Picking the Plough or Not

How do personality traits influence occupational attainment in emerging Southeast Asia?[*]

Dorothee Bühler[†]   Rasadhika Sharma[‡]   Wiebke Stein[§]

26th August 2019

Abstract

Rural labor markets in emerging countries offer limited occupation choices to individuals and decisions are often made out of necessity rather than opportunities. Given these difficult circumstances it is all the more important to understand the role of personality traits for occupation related decisions. Against this background, this paper examines the relation between personality traits and occupational attainment in two emerging Southeast Asian economies. Using new micro level data from individuals living in rural areas of Thailand and Vietnam we test the importance of a broad range of personality measures, while controlling for other channels of human capital formation. In addition, we are able to contrast the influence of personality traits on occupational attainment for both an emerging market and a socialist economy. Our results suggest that common measures of personality traits can be applied in a rural setting and are important for individual occupational attainment. In particular, we find that conscientious individuals are more likely to engage in self-employment or permanent jobs. Other non-cognitive skills such as locus of control, trust, risk, and patience play an inferior role.

Keywords: Personality traits; Big Five Factor Model; Occupational Attainment; Southeast Asia; TVSEP
JEL: D91; O1; R2

1 Introduction

Determining individual's occupation decisions is a prominent topic among labor economists. Empirical and experimental evidence (Jencks and Williams, 1979; Nyhus and Pons, 2005; Wells et al., 2016) corroborate that in addition to cognitive skills, non-cognitive skills – also called personality traits – play an important role in determining individual decision making behavior (Wichert and Pohlmeier, 2010), job performance (Barrick and Mount, 1991) and economic outcomes (Piatek and Pinger, 2010). According to Heckman and Cunha (2007) non-cognitive skills are vital when it comes to actually realizing the acquired potential (i.e. cognitive skills). Therefore, the importance of personality traits in determining occupational attainment (Cobb-Clark and Tan, 2011; John and Thomsen, 2014) and occupational earnings (Osborne Groves, 2003; Mueller and Plug, 2006; Heineck and Anger, 2010) has been acknowledged widely in the literature. While existing studies have produced valuable results, the focus is on industrialized countries, using data from the U.S., Japan or European countries.

By 2030, 85 % of the worlds population will be based in emerging and developing countries, building the backbone of the global economy (UNHCS, 2001). In order to create sufficient job opportunities for the growing population and improve living circumstances, it is vital to understand individual labor market decisions in these countries. Labor markets in emerging and developing countries vary substantially from labor markets in industrialized countries. They are characterized as labor intensive and capital scarce (Campbell and Ahmed, 2012). There is little specialization and mostly small scale operations (Banerjee and Duflo, 2007). In particular, rural economies are informal, likely to be less productive, credit insufficient, and prone to greater earnings instability (Campbell, 2011). Gollin et al. (2014) highlight that in most developing countries labor is misallocated into the agricultural sector, leading to a large agricultural productivity gap. Low levels of skills among farmers is thought to be one of the main reasons for this gap (Laajaj and Macours, 2017). Therefore, transferring results from existing studies would be over-simplification. Only recently, some studies started to address the determinants and impacts of non-cognitive skills in developing economies (Attanasio et al., 2015; Gertler et al., 2014; Laajaj and Macours, 2017).

Against this background, this paper aims to shed light on personality traits and their relevance in rural labor markets of emerging Southeast Asian economies. The scope of this study is twofold: First, we implement and validate measures of personality traits, namely the Big Five factor model (McCrae and John, 1992; Costa and McCrae, 1997), in an emerging country setting. Second, we examine the importance of personality traits for occupational attainment in rural areas of Southeast Asia. Given that personality traits influence preferences and individual's motivation, it is worth understanding why some individuals decide to pursue an occupation other than farming as their main occupation. Since the skill set and the labor market opportunities in these settings are rather homogeneous, personality traits might explain why some individuals pursue a career other than farming. We therefore employ a multinominal logit model, using subsistence farming as the baseline occupation and test it against different occupation categories such as self-employment or permanent wage employment. In addition, we are able to study the importance of personality traits in two different political systems.

For our analysis, we use a data set for Thailand and Vietnam, collected under the Thailand Vietnam Socio Economic Panel (TVSEP) in 2017.[1] A section on measurement of personality traits was included for the first time in 2017, providing information on around 4000 individuals. In our sample, like most rural populations in developing countries, the majority of households rely on income from agriculture and environmental resource extraction (Parvathi and Nguyen, 2018). Previous research in the region

---

[1] For more information please refer to the project webpage: `https://www.tvsep.de/overview-tvsep.html`.

shows that households engaging in activities other than farming tend to be better off than farming-only households (Sohns and Revilla Diez, 2016; Sharma et al., 2016).

In order to capture an individual's personality we use eight different measures: the Big Five factor model, locus of control as well as measures on patience, risk and trust. The Big Five model thereby captures a persons intrinsic personality, whereas the other measures determine outcome related behavior and attitude (John and Thomsen, 2014).

Our results confirm that the Big Five personality measures hold for our rural sample population. Further, our robustness tests show that the measures are stable across time. Despite the different political regimes, the results do not differ substantially between the Thai and Vietnamese sub sample. In terms of occupational attainment, we find that Conscientiousness is the most decisive factor. This is line with literature utilizing developed country data sets (Barrick and Mount, 1991). Conscientiousness is particularly important for choosing high skilled jobs over subsistence farming. Our results indicate that it is crucial for development support policies to identify individuals who are willing to choose an occupation outside of the farming business. Our study adds to the literature on personality measures by applying existing measures to individuals in rural Southeast Asia. In addition, we add to the literature on the importance of personality traits for occupational attainment by providing evidence from a large panel study in Thailand and Vietnam.

The rest of the paper is organized as follows: Section 2 provides the theoretical framework for our paper. Section 3 introduces the study design and illustrates data collection, measurement of the traits and the econometric models used in our paper. Section 4 presents the results, which is followed by a conclusion in Section 5.

2 Theoretical Framework

2.1 Occupation and human capital

Labor market outcomes, such as occupational attainment and earnings, relate to the human capital of the individual. To conceptualize this, we follow the human capital and earnings models that study the behavior of humans in relation to their human capital formation and occupational attainment (Ben-Porath, 1967, 1970; Mincer, 1970; Heckman, 1976; Cunha et al., 2006). In the simplest setting, we assume that individuals choose their occupation in order to maximize their life-time earnings. Further, individuals are assumed to choose the individually optimal investment into human capital that allows them to reach their desired occupation and to maximize their earnings (Blau et al., 1956). Thus, labor market outcomes, such as occupational attainment and earnings, can be depicted as:

$$max(LM outcome) = f(H) + \epsilon \tag{1}$$

Where ϵ signifies the idiosyncratic difference in labor market outcomes and H the human capital of the individual. Human capital is considered a latent variable as there does not exist one variable that allows us to measure it directly. It is rather a combination of different factors which define it, including skills (S) and other individual characteristics (I), socio-economic characteristics related to the family background (F), and other factors, which affect the labor market outcome (X), including labor market experience, labor market conditions and health (Mincer, 1970, 1974). Therefore, human capital can be

formally described as:

$$H = \alpha S + \beta I + \delta F + \gamma X + \mu \tag{2}$$

The individual skill set S refers to cognitive and non-cognitive skills, which are key determinants for labor market outcomes of the individual. Cognitive skills, often referred to as education or level of technical skills, are closely associated with the individuals occupational attainment as well as earning differentials (Cawley et al., 2001; Finnie and Meng, 2002; Hanushek and Woessmann, 2008; McIntosh and Vignoles, 2001). In addition to cognitive skills, non-cognitive skills, such as personality traits or interpersonal skills, relate to labor market outcomes. In particular, empirical evidence suggests that personality traits affect job search behavior, occupational attainment, job satisfaction, work behavior, and income (Ones et al., 2003; Judge et al., 2002b,a).

In addition to cognitive and non-cognitive skills other characteristics related to the individual (I) such as gender, age and ability shape the occupation decision and the earnings potential. In the context of developing countries gender plays an important role with respect to labor market outcomes as females face different constraints compared to men. Evidence from Schmidt and Strauss (1975) suggests that females are less likely to work in high skilled white collar jobs. Besides those individual characteristics, the socio-economic and family background matters for the formation of human capital and thus labor market related decisions (F). Social capital is also an important factor. Evidence from (Bentolila et al., 2010) shows that the the network of the individual or family increase the chance of finding job opportunities. Finally, the general labor market situation and other regional disparities are decisive for the individual decision making and realization from human capital investments (X).

We therefore capture these aspects in our model and include measures for each facet of human capital into the analysis.

2.2 Definition of non-cognitive skills

As was previously described, personality traits build a part of the individuals human capital. Besides the Big Five model, which is the most prominent concept, there are other measures that capture a persons personality, such as locus of control, trust, risk attitudes, and patience.

The Big Five Inventory   The Big Five model proposed by McCrae and John (1992); Costa and Mc-Crae (1997) is the most cross-culturally validated model of personality traits (Stuetzer et al., 2018). The factors are relatively stable over an individual's lifetime (Heineck and Anger, 2010) and are considered heritable (Hofstede and McCrae, 2004). The Big Five model includes traits of Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism.[2] Openness captures how individuals value new experiences and changes (Rolland, 2002). An open person is creative and enthusiastic about complex jobs. Previous research finds that individuals who are more open, opt for self-employment (Obschonka and Stuetzer, 2017; Stuetzer et al., 2018) or prefer professional jobs requiring analytical and creative thinking (Wells et al., 2016; John and Thomsen, 2014). Conscientiousness depicts how an individual handles tasks. Persons displaying high levels of Conscientiousness are responsible, efficient and hardworking, in their own work and the work done for others (Wichert and Pohlmeier, 2010). Extraversion captures the individual's social relationship. A person with a high level of Extraversion seeks to establish contact with others, displays confidence and is positive (Schäfer, 2016; Wichert and Pohlmeier, 2010). Extroverted

---

[2] See Table A.1 in the appendix for a graphic overview

individuals are expected to choose and perform better in jobs involving social interaction (Barrick and Mount, 1991). Agreeableness refers to the quality of interpersonal relationships of the individual. An agreeable person is caring and selfless. Neuroticism captures how an individual behaves under stressful situations. Scoring high on this factor indicates that the individual is emotionally unstable and does not cope well with stress (Rammstedt, 2007; Schmitt et al., 2008). Overall, Conscientiousness is considered as the most important predictor of occupational performance (Barrick and Mount, 1991). In case of Openness, there is no consensus on the influence of higher Openness on earnings, with studies demonstrating both positive (Mueller and Plug, 2006) and negative association (Seibert and Kraimer, 2001). An extraverted person earns more and is more successful at work, while an agreeable individual would display lower job satisfaction (Seibert and Kraimer, 2001). Agreeableness is also linked positively to the individual's normative commitment (Erdheim et al., 2006). Scoring high on Neuroticism negatively influences earnings and job satisfaction (Nyhus and Pons, 2005). Specifically for entrepreneurship, a successful entrepreneur scores high on Extraversion, Conscientiousness, and Openness and low on Agreeableness and Neuroticism (Stuetzer et al., 2018; Obschonka and Stuetzer, 2017).

Additional non-cognitive skills   Another non-cognitive skill is the locus of control, which captures the individuals belief of how much their decisions affect their outcomes (Rotter, 1966). A person with an internal locus of control believes that reinforcement in life is contingent on their actions (Piatek and Pinger, 2016). In contrast, a person with an external locus of control views their life as being beyond their control and, rather, influenced by external factors such as destiny (Caliendo et al., 2015). We expect that individuals with an internal locus of control to be more likely to step out of their comfort zone. Hence, this trait might be stronger in entrepreneurs or managers and less visible in professionals (John and Thomsen, 2014). Additionally, it is proposed that individuals with a stronger internal locus tend to invest in themselves, for example in education and training (Piatek and Pinger, 2010) and in their businesses and employees (Sharma and Tarp, 2018). These individuals also engage in high paying jobs and show greater mobility towards higher paying jobs (Schnitzlein and Stephani, 2016). Trust is the quality of an individual to rely on others, to trust them and their dealing of strangers (Caliendo et al., 2012). Caliendo et al. (2014) find that a trustworthy person is more likely to start a business. The most researched personality trait in labor force participation is the risk attitude of the individual (Caliendo et al., 2010). If the individual is risk averse, they will prefer more stable job profiles such as permanent employment or the default of subsistence farming. On the contrary, a risk-loving individual is more likely to engage in self-employment or adopt new technologies (Dustmann et al., 2017; Falk et al., 2018). Another variable is patience, which refers to the individuals willingness to wait. Patient people are more likely to save and disply higher educational attainment (Falk et al., 2018) which might lead to better occupational outcomes. Literature posits that being patient might positively influence entrepreneurial decisions (Caliendo et al., 2012). However, Caliendo et al. (2014), find that patience is collinear with emotional stability or Neuroticism included in the Big Five, and, therefore, would display no effect on the occupational decision. We are unclear about the expectations in this regard.

3 Study Design

3.1 Country Background and Data

We use micro data originating from the Thailand Vietnam Socio Economic Panel (TVSEP). The economic, cultural and institutional background across the two countries is quite diverse. While Thailand is

a constitutional monarchy which operates under relatively free, market driven policies, Vietnam belongs to the four remaining countries worldwide which are governed by a one-party socialist system openly advocating communism (Gloede et al., 2015).[3] Economic development across Thailand and Vietnam differs substantially. According to their Gross Domestic Product (GDP) per capita, Vietnam belongs to the lower-middle-income economies, while Thailand is classified as an upper-middle income country (World Bank, 2018). Despite recent growth and increases in overall household wealth, pockets of poverty persist in rural areas of both countries (Hardeweg et al., 2013b).

Since 2007, the TVSEP regularly administers surveys among rural households in Thailand and Vietnam. Until now, six additional waves have been conducted, in 2008, 2010, 2011, 2013, 2016 and 2017. The Thai data were collected in the provinces Buriram, Nakhon Panom and Ubon Ratchathani and the Vietnamese data in the provinces Thua Thien Hue, Ha Tinh and Dak Lak. Figure A.1 in the Appendix exhibits an overview of the survey region. The survey covers 4,000 rural households in 440 villages. For the purpose of this study, we use data on 2,734 individual respondents who answered the subsection on personality traits. The sample is not exactly identical to the household sample due to three reasons: First, common survey attrition; Second, we have to exclude households that did not answer the survey items; Third, we apply an age restriction and only include respondents aged between 17 to 64 years because our analysis focuses on working-age individuals (OECD, 2019).

The household sample in each province was randomly drawn based on a stratification process considering the heterogeneous agro-ecological conditions within the regions.[4] All monetary variables were converted to 2005 Purchasing Power Parity USD (PPP USD) equivalents.

In both countries, an almost identical household survey is applied. It consists of nine sections covering individual information on household members (e.g. age, education, health, and employment) as well as household-level information on expenditures, shocks, risks, income earning activities such as farming, livestock raising and fishing, household financial situation, housing conditions, transfers received, and assets owned. In addition to the household survey, a village-level survey is administered to the village chief collecting information on the village location, population, infrastructure, employment, agriculture, and economic conditions.

In the 2017 panel wave of the TVSEP, an additional module was included which asks for the established psychological personality inventories. These questions allow to study personality traits and their consequences on a large, representative sample of rural households in Thailand and Vietnam and to relate them to a rich set of socio-economic variables.

For our analysis, we categorize our sample of working age individuals by occupation type and define seven occupation categories: Subsistence farming, commercial farming, self-employed, permanent wage employed, worker (casual), housewife and not working.[5] We separate between subsistence farming and commercial farming to get a more comprehensive understanding of peoples job opportunities.[6] The survey setting is rural areas in Thailand and Vietnam. Naturally, people mainly work in farming. In our sample, 67% of the respondents report agriculture as their main occupation, of those 67%, 42% are engaged in subsistence farming, meaning that their agricultural output is mainly used for home consumption and not for commercial gain. 25% are engaged in commercial farming. The remaining 33% of the sample engage in different wage generating activities. The majority of people that do not work in the farming sector are self-employed (12%). Respondents run various kinds of businesses, for example retail or small food

---

[3]   The other three countries are China, Cuba and Lao PDR.
[4]   See Hardeweg et al. (2013b) for a detailed overview of the sampling strategy.
[5]   We build the occupation categories based on self reported answers from the respondent about their main occupation.
[6]   Respondents are categorized as being engaged in subsistence farming, if the share of income from farming of the respondents household is less than 0.5. If the farming share from the household income is larger than 0.5, the respondent is said to be engaged in commercial farming.

shops. 9% are employed permanently. Respondents engaged in permanent wage employment have on the highest education, with an average of 10 years. 6% of respondents are casual workers, 4% housewives and 2% do not work.

In order to validate our survey measures we use additional data from a TVSEP Add-on project that was conducted in Ubon Rathathani, Thailand, in November 2017 amongst the same households. [7] The Add-on questionnaire includes the exact same questions on personality traits as the TVSEP household survey from summer 2017. This gives us the unique opportunity to compare the answers from one individual at two different points in time for one of the TVSEP survey provinces. Hence, we can test the stability of the survey measure. We identified 505 cases where the respondent in the summer and in November are the same person. For these 505 cases, we compare the answers given in the summer with those given in November.

3.2 Measurement of personality traits

We capture the different aspects of personality by using nine distinct measures: the Big Five inventory, locus of control, risk and trust. Apart from the Big Five Inventory, all items have been asked and tested in previous survey waves.

The Big Five Inventory   We follow the Big Five model (Costa and McCrae, 1992, 1997) which has become the standard personality measurement in psychology, described in Section 2.2. The model defines personality along the five following dimensions: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. The survey questions used to capture these dimensions are based on the Big Five personality inventory questions used in the German Socio Economic Panel (SOEP).[8] Similar questions are used in the British micro panel survey and World Bank surveys across different countries (Guerra et al., 2016). In the respective questionnaire section in the TVSEP survey, respondents are asked how much they agree with different statements about themselves. They rank their answers on a 7 point Likert scale ranging from 1 to 7, where 1 means "Does not apply to me at all" and 7 means "Applies to me perfectly". In total, respondents are presented with 15 survey questions. Figure A.2 in the Appendix exhibits an overview of the survey questions.[9]

Locus of control   We capture the extent to which respondents believe that they have control over their life outcomes by using a survey item that asks about the reasons for why people have low incomes. Answers include among others: *pure luck*, *knowing the right people*, or *hard work good education*. The item scale ranges from 1 to 9, where 1 means that the person has a complete external locus of control and 9 means that the person has a complete internal locus of control.

Risk   We capture someones willingness to take risks by using the standard risk measurement item used in many economic studies. The question asks: *Are you generally a person who is fully prepared to take risks or do you try to avoid taking risk?* Respondents can rank themselves on a scale from 0 to 10.

---

[7] The Add-on project is about *Behavioral insights into over-indebtedness within a vulnerable population.* For more details on the Add-on project, see Klühs et al. (2019).

[8] See survey page for details: https://www.diw.de/en/soep

[9] An identical set of questions was administered to individuals who participated in the Add-on project. However, the answer modalities differed slightly. Although, the items are measured on the same scale (7 point Likert scale), each number on the scale was labelled explicitly (each answer option is associated with a specific phrase, e.g. 1 means Disagree fully, 3 means Disagree a little, 6 means Agree strongly). Despite these differences, we rely on the comparison of the TVSEP data with the Add-on data to reveal, if the measures are reliable or not.

0 means *Unwilling to take risks* and 10 means *Fully prepared to take risk*. This survey measure has been experimentally validated for the TVSEP data by Hardeweg et al. (2013a)

Trust   Trust is measured by a dummy variable, based on the following question: *Generally speaking, would you say that most people can be trusted or that you need to be very careful when dealing with people?* The variable is 0 if the respondents answer is *Need to be very careful when dealing with people* and 1 if the answer is *Most people can be trusted*. Similar scales have been applied in the SOEP and validated by Becker et al. (2012); Dohmen et al. (2009).

Patience   We measure a persons patience through the following question: *Are you generally a person who is fully prepared to give up something now in order to gain more in the future?* Again, respondents rank themselves on a scale from 0 to 10, where 0 means *Unwilling to wait* and 10 means *Fully prepared to wait*. Similar questions have been used in other major surveys such as the Global Preference Survey and validated by (Falk et al., 2018, 2016).

3.3   Labor market status and characteristics of sample population

In this section we give an overview of characteristics of the whole TVSEP population. In total, the survey population covers information on about 11,000 working-age individuals. Working-age individuals refers to people aged 17-64 (OECD, 2019). While we have individual information about all working-age household members, the personality traits section was only answered by the household head or his/her spouse. However, we use information on the total sample of working-age individuals to shed light on the overall labor market situation in our study areas. Hereby, we want to give an idea about the differences between our sample population – that consists only of the respondents – and the rest of the survey population, which is representative for rural households in these areas. Table 1 displays the main characteristics of the working-age population and the respondents and Figure 1 shows the employment status and sector composition of employment for the working-age population[10] in our sample.

The average working-age individual in our survey is about 38 years old, has 8.6 years of education and belongs to the ethnic majority of the respective country (Thai or Kinh). The gender ratio is on par and every second person reports to be engaged in farming. The distribution of employment status shows that a large share (40 %) of the working-age population is engaged in either subsistence or commercial farming. Given that many households operate their own farming business the labor market status of these people is similar to being self-employed. About one fourth of the working-age individuals are permanently employed, 9 percent are in casual employment, and 8 percent are self-employed outside agriculture. While agriculture is clearly the most important sector for employment, production & industry and crafts & services together account for one fourth of the employment.

As Table 1 shows the respondents differ from the rest of the working-age population in relation to age, gender, literacy and education. Given that the project aims to interview the household head or his/her spouse this is not surprising. However, it also means that our results can not be generalized to the total working-age population in the survey areas. The average respondent in our sample is engaged in farming, 49 years old, female, and has 6 years of education.

---

[10] We us data on all working-age individuals collected in the survey. Working-age refers to individuals aged 17 to 64 years of age

Table 1: Descriptive statistics of working-age sample population

	Sample working-age population	Thailand Respon-dents	Rest of working-age population	Sign.	Vietnam Respon-dents	Rest of working-age population	Sign.
Age (years)	37.79	47.74	35.82	***	50.51	32.61	***
Gender (in %) (1=Female)	0.50	0.59	0.46	***	0.70	0.46	***
Literacy (in %)	0.96	0.92	0.99	***	0.98	0.94	***
Education (years)	8.63	6.95	9.58	***	6.34	8.93	***
Ethnic majority (in %)*	0.87	0.76	0.97	***	0.96	0.78	***
Religious (in %)*	0.64	0.29	1.00	***	1.00	0.29	***
Farmer (in %)	0.50	0.84	0.38	***	0.77	0.44	***
N	11,292	1,643	4,287		1,540	3,822	

Note: Whole sample refers to the total working-age population covered in the sample. Working-age refers to individuals aged 17 to 64. Respondents are those individuals who answered the questionnaire i.e. those individuals who responded to the character traits and risk-related questions. *, **, and *** denote significance at the 10, 5, and 1 percent levels for two-sided ttests.
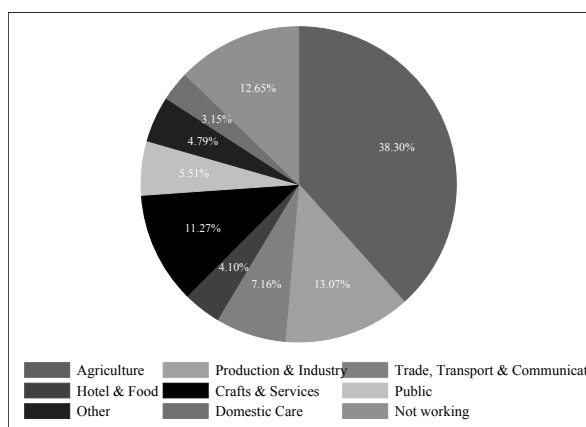*Shares for Religious and Ethnicity are based on answers from the respondent about the respective household member
Source: Authors' calculations.

Figure 1: Employment status of working-age population*

(a) Occupational attainment
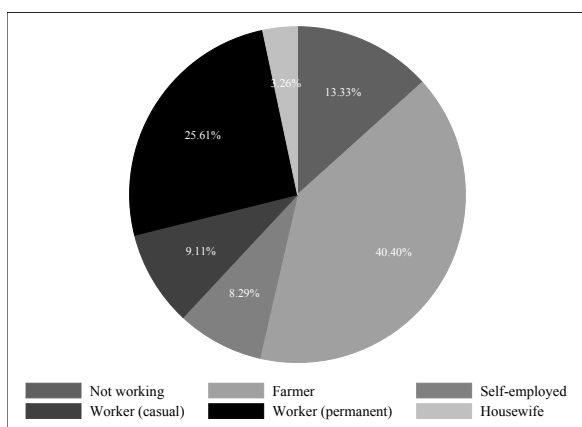
(b) Sector of employment

Note: Working-age population refers to all individuals covered in the survey aged between 17 and 64 years old.
Source: Authors' calculations.

3.4 Specification of econometric models

In the analysis, we use different methodologies to address our research questions. We start by assessing the internal validity of the survey measure for personality traits in our sample and use descriptive statistics to analyze differences between occupation groups. We then apply a multinomial logit regression to estimate the influence of personality traits on an individual's occupational attainment.

In the first step, we address the internal validity of the Big Five model for our sample population in three ways: (i) we compute the Cronbach's itemized alpha coefficient to test for internal consistency of the scales, (ii) we conduct a PCA based on the survey questions, and (iii) we test the stability of the personality traits over time. The Cronbach's itemized alpha coefficient (Cronbach, 1951) is widely used in the psychological literature and tests the internal consistency of the scales across the survey questions and across the five personality traits (Schäfer, 2016; Yomaboot and Cooper, 2016).

We use a principal component analysis (PCA) to validate the structure of the personality factors for the sample population (Schmitt et al., 2007). The PCA is based on the 15 personality questions administered to respondents in the household questionnaire (see Table A.2) and allows it us to reduce the dimension of the traits variables by creating factors which are homogeneous within themselves and heterogeneous between each other (Backhaus et al., 2011). In order to compare our measures with other studies, we also construct simple averages for the respective Big Five traits to produce comparable measures of the personality traits for our sample population (see Tables A.1 and A.2 for relation between personality traits and survey questions). We use the Kaiser criterion (K1) (Ford et al., 1986) which retains all factors with eigenvalues greater or equal to one, to determine the number of factors to be retained, resulting in five factors which explain a total of 56% of the variance. Following Hair et al. (2009), only the factors with loadings greater than 0.30, i.e. meeting the minimum practical significance level, are interpreted.

To validate the stability of the personality traits in our sample, we use data from an Add-on project conducted in Ubon Ratchathani. Given that the same individuals were asked the same type of questions, this allows us to compare the responses from the same person at two different points in time. A two-sided ttest is executed to compare the results.

In the second step of the analysis, we group individuals into seven occupation groups: (i) subsistence farming, (ii) commercial farming, (iii) self-employed, (iv) worker casual, (v) worker permanent, (vi) housewife, and (vii) not working. The grouping is based on the self-reported information regarding the 'main occupation in the reference period'. We use two-sided ttests to detect differences between different types of occupations with respect to personality traits, cognitive skills, and individual characteristics such as age, religion, ethnicity and gender.

In the thrid step, we use a multinomial logit model to understand, in how far the individual's personality traits predict occupational attainment. The concept of the human capital approach, described in Section 2.2 is the basis for our regression model and the variables included. The regression takes the following form:

$$Pr(O_{ijr} = 0) = \beta_0 + \beta_1 E_{ijrc} + + \beta_2 P_{ijrc} + \gamma_1 I_{ijr} + \gamma_2 HH_{jr} + \gamma_3 LM_r + \gamma_4 D_r + \epsilon_{ijr} \tag{3}$$

Where O_{ijr} denotes probability of individuals i in household j and region r to engage in an occupation in relation to the base category of being a subsistence farmer. E_{ijrc} represents the cognitive skills of individuals measured as years of schooling. The vector P_{ijrc} captures the set non-cognitive skills of each individual, including the Big Five measures as well as the variables on locus of control, patience, risk and trust. I_{ijr} and H_{jr} are vectors of individual and household control variables. These include gender,

age, and being active in a political party. Furthermore we also control for household size, ethnicity and mobile phone ownership refer to socio-economic characteristics related to the family background. Finally, we include controls for the labor market situation (LM_r) at the district level and for the province (D_r) in which the household resided to capture regional differences.

4 Results

4.1 Validity of the survey measure

This section addresses the internal validity of our newly introduced survey measures - the Big Five Inventory. We use an unrestricted sample throughout Section 4.1 and only apply the working age restriction in Sub-section 4.2 and 4.3, where we analyze the relationship between personality traits and occupational attainment.

Cronbach's Alpha   In order to test for internal consistency of the survey measures we compute the Cronbach's itemized alpha coefficient for the overall TVSEP sample as well as for the Ubon Sub-sample. The Cronbach's itemized alpha coefficient ranges between 0.42 and 0.60 across the Big Five factors. The overall reliability lays a 0.64 for the whole sample indicating a good fit (Schäfer, 2016) . For the Ubon Sub-sample the score lays at 0.67. Detailed results are reported in Table A.3 in the Appendix. Our results are similar to those of Rammstedt and John (2007).

Principal Component Analysis   The PCA reveals five factors (see Table A.3 and Figure A.2 in the Appendix). In order to avoid confusion with the five factors from the Big Five model we name our factors: (i) Creativeness, (ii) Diligence, (iii) Skepticism, (iv) Approachability, and (v) Amiableness. Individuals who are creative consider themselves as artistic, have new ideas and an active imagination. They work thoroughly and efficiently, are sociable, and kind to others. People who are diligent are very determined to work (i.e. not lazy at all) and are always considerate and kind to others (i.e. never rude). The factor skepticism combines the items worrying and nervousness. Approachability combines new ideas, talkative, outgoing (i.e. not reserved) and stressed easily (i.e. not relaxed). Finally, Amiableness is a combination of talkative and sociable but also forgiving and kind.

Table 2 shows the correlation between the Big Five factors and the factors derived from the conducted PCA. The results suggest that our factors are relatively close to the Big Five factors. Our factor Creativeness is significantly correlated to the factor Openness from the Big Five model. Similarly, our factor Skepticism can be clearly mapped to the factor Neuroticism, and, our factor Approachability to the Big Five factor Extraversion. For the remaining two factors, Diligence and Amiableness we see correlations with more than one factor or with none of the factors from the Big Five model. Overall, we conclude that it is suitable to use the Big Five factors for our survey population as the results suggest a strong correlation between our factors and the Big Five factors. The same validation technique has been followed by (Rammstedt and John, 2007) to establish the equivalence of the BFI-S to the BFI-44.

Comparison of Sub-Sample   Table 3 depicts the average score for each of the Big Five factors for those individuals included in the TVSEP and the Add-on project. The results reveal that on average the factors differ only slightly between the answers given in the TVSEP data and the Add-on project. The factors Extraversion, Agreeableness and Neuroticism are not statistically different from each other. Although, the factors Openness and Conscientiousness are statistically different from each other, the

Table 2: Correlation between Big Five and Factors from PCA

	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
Creativeness	**0.76**	**0.63**	0.38	0.50	-0.23
Diligence	-0.37	**0.51**	0.12	**0.64**	-0.12
Skepticism	-0.02	0.13	-0.06	0.09	**0.92**
Approachability	0.22	0.08	**0.75**	-0.24	0.11
Amiableness	-0.21	-0.42	0.46	0.32	0.07

Correlation higher than absolute 0.50 are shown in bold.
Source: Authors' calculations.

mean values are still very close together and do not contradict each other. Some of this variation might also be the result of the different answer framing in the Add-on questionnaire. Due to this alteration the answers are not 100 percent comparable. Moreover, questions were posed by enumerators and not self-reported. This might have added some additional variation to the answers. The findings show that the answers are consistent over time, which lets us to believe that overall the 15 survey questions were posed in the correct way and that respondents understood them.

Table 3: Comparison of sample means

	Mean TVSEP	Mean Add-on	Mean Difference
Openness	4.601	4.922	-0.321***
Conscientiousness	5.549	5.743	-0.195***
Extraversion	4.484	4.505	-0.021
Agreeableness	5.593	5.589	0.004
Neuroticism	3.399	3.264	0.135

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels for two-sided ttests.
Source: Authors' calculations.

Overall, the results from the Cronbach's alpha and the PCA indicate that the personality factors in our sample population are similar to the Big Five factors. Furthermore, the comparison between the TVSEP data and the Add-on projects show that individuals answer consistent across the two surveys. Thus, we conclude that the personality trait questions can be utilized to form the Big Five factors for our study population. For comparability we use the average score of the original Big Five factors for the remainder of the study.

4.2 Differences across countries and occupation categories

In this section we briefly review the differences across the Thai and Vietnamese sub sample. Furthermore, we provide a descriptive overview of the different personality traits and some socio-economic characteristics across the different occupation groups.

Table 4 reports the average scores on the question items for the Thai and Vietnamese sub sample. The significance levels refer to the statistical difference between the two countries.

The results illustrate that on average, Vietnamese tend to report a higher score on all factors, except Openness. County differences are highly significant for almost all of the 15 survey items. In general, the Thai population appears to be more homogenous with respect to personality traits. This is not surprising given the ethnic homogeneity in Thailand and the fact that Buddhism has a strong influence on all aspects of live in Thailand. 97% of the Thailand sample population identify themselves as Thai and 99% follow Buddhism. In contrast, rural Vietnam is more diverse in terms of both religion and ethnicity. 78% of the sample population belongs to the majority ethnicity Kinh and 70% consider themselves as Atheists. The results show that the rural Thai population scores higher in the questions related to Openness. Thus,they

are more artistic and have a more active imagination compared to the Vietnamese population. They also score higher on efficiency and being talkative. In contrast, the Vietnamese are less reserved and less rude but score significantly higher on the questions related to Neuroticism.

Table 4: Personality traits by country

Trait	Variables	Thailand	Vietnam	Diff.
Openness	artistic	5.04	3.76	***
	new_ideas	4.59	4.46	*
	active_imagination	4.37	3.97	***
Conscientiousness	work_thorough	5.55	5.72	***
	efficient	5.86	5.47	***
	lazy_r	5.61	6.23	***
Extraversion	talkative	4.98	4.57	***
	sociable	5.06	4.99	
	reserved_r	3.39	4.10	***
Agreeableness	forgiving	5.80	5.81	
	kind	5.96	5.88	*
	rude_r	5.49	5.96	***
Neuroticism	worries	3.86	5.59	***
	nervous	3.51	4.46	***
	relaxed_r	2.66	3.27	***
	N	1575	1595	

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels for two-sided ttests.
Source: Authors' calculations.

Table 5 reports the average scores on the question items for the different categories of occupations – subsistence farmers, commercial farmers, self-employed, casual workers, permanent workers, housewives and non-workers – previously described. The significance levels refer to the statistical difference between one particular group and subsistence farmers.

The results suggest that commercial farmers are significantly different from subsistence farmers along the factors of Openness, Extraversion and Agreeableness as well as trust and patience. For example, commercial farmers are less artistic than the average subsistence farmer as well as less reserved. They also score higher on trust and patience.

Self-employed individuals differ along the factors of Openness and Conscientiousness. Self-employed individuals are more open to new ideas and less lazy than the average subsistence farmer. They are also better educated, with an average of 7.13 years of schooling. The group of casual workers differs along the factors of Openness, Extraversion and Neuroticism. They have an active imagination and tend to worry a lot as well as being nervous easily. They have a lower imagination, are less social and worry less.

In contrast to the casual worker, permanent workers differ along the factors of Conscientiousness and Extraversion. They also have a higher internal locus of control. Permanently employed individuals are significantly more efficient and sociable compared to the average subsistence farmer. With an average age of 46.20 these individuals are significantly younger and with almost 10 years of education they are in comparison the best educated group.

Housewives in our sample population score significantly different on Conscientiousness and Extraversion. They are lazier and less sociable than the average farmer. Housewives score have a higher internal locus of control and score lower on trust. Finally, the group of non-workers differs along the dimension of Neuroticism. Interestingly, individuals who are not working worry less and are less nervous.

In sum, the results indicate that personality traits differ across Thailand and Vietnam as well as across occupation groups. Comparing mean levels of personality traits at national levels is appropriate and aids to understand the link between culture and psychology (Levine, 2001; Saucier Goldberg, 2001). Overall, it reveals that countries and regions differ with regards to the Big Five. Different cultures,

political systems, religion, history etc. are also reflected in peoples personalities. Furthermore, the comparison by occupation group indicates that individuals who opt for self-employment or permanent wage-employment score higher along the factor of Conscientiousness. Furthermore, individuals in these two groups are younger and significantly better educated compared to farmers.

Table 5: Personality traits by occupation

Trait	Variables	Farmer subsistence	Farmer commercial	Self-employed	Worker casual	Worker permanent	House-wife	Not working
Openness	Artistic	4.36	4.05***	4.49	4.39	4.60	4.68	4.80
	New ideas	4.58	4.49	4.82*	4.35	4.77	4.35	4.26
	Active imagination	4.23	4.07*	4.27	3.76**	4.37	3.98	4.07
Conscientious-ness	Work thoroughly	5.63	5.61	5.73	5.46	5.75	5.44	5.30
	Efficient	5.65	5.57	5.72	5.80	5.89**	5.57	5.41
	Lazy	2.10	2.00	1.85**	2.09	1.95	2.60**	2.31
Extraversion	Talkative	4.74	4.79	4.93	4.72	4.86	4.81	4.30
	Sociable	5.06	4.98	4.96	4.72*	5.38*	4.60**	5.00
	Reserved	4.33	3.98***	4.29	4.41	4.48	4.47	4.04
Agreeable-ness	Forgiving	5.85	5.73	5.79	5.68	5.92	5.81	5.85
	Kind	5.96	5.81**	5.92	5.75*	6.05	5.75	5.93
	Rude	2.33	2.20	2.22	2.42	2.31	2.37	2.37
Neuroticism	Worries	4.89	4.82	4.94	4.34***	4.85	4.65	4.09**
	Nervous	4.05	4.19	3.93	3.66*	3.79	4.36	3.20***
	Relaxed	5.02	4.96	5.04	5.04	5.20	4.96	5.02
	Locus of control	4.44	4.37	4.71	4.45	4.85	5.28**	4.98
	Trust	1.78	1.85*	1.73	1.68	1.76	1.61*	1.76
	Risk	6.40	6.38	6.53	6.35	6.30	5.95	5.96
	Patience	6.35	6.64*	6.39	5.92	6.30	5.90	5.80
	Age (years)	50.17	48.87**	48.54***	48.07**	46.20***	48.14	49.31
	Education (years)	6.25	6.40	7.13***	5.83	10.01***	5.89	6.72
	Religious (1=religious)	0.61	0.53***	0.60	0.86***	0.65	0.84***	0.80**
	Ethnicity (1= majority)	0.87	0.76***	0.97***	0.85	0.89	0.87	0.94
	Gender (1=female)	0.66	0.57***	0.70	0.61	0.53***	0.98***	0.56
	N	1134	672	328	162	210	110	54

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels for two-sided t-tests. All subgroups are tested against the group 'subsistence farmer'
Source: Authors' calculations.

14

4.3 Importance of personality traits for occupational attainment

Results from the multionominal logit regression are presented in Table 6. Using Subsistence farming as the baseline occupation, the columns depict the relative odds ratio of one occupation category, each in relation to being a farmer. Controls for individual, household and region-specific effects are included. The pseudo R squared of 0.11 indicates that the model fit is acceptable.

The results show some heterogeneity across groups. For respondents, who score higher on Extraversion the relative odds of choosing to take up Commercial Farming over Subsistence Farming increases. The results match with the idea of an active and outgoing farmer. Moreover, higher levels of Conscientiousness are associated with a higher likelihood of choosing Self-employment or Permanent wage employment over Subsistence farming. Both are occupation categories that require someone to be well organized and responsible. For the group of casual workers we see opting for this occupation category is not only influenced by higher levels of conscientiousness, but also that lower levels of Openness and Patience increase the odds of working in casual wage-employment. Interestingly, we see that having a higher internal locus of control, i.e. a strong feeling that ones own life outcomes are contingent on their actions, increases the relative odds of being a housewife. Furthermore, the results reveal a negative relationship between Neuroticism and being unemployed. Meaning, that respondents, who are not working tend to worry less and are less nervous, which seems puzzling, since unemployment is generally associated with higher stress levels. Overall, our results suggest that personality traits, specifically, Conscientiousness, are associated with the occupational attainment of individuals. In particular, for individuals who score higher on Conscientiousness, the relative odds of choosing self-employment, permanent employment or casual wage employment increase in relation to the odds of opting to become a Subsistence-Farmer. Our results indicate that Conscientiousness is particularly important for choosing higher skilled jobs over farming. This is crucial for development support policies as in order to generate better employment opportunities in rural areas there is not only a need to develop suitable financial instruments, but also to identify individuals who are willing to choose an occupation outside of the farming business.

The individual-level control variables indicate further important differences that relate to occupational attainment. The results confirm that for females the odds of being a housewife are substantially larger than to engage in Subsistence-Farming. Furthermore, the odds of choosing self-employment over Subsistence-Farming are also larger for females. This potentially hints at the fact that households diversify their income earning activities but keep farming one activity that is predominantly conducted by males. Whereas women run small businesses from their home, which also gives them the opportunity to take care of the children at the same time. Given, the rural setting of the sample, where women tend to take care of the children, these results seem plausible. The results are also in line with the fact that women are less likely to engage in Commercial Farming as well. The picture is different for individuals who choose to take up permanent employment rather than becoming a Subsistence-Farmer. The odds for choosing permanent employment over farming is significant but smaller for women meaning that in our sample population it is rather men who opt for permanent wage employment. In terms of age the results clearly show that the odds of choosing self-employment, working casually or permanently decrease in relation to Subsistence-Farming with every year of age. This indicates that younger people opt for occupations other than farming. Finally, for individuals with a higher level of education the odds ratio of choosing self-employment or permanent employment are larger than choosing farming. Thus, higher skilled individuals opt for more complex tasks that are likely related with higher income.

Overall, the results from our regression analysis suggest that Personality Traits are important factors for the occupational attainment of individuals in rural Southeast Asia. Specifically, individuals who are

Table 6: Relation between personality traits and occupational attainment

	Commercial Farming	Self-employed	Wage-employed (permanent)	Worker (casual)	Housewife	Not Working
	(1)	(2)	(3)	(4)	(5)	(6)
Openness	-0.0668	0.0355	-0.0306	-0.213***	0.0214	-0.0369
	(0.0433)	(0.0566)	(0.0704)	(0.0741)	(0.0926)	(0.122)
Conscientiousness	0.0204	0.198**	0.267**	0.193*	-0.159	-0.227
	(0.0622)	(0.0838)	(0.108)	(0.105)	(0.124)	(0.155)
Extraversion	0.0948*	-0.000387	-0.0105	-0.0533	-0.0859	-0.0278
	(0.0490)	(0.0633)	(0.0797)	(0.0843)	(0.103)	(0.135)
Agreeableness	-0.0817	-0.0467	0.0920	-0.0888	0.0713	0.156
	(0.0605)	(0.0790)	(0.102)	(0.0998)	(0.125)	(0.172)
Neuroticism	-0.00842	-0.00702	0.00163	0.0234	0.108	-0.280**
	(0.0489)	(0.0622)	(0.0793)	(0.0835)	(0.104)	(0.135)
Locus of Controls	-0.00435	0.0242	0.0302	-0.0300	0.0794**	0.0432
	(0.0186)	(0.0233)	(0.0291)	(0.0321)	(0.0375)	(0.0504)
Trust	0.0622	-0.151	-0.0946	0.109	-0.0351	0.131
	(0.0765)	(0.102)	(0.123)	(0.130)	(0.166)	(0.213)
Risk	-0.00866	0.00969	-0.0500	-0.000409	-0.0327	-0.0540
	(0.0194)	(0.0252)	(0.0319)	(0.0311)	(0.0373)	(0.0512)
Patience	0.0118	-0.0102	-0.0131	-0.0540*	-0.0313	-0.0375
	(0.0191)	(0.0240)	(0.0304)	(0.0296)	(0.0366)	(0.0503)
Age	-0.00842	-0.0244***	-0.0310***	-0.0479***	-0.0220	-0.0322*
	(0.00635)	(0.00825)	(0.00924)	(0.0109)	(0.0135)	(0.0172)
Years of Schooling	0.00786	0.0786***	0.279***	-0.0324	-0.00273	0.0257
	(0.0174)	(0.0212)	(0.0240)	(0.0306)	(0.0367)	(0.0480)
Religious	-0.325**	-0.313	0.0567	0.303	0.332	0.616
	(0.158)	(0.205)	(0.250)	(0.336)	(0.379)	(0.534)
Ethnicity	-0.170	1.655***	-0.209	-0.454	-0.339	-0.220
	(0.173)	(0.366)	(0.308)	(0.317)	(0.422)	(0.721)
Gender	-0.279**	0.272*	-0.423**	-0.357*	3.202***	-0.448
	(0.109)	(0.148)	(0.174)	(0.186)	(0.721)	(0.296)
Constant	-0.158	-3.066**	-16.64	4.216***	-1.424	2.802
	(0.767)	(1.210)	(783.3)	(1.349)	(1.769)	(2.112)
Controls	x	x	x	x	x	x
Observations	2,658	2,658	2,658	2,658	2,658	2,658
R2	0.113	0.113	0.113	0.113	0.113	0.113
Chi2	926.9	926.9	926.9	926.9	926.9	926.9

Note: *, **, and *** denote significance at the 10, 5, and 1 percent levels. Clustered standard errors in parentheses.
Source: Authors' calculations

more conscientious and are better educated opt for self-employment and permanent wage employment. Furthermore, gender norms are quite persistent and women are more likely to take up housework or engage in self-employment rather than farming.

5   Conclusion

In this paper, we analyze the relationship between individual personality traits and the occupational attainment of individuals in emerging economies. To achieve this, we employ data from a comprehensive household survey from Thailand and Vietnam collected under the Thailand Vietnam Socio Economic Panel. As this is the first paper that uses the personality questions from this data set, our first research question examines the validity of the Big Five model for our sample. The results from the Cronbach's alpha and the PCA confirm the validity of the survey measurement tool applied. An additional robustness test is executed by comparing the results from one province with a sub sample that was interviewed under an Add-on project. The answers of the respondents illustrate consistency over time.

In addition, we investigate the importance of personality traits across countries and different occupation groups. Our results suggest that on average personality traits are more homogeneous among the Thai compared to the Vietnamese sub sample. While the Thai score higher on questions related to Openness, the Vietnamese sample reports to be less reserved and less rude and scores higher on questions related to Neuroticism. Furthermore, self-employed and permanently employed individuals are younger and better educated and report higher levels of Openness, Conscientiousness and Extraversion. Interestingly, individuals that are not working display lower levels of Neuroticism.

We further examine the influence of personality traits on occupational attainment and compare across occupations that could be a possible alternative to subsistence farming in our sample. we perform a multinomial logit estimation and find that the Big Five and Conscientiousness in particular are the most important predictor of occupational attainment of an individual in Southeast Asia. Other non-cognitive skills, such as locus of control, trust, risk and patience play an inferior role in predicting occupational attainment. Conscientious and more educated individuals opt for self-employment or permanent wage jobs. Women are mostly engaged as housewives. However, women are more likely to prefer self-employment over farming.

Our study contributes to the literature by providing empirical evidence not only in the context of developing countries but also in reference to rural job markets. The results emphasize the important role of personality traits in individual decision making. From a policy perspective, a better understanding of personality traits would aid in efficient policy making. The need to rethink development policy to account for human factors has been widely identified (World Bank, 2015). Success of most development policies is contingent on an individual's participation, which again depends on the individual's personality. This is especially important for labor market policies. While policy makers can improve employment services and incentivize self-employment through offering micro grants, it is up to the population to size these opportunities.

In the next step, we aim to utilize the panel structure of TVSEP and look at the family background of the respondents and their past shock experience.

References

Attanasio, Orazio, Sarah Cattan, Emla Fitzsimons, Costas Meghir, and Marta Rubio-Codina, "Estimating the Production Function for Human Capital: Results from a Randomized Control Trial in Colombial." NBER Working Paper No. 20965, National Bureau of Economic Research, Cambridge, MA, USA 2015.

Backhaus, Klaus, Bernd Erichson, Wulff Plinke, and Rolf Weiber, *Multivariate Analysemethoden: Eine anwendungsorientierte Einfhrung*, 13th ed., Berlin, Heidelberg, New York: Springer-Verlag, 2011.

Banerjee, Abhijit V and Esther Duflo, 2007, "The Economic Lives of the Poor." *The journal of economic perspectives : a journal of the American Economic Association*, *21* (1), 141–167.

Barrick, Murray R. and Michael K. Mount, 1991, "The Big Five Personality Dimensions and Job Performance: A Meta Analysis." *Personal Psychology*, *44* (1), 1–26.

Becker, Anke, Thomas Deckers, Thomas Dohmen, Armin Falk, and Fabian Kosse, 2012, "The Relationship Between Economic Preferences and Psychological Personality Measures." *Annual Review of Economics*, *4* (1), 453–478.

Ben-Porath, Yoram, 1967, "The Production of Human Capital and the Life Cycle of Earnings." *Journal of Political Economy*, *75* (4), 352–365.

Ben-Porath, Yoram, "The Production of Human Capital over Time." in W. Lee Hansen, ed., *Education, Income and Human Capital*, New York, U.S.: National Bureau of Economic Research, 1970, pp. 129–147.

Bentolila, Samuel, Claudio Michelacci, and Javier Suarez, 2010, "Social Contacts and Occupational Choice." *Economica*, *77* (305), 20–45.

Blau, Peter M., John W. Gustad, Richard Jessor, Herbert S. Parnes, and Richard C. Wilcoc, 1956, "Occupational Choice: A Conceptual Framework." *Industrial and Labor Relations Review*, *9* (4), 531–543.

Caliendo, Marco, Deborah A. Cobb-Clark, and Arne Uhlendorff, 2015, "Locus of Control and Job Search Strategies." *Review of Economics and Statistics*, *97* (1), 88–103.

Caliendo, Marco, Frank Fossen, and Alexander Kritikos, 2010, "The impact of risk attitudes on entrepreneurial survival." *Journal of Economic Behavior & Organization*, *76* (1), 45–63.

Caliendo, Marco, Frank Fossen, and Alexander Kritikos, 2012, "Trust, positive reciprocity, and negative reciprocity: Do these traits impact entrepreneurial dynamics?" *Journal of Economic Psychology*, *33* (2), 394–409.

Caliendo, Marco, Frank Fossen, and Alexander S. Kritikos, 2014, "Personality characteristics and the decisions to become and stay self-employed." *Small Business Economics*, *42* (4), 787–814.

Campbell, Duncan, *The global crisis: causes, responses and challenges*, Geneva: International Labour Office, 2011.

Campbell, Duncan and Ishraq Rayeed Ahmed, "The Labour Market in Developing Countries." in "in" 2012.

Cawley, John, James Heckman, and Edward Vytlacil, 2001, "Three observations on wages and measured cognitive ability." *Labour Economics*, *8* (4), 419 – 442.

Cobb-Clark, Deborah A. and Michelle Tan, 2011, "Non-cognitive skills, occupational attainment, and relative wages." *Labour Economics*, *18*, 1–13.

Costa, Paul T. Jr. and Robert R. McCrae, "Revised NEO Personality Inventory (NEO-PI-R) and NEO Five Factor Inventory (NEO-FFI) Professional Manual." Technical Report, Odessa, FL, USA 1992.

Costa, Paul T. Jr. and Robert R. McCrae, 1997, "Personality trait structure as a human universal." *American Psychologist*, *52*, 587–596.

Cronbach, Lee J., 1951, "Coefficient alpha and the internal structure of tests." *Psychometrika*, *16* (3), 297–334.

Cunha, Flavio, James J. Heckman, Lance J. Lochner, and Dimitriy V. Masterov, "Interpreting the Evidence on Life Cycle Skill Formation." in Eric A. Hanusheck and Finis Welch, eds., *Handbook of the Economics of Education (Vol. 1)*, Amsterdam and Oxford: Elsevier, 2006, pp. 697–805.

Dohmen, Thomas, Armin Falk, David Huffman, and Uwe Sunde, 2009, "Homo Reciprocans: Survey Evidence on Behavioural Outcomes*." *The Economic Journal*, *119* (536), 592–612.

Dustmann, Christian, Francesco Fasani, Xin Meng, and Luigi Minale, 2017, "Risk Attitudes and Household Migration Decisions." *SSRN Electronic Journal.*

Erdheim, Jesse, Mo Wang, and Michael J. Zickar, 2006, "Linking the Big Five personality constructs to organizational commitment." *Personality and Individual Differences*, *41* (5), 959–970.

Falk, Armin, Anke Becker, Thomas Dohmen, Benjamin Enke, David Huffman, and Uwe Sunde, "The preference survey module: A validated instrument for measuring risk, time, and social preferencesl." IZA Discussion Paper No. 9674, Institute of Labor Economics, Bonn, Germany 2016.

Falk, Armin, Anke Becker, Thomas Dohmen, Benjamin Enke, David Huffman, and Uwe Sunde, 2018, "Global Evidence on Economic Preferences." *The Quarterly Journal of Economics*, *133* (4), 1645–1692.

Finnie, Ross and Ronald Meng, 2002, "Minorities, Cognitive Skills and Incomes of Canadians." *Canadian Public Policy / Analyse de Politiques*, *28* (2), 257–273.

Ford, J. Kevin, Robert C. MacCallum, and Marianne Tait, 1986, "The application of exploratory factor analysis in applied psychology: A critical review and analysis." *Personnel Psychology*, *39* (2), 291–314.

Gertler, Paul, James Heckman, Rodrigo Pinto, Arianna Zanolini, Christel Vermeersch, Susan Walker, Susan M. Chang, and Sally Grantham-McGregor, 2014, "Labor market returns to an early childhood stimulation intervention in Jamaica." *Science*, *344*, 998–1001.

Gloede, Oliver, Lukas Menkoff, and Hermann Waibel, 2015, "Shocks, Individual Risk Attitude, and Vulnerability to Poverty among Rural Households in Thailand and Vietnam." *World Development*, *71*, 55–78.

Gollin, Douglas, David Lagakos, and Michael E. Waugh, 2014, "The Agricultural Productivity Gap." *Quarterly Journal of Economics*, *129* (2), 939–993.

Guerra, N., K. Modecki, and W. Cunningham, "Developing Socio-Emotional Skills for the Labor Market - The Practise Model." Policy Research Working Paper No. 7123, World Bank, Washington D.C., USA 2016.

Hair, Joseph F., William C. Black, Barry J. Babin, and Rolph E. Anderson, *Multivariate data analysis*, 7 ed., Harlow, Essex, UK: Pearson Education Limited, 2009.

Hanushek, Eric A. and Ludger Woessmann, 2008, "The Role of Cognitive Skills in Economic Development." *Journal of Economic Literature*, *46* (3), 607–68.

Hardeweg, Bernd, Lukas Menkhoff, and Hermann Waibel, 2013, "Experimentally Validated Survey Evidence on Individual Risk Attitudes in Rural Thailand." *Economic Development and Cultural Change*, *61* (4), 859–888.

Hardeweg, Bernd, Stephan Klasen, and Hermann Waibel, "Establishing a Database for Vulnerability Assessment." in Stephan Klasen and Hermann Waibel, eds., *Vulnerability to Poverty: Theory, Measurements and Determinants with Case Studies from Thailand and Vietnam*, Basingstoke, UK: Palgrave Macmillan, 2013, pp. 50–79.

Heckman, James and Flavio Cunha, 2007, "The Technology of Skill Formation." *American Economic Review*, *97* (2), 31–47.

Heckman, James J., 1976, "A Life-Cycle Model of Earnings, Learning, and Consumption." *Journal of Political Economy*, *84* (4, Part 2), S9–S44.

Heineck, Guido and Silke Anger, 2010, "The returns to cognitive abilities and personality traits in Germany." *Labour Economics*, *17* (3), 535–546.

Hofstede, Geert and Robert R. McCrae, 2004, "Personality and Culture Revisited: Linking Traits and Dimensions of Culture." *Cross-Cultural Research*, *38* (1), 52–88.

Jencks, Christopher, Susan Bartlett Mary Corcoran James Crouse David Eaglesfield Gregory Jackson Kent McCelland Peter Mueser Michael Olneck Joseph Schwartz Sherry Ward and Jill Williams, *Who gets ahead? The Determinants of Economic Success in America*, New York, U.S.: Basic Books, 1979.

John, Katrin and Stephan L. Thomsen, 2014, "Heterogeneous returns to personality: the role of occupational choice." *Empirical Economics*, *47*, 553–592.

Judge, Timothy A., Daniel Heller, and Michael K. Mount, 2002, "Five-factor Model of Personality and Job Satisfaction: A Meta-analysis." *Journal of Applied Psychology*, *87*, 530–41.

Judge, Timothy A., Joyce E. Bono, Remus Ilies, and Megan W. Gerhardt, 2002, "Personality and Leadership: A Qualitative and Quantitative Review." *Journal of Applied Psychology*, *87*, 765–80.

Klühs, Theres, Melanie Koch, and Wiebke Stein, "Don't Expect Too Much: The Effect of Biased Expectations on (Over)-Indebtedness." 2019. Mimeo.

Laajaj, R. and K. Macours, "Measuring SKills in Developing Countries." Policy Research Working Paper No. 8000, World Bank, Washington D.C., USA 2017.

McCrae, Robert R. and Oliver P. John, 1992, "An Introduction to the Five-Factor Model and Its Applications." *Journal of Personality*, *60* (2), 175–215.

McIntosh, Steven and Anna Vignoles, 2001, "Measuring and Assessing the Impact of Basic Skills on Labour Market Outcomes." *Oxford Economic Papers*, *53* (3), 453–481.

Mincer, Jacob, 1970, "The Distribution of Labor Incomes: A Survey with Special Reference to the Human Capital Approach." *Journal of Economic Literature*, *8* (1), 1–26.

Mincer, Jacob, "Schooling, Experience, and Earnings." Technical Report, National Bureau of Economic Research, New York 1974.

Mueller, Gerrit and Erik Plug, 2006, "Estimating the effect of personality on male and female earnings." *Industrial and Labor Relations Review*, *60* (1), 3–22.

Nyhus, Ellen K. and Empar Pons, 2005, "The effects of personality on earnings." *Journal of Economic Psychology*, *26*, 363–384.

Obschonka, Martin and Michael Stuetzer, 2017, "Integrating psychological approaches to entrepreneurship: the Entrepreneurial Personality System (EPS)." *Small Bus Econ*, *49*, 203–231.

OECD, "Working age population." https://data.oecd.org/pop/working-age-population.htm 2019. [Online; accessed 12-June-2019].

Ones, Deniz S., Chockalingam Viswesvaran, and Frank L. Schmidt, 2003, "Personality and absenteeism: a meta-analysis of integrity tests." *European Journal of Personality*, *17* (S1), S19–S38.

Osborne Groves, Melissa, 2003, "How important is your personality? Labor market returns to personality for women in the US and UK." *Journal of Economic Psychology*, *26*, 827–841.

Parvathi, Priyanka and Trung Thanh Nguyen, 2018, "Is Environmental Income Reporting Evasive in Household Surveys? Evidence From Rural Poor in Laos." *Ecological Economics*, *143*, 218–226.

Piatek, Remi and Pia Pinger, "Maintaining (Locus of) Control? Assessing the Impact of Locus of Control on Education Decisions and Wages." SOEP Papers No. 338, German Institute for Economic Research (DIW), Berlin, Germany 2010.

Piatek, Rmi and Pia Pinger, 2016, "Maintaining (Locus of) Control? Data Combination for the Identification and Inference of Factor Structure Models." *Journal of Applied Econometrics*, *31* (4), 734–755.

Rammstedt, Beatrice, 2007, "The 10-Item Big Five Inventory: Norm Values and Investigation of Sociodemographic Effects Based on a German Population Representative Sample." *European Journal of Psychological Assessment*, *23* (3), 193–201.

Rammstedt, Beatrice and Oliver P. John, 2007, "Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German." *Journal of Research in Personality*, *41* (1), 203–212.

Rolland, Jean-Pierre, *The Cross-Cultural Generalizability of the Five-Factor Model of Personality*, Boston, MA: Springer US,

Rotter, Julian B., 1966, "Generalized expectancies for internal versus external control of reinforcement." *Psychological Monographs: General and Applied*, *80* (1), 1–28.

Schäfer, Konrad C., "The Influence of Personality Traits on Private Retirement Savings in Germany." SOEP Papers No. 867, German Institute for Economic Research (DIW), Berlin, Germany 2016.

Schmidt, Peter and Robert P. Strauss, 1975, "The Prediction of Occupation Using Multiple Logit Models." *International Economic Review*, *16* (2), 471–486.

Schmitt, David P., Ano Realo, Martin Voracek, and Jüri Allik, 2008, "Why Cant a Man Be More Like a Woman? Sex Differences in Big Five Personality Traits Across 55 Cultures." *Journal of Personality and Social Psychology*, *94* (1), 168–182.

Schmitt, David P., Jüri Allik, Robert R. McCrae, and Verónica Benet-Martnez, 2007, "The Geographic Distribution of Big Five Personality Traits: Patterns and Profiles of Human Self-Description Across 56 Nations." *Journal of Cross-Cultural Psychology*, *38* (2), 173–212.

Schnitzlein, Daniel and Jens Stephani, 2016, "Locus of Control and low-wage mobility."

Seibert, Scott E. and Maria L. Kraimer, 2001, "The Five-Factor Model of Personality and Career Success." *Journal of Vocational Behavior*, *58*, 1–21.

Sharma, Rasadhika, Tung Nguyen, Ulrike Grote, and Trung Thanh Nguyen, "Changing livelihoods in rural Cambodia: Evidence from panel household data in Stung Treng. Center of Development Research." Working Paper 149, ZEF - Centre for Development Research, Bonn, Germany 2016.

Sharma, Smriti and Finn Tarp, 2018, "Does managerial personality matter? Evidence from firms in Vietnam." *Journal of Economic Behavior & Organization*, *150*, 432–445.

Sohns, Franziska and Javier Revilla Diez, 2016, "Self-Employment and its influence of the vulnerability to poverty of households in rural Vietnam a panel data analysis." *Geographical Review*, *107* (2), 336–359.

Stuetzer, Michael, David B. Audretsch, , Martin Obschonka, Samuel D. Gosling, Peter J. Rentfrow, and Jeff Potter, 2018, "Entrepreneurship culture, knowledge spillovers and the growth of regions." *Regional Studies*, *52* (5), 608–618.

UNHCS, "General Assembly, Special Session for an overall review appraisal of the implementation of the Habitat Agenda. Press Kit. Urbanization: Facts and Figures." https://www.un.org/ga/Istanbul+5/bg10.htm 2001. [Online; accessed 12-June-2019].

Wells, Robert, Roger Ham, and P. N. (Raja) Junankar, 2016, "An examination of personality in occupational outcomes: antagonistic managers, careless workers and extraverted salespeople." *Applied Economics*, *48* (7), 636–651.

Wichert, Laura and Winfried Pohlmeier, "Female Labor Force Participation and the Big Five." Discussion Paper No. 10-003, ZEW - Centre for European Economic Research, Berlin, Germany 2010.

World Bank, "World Development Report 2015: Mind, Society, and Behavior." Technical Report, World Bank, Washington, D.C., U.S. 2015.

World Bank, *Riding the Wave: An East Asian Miracle for the 21st Century*, Washington, D.C., USA: World Bank, 2018.

Yomaboot, Panida and Andrew J. Cooper, 2016, "Factor Structure and Psychometric Properties of the International Personality Item Pool-NEO (IPIP-NEO) Thai Version." *Journal of Somdet Chaopraya Institute of Psychiatry*, *10* (5), 36–49.

A   Appendix

Table A.1: Example of adjectives defining the Big Five factors

Factor	Facets/Adjectives
Extraversion	Active, Assertive, Energetic, Enthusiastic, Outgoing, Talkative
Agreeableness	Appreciative, Forgiving, Generous, Kind, Sympathetic, Trusting
Conscientiousness	Efficient, Organized, Planful, Reliable, Responsible, Thorough
Neuroticism	Anxious, Self-Pitying, Tense, Touchy, Unstable, Worrying
Openness	Artistic, Curious, Imaginative, Insightful, Original, Wide interests

Figure A.1: Overview of Survey Region

Table A.2: Overview of survey questions

| Do you see yourself as someone who. |
| --- |
| |
| is sometimes a bit rude to others? |
| works thoroughly? |
| is talkative? |
| worries a lot? |
| is original, comes up with new ideas? |
| has a forgiving nature? |
| tends to be lazy? |
| is outgoing, sociable? |
| gets nervous easily? |
| values artistic, aesthetic experiences? |
| is considerate and kind to almost everyone? |
| does tasks efficiently? |
| is reserved? |
| is relaxed, handles stress well? |
| has an active imagination? |
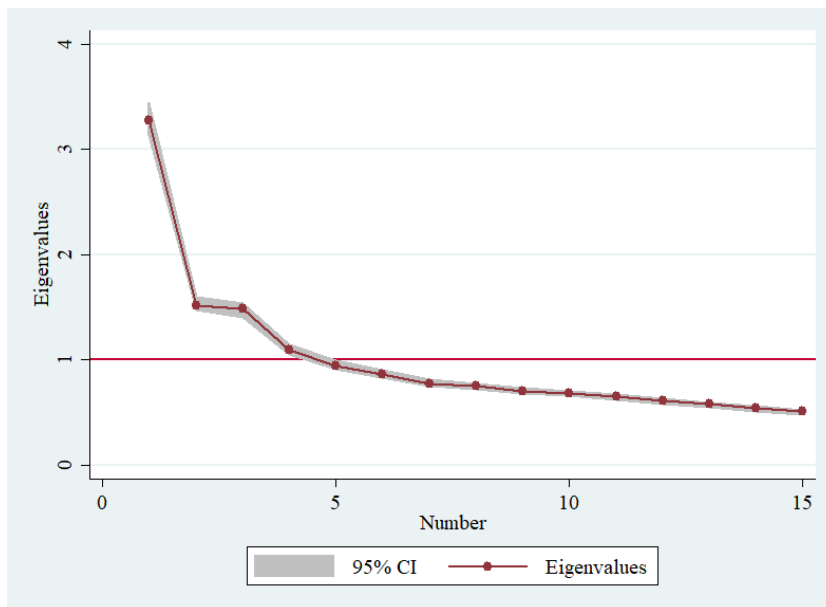
Figure A.2: Scree plot of eigenvalues after PCA

Table A.3: Cronbach's Alpha

Personality Trait	Cronbach's alpha	No. of items
Openness	0.60	3
Conscientiousness	0.55	3
Extraversion	0.42	3
Agreeableness	0.58	3
Neuroticism	0.56	3
All Traits	0.67	15

Table A.4: Factor Loadings according to PCA

BFI-Items	Factor 1 Creativeness	Factor 2 Diligence	Factor 3 Skepticism	Factor 4 Approachability	Factor 5 Amiableness
Artistic	**0,30**	-0,27	-0,10	0,01	0,08
New Ideas	**0,31**	-0,12	0,12	**0,31**	**-0,35**
Active Imagnation	**0,32**	-0,26	0,10	0,05	-0,14
Work thoroughly	**0,30**	0,22	0,10	0,04	**-0,39**
Efficient	**0,35**	0,11	-0,08	-0,06	**-0,30**
Lazy (reversed)	0,10	**0,53**	-0,08	0,05	**-0,31**
Talkative	0,24	-0,12	-0,03	**0,45**	0,22
Sociable	**0,32**	-0,02	0,00	**0,30**	**0,30**
Reserved (reversed)	-0,15	0,24	-0,12	**0,65**	0,15
Forgiving	0,28	0,25	0,04	-0,19	**0,48**
Kind	**0,35**	0,23	0,00	-0,18	**0,33**
Rude (reversed)	0,00	**0,53**	-0,14	-0,04	0,06
Worries	0,00	0,15	**0,67**	0,01	-0,01
Nervous	0,00	0,01	**0,66**	-0,02	0,12
Relaxed	**-0,31**	0,12	0,17	**0,32**	0,00