly what Heckman considers as "soft skills" (Heckman and Kautz, 2012), bring positive and significant returns in the labor market. Using CHEERS data (Career after Higher Education – A European Research Survey), Garcia-Aracil et al. (2004), for instance, show that what they call "participative" skills - which entail among others decision-making ability, assertiveness, and personal involvement - are the most rewarded in the European labor market. In another paper, also based on the CHEERS data, Garcia-Aracil and Van der Velden (2008) show that it is the jobs with higher "participative and methodological competency requirements" that pay higher wages to those who possess high levels of these skills. None of these skills, however, could be directly linked to the entrepreneurial skills described before. The REFLEX project includes a wider set of skills, some of them directly linked to the definition proposed by Kirzner (1999), thus permitting more direct analysis on the entrepreneurial skills.

Finally, our research is related to the literature on corporate entrepreneurship (also known as intrapreneurship or entrepreneurial employees). Corporate entrepreneurship refers to the firm's strategy of being closely attentive to entrepreneurial opportunities and involves the different level managers of the firm. Kuratko and Audretsch (2013) provide a review of this literature. They distinguish two domains of corporate entrepreneurship: corporate venturing and strategic entrepreneurship. The former is about creating new businesses within the corporation, while the latter domain attempts to strengthen the competitive advantage of the existing businesses in the corporation. Unlike this literature, we do not focus on the effect of entrepreneurial activity within the corporation on its innovation performance; rather, we study the effect of worker's

entrepreneurial skills on wages. Our focus is, therefore, the average returns of entrepreneurial skills in wage employment.

## 3. Data and methodology

### Data

We use the REFLEX data (Research into Employment and professional FLEXibility), a survey of tertiary graduates from the year 2000 that were interviewed five years later. It covers 15 countries and collects information on individual characteristics, first and current job, as well as tertiary-level study program characteristics. Moreover, individuals report measures of 19 individual competencies and their correspondent job requirement level.[3]

We choose Spain in our analysis because it has a large sample size. The response rate was 22%, which corresponds to 3,912 respondents (Allen and Van der Velden, 2009). We exclude those individuals above 45 years old, those working 20 or fewer hours weekly and those with more than 72 months of experience. The final sample size is 2123 individuals, of whom 1973 are in wage employment (93%) and 150 are self-employed (7%).[4]

Table 1 reports the 19 competencies that are included in the survey. Respondents are asked how much each competency is required in their current job and which is their own level of competency. These self-reported measures are evaluated in a 7-level Likert scale (1-very low, 7-very high).

Table 1. Competencies

| List of competencies asked in REFLEX. |
|---|
| Mastery of your own field or discipline. |
| Knowledge of other fields or disciplines. |
| Analytical thinking. |
| Ability to rapidly acquire new knowledge. |
| Ability to negotiate effectively. |
| Ability to perform well under pressure. |
| Alertness to new opportunities. |
| Ability to coordinate activities. |
| Ability to use time efficiently. |
| Ability to work productively with others. |
| Ability to mobilize the capacities of others. |
| Ability to make your meaning clear to others. |
| Ability to assert your authority. |
| Ability to use computers and the internet. |
| Ability to come up with new ideas and solutions. |
| Willingness to question your own and others' ideas. |
| Ability to present products, ideas or reports to an audience. |
| Ability to write reports, memos or documents. |
| Ability to write and speak in a foreign language. |

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[3] A full description of the survey is provided in the report by Allen and Van der Velden (2009). More information is also available in http://www.reflexproject.org.

[4] The percentage of self-employed individuals in a comparable sample computed from the EPA survey 2005 is around 8%.

We want to disentangle which competencies affect the decision between self-employment and wage employment and whether they are rewarded in wage employment.

The rest of explanatory variables used in the study include gender, age, field of study, grade in secondary education, whether the study program gives access to doctorate studies, and experience. Moreover, since the level of competencies is asked five years after graduation and could be endogenous to the type of current job, some specifications include additional job controls for those in wage employment. These are the required level of competency in the job, firm size, public/private sector and permanency of the contract. We provide descriptive statistics of all the variables in Table 2.

From Table 2 we observe that there are relatively more women in wage employment than in self-employment. Moreover, Engineering is the field of study most widely represented within self-employment, while Social Sciences are more common in wage employment. As for parental education, the average education level of the father is higher in the self-employed sample. Concerning competencies, self-employed individuals report on average a higher level of all of them except for the ability to work with others and the ability to use computers. This is true with respect to both, the own level of competencies and the job requirement level. The largest differences across the two samples with respect to the own level of competency are in alertness to opportunities, ability to work under pressure and ability to negotiate. The largest differences with respect to the required level of competencies occur in alertness to opportunities, ability to negotiate and mastery of own field, by order of importance.

**Methodology**

We estimate a Heckman selection model. The system of equations to estimate is the following:

$$y_1^* = x_1' \beta_1 + \varepsilon_1$$
$$y_2^* = x_2' \beta_2 + \varepsilon_2 \quad,$$

where $y_1^*$ is the latent variable that determines whether the individual will choose wage employment or self-employment, $y_2^*$ is the wage in a salaried job, which is only observed when $y_1^* > 0$, and $\varepsilon_1$ and $\varepsilon_2$ are the error terms, assumed jointly normally distributed and homoscedastic, with $\mathrm{var}(\varepsilon_1) = 1$, $\mathrm{var}(\varepsilon_2) = \sigma^2$ and $corr(\varepsilon_1, \varepsilon_2) = \rho$.

Individuals choose wage employment when the utility of such a choice is larger than the utility of self-employment.

$$y_1^* = u(wage\ employment) - u(self-employment).$$

We do not observe utilities, but whether they decided to be self-employed or in wage employment. The observed variable is then

$$y_1 = \begin{cases} 1 \text{ if } y_1^* > 0 \\ 0 \text{ if } y_1^* \leq 0 \end{cases}.$$

We use father's education as the exclusion restriction. Parental education represents the level of financial and other help that the individual might get from the family to engage in self-employment. Moreover, we argue that parental education does not have a direct effect on wage, but rather through education. Therefore, we consider it a good exclusion restriction for our analysis.

The likelihood function for this model is

$$L = \prod_{i=1}^{n} \left\{ \Pr(y_{1i}^* \leq 0) \right\}^{1-y_{1i}} \left\{ f(y_{2i} \mid y_{1i}^* > 0) \times \Pr(y_{1i}^* > 0) \right\}^{y_{1i}}.$$

We estimate different specifications. In all of them, the explanatory variable of interest is the own level of competency. The results from these estimations allow us to identify correlations. To argue causality we would need to have exogeneity between competencies and employment type as well as with wages. However, information on competencies, employment type and wages was all asked at the same point in time. The own level of competencies might therefore be influenced by the job characteristics of the individual. Unfortunately, given the data we have, the only choice to lessen this endogeneity problem is to add job characteristics as controls. Therefore, we add the required level of competency and other job characteristics in some specifications.

## 4. Results

As mentioned in the previous section, we estimate a Heckman selection model where the logarithm of gross hourly wage is the dependent variable in the main equation and whether individuals are employed in wage employment is the selection variable.

Table 3 summarizes the main results of the basic specification. In each equation we include the own level of one competency in both, main and selection equations. All equations control for gender, age, field of study, grade in secondary education, whether the study program gives access to doctorate studies and experience. Father's education is the exclusion restriction in the selection equation. Only three competencies have a significantly negative coefficient in the selection equation: alertness to opportunities, ability to work under pressure and knowledge of other fields. These three competencies are therefore associated to a higher likelihood to become self-employed (lower likelihood of wage employment). In contrast, the ability to work with others has a positive and significant coefficient, indicating that this ability tends to increase the probability to choose wage employment. Alertness to opportunities is the competency more directly linked to entrepreneurial skills in the entrepreneurship literature. The two other competencies closer to entrepreneurship - ability to come up with ideas (creativity) and willingness to question them (counterfactual thinking) - do not seem to affect the decision to become self-employed.

While few competencies appear relevant for the decision to become self-employed, many of them are rewarded in wage employment. This is the case for analytical thinking, ability to work with others, ability to assert authority, ability to come up with ideas and solutions, willingness to question ideas, ability to present to an audience, and ability to speak a foreign language. The most rewarded is analytical thinking.

It is important to notice, however, that the competencies that increase the likelihood of self-employment (alertness to opportunities, ability to work under pressure and knowledge of other fields) are not rewarded in wage employment. This suggests that the benefits of those policies promoting them come uniquely from the increase in self-employment and possibly its effect on self-employment quality. They do not seem to increase productivity in wage employment.

The report of the own level of competencies, however, might be strongly influenced by the type of job of the individual. It is therefore important to control for job characteristics. In Table 4 we introduce in the main equation the job requirement level of each competency together with the own level reported. Results on the selection into wage employment do not change. However, the positive effects on wages of all competencies - except analytical thinking - disappear. Results reveal that the wage level is determined by the requirement level of each competency. Only analytical thinking retains positive returns when controlling for requirement level. Moreover, the own level of

ability to coordinate activities, use time efficiently, mobilize the capacities of the others and write reports show negative returns.

Table 5 adds some other job characteristics, such as whether it is in the public sector, whether the contract is permanent and the firm size. Now, the ability to coordinate activities joins the competencies that increase the likelihood of self-employment, although at the 10% significance level only. None of these entrepreneurial competencies, though, is rewarded in wage employment.

The rest of the variables affect the dependent variables as expected. Table 6 reports the complete results for the case of alertness to new opportunities. The coefficients of the rest of the variables remain similar when other competencies are included. Female graduates earn on average less than male graduates. Those that studied a program with direct access to doctorate and those with a higher grade in secondary education earn higher wages. Experience is also rewarded in wage employment. Engineering and Education are the fields of study with a higher return. Public sector pays on average higher wages than the private sector. Those workers with a permanent contract earn more, as well as those working in larger firms.

Concerning the probability to become self-employed, Services, Engineering, Agriculture, Humanities and Health are the fields of study with a larger fraction of graduates who became self-employed. As expected, having a father with tertiary education increases significantly the probability to become self-employed.

Finally, we estimate the Heckman selection model with all the competencies included simultaneously. Results are presented in Table 7. The main results remain the same. Analytical thinking and ability to assert authority are rewarded in wage employment, even when controlling for job characteristics (estimation (3)). Alertness to opportunities, ability to work under pressure, ability to mobilize others and knowledge of other fields are related to a larger probability to become self-employed. Moreover, these competencies are not rewarded in wage employment. In contrast, the ability to work with others increases the probability to be in wage employment and it is rewarded in this type of job.

## 5. Conclusions

This paper identifies and estimates the effect of entrepreneurial competencies on wages for higher education graduates in Spain. We employ a sample of university graduates from the REFLEX survey, who graduated in the year 2000 and were interviewed five years later.

Alertness to new opportunities, ability to work under pressure, ability to mobilize others and knowledge of other fields are the competencies that increase the probability of self-employment in Spain. In contrast, the ability to mobilize others increases the likelihood to be in wage employment. We find that the competencies that increase self-employment are not rewarded in wage employment. Therefore, our results suggest that policies promoting entrepreneurial skills of individuals do not have additional benefits outside self-employment.

This work has two main policy implications. On the one hand, we identify which competencies should be included in entrepreneurship education in Spain: alertness to new opportunities, ability to work under pressure, ability to mobilize others and knowledge of other fields. On the other hand, we find that these competencies are not rewarded in wage employment, so the benefits of policies promoting entrepreneurial education remain within self-employment activity only. This should be taken into account when deciding upon policies fostering entrepreneurship.

# References

ALLEN, J. & VAN DER VELDEN, R. 2009. Competencies and Early Labour Market Careers of Higher Education Graduates. *Higher Education as a Generator of Strategic Competencies (HEGESCO).* Ljubljana: University of Ljubljana.

ALLEN, J. & VELDEN, R. V. D. 2001. Educational Mismatches vs. Skill Mismatches: Effects of Wages, Job Satisfaction and On-the-job Search. *Oxford Economic Papers,* 3**,** 434-452.

ARDICHVILI, A., CARDOZO, R. & RAY, S. 2003. A theory of entrepreneurial opportunity identification and development. *Journal of Business Venturing,* 18**,** 105-123.

ARENIUS, P. & CLERCQ, D. D. 2005. A Network-based Approach on Opportunity Recognition. *Small Business Economics,* 24**,** 249-265.

ARENIUS, P. & MINNITI, M. 2005. Perceptual Variables and Nascent Entrepreneurship. *Small Business Economics,* 24**,** 233-247.

BARON, R. A. 2004. The cognitive perspective: a valuable tool for answering entrepreneurship's basic "why" questions. *Journal of Business Venturing,* 19**,** 221-239.

BARON, R. A. & ENSLEY, M. D. 2006. Opportunity recognition as the detection of meaningful patterns: evidence from comparisons of novice and experienced entrepreneurs. *Management Science,* 52**,** 1331-1344.

BECKER, G. 1993. *Human Capital. A Theoretical and Empirical Analysis with Special Reference to Education,* Chicago and London, The University of Chicago Press.

BÉCHARD, J.-P. & GRÉGOIRE, D. 2005. Entrepreneurship Education Research Revisited: The Case of Higher Education. *Academy of Management Learning & Education,* 4**,** 22-43.

BIESMA, R. G., PAVLOVA, M., VAN MERODE, G. G. & GROOT, W. 2007. Using conjoint analysis to estimate employers preferences for key competencies of master level Dutch graduates entering the public health field. *Economics of Education Review,* 26**,** 375-386.

BLANCHFLOWER, D. G. & OSWALD, A. J. 1998. What Makes an Entrepreneur? *Journal of Labor Economics,* 16**,** 26-60.

CARDON, M. S., GREGOIRE, D. A., STEVENS, C. E. & PATEL, P. C. 2013. Measuring entrepreneurial passion: conceptual foundations and scale validation. *Journal of Business Venturing,* 28**,** 373-396.

CARLSSON, B., ACS, Z. J., AUDRETSCH, D. B. & BRAUNERHJELM, P. 2009. Knowledge creation, entrepreneurship, and economic growth: a historical review. *Industrial and Corporate Change,* 18**,** 1193-1229.

DOMS, M., LEWIS, E. & ROBB, A. 2010. Local labor force education, new business characteristics, and firm performance. *Journal of Urban Economics,* 67**,** 61-77.

EUROPEAN COMMISSION 2009. An EU Strategy for Youth – Investing and Empowering: A renewed open method of coordination to address youth challenges and opportunities. *In:* COMMUNITIES, C. O. T. E. (ed.) *546.* Brussels.

EUROPEAN COMMISSION 2013. Entrepreneurship 2020 Action Plan. Reigniting the entrepreneurial spirit in Europe.: European Commission.

FIET, J. O. 2001. The theoretical side of teaching entrepreneurship. *Journal of Business Venturing,* 16**,** 1-24.

GAGLIO, C. M. 2004. The role of mental simulations and counterfactual thinking in the opportunity identification process. *Entrepreneurship Theory and Practice,* 28**,** 533-552.

GARCIA-ARACIL, A. 2009. European graduates' level of satisfaction with higher education. *Higher Education,* 57**,** 1-21.

GARCIA-ARACIL, A. & VAN DER VELDEN, R. 2008. Competencies for young European higher education graduates: labor market mismatches and their payoffs. *Higher Education,* 55**,** 219-239.

GARCIA-ARACIL, A., MORA, J. G. & VILA, L. E. 2004. The rewards of human capital competences for young European higher education graduates. *Tertiary Education and Management,* 10**,** 287-305.

GRANOVETTER, M. S. 1973. The Strength of Weak Ties. *The American Journal of Sociology,* 78**,** 1360-1380.

GROSSMANN, V. 2009. Entrepreneurial innovation and economic growth. *Journal of Macroeconomics,* 31**,** 602-613.

HAASE, H. & LAUTENSCHLÄGER, A. 2011. The 'Teachability Dilemma' of entrepreneurship. *International Entrepreneurship and Management Journal,* 7**,** 145-162.

HAMILTON, B. H. 2000. Does Entrepreneurship Pay? An Empirical Analysis of the Returns to Self-Employment. *Journal of Political Economy,* 108**,** 604-631.

HANUSHEK, E. A. & ZHANG, L. 2009. Quality Consistent Estimates of International Schooling and Skill Gradients. *Journal of Human Capital,* 3**,** 107-143.

HARTOG, J., VAN PRAAG, M. & VAN DER SLUIS, J. 2010. If you are so smart, why aren't you an entrepreneur? Returns to cognitive and social ability: entrepreneurs versus employees. *Journal of Economics & Management Strategy,* 19**,** 947-989.

HECKMAN, J. J. & KAUTZ, T. 2012. Hard evidence on soft skills. *Labour Economics,* 19**,** 451-464.

HECKMAN, J. J., LOCHNER, L. J. & TODD, P. E. 2003. Fifty Years of Mincer Earnings Regressions. *NBER Working Papers,* 9732.

HEIJKE, H., MENG, C. & RAMAEKERS, G. 2003. An investigation into the role of human capital competences and their pay-off. *International Journal of Manpower,* 24**,** 750-773.

HYYTINEN, A., ILMAKUNNAS, P. & TOIVANEN, O. 2013. The return-to-entrepreneurship puzzle. *Labour Economics,* 20**,** 57-67.

IYIGUN, M. F. & OWEN, A. L. 1999. Entrepreneurs, Professionals, and Growth. *Journal of Economic Growth,* 4**,** 213-232.

KIRZNER, I. 1999. Creativity and/or Alertness: A Reconsideration of the Schumpeterian Entrepreneur. *The Review of Austrian Economics,* 11**,** 5-17.

KIRZNER, I. M. 1973. *Competition and entrepreneurship,* Chicago, Chicago University Press.

KURATKO, D. F. 2005. The Emergence of Entrepreneurship Education: Development, Trends, and Challenges. *Entrepreneurship Theory and Practice,* 29**,** 577-598.

KURATKO, D. F. & AUDRETSCH, D. B. 2013. Clarifying the domains of corporate entrepreneurship. *International Entrepreneurship and Management Journal,* 9**,** 323-335.

LAZEAR, EDWARD P. 2005. Entrepreneurship. *Journal of Labor Economics,* 23**,** 649-680.

MARTIARENA, A. 2013. What's so entrepreneurial about intrapreneurs? *Small Business Economics,* 40**,** 27-39.

MARTIN, B. C., MCNALLY, J. J. & KAY, M. J. 2013. Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing,* 28**,** 211-224.

MARTÍNEZ, D., MORA, J.-G. & VILA, L. E. 2007. Entrepreneurs, the Self-employed and Employees amongst Young European Higher Education Graduates. *European Journal of Education,* 42**,** 99-117.

MINCER, J. A. 1974. *Schooling, Experience, and Earnings,* New York, Columbia University Press.

MORA, J.-G., GARCIA-ARACIL, A., CAROT, J. M. & VILA, L. E. 2006. Monetary rewards and competences of young european graduates. *Higher Education Management and Policy,* 18**,** 29-44.

MORRIS, M. H., WEBB, J. W., FU, J. & SINGHAL, S. 2013. A Competency-Based Perspective on Entrepreneurship Education: Conceptual and Empirical Insights. *Journal of Small Business Management,* 51**,** 352-369.

O'CONNOR, A. 2013. A conceptual framework for entrepreneurship education policy: Meeting government and economic purposes. *Journal of Business Venturing,* 28**,** 546-563.

OOSTERBEEK, H., VAN PRAAG, M. & IJSSELSTEIN, A. 2010. The impact of entrepreneurship education on entrepreneurship skills and motivation. *European Economic Review,* 54**,** 442-454.

PINCHOT, G. 1985. *Intrapreneuring.,* New York: Harper and Row.

POSCHKE, M. 2013. Who becomes an entrepreneur? Labor market prospects and occupational choice. *Journal of Economic Dynamics and Control,* 37**,** 693-710.

PRAAG, C. M. & VERSLOOT, P. 2007. What is the value of entrepreneurship? A review of recent research. *Small Business Economics,* 29**,** 351-382.

SHANE, S., LOCKE, E. A. & COLLINS, C. J. 2003. Entrepreneurial motivation. *Human Resource Management Review,* 13**,** 257-279.

SHARMA, P. & CHRISMAN, J. J. 1999. Toward a reconciliation of the definitional issues in the field of corporate entrepreneurship. *Entrepreneurship Theory and Practice,* 23**,** 11-27.

TANG, J., KACMAR, K. M. & BUSENITZ, L. 2012. Entrepreneurial alertness in the pursuit of new opportunities. *Journal of Business Venturing,* 27**,** 77-94.

TEIJEIRO, M., RUNGO, P. & FREIRE, M. J. 2013. Graduate competencies and employability: The impact of matching firms' needs and personal attainments. *Economics of Education Review*.

VALLIERE, D. 2013. Towards a schematic theory of entrepreneurial alertness. *Journal of Business Venturing,* 28**,** 430-442.

VAN DER SLUIS, J. & VAN PRAAG, M. 2004. Economic returns to education for entrepreneurs: The development of a neglected child in the family of economics of education? *Sweedish Economic Policy Review,* 11**,** 183-226.

VAN DER SLUIS, J., VAN PRAAG, M. & VIJVERBERG, W. 2008. EDUCATION AND ENTREPRENEURSHIP SELECTION AND PERFORMANCE: A REVIEW OF THE EMPIRICAL LITERATURE. *Journal of Economic Surveys,* 22**,** 795-841.

VON GRAEVENITZ, G., HARHOFF, D. & WEBER, R. 2010. The effects of entrepreneurship education. *Journal of Economic Behavior & Organization,* 76**,** 90-112.

Table 2. Descriptive statistics.

| variable | Self-employed mean | sd | Wage employment mean | sd |
|---|---|---|---|---|
| Female | 0,553 | 0,499 | 0,633 | 0,482 |
| Long program* | 0,727 | 0,447 | 0,696 | 0,460 |
| Grade secondary education | 2,940 | 0,943 | 2,903 | 0,945 |
| Father's education | 1,907 | 0,877 | 1,732 | 0,831 |
| log(hourly wage) | . | . | 2,151 | 0,377 |
| Public sector | . | . | 0,323 | 0,468 |
| Permanent contract | . | . | 0,615 | 0,487 |
| Medium firm size | . | . | 0,190 | 0,392 |
| Large firm | . | . | 0,532 | 0,499 |
| Months of experience | . | . | 50,007 | 15,036 |
| *Field of study* | | | | |
| Education | 0,080 | 0,272 | 0,108 | 0,311 |
| Humanities and arts | 0,093 | 0,292 | 0,064 | 0,245 |
| Social Sciences | 0,207 | 0,406 | 0,349 | 0,477 |
| Science & Maths | 0,080 | 0,272 | 0,148 | 0,355 |
| Engineering | 0,307 | 0,463 | 0,154 | 0,361 |
| Agriculture & Vet | 0,067 | 0,250 | 0,041 | 0,198 |
| Health and welfare | 0,147 | 0,355 | 0,130 | 0,337 |
| Services | 0,020 | 0,140 | 0,006 | 0,078 |
| Observations | 150 | | 1973 | |

* dummy indicating whether studies provide direct access to doctorate.

| Competency | Competencies (Own Level): Self-employed mean | sd | Wage employment mean | sd | Competencies (Required Level): Self-employed mean | sd | Wage employment mean | sd |
|---|---|---|---|---|---|---|---|---|
| Mastery of own field | 5,287 | 0,979 | 5,187 | 1,071 | 5,633 | 1,297 | 5,156 | 1,488 |
| Knowledge other fields | 4,547 | 1,156 | 4,346 | 1,224 | 4,367 | 1,534 | 4,125 | 1,537 |
| Analytical thinking | 5,173 | 1,241 | 5,060 | 1,223 | 5,080 | 1,459 | 4,759 | 1,527 |
| Ability to learn | 5,793 | 0,964 | 5,723 | 1,032 | 5,393 | 1,361 | 5,224 | 1,422 |
| Ability to negotiate | 4,747 | 1,227 | 4,492 | 1,474 | 5,073 | 1,723 | 4,506 | 1,859 |
| Ability to work under pressure | 5,733 | 1,121 | 5,411 | 1,277 | 5,727 | 1,236 | 5,366 | 1,534 |
| Alertness to opportunities | 5,087 | 1,215 | 4,682 | 1,334 | 4,927 | 1,498 | 4,340 | 1,739 |
| Ability to coordinate | 5,567 | 1,167 | 5,379 | 1,215 | 5,520 | 1,403 | 5,197 | 1,525 |
| Ability to use time efficiently | 5,587 | 1,171 | 5,490 | 1,165 | 5,813 | 1,195 | 5,555 | 1,352 |
| Ability to work with others | 5,547 | 1,288 | 5,809 | 1,171 | 5,340 | 1,621 | 5,473 | 1,560 |
| Ability to mobilize others | 5,013 | 1,290 | 4,747 | 1,322 | 4,940 | 1,610 | 4,703 | 1,709 |
| Ability to make meaning clear | 5,553 | 1,156 | 5,484 | 1,124 | 5,773 | 1,124 | 5,619 | 1,334 |
| Ability to assert authority | 4,893 | 1,249 | 4,702 | 1,378 | 5,193 | 1,491 | 4,761 | 1,733 |
| Ability to use computers | 5,547 | 1,196 | 5,640 | 1,236 | 5,133 | 1,464 | 5,256 | 1,509 |
| Ability to come up with ideas | 5,480 | 1,028 | 5,288 | 1,142 | 5,520 | 1,230 | 5,166 | 1,467 |
| Willingness to question ideas | 5,327 | 1,245 | 5,287 | 1,206 | 5,113 | 1,421 | 4,717 | 1,562 |
| Ability to present | 4,827 | 1,473 | 4,739 | 1,540 | 4,900 | 1,775 | 4,624 | 1,830 |
| Ability to write | 5,493 | 1,140 | 5,417 | 1,260 | 5,480 | 1,482 | 5,086 | 1,666 |
| Foreign language | 3,953 | 1,789 | 3,841 | 1,844 | 3,360 | 1,933 | 3,369 | 2,072 |

Table 3. Heckman selection model, basic model.

| | (1)<br>Mastery<br>own field | (2)<br>Knowledge<br>other fields | (3)<br>Analytical<br>thinking | (4)<br>Ability<br>to learn | (5)<br>Ability<br>to negotiate | (6)<br>Work<br>under<br>pressure | (7)<br>Alertness<br>to opportunities | (8)<br>Ability<br>to coordinate | (9)<br>Ability<br>to use time<br>efficiently | (10)<br>Ability<br>to work w/<br>others |
|---|---|---|---|---|---|---|---|---|---|---|
| Log(wage) | | | | | | | | | | |
| Own level | 0.013 | 0.010 | 0.040*** | 0.005 | 0.007 | 0.002 | 0.004 | 0.011 | -0.010 | 0.017** |
| | (0.008) | (0.007) | (0.007) | (0.008) | (0.006) | (0.007) | (0.007) | (0.007) | (0.008) | (0.007) |
| Selection into wage employment | | | | | | | | | | |
| Own level | -0.010 | -0.054* | -0.005 | -0.025 | -0.041 | -0.066** | -0.107*** | -0.048 | -0.037 | 0.072** |
| | (0.037) | (0.032) | (0.032) | (0.037) | (0.028) | (0.032) | (0.031) | (0.032) | (0.033) | (0.029) |
| Observations | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 |
| Censored obs. | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Sigma | .39 | .39 | .387 | .39 | .389 | .389 | .391 | .389 | .39 | .39 |
| Rho | .888 | .891 | .896 | .889 | .886 | .88 | .909 | .888 | .889 | .889 |
| Lambda | .346 | .347 | .347 | .347 | .345 | .342 | .356 | .346 | .347 | .346 |

| | (11)<br>Ability<br>to mobilize | (12)<br>Ability<br>to make<br>meaning | (13)<br>Ability<br>to assert<br>authority | (14)<br>Ability<br>to use<br>computers | (15)<br>Ability<br>to come up<br>w/ idea | (16)<br>Willingness<br>to question<br>ideas | (17)<br>Ability<br>to present | (18)<br>Ability to<br>write reports | (19)<br>Foreign<br>language | |
|---|---|---|---|---|---|---|---|---|---|---|
| Log(wage) | | | | | | | | | | |
| Own level | 0.009 | 0.011 | 0.027*** | -0.001 | 0.014* | 0.019*** | 0.016*** | 0.004 | 0.009* | |
| | (0.007) | (0.008) | (0.006) | (0.007) | (0.008) | (0.007) | (0.006) | (0.007) | (0.005) | |
| Selection into wage employment | | | | | | | | | | |
| Own level | -0.031 | 0.008 | -0.005 | 0.007 | -0.034 | 0.009 | -0.019 | 0.013 | 0.010 | |
| | (0.029) | (0.034) | (0.029) | (0.033) | (0.035) | (0.032) | (0.027) | (0.032) | (0.023) | |
| Observations | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | |
| Censored Obs. | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | |
| Sigma | .39 | .39 | .387 | .39 | .389 | .39 | .386 | .39 | .39 | |
| Rho | .887 | .888 | .884 | .888 | .883 | .89 | -.834 | .889 | .889 | |
| Lambda | .345 | .346 | .342 | .346 | .343 | .347 | -.322 | .347 | .347 | |

* p<0.10, ** p<0.05, *** p<0.01

Controls included in main and selection equations: Female, Age, Long program, Grade Secondary education, Fields of study, Experience.

Controls included in selection equation only: Father's education (secondary and tertiary education dummies).

Table 4. Heckman selection model, with required level of competency included.

| | (1) Mastery own field | (2) Knowledge other fields | (3) Analytical thinking | (4) Ability to learn | (5) Ability to negotiate | (6) Work under pressure | (7) Alertness to opportunities | (8) Ability to coordinate | (9) Ability to use time efficiently | (10) Ability to work w/ others |
|---|---|---|---|---|---|---|---|---|---|---|
| Log(wage) | | | | | | | | | | |
| Required level | 0.037*** | 0.021*** | 0.034*** | 0.024*** | 0.025*** | 0.008 | 0.013** | 0.037*** | 0.031*** | 0.023*** |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.005) | (0.006) | (0.005) | (0.006) | (0.006) | (0.006) |
| Own level | -0.003 | -0.001 | 0.017** | -0.009 | -0.009 | -0.003 | -0.004 | -0.014* | -0.023*** | 0.003 |
| | (0.008) | (0.008) | (0.008) | (0.009) | (0.007) | (0.008) | (0.007) | (0.008) | (0.008) | (0.008) |
| Selection into wage employment | | | | | | | | | | |
| Own level | -0.008 | -0.055* | -0.004 | -0.026 | -0.040 | -0.066** | -0.107*** | -0.051 | -0.034 | 0.072** |
| | (0.038) | (0.033) | (0.033) | (0.037) | (0.028) | (0.032) | (0.031) | (0.033) | (0.034) | (0.030) |
| Observations | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 |
| Censored Obs. | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Sigma | .381 | .387 | .383 | .388 | .387 | .388 | .39 | .384 | .386 | .387 |
| Rho | .847 | .879 | .885 | .888 | .89 | .877 | .902 | .872 | .875 | .879 |
| Lambda | .323 | .34 | .339 | .345 | .345 | .341 | .352 | .335 | .338 | .34 |

| | (11) Ability to mobilize | (12) Ability to make meaning | (13) Ability to assert authority | (14) Ability to use computers | (15) Ability to come up w/ idea | (16) Willingness to question ideas | (17) Ability to present | (18) Ability to write reports | (19) Foreign language |
|---|---|---|---|---|---|---|---|---|---|
| Log(wage) | | | | | | | | | |
| Required level | 0.034*** | 0.049*** | 0.037*** | 0.000 | 0.034*** | 0.030*** | 0.030*** | 0.037*** | 0.016*** |
| | (0.005) | (0.007) | (0.005) | (0.006) | (0.006) | (0.006) | (0.005) | (0.006) | (0.004) |
| Own level | -0.013* | -0.012 | 0.005 | -0.001 | -0.006 | 0.003 | -0.006 | -0.020*** | 0.000 |
| | (0.007) | (0.008) | (0.007) | (0.008) | (0.008) | (0.008) | (0.007) | (0.008) | (0.006) |
| Selection into wage employment | | | | | | | | | |
| Own level | -0.034 | 0.013 | -0.004 | 0.007 | -0.032 | 0.011 | 0.020 | 0.015 | 0.009 |
| | (0.030) | (0.034) | (0.030) | (0.033) | (0.036) | (0.033) | (0.026) | (0.033) | (0.023) |
| Observations | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 | 2123 |
| Censored Obs. | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Sigma | .385 | .382 | .38 | .39 | .384 | .385 | .384 | .383 | .388 |
| Rho | .881 | .868 | .866 | .888 | .869 | .876 | .868 | .861 | .886 |
| Lambda | .339 | .331 | .329 | .346 | .334 | .337 | .333 | .33 | .344 |

* p<0.10, ** p<0.05, *** p<0.01
Controls included in main and selection equations: Female, Age, Long program, Grade Secondary education, Fields of study, Experience.
Controls included in selection equation only: Father's education (secondary and tertiary education dummies).

Table 5. Heckman selection model, with job characteristics included.

| | (1) Mastery own field | (2) Knowledge other fields | (3) Analytical thinking | (4) Ability to learn | (5) Ability to negotiate | (6) Work under pressure | (7) Alertness to opportunities | (8) Ability to coordinate | (9) Ability to use time efficiently | (10) Ability to work w/ others |
|---|---|---|---|---|---|---|---|---|---|---|
| Log(wage) | | | | | | | | | | |
| Required level | 0.036*** | 0.021*** | 0.031*** | 0.025*** | 0.031*** | 0.013** | 0.021*** | 0.037*** | 0.034*** | 0.019*** |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.005) | (0.006) | (0.005) | (0.006) | (0.006) | (0.006) |
| Own level | -0.007 | -0.004 | 0.012 | -0.010 | -0.007 | -0.000 | -0.006 | -0.009 | -0.022*** | 0.004 |
| | (0.008) | (0.007) | (0.008) | (0.009) | (0.006) | (0.008) | (0.007) | (0.008) | (0.008) | (0.008) |
| Selection into wage employment | | | | | | | | | | |
| Own level | -0.017 | -0.061* | -0.002 | -0.026 | -0.049 | -0.083** | -0.110*** | -0.069* | -0.046 | 0.080** |
| | (0.042) | (0.035) | (0.036) | (0.042) | (0.031) | (0.036) | (0.035) | (0.036) | (0.037) | (0.034) |
| Observations | 1969 | 1969 | 1969 | 1969 | 1969 | 1969 | 1969 | 1969 | 1969 | 1969 |
| Censored Obs. | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Sigma | .336 | .345 | .342 | .346 | .341 | .346 | .345 | .343 | .347 | .344 |
| Rho | .565 | .692 | .686 | .707 | .675 | .687 | .695 | .706 | .735 | .663 |
| Lambda | .19 | .239 | .235 | .245 | .23 | .238 | .24 | .243 | .255 | .228 |

| | (11) Ability to mobilize | (12) Ability to make meaning | (13) Ability to assert authority | (14) Ability to use computers | (15) Ability to come up w/ idea | (16) Willingness to question ideas | (17) Ability to present | (18) Ability to write reports | (19) Foreign language |
|---|---|---|---|---|---|---|---|---|---|
| Log(wage) | | | | | | | | | |
| Required level | 0.032*** | 0.042*** | 0.032*** | 0.004 | 0.032*** | 0.032*** | 0.027*** | 0.033*** | 0.014*** |
| | (0.005) | (0.006) | (0.005) | (0.006) | (0.006) | (0.005) | (0.005) | (0.006) | (0.004) |
| Own level | -0.012* | -0.013* | 0.003 | -0.004 | -0.003 | 0.002 | -0.004 | -0.014** | -0.002 |
| | (0.007) | (0.008) | (0.007) | (0.008) | (0.008) | (0.007) | (0.006) | (0.007) | (0.005) |
| Selection into wage employment | | | | | | | | | |
| Own level | -0.052 | -0.004 | -0.026 | 0.027 | -0.060 | 0.012 | 0.001 | 0.001 | 0.006 |
| | (0.032) | (0.037) | (0.032) | (0.036) | (0.039) | (0.035) | (0.029) | (0.035) | (0.025) |
| Observations | 1969 | 1969 | 1969 | 1969 | 1969 | 1969 | 1969 | 1969 | 1969 |
| Censored Obs. | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| Sigma | .345 | .343 | .341 | .348 | .341 | .343 | .338 | .339 | .345 |
| Rho | .72 | .7 | .688 | .706 | .649 | .687 | .592 | .616 | .68 |
| Lambda | .248 | .241 | .235 | .246 | .221 | .235 | .2 | .209 | .235 |

* $p<0.10$, ** $p<0.05$, *** $p<0.01$

Controls included in main and selection equations: Female, Age, Long program, Grade Secondary education, Fields of study, Experience.

Controls included in selection equation only: Father's education (secondary and tertiary education dummies).

Controls included in main equation only: Job characteristics (public sector, permanent contract, firm size).

Table 6. Heckman selection model for the competency alertness to opportunities.

| | (1) Ln(wage) | (1) selection | (2) Ln(wage) | (2) selection | (3) Ln(wage) | (3) selection |
|---|---|---|---|---|---|---|
| Own level of alertness | 0.004 | -0.107*** | -0.004 | -0.107*** | -0.006 | -0.110*** |
| | (0.007) | (0.031) | (0.007) | (0.031) | (0.007) | (0.035) |
| Required level of alertness | | | 0.013** | | 0.021*** | |
| | | | (0.005) | | (0.005) | |
| Female | -0.096*** | -0.015 | -0.099*** | -0.019 | -0.079*** | 0.007 |
| | (0.019) | (0.084) | (0.019) | (0.085) | (0.018) | (0.094) |
| Age | -0.002 | -0.034** | -0.001 | -0.035** | -0.006* | -0.041** |
| | (0.004) | (0.016) | (0.004) | (0.016) | (0.003) | (0.016) |
| Long program | 0.087*** | -0.071 | 0.084*** | -0.076 | 0.092*** | -0.056 |
| | (0.022) | (0.098) | (0.022) | (0.098) | (0.021) | (0.112) |
| Grade in secondary educ. | 0.056*** | 0.079* | 0.057*** | 0.081* | 0.030*** | 0.041 |
| | (0.010) | (0.044) | (0.010) | (0.044) | (0.009) | (0.050) |
| Experience | 0.003*** | -0.008*** | 0.003*** | -0.008*** | 0.003*** | -0.010*** |
| | (0.001) | (0.003) | (0.001) | (0.003) | (0.001) | (0.003) |
| Education | 0.126*** | 0.068 | 0.132*** | 0.074 | 0.086*** | -0.183 |
| | (0.032) | (0.155) | (0.032) | (0.157) | (0.031) | (0.184) |
| Humanities | -0.046 | -0.207 | -0.040 | -0.216 | -0.051 | -0.367** |
| | (0.037) | (0.154) | (0.037) | (0.154) | (0.035) | (0.170) |
| Science&Maths | 0.039 | 0.097 | 0.039 | 0.100 | 0.056** | 0.141 |
| | (0.027) | (0.144) | (0.027) | (0.145) | (0.025) | (0.160) |
| Engineering | 0.125*** | -0.505*** | 0.124*** | -0.507*** | 0.160*** | -0.491*** |
| | (0.028) | (0.119) | (0.028) | (0.119) | (0.027) | (0.130) |
| Agriculture&Vet | 0.015 | -0.393** | 0.016 | -0.397** | 0.030 | -0.468** |
| | (0.045) | (0.188) | (0.045) | (0.189) | (0.043) | (0.202) |
| Health | 0.067** | -0.171 | 0.070** | -0.178 | 0.036 | -0.336** |
| | (0.030) | (0.134) | (0.030) | (0.136) | (0.029) | (0.160) |
| Services | 0.096 | -0.631* | 0.097 | -0.636* | 0.013 | -0.877** |
| | (0.108) | (0.360) | (0.107) | (0.362) | (0.102) | (0.387) |
| Public sector | | | | | 0.222*** | |
| | | | | | (0.020) | |
| Permanent contract | | | | | 0.159*** | |
| | | | | | (0.017) | |
| Medium firm | | | | | 0.094*** | |
| | | | | | (0.023) | |
| Large firm | | | | | 0.138*** | |
| | | | | | (0.019) | |
| Father w/ secondary educ. | | -0.124 | | -0.127 | | -0.131 |
| | | (0.090) | | (0.091) | | (0.105) |
| Father w/ tertiary educ. | | -0.281*** | | -0.277*** | | -0.297*** |
| | | (0.083) | | (0.084) | | (0.097) |
| Constant | 1.785*** | 3.528*** | 1.749*** | 3.545*** | 1.688*** | 3.958*** |
| | (0.119) | (0.549) | (0.119) | (0.552) | (0.112) | (0.572) |
| Observations | 2123 | | 2123 | | 1969 | |
| Censored Obs. | 150 | | 150 | | 150 | |
| Sigma | .391 | | .39 | | .345 | |
| Rho | .909 | | .902 | | .695 | |
| Lambda | .356 | | .352 | | .24 | |

* p<0.10, ** p<0.05, *** p<0.01

Table 7. Heckman selection model with all competencies included.

| | (1) | | (2) | | (3) | |
|---|---|---|---|---|---|---|
| | Ln(wage) | selection | Ln(wage) | selection | Ln(wage) | selection |
| Own level of competencies: | | | | | | |
| Mastery of own field | 0.005 | -0.008 | 0.002 | 0.007 | -0.004 | 0.019 |
| | (0.009) | (0.044) | (0.009) | (0.046) | (0.009) | (0.051) |
| Knowledge of other fields | -0.004 | -0.059 | -0.003 | -0.066* | -0.004 | -0.073* |
| | (0.008) | (0.039) | (0.008) | (0.040) | (0.008) | (0.044) |
| Analytical thinking | 0.049*** | 0.045 | 0.034*** | 0.044 | 0.029*** | 0.055 |
| | (0.009) | (0.041) | (0.010) | (0.043) | (0.009) | (0.045) |
| Ability to learn | -0.013 | 0.008 | -0.012 | 0.026 | -0.014 | 0.011 |
| | (0.011) | (0.050) | (0.011) | (0.052) | (0.011) | (0.057) |
| Ability to negotiate | -0.004 | -0.001 | -0.009 | -0.009 | -0.006 | -0.005 |
| | (0.008) | (0.037) | (0.008) | (0.039) | (0.008) | (0.041) |
| Work under pressure | -0.008 | -0.063 | 0.001 | -0.079* | 0.006 | -0.081* |
| | (0.008) | (0.040) | (0.009) | (0.041) | (0.009) | (0.045) |
| Alertness to opportunities. | -0.009 | -0.115*** | 0.002 | -0.109** | -0.002 | -0.107** |
| | (0.008) | (0.042) | (0.009) | (0.043) | (0.009) | (0.045) |
| Ability to coordinate | 0.000 | -0.048 | -0.012 | -0.058 | -0.003 | -0.060 |
| | (0.010) | (0.050) | (0.010) | (0.051) | (0.010) | (0.054) |
| Ability to use time efficiently | -0.027*** | -0.015 | -0.025*** | -0.014 | -0.023*** | -0.015 |
| | (0.009) | (0.044) | (0.009) | (0.044) | (0.009) | (0.047) |
| Ability to work with others | 0.020** | 0.171*** | 0.018* | 0.173*** | 0.018* | 0.188*** |
| | (0.009) | (0.040) | (0.010) | (0.041) | (0.009) | (0.044) |
| Ability to mobilize others | -0.014 | -0.086** | -0.018* | -0.090** | -0.018** | -0.096** |
| | (0.009) | (0.044) | (0.009) | (0.045) | (0.009) | (0.048) |
| Ability to make meaning clear | -0.006 | -0.006 | -0.007 | -0.001 | -0.009 | -0.007 |
| | (0.010) | (0.048) | (0.010) | (0.049) | (0.010) | (0.051) |
| Ability to assert authority | 0.038*** | 0.041 | 0.026*** | 0.043 | 0.019** | 0.035 |
| | (0.008) | (0.042) | (0.009) | (0.044) | (0.008) | (0.046) |
| Ability to use computers | -0.013 | -0.001 | 0.004 | 0.025 | -0.000 | 0.053 |
| | (0.008) | (0.042) | (0.009) | (0.043) | (0.009) | (0.044) |
| Ability to come up with ideas | -0.000 | -0.029 | 0.001 | -0.044 | 0.004 | -0.073 |
| | (0.011) | (0.055) | (0.011) | (0.057) | (0.011) | (0.060) |
| Willingness to question ideas | 0.007 | 0.029 | 0.005 | 0.029 | 0.004 | 0.043 |
| | (0.009) | (0.044) | (0.009) | (0.044) | (0.009) | (0.046) |
| Ability to present | 0.008 | 0.058* | -0.001 | 0.061* | 0.002 | 0.057 |
| | (0.007) | (0.034) | (0.008) | (0.035) | (0.008) | (0.038) |
| Ability to write reports | -0.009 | 0.036 | -0.020** | 0.040 | -0.014 | 0.026 |
| | (0.009) | (0.043) | (0.009) | (0.044) | (0.009) | (0.046) |
| Foreign language | 0.006 | 0.009 | 0.005 | 0.010 | 0.003 | -0.002 |
| | (0.005) | (0.025) | (0.006) | (0.026) | (0.006) | (0.028) |
| Individual characteristics: | | | | | | |
| Female | -0.078*** | -0.006 | -0.078*** | 0.009 | -0.066*** | 0.017 |
| | (0.019) | (0.088) | (0.019) | (0.090) | (0.018) | (0.097) |
| Age | -0.003 | -0.039** | 0.001 | -0.038** | -0.003 | -0.044*** |
| | (0.004) | (0.017) | (0.003) | (0.017) | (0.003) | (0.017) |
| Long program | 0.074*** | -0.072 | 0.063*** | -0.085 | 0.077*** | -0.071 |
| | (0.022) | (0.102) | (0.021) | (0.103) | (0.020) | (0.114) |
| Grade secondary educ. | 0.050*** | 0.069 | 0.049*** | 0.062 | 0.027*** | 0.026 |
| | (0.010) | (0.048) | (0.010) | (0.050) | (0.009) | (0.053) |
| Experience | 0.003*** | -0.008** | 0.003*** | -0.007** | 0.002*** | -0.008** |
| | (0.001) | (0.003) | (0.001) | (0.003) | (0.001) | (0.003) |
| Education | 0.098*** | -0.031 | 0.077** | -0.040 | 0.050 | -0.247 |
| | (0.033) | (0.164) | (0.032) | (0.171) | (0.031) | (0.187) |
| Humanities | -0.050 | -0.226 | -0.040 | -0.327** | -0.044 | -0.380** |
| | (0.037) | (0.161) | (0.036) | (0.162) | (0.034) | (0.176) |
| Science&Maths | 0.007 | 0.055 | 0.013 | 0.128 | 0.045* | 0.124 |
| | (0.028) | (0.153) | (0.027) | (0.158) | (0.025) | (0.170) |
| Engineering | 0.109*** | -0.529*** | 0.095*** | -0.501*** | 0.135*** | -0.503*** |
| | (0.028) | (0.123) | (0.027) | (0.128) | (0.026) | (0.136) |
| Agriculture&Vet | -0.009 | -0.457** | -0.018 | -0.469** | -0.002 | -0.495** |
| | (0.044) | (0.189) | (0.043) | (0.192) | (0.041) | (0.205) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Health | 0.051* | -0.254* | 0.027 | -0.245* | 0.019 | -0.366** |
| | (0.030) | (0.141) | (0.029) | (0.145) | (0.029) | (0.163) |
| Services | 0.036 | -0.804** | 0.030 | -0.879** | -0.040 | -1.040*** |
| | (0.106) | (0.371) | (0.103) | (0.377) | (0.099) | (0.392) |
| Required level of competencies: | | | | | | |
| Mastery of own field | | | 0.018*** | | 0.020*** | |
| | | | (0.007) | | (0.007) | |
| Knowledge of other fields | | | -0.000 | | 0.000 | |
| | | | (0.007) | | (0.006) | |
| Analytical thinking | | | 0.017** | | 0.007 | |
| | | | (0.008) | | (0.008) | |
| Ability to learn | | | -0.005 | | -0.005 | |
| | | | (0.008) | | (0.008) | |
| Ability to negotiate | | | 0.014** | | 0.020*** | |
| | | | (0.006) | | (0.006) | |
| Work under pressure | | | -0.017** | | -0.015** | |
| | | | (0.007) | | (0.007) | |
| Alertness to opportunities. | | | -0.021*** | | -0.013* | |
| | | | (0.007) | | (0.007) | |
| Ability to coordinate | | | 0.010 | | 0.010 | |
| | | | (0.008) | | (0.008) | |
| Ability to use time efficiently | | | 0.004 | | 0.009 | |
| | | | (0.008) | | (0.008) | |
| Ability to work with others | | | -0.003 | | -0.006 | |
| | | | (0.007) | | (0.007) | |
| Ability to mobilize others | | | 0.005 | | 0.006 | |
| | | | (0.007) | | (0.007) | |
| Ability to make meaning clear | | | 0.021** | | 0.011 | |
| | | | (0.009) | | (0.008) | |
| Ability to assert authority | | | 0.014** | | 0.008 | |
| | | | (0.007) | | (0.006) | |
| Ability to use computers | | | -0.028*** | | -0.021*** | |
| | | | (0.007) | | (0.007) | |
| Ability to come up with ideas | | | 0.004 | | 0.002 | |
| | | | (0.009) | | (0.009) | |
| Willingness to question ideas | | | 0.001 | | 0.007 | |
| | | | (0.007) | | (0.007) | |
| Ability to present | | | 0.004 | | -0.001 | |
| | | | (0.007) | | (0.007) | |
| Ability to write reports | | | 0.017** | | 0.014** | |
| | | | (0.007) | | (0.007) | |
| Foreign language | | | 0.006 | | 0.005 | |
| | | | (0.005) | | (0.005) | |
| Job characteristics: | | | | | | |
| Public sector | | | | | 0.195*** | |
| | | | | | (0.019) | |
| Permanent contract | | | | | 0.154*** | |
| | | | | | (0.017) | |
| Medium firm | | | | | 0.091*** | |
| | | | | | (0.022) | |
| Large firm | | | | | 0.133*** | |
| | | | | | (0.019) | |
| Father w/ secondary educ. | | -0.126 | | -0.081 | | -0.127 |
| | | (0.095) | | (0.099) | | (0.109) |
| Father w/ tertiary educ. | | -0.299*** | | -0.236** | | -0.284*** |
| | | (0.087) | | (0.093) | | (0.101) |
| Constant | 1.764*** | 3.281*** | 1.548*** | 3.090*** | 1.528*** | 3.489*** |
| | (0.132) | (0.652) | (0.131) | (0.670) | (0.124) | (0.670) |
| Observations | 2123 | | 2123 | | 1969 | |
| Censored Obs. | 150 | | 150 | | 150 | |
| Sigma | .382 | | .366 | | .33 | |
| Rho | .902 | | .872 | | .678 | |
| Lambda | .344 | | .319 | | .224 | |

* p<0.10, ** p<0.05, *** p<0.01