Picking the plough or not

How do personality traits influence occupation choice in rural Southeast Asia?

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Abstract:

The aim of this paper is twofold: First, we implement and validate the famous Big Five model on personality traits in a rural developing country setting. Second, we provide micro level empirical evidence that examines the influence of personality traits on occupational choice. Using new representative individual level data from Thailand and Vietnam, our results show that the Big Five model can be applied in a rural setting. Moreover, we find that Openness and Conscientiousness are crucial determinants for individual's occupational choice.

Keywords: Personality traits, Big Five Factor Model, Occupational Choice, Southeast Asia, TVSEP

JEL classification: D91, O1, R2

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1. Introduction

Why do some people stay in farming, while others engage in self or wage employment? What determines the reaction of people to opportunities and challenges? It is impossible to answer these questions without understanding the individual – something acknowledged by Goldberg (1981), when he states, how "*any model for structuring individual differences will have to encompass at some level something like the Big Five*". The Big Five measure fundamental dimensions of personality, which influence the interpersonal, emotional and motivational style of individuals (McCrae & Costa, 2009). These include Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness (McCrae & Costa, 2011).

After the fall of the classical rationality assumption of individual agents, personality traits have been included into microeconomic models of decision making and utility maximization. Empirical and experimental evidence (Jencks, 1979; Osborne, 2000) corroborate that in addition to cognitive skills, personality traits play an important role in determining individual decision making. They act as channels through which non-cognitive skills influence individual's decision making behavior (Wichert and Pohlmeier, 2010), job performance (Barrick and Mount, 1991) and economic outcomes (Piatek and Pinger, 2008; Nyhus and Pons, 2005).

However, as most of these instruments were developed in the western world, the focus has been constricted to the US, Japan, South Korea, and European countries (Rammstedt, 2007; Rammstedt and John, 2006; Cobb-Clark and Schurer, 2012; McCrae and Costa, 1999). Hence, the general applicability of the results is questionable, especially in the context of developing countries. By 2030, 85 per cent of the world's population would be based in these countries (UNCHS, 2001) and will form the backbone of the global economy. Therefore, it is pertinent to include them in the analyses to obtain comprehensive insights. The research has also been centered on occupational choice and performance in the entrepreneurial and innovation sectors (Stuetzer et al., 2018; Obschonka and Stuetzer, 2017), whilst overlooking the farmers, small scale entrepreneurs and low-income wage employees that are peculiar to the rural setting.

Against this background, we add to the literature in two ways: First, we validate the usage of personality traits in a developing country setting. Second, we provide micro level empirical evidence that examines occupational choice in rural areas of Southeast Asia. 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. As this is the first paper that utilizes the personality measures for this data, the first part of our analysis focusses on validating the survey measure and compares population specific patterns to previous findings. In particular, we elaborate on the measurement and construction of the Big Five and examine its validity for our sample population. Furthermore, we compare gender specific statistics across Thailand and Vietnam and relate them to existing studies from other countries. In the second part of the analysis, we employ a multinomial logit model to assess the influence of the Big Five on occupational choice. 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 shows that households engaging in activities other than farming tend to be better off than farming-only households (Sohns & Revilla Diez, 2016; Sharma et al., 2016). While observable characteristics such as education and land ownership have been found to influence occupation choice, the role of personality traits is less clear for rural populations. 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.

Our results suggest that the survey measures were successfully implemented. Similar to the Big Five we find five personality factors in the sample population. Furthermore, in line with the existing literature (Schmitt et al., 2009; Costa and McCrae, 2001), we find that men are generally more open while women

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

are more neurotic. For occupational choice, Openness and Conscientiousness are the most decisive factors. Conscientiousness is particularly important for choosing high skilled jobs over 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.

The rest of the paper is organized as follows: Section 2 provides an overview on personality traits and the Big Five factors, and occupational choice. 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. Personality Traits

Individual preferences are a main feature in decision-making theories (Samuelson, 1948; Varian, 1982; Cherchye et al., 2011; Vermeulen, 2012). In standard economics, these theories make simplifying assumptions with respect to preferences, such that preferences are not explicitly formed within the model itself. However, empirical evidence has shown that individuals do not always act rationally and that preferences are not homothetic (Kahneman et al., 1982).

While there are many factors that influence individuals' preferences, personality traits have been identified as one main determinant. The concept of personality traits goes back to the German psychologist Baumgarten (1933) who suggested that analyzing languages could lead to a better understanding of personality. His work encouraged Allport & Odbert (1936) to conduct the same analysis in English. This started a string of research that produced numerous scales and instruments. Based on scales from Cartell (1943) and Fiske (1949), Tupes and Christal (1961) developed the first replicable five factor model of personality. The development of scales continued further and other factors were established, but the number 'five' remained (Borgatta, 1964; Smith, 1969; Norman, 1967).

Out of the various versions, the model developed by McCrae & Costa (1997, 1992) has been used most extensively. They started with a questionnaire based on the three factors, namely, Neuroticism, Extraversion and Openness to experience, and, added Agreeableness and Conscientiousness on the suggestions of Digman (1990) and Goldberg (1993). This gave rise to the Big Five model.

2.1 The Big Five model

The Big Five model is the most cross-culturally validated model of personality traits (Streuetzer et al., 2017). The factors are relatively stable over an individual's lifetime (Heineck and Agner, 2010) and are considered heritable by Hofstede and McCrae, 2004. Table 1 illustrates the facets or adjectives associated with each factor of the Big Five model.

Table 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

Source: McCrae & Costa, 1992

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; Rolland, 2002; Wichert and Pohlmeier, 2010). Agreeableness refers to the quality of interpersonal relationships of the individual. An agreeable person is caring and selfless. 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). 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. Openness

captures how individuals value new experiences and changes (Rolland, 2002). An open person is creative and enthusiastic about complex jobs.

Traits transcend cultures. Scores on different factors display similar patterns across cultures irrespective of the differences in histories of the countries (McCrae et al., 2004). While McCrea et al. (2004) find that younger people score higher on Extraversion, Agreeableness, Neuroticism, and Openness, Rammstedt (2007) on the other hand finds that sores on Agreeableness and Conscientiousness relate positively with age. Education is positively correlated with Openness but shows an unclear relationship with Conscientiousness (Cobb-Clark and Schrurer, 2012; Rammstedt, 2007). Interestingly, gender differences in personality traits across cultures tend to be larger than those illustrated in cognitive ability, self-esteem and attributional style (Else-Quest et al., 2006). In general, females tend to score higher on all factors except Openness (Costa et al., 2001; Rammstedt, 2007). In contrast to normal belief, the magnitude of gender differences is larger in modern societies such as America and Western Europe than traditional societies of Asia and Africa (Schmitt et al., 2009).

2.2 Occupational choice and personality traits

Occupational choice for an individual can be contingent on the rewards offered by the different occupations and the individual's assessment of being able to realize this occupation (Blau et al., 1956). While the first factor parallels the labor market outcomes, the second relates to individual differences. These differences arise from various sources. For example, human capital theory illustrates the impact of education, gender, age and ethnicity on economic performance (Becker, 1993). Literature establishes that education and age are positively related to attainment of a white collar job (Ham et al, 2009, Bjerk, 2007). Higher education is also linked negatively to a full-time farming occupation (Hennessey & Rehman, 2007). Females are less likely to land high skilled white collar jobs (Schmidt and Strauss, 1975). Social capital is also an important factor. Contacts can aid to find job opportunities (Bentolila et al., 2008).

Additionally, the choice can also reflect the individual's preferences and productive capacities. These are captured by differences in personality traits (Borghans et al. 2008). For instance, Conscientiousness is considered as the most important predictor of occupational performance (Barrick and Mount, 1991). 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, Wang and Zickar, 2006). The same is seen for Neuroticism where an individual scoring high on this factor has a higher work commitment (Vearing and Mark, 2007). 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).

3. Study design

3.1 Data

We use micro data originating from the Thailand Vietnam Socio Economic Panel (TVSEP). 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 3,170 individual respondents who answered the subsection on personality traits.[2]

[2] 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 20 to 70 years because our analysis focuses on working-age individuals.

The household sample in each province was randomly drawn based on a stratification process considering the heterogeneous agro-ecological conditions within the regions.[3] In Thailand, each household in the survey region had an equal probability of being included in the survey, while poor households were oversampled in Vietnam (Hardeweg et al., 2013). We correct for this by applying sampling weights throughout our analysis. The data is representative for rural households in both countries (Liebenehm et al., 2018). 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.

In addition to the survey data from the TVSEP, we use data from a TVSEP Add-on project that was conducted in Thailand in November 2017 amongst the same households. The Add-on project is about *Behavioral insights into over-indebtedness within a vulnerable population* and collected data on households in Ubon Rathathani.[4] The Add-on questionnaire includes the exact same question on personality traits as 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. Hence, we can verify if the answers are consistent over time. Within this short time horizon of just four month, the answers should not vary too much. The Add-on project interviewed 760 households. Within the household, the respondent in the summer and in November may vary. 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. The results are discussed in Section 4.1.

3.2 Measurement of personality traits

We follow the Big Five model developed by Costa and McCrae (1992, 1997) which has become the standard personality measurement in psychology. The model defines personality along the five following factors: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism.

The survey questions are based on the Big Five personality inventory questions used in the German Socio Economic Panel (SOEP).[5] 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.

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 explicitly labelled (each answer option is associated

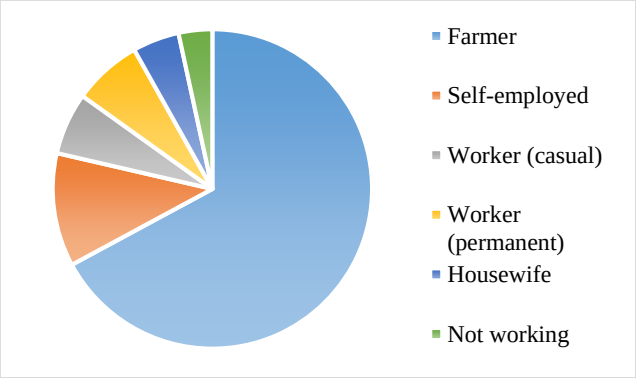
[3] See Hardeweg et al., 2013 for a detailed overview of the sampling strategy
[4] For more details on the Add-on project, see Klühs et al. 2019.
[5] See survey page for details: https://data.soep.de/soep-core/topics/.

with a specific phrase, e.g. 1 means “Disagree fully”, 3 means “Disagree a little”, 6 means “Agree strongly”). Figure A. 3 and Figure A. 4 in the Appendix display both scales. 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.

3.3 Occupations in the survey population

The survey questionnaire includes very detailed questions on the type of occupation that people are engaged in. For our analysis, we group these occupation types into six broad categories and do not differentiate between specific work activities. The following categories exist: Farmer, self-employed, worker (casual), worker (permanent), housewives and not working. Figure 1 exhibits a graphical overview of the different occupation categories.

Figure 1: Occupation Categories



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. The remaining 33% engage in different wage generating activities. The majority of people that do not work in the farming sector are self-employed (11%). Respondents run various kinds of businesses, for example retail or small food shops.

Table 2 depicts a descriptive overview of our respondents by occupation category. The average respondent in our sample is engaged in farming, is 52 years old, is a female, and has 6 years of education.

Table 2: Descriptive statistics of respondents by occupation category

	Farmer	Self-employed	Worker (casual)	Worker (permanent)	Housewife	Not working
Share of individuals	0.67	0.11	0.06	0.07	0.05	0.03
Average age	52.36	50.23	51.61	47.22	5.13	60.63
Average education	6.08	6.97	5.59	9.9	5.41	5.07
Share female	0.60	0.70	0.60	0.52	0.98	0.63

3.4 Specification of econometric models

In the analysis, we use different methodologies to address our research questions. First, we assess the internal validity of the survey measure for personality traits in our sample. Second, we use descriptive statistics to analyze differences between subgroups in our sample population. Third, we apply a

multinomial logit regression to estimate the influence of personality traits on an individual's occupational choice.

We address the internal validity of the Big Five model for our sample population in three steps: (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. First, 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).

In addition, we conduct a principal component analysis (PCA) based on the 15 questions administered to respondents in the household questionnaire to validate the structure of the personality factors (Schmitt et al., 2007). Conducting a PCA is advantageous when datasets contain a large number of variables that must be accounted for. Since we have fifteen variables which capture personality traits, this approach is useful to create groups which are homogeneous within themselves and heterogeneous between each other (Backhaus et al., 2011). The PCA analysis is used to reduce the dimensionality of the input variables and identify major trait factors in our survey population. 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 Appendix for relation between personality traits and survey questions). For the PCA, the 15 observed variables (see Table 1) representing individual's personality traits were included. The Kaiser criterion (K1) (Ford et al., 1986) which retains all factors with eigenvalues greater or equal to one, was used 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 part of the analysis, we use ttests to detect differences between different subgroups in our sample. Specifically, we test whether there are significant differences between males and females, Thai and Vietnamese respondents, and for individuals in different types of occupations.

In the third part of the analysis, we use a multinomial logit model to understand, how far the individual's personality traits predict the occupational choice. We control for individual, household and labor market characteristics. The regression takes the following form:

$$\Pr(oc_{ijr} = O) = \beta_0 + \beta_1 T_{ijrc} + \gamma_1 IC_{ijr} + \gamma_2 HH_{jr} + \gamma_3 LM_r + \gamma_4 D_r + \epsilon_{ijr}$$

Where oc_{ijr} denotes probability of individuals i in household j and region r to engage in an occupation in relation to being a farmer. T_{ijrc} represents the vector of personality traits of each individual. IC_{ijr} and HH_{jr} are vectors of individual and household control variables. We control for gender, age, years of education and being active in a political party at the individual-level as well as for household size, ethnicity and mobile phone ownership at the household-level. Further 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

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 and at 0.67 for the subsample (see Table A. 1 in the Appendix). Our results are similar to those of Rammstedt and John (2006).

The PCA reveals five factors (see Table A. 2 and Figure A. 5 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 3 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 (2006) to establish the equivalence of the BFI-S to the BFI-44.

Table 3: 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

Note: correlation higher than absolute 0.50 are shown in bold.

Table 4: 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

Table 4 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 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.

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 Gender related differences

Table 5 depicts the descriptive analysis of personality traits across gender. We find that average scores for respective personality traits questions differ significantly by gender. In the combined sample, men are more open to new ideas and have a more active imagination. This is largely in line with findings of Schmitt et al. (2009) who establish that Openness reported by individuals can vary greatly by culture. Women tend to be more open to feelings while men are open to new ideas. In case of Conscientiousness, men report themselves to be more efficient than women. In the Extraversion factor, women are more talkative but men rate themselves as being more sociable and less reserved. We also find no statistically significant difference along the factor of Agreeableness. However, as expected, women score higher on all questions capturing Neuroticism. Our results for Openness and Neuroticism are in line with previous findings (Costa and McCrae, 2001). As the sample belongs to rural Southeast Asia, the self-reporting could suffer from 'societal desirability bias', which makes an individual answer in expected gender relevant norms (Schmitt et al., 2009).

Thailand and Vietnam differ substantially in terms of their culture and religion and, thus, we also report gender differences by country. 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 our sample population are Thai and 99% follow Buddhism. Further, rural Thailand is known to be a rather traditional society for which gender differences in personality traits are less common (Knodel & Nguyen, 2015).

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 descriptive results show that men score higher for all questions pertaining to Openness. They also report higher on Conscientiousness and Extraversion. Under Agreeableness, females tend to be more forgiving and score significantly on all items of Neuroticism.

Overall, our descriptive statistics confirm that personality traits differ across gender. In line with previous findings, men in our sample population score higher on Openness and females score higher on Neuroticism. While the evidence on other factors differs across countries, we conclude that cultural gender norms either play a role in how people perceive the questions or are decisive for the formation of personality traits as such.

Table 5: Personality traits by Gender and country

		Overall			Thailand			Vietnam		
Trait	**Variables**	male	female	Diff.	male	female	Diff.	male	female	Diff.
Openness	Artistic	4.34	4.42		4.92	5.10		3.90	3.65	**
	New ideas	4.66	4.44	***	4.68	4.55		4.65	4.32	***
	Active imagination	4.26	4.12	*	4.45	4.34		4.12	3.86	**
Conscientiousness	Work thoroughly	5.68	5.61		5.53	5.56		5.79	5.67	**
	Efficient	5.73	5.63	*	5.92	5.83		5.58	5.39	**
	Lazy (reversed)	5.98	5.89		5.66	5.59		6.21	6.24	
Extraversion	Talkative	4.60	4.88	***	4.74	5.09	***	4.50	4.63	
	Sociable	5.15	4.95	***	5.15	5.01		5.15	4.87	***
	Reserved (reversed)	3.90	3.66	***	3.56	3.31	*	4.16	4.05	
Agreeable-ness	Forgiving	5.80	5.81		5.90	5.75		5.73	5.88	*
	Kind	5.92	5.92		5.96	5.96		5.88	5.88	
	Rude (reversed)	5.74	5.72		5.49	5.48		5.93	5.99	
Neuroticism	Worries	4.52	4.86	***	3.60	3.99	***	5.22	5.86	***
	Nervous	3.65	4.19	***	3.27	3.63	***	3.93	4.84	***
	Relaxed (reversed)	2.81	3.06	***	2.54	2.71	*	3.02	3.46	***
	N	1188	1982		513	1062		675	920	

4.3 Differences across occupation categories

Table 6 reports the average scores on the question items for the different categories of occupations – famers, 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 all other individuals in the sample.

The results suggest that farmers are significantly different from other individuals along the factors of Openness, Extraversion and Neuroticism. Farmers are less artistic than the average individual and score higher on being outgoing, worry more and are slightly more nervous. Since farmers are the largest group, their age and education is close to the overall average. However, they are on average slightly less educated.

Self-employed individuals differ along the factors of Openness, Conscientiousness and Extraversion. As expected, individuals in this group are significantly more open to new ideas, less lazy and tend to be more talkative (Struetzer et al., 2017). They are better educated than most of the sample with an average of 7 years.

The group of casual workers differs along the factors of Openness, Extraversion and Neuroticism. They have less innovative ideas and a lower imagination. In addition, they are less social and worry less. The average education level of casual worker is 6.6 years which is below the sample average.

In contrast to the casual worker, permanent workers differ mainly along the factors of Conscientiousness and Extraversion. Permanently employed individuals are significantly more efficient and sociable compared to the average. With an average age of 47.22 these individuals are significantly younger and with almost 10 years of education they are the best educated group.

Housewives in our sample population score significantly different on Conscientiousness, Extraversion and Neuroticism. They are slightly lazier, more reserved and more nervous compared to the average individual. Housewives have the second lowest level of education and are older than the average.

Table 6: Personality traits by occupation

Trait	Variables	All	Farmers	Self-employed	Worker (casual)	Worker (permanent)	Housewife	Not working
Openness	Artistic	4.39	4.31***	4.52	4.41	4.54	4.62	4.95***
	New ideas	4.53	4.51	4.78***	4.29*	4.77*	4.31	4.23
	Active imagination	4.17	4.18	4.24	3.83**	4.36	3.97	4.20
Conscien-tiousness	Work thoroughly	5.63	5.64	5.73	5.52	5.76	5.51	5.33*
	Efficient	5.67	5.64	5.70	5.73	5.90**	5.62	5.57
	Lazy (reversed)	5.92	5.91	6.15***	5.90	6.05	5.47***	5.72
Extraversion	Talkative	4.77	4.75	4.95*	4.64	4.88	4.80	4.56
	Sociable	5.02	5.05	5.00	4.69**	5.36**	4.70	5.03
	Reserved (reversed)	3.75	3.81**	3.71	3.63	3.52	3.43*	3.73
Agreeable-ness	Forgiving	5.81	5.81	5.77	5.68	5.94	5.80	5.88
	Kind	5.92	5.92	5.92	5.79	6.05	5.89	6.01
	Rude (reversed)	5.73	5.74	5.72	5.64	5.69	5.77	5.70
Neuroticism	Worries	4.73	4.79*	4.86	4.40*	4.88	4.49	3.83***
	Nervous	3.99	4.04*	3.91	3.78	3.80	4.39**	3.38***
	Relaxed (reversed)	2.97	2.98	2.97	2.94	2.81	3.00	2.94
	Age (years)	52.07	52.36*	50.23***	51.61	47.22***	54.13*	60.63***
	Education (years)	6.34	6.08***	6.97***	5.59**	9.79***	5.41***	5.07***
	N	3170	2128	364	199	221	150	108

Finally, the group of non-workers differs along Openness, Conscientiousness and Neuroticism. Individuals who are not working rate themselves as being more artistic than the average. Furthermore, they work less thoroughly, worry less and are less nervous. Individuals in this group are significantly older than the average and have the lowest education level. The high score on the factors Neuroticism together with the relative age of this group hints at the fact that certain personality traits change as people become older (Schäfer, 2016; Hofstede and McCrae, 2004).

In sum, the results indicate that personality traits differ across occupation groups. Particularly, individuals who opt for self-employment or permanent wage-employment score higher along the factors of Conscientiousness and Extraversion. Furthermore, individuals in these two groups are younger and significantly better educated compared to the average. In line with the results on gender, housewives score higher on the factor Neuroticism. Interestingly, individuals who are not working score even higher in Neuroticism. This potentially hints at an age effect as most individuals in this group are older compared to the average.

4.5 Importance of traits for occupation choice

The results from our regression on the importance of personality traits for occupation choice are presented in Table 7. 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 0.13 indicates that the model fit is acceptable.

Our results suggest that personality traits, specifically, Openness and Conscientiousness are associated with the occupation choices of individuals. In particular, for individuals who score higher on Openness the relative odds of choosing to take up casual wage employment over farming is 0.853. Therefore, for people who score higher on Openness the relative odds of choosing casual wage employment are lower than the relative odds of taking up farming. For Individuals who score higher on Conscientiousness, the relative odds of choosing self-employment or permanent employment increase in relation to the odds of

opting to become a farmer. Similarly, the results also show a negative relation between higher Conscientiousness and the relative odds of choosing to stay out of work. Our results indicate that Conscientiousness is particularly important for choosing high 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.

Table 7: Relation between personality traits and occupation choice

VARIABLES	(1) Self employed	(2) Worker (casual)	(3) Wage employment (permanent)	(4) Housewife	(5) Not working
Openness	1.059	0.853**	0.969	0.971	0.962
	(0.0536)	(0.0544)	(0.0635)	(0.0738)	(0.0844)
Conscientiousness	1.230***	1.154	1.290**	0.866	0.799*
	(0.0927)	(0.104)	(0.131)	(0.0896)	(0.0927)
Extraversion	0.990	0.874*	0.961	0.889	0.947
	(0.0568)	(0.0635)	(0.0719)	(0.0764)	(0.0944)
Agreeableness	0.928	0.934	1.121	1.135	1.152
	(0.0653)	(0.0810)	(0.106)	(0.118)	(0.140)
Neuroticism	1.006	1.062	1.065	1.148	0.892
	(0.0562)	(0.0770)	(0.0788)	(0.0982)	(0.0872)
Gender	1.663***	0.855	0.712**	31.72***	1.215
	(0.223)	(0.138)	(0.117)	(18.69)	(0.266)
Age	0.983**	0.977***	0.969***	1.026**	1.090***
	(0.00646)	(0.00836)	(0.00790)	(0.0107)	(0.0157)
Education	1.095***	0.973	1.309***	1.037	1.020
	(0.0209)	(0.0268)	(0.0292)	(0.0337)	(0.0453)
Constant	0.134**	16.35***	0.0204***	0.0147***	0.00703***
	(0.124)	(16.79)	(0.0290)	(0.0202)	(0.0105)
Controls	x	x	x	x	x
Observations	3,148	3,148	3,148	3,148	3,148
chi2	925.2	925.2	925.2	925.2	925.2
r2_p	0.130	0.130	0.130	0.130	0.130

The individual-level control variables indicate further important differences that relate to occupational choice. The results confirm that for females the odds of being a housewife are substantially larger than to engage in farming. Furthermore, the odds of choosing self-employment over 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. The picture is different for individuals who choose to take up permanent employment rather than becoming a 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 farming with every year of age. On the contrary the odds of choosing to be a housewife or to be out of work increases with age. This is not very surprising as it indicates that younger people opt for occupations other than farming, while old people stop working or rather engage in household chores. 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, our preliminary results suggest that Openness and Conscientiousness are important factors for occupation choice of individuals in rural Southeast Asia. Specifically, individuals who are more conscientious and are better educated opt for self-employment and permanent wage employment. Furthermore, gender norms are quite persistent and women engage mainly in housework. However, the results also suggest that women are more likely to take up self-employment rather than farming.

5. Conclusion

In this paper, we use the Big Five model to analyze the relationship between individual personality traits and the occupational choice of the individual. To achieve this, we employ data on 4000 individuals 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 dataset, 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 of the complete sample with a sub sample that was interviewed under an Add-on project. The answers of the respondents illustrate consistency over time.

In addition, we examine if established gender differences in personality traits hold in our country context. In line with literature, we find that men tend to score higher on openness and women report higher neuroticism. However, men also report higher levels of Extraversion and Conscientiousness. We attribute this anomaly to the presence of 'societal desirability bias' (Schmitt et al., 2009) amongst respondents; culturally established gender norms can influence the perception of questions and how they answer. In addition, we also look for personality trait differences across occupation groups. Self-employed and permanent employed individuals are younger and more educated, and, report higher levels of Conscientiousness and Extraversion. In resonance with the results from gender, housewives report higher Neuroticism. Interestingly, individuals that are not working are older and score the highest on Neuroticism, which could indicate an age-effect.

For our second research question, we examine the influence of personality traits on occupational choice. We compare across occupations that could be a possible alternative to farming in our sample. To do this, we perform a multinomial logit estimation. Openness and Conscientiousness are the most important predictors of the occupational choice of an individual in Southeast Asia. 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 (e.g. WDR, 2015 p. 5). 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. This is especially important with regards to understanding respondent's occupational choice. We also intend to run the analysis for different sub-groups, e.g. by age groups.

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Appendix

Figure A. 1: Overview Survey Region

Figure 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. 3: Item scale TVSEP questionnaire

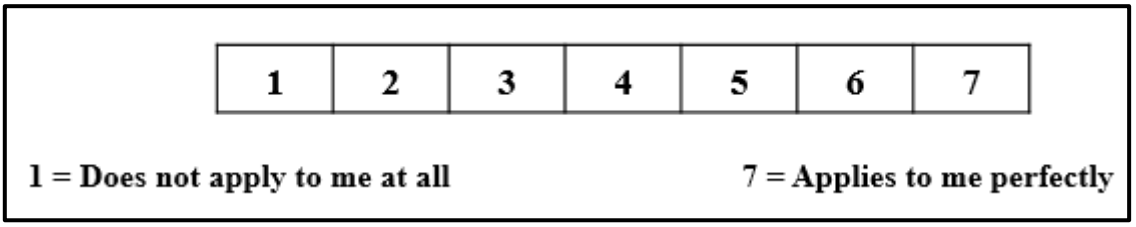

Figure A. 4: Item scale November Add-On questionnaire

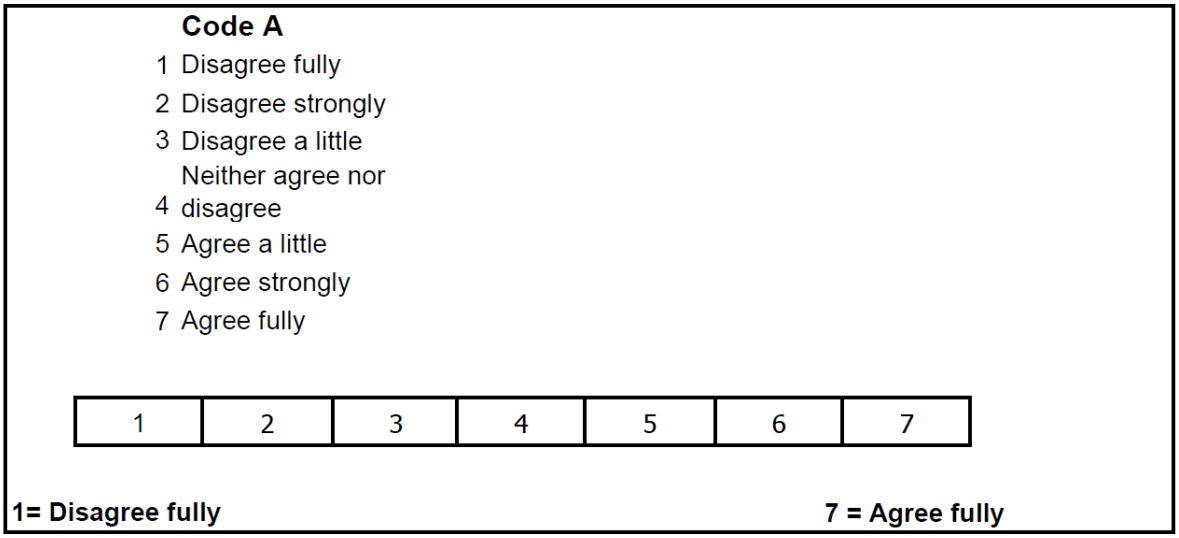

Table A. 1: Cronbach's alpha

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. 2: Factor Loadings

BFI Items	Factor 1 Creativeness	Factor 2 Diligence	Factor 3 Skepticism	Factor 4 Approachability	Factor 5 Amiableness
artistic	**0.30**	-0.24	-0.17	0.04	0.02
new_ideas	**0.30**	-0.15	0.13	**0.33**	**-0.31**
active imagination	**0.33**	-0.28	0.02	0.12	-0.22
work thoroughly	**0.30**	0.19	0.15	0.07	-0.29
efficient	**0.36**	0.10	-0.05	-0.02	-0.27
lazy_r	0.09	**0.54**	0.08	0.09	**-0.33**
talkative	0.25	-0.08	-0.06	**0.40**	**0.36**
sociable	**0.32**	-0.01	0.00	0.23	**0.34**
reserved_r	-0.15	0.25	-0.04	**0.66**	0.18
forgiving	0.27	0.26	0.10	-0.26	**0.44**
kind	**0.35**	0.23	0.04	-0.22	**0.31**
rude_r	-0.01	**0.53**	-0.01	-0.02	-0.05
worries	0.01	-0.03	**0.68**	0.02	-0.02
nervous	0.00	-0.16	**0.63**	-0.08	0.12
relaxed_r	-0.32	0.05	0.20	**0.31**	0.07

Note: Loadings higher than absolute 0.30 are shown in bold.

Figure A. 5: Scree plot of eigenvalues after PCA