Development Economic Review
Volume 17 No.1 (January 2023)

WAGE DETERMINATION IN LAO PDR: COGNITIVE AND SOCIO-EMOTIONAL SKILLS

Malaina Sadettan* and Anan Wattanakuljarus**

Received October 5, 2022
Revised October 16, 2022
Accepted October 21, 2022

Abstract

This research investigates the significance of cognitive skills and socio-emotional skills on wage determinants in Least-Developed countries by using Lao PDR as case study. Using the Mincerian Model based on data collected from the Skills toward Employment and Productivity (STEP) Household Survey, the results revealed that there are positive and significant relationships between cognitive skill (additional year of schooling) and years of work experience on wages. For socio-emotional variables, conscientiousness and agreeableness show a consistently positive relationship with wages and there is a negative correlation between decision making and wages.

Keywords: Cognitive Skills, Socio-emotional Skills, Wages, Lao PDR

* Graduate Student - Graduate School of Development Economics, National Institute of Development Administration, 148 Serithai Road, Klong-Chan, Bangkapi, Bangkok 10240, Thailand - Email: Malaina.st@gmail.com
** Associate Professor of Economics - Graduate School of Development Economics, National Institute of Development Administration, 148 Serithai Road, Klong-Chan, Bangkapi, Bangkok 10240, Thailand - Email: Ontanan@yahoo.com

พัฒนาการเศรษฐกิจปริทรรศน์
ปีที่ 17 ฉบับที่ 1 (มกราคม 2566)

ทักษะทางสติปัญญาและทักษะทางสังคมและอารมณ์กับการกำหนดค่าจ้างในประเทศสปป.ลาว

มาลัยน่า สเด็จตัน* และ อนันต์ วัฒนกุลจรัส**

รับวันที่ 5 ตุลาคม 2565
ส่งแก้ไขวันที่ 16 ตุลาคม 2565
ตอบรับตีพิมพ์ 21 ตุลาคม 2565

บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาความสำคัญของทักษะทางสติปัญญาและทักษะทางสังคมและอารมณ์ในการอธิบายความแตกต่างของค่าจ้างในประเทศ สปป.ลาว โดยวิธีการขยายแบบจำลองสมการของมินเซอร์ และใช้ข้อมูลทุติยภูมิจากการสำรวจทักษะสู่การจ้างงานและผลิตภาพแรงงานในระดับ ผลการวิจัยครั้งนี้พบว่า สำหรับทักษะทางสติปัญญานั้น จำนวนปีการศึกษาและประสบการณ์ทำงานมีความสัมพันธ์เชิงบวกอย่างมีนัยสำคัญทางสถิติกับค่าจ้าง ส่วนทักษะทางสังคมและอารมณ์พบว่าคุณลักษณะทักษะของการมุ่งเป้าหมายแห่งความสำเร็จ และคุณลักษณะทักษะของการเอาใจเขามาใส่ใจเรามีความสัมพันธ์เชิงบวกกับค่าจ้างแรงงานอย่างมีนัยสำคัญทางสถิติ ในขณะที่คุณลักษณะทักษะของการตัดสินใจมีความสัมพันธ์เชิงลบกับค่าจ้างแรงงานในประเทศ สปป.ลาว

คำสำคัญ: ทักษะทางด้านสติปัญญา, ทักษะทางสังคมและอารมณ์, ค่าจ้างแรงงาน, สาธารณรัฐประชาธิปไตยประชาชนลาว (สปป. ลาว)

* นักศึกษาปริญญาโท - คณะพัฒนาการเศรษฐกิจ สถาบันบัณฑิตพัฒนบริหารศาสตร์ (นิด้า) 148 ถนนเสรีไทย แขวงคลองจั่น เขตบางกะปิ กรุงเทพมหานคร 10240 - Email: : Malaina.st@gmail.com

** รองศาสตราจารย์ - คณะพัฒนาการเศรษฐกิจ สถาบันบัณฑิตพัฒนบริหารศาสตร์ (นิด้า) 148 ถนนเสรีไทย แขวงคลองจั่น เขตบางกะปิ กรุงเทพมหานคร 10240 - Email: Ontanan@yahoo.com

1. Introduction

For many centuries, the national income of a country has been considered as one of the important indicators to show the development level of that country and commonly the income comes from a range of sources, for example, foreign trade, tourism, or from the employment of the government or private firms. The fundamental economic system of Lao PDR is still generally dependent on business units, both small and medium size, including those in agriculture, industry and services which can drive a national economy.

Firms or employers commonly have their own standards for choosing workers or employees, and they normally offer the different positions in their own specification to pick employees most suited to the positions, fitting the positions all together efficiently, the organization proceeds onward with a high profit and advantage. Most organizations have their own specifications in picking employees based on various backgrounds, for example, educational achievement, major field of study, quantities of years of work experience and other required individual information. All the background factors are needed for employers to select the most efficient candidates to be their employees.

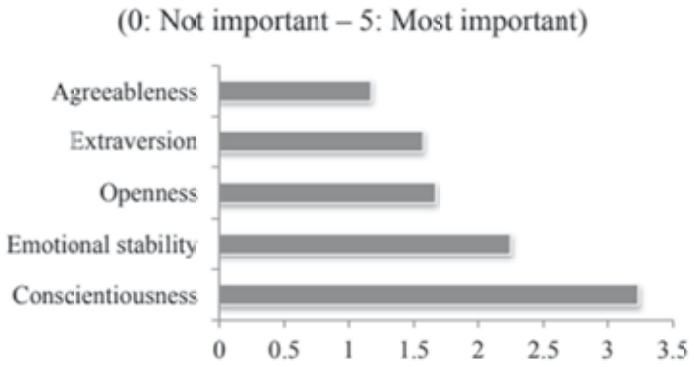
In many careers, the information that is most important to employers is the educational level of employees. The Mincer Equation is a famous recommendation explaining level of education and other variables that are required by firms (Mincer, 1958). Nonetheless, for employers to verify ability of workers, education may not provide the perfect information when we consider some different careers, for example receptionist, salesman, air hostess and other careers that need to deal with people on a personal level. For such careers, some additional personality data might be required, such as readiness, friendliness, and gentleness, to service their customers. Hence, beyond basic requirements (educational achievement, major study field and work experience) other additional qualifications are required.

Nowadays, other additional variables, such as personal traits and behavioral attitudes as well as the basic requirements are getting attention for many economists; in many cases focus is on such as educational background (being measured by attained level of education), work experience attained, numeracy, literacy, and the ability to solve abstract problems. These are ordered into ‘Cognitive Skills’. Cognitive skills have been described by Neisser as the “capacity to comprehend complex thoughts, to adjust effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome impediments

by taking thought." (Neisser et al., 1996)

However, schooling or level of education is not the only variable that can be used to fully explain variations in labor market outcomes. Thus, more recent research has paid attention to other additional variables, which can be described as including personality traits and behavioral attitudes which are classified into 'Socio-Emotional Skills', sometimes being called non-cognitive skills, or soft skills, in the related literature. A well-known study by Heckman, Stixrud and Urzua (2006) has described the impact of cognitive and non-cognitive skills on success in the labor market outcome; the result of the study found that non-cognitive skills are just as essential as cognitive skills in predicting labor wages. Thus, this research is investigating to figure out the effect of these cognitive and socio-emotional skills towards wage levels by using an expanded Mincerian earnings model which has added set of socio-emotional skills into the model.

Figure 1: Importance of the Big Five Personality Traits



Source: Lao Enterprise-STEP Survey (2011-2012) report by World Bank, 2013

With reference to the report by the World Bank (2013), shown in Figure 1, researchers explored types of non-cognitive skills demand in the job market, and the survey findings implies that conscientiousness and emotional stability are the two most desirable traits among a set of non-cognitive skills, called the "Big Five Personality Traits" for all occupations in Laos. These confirm that beyond the cognitive skills, employers in Laos also value the socio-emotional skills. Hence, it is interesting to understand whether socio-emotional skills significantly have an effect on the wages of labor.

Income distribution is the common problem that occurs in Laos when considering the relationship between cognitive skills, socio-emotional skills, and wages, as the labor market outcome is based on longitudinal data. However, although many studies are available in a literature review, in most cases the data come from high-income countries. Regrettably, especially in low and middle-income countries, regarding socio-emotional skills, related data is rare. Thus, the empirical results of this paper will provide critical information and can be the guidelines for governments of similar countries to develop the necessary human resources to fulfill economic needs.

2. Literature Review

2.1 The Earnings Function

The earnings function begins with a Standard Neoclassical Model, in which individual utility functions are independent predictions that in competitive labor markets, workers will be paid their marginal products by cost-minimizing firms who purchase their services. Many firms have strictly followed ae payment formula based on education (Frank, 1984). Many economists understand years of schooling, years of work experience, and educational attainment, as a cognitive skill; these explain much of the variation in cognitive skills that can explain earning and occupational status.

Education is very important to the development of human capital in any country. On an individual data basis, people with higher education tend to earn higher incomes. In this way, we often use the “Mincerian equation”, which is a popular model to estimate the relationship between human capital development that affects the development of cognitive skills and higher incomes when people graduate and enter the labor market. Mincer’s earnings regression” can be expressed in an equation (1) as below:

$$\ln\left[\left(w(s,x)\right)\right] = \alpha_0 + \rho_s s + \beta_0 x + \beta_1 x^2 + \varepsilon \qquad (1)$$

$w(s, x)$ represents the wage at schooling level s and work experience x, ρ_s represents “the rate of return to schooling”, being assumed to be the same for all schooling levels, and β_0, β_1 represents the return to experience; ε is a mean zero residual with $E\left(\frac{\varepsilon}{s}, x\right)$ = 0, respectively (Mincer, 1958, 1974 quoted in Heckman, Lochner, & Todd, 2003).

Nonetheless, level of schooling and work experience as a variable in the earning function is limited to explanation of cognitive skills. It might not be powerful enough to predict future earnings. Thus Heckman et al. (2006) have presented a model for wages and experience called a “hedonic model”, where wages are given by a linear in the parameters specification. Both cognitive and non-cognitive skills are being assumed to affect earnings in this model. It shows in equation (2) as below:

$$Y_s = \beta_{y,s} X_y + \alpha^C_{y,s} f^C + \alpha^N_{y,s} f^N + e_{y,s} \quad \text{for } s = 1 \ldots . \bar{s} \tag{2}$$

X_y is a vector of observed controls, e.g., demographic (gender, age, family interaction etc.) and socioeconomic factors (occupation, firm size, etc.), $\beta_{y,s}$ is the vector of returns associated with X_y, $\alpha^C_{y,s} f^C$ and $\alpha^N_{y,s} f^N$ are the cognitive and non-cognitive loadings, respectively; $e_{y,s}$ represents an idiosyncratic error term associated with existing cognitive and non-cognitive characteristics.

2.2 Socio-emotional skills

Cognitive skills are the capacity to identify issues, to deal with problems properly and creatively, processing speed ability, and ability to learn new information such as numeracy, literacy or speech. Technical skills, or hard skills, involve knowledge or know-how, an ability to use technology at work, such as knowing how to use computers or the way a chief engineer must have knowledge of engines and be able to control and use machines as well. In general, these skills are both important for improving performance and outcomes, while socio-emotional skills or non-cognitive skills are important for workers who need to be more able to adapt with changing environments and work professionally. In this part, socio-emotional skills are split into two groups, one which includes behavioral traits, and the other one is key personality traits.

In addition, the study by Guerra, Modecki, and Cunningham in 2014 (quoted in Acosta, Muller, & Sarzosa, 2015) has described the meaning of socio-emotional skills as a different skills’ set, one which enables people to adapt effectively in social situations. Then there are patterns of behaviors like feeling, thinking, and conduct; for example, the capacity in work, obligation, responsibility and teamwork, which are called behavioral traits. The last factor is the personality of a person, related to emotion, sensitivity, patience and self-confidence; these are called personality traits, and these measured personality traits can be positively correlated

over the life cycle. However, they are not fixed and can be changed by experience and investment (Almlund, Duckworth, Heckman, & Kautz, 2011).

2.2.1 Personality Traits

Personality traits are one part of the Socio-emotional set of skills. These traits are divided into five important factors, known well as “The Big Five” skills, which are always measured in various studies across county. At present, many psychologists agree about these five critical components in the Big Five factors personality analysis, especially where human personality is described. All traits are a form composed of thoughts, feelings and actions of a person that make people different from other, and are quite stable over the time of a person’s life and consistent with their expressive behavior.

In the late 1950s, The Big Five initial model was formed by Raymond and E.Tupes. Later, the five-factor model of personality was advanced by J.M. Digman in 1990, followed by Goldberg where that systemization was extended to the highest level (Goldberg, 1993). In 1996 McCrae and Costa employed a Big Five personalities model which could measure the returns in labor market outcome related to the cognitive skills. Since then, this model has been continuously used by many researchers, for example, Borghans, Angela, and Heckman (2008) and Heineck and Anger (2010).

We can define the Big Five factors model as below:

1) Openness to experience refers to the nature of the person who often initiates thinking in creativity, has high imagination levels, displays their interest in surrounding things, always tries to solve problems with new ideas and is ready to take the risk of experimenting with propositions confidently.
2) Conscientiousness is the trait of a person who has good behavior. For instance, he or she maintains courteousness, has intention, has patience and demonstrates responsibility in working and can determine the direction or provide steps necessary to succeed in the objectives of the work.
3) Extraversions refer to the person who is sociable, talkative, cheerful, lively, always seeks out and makes a new friend. This personality likes to cooperate with other coworkers.
4) Agreeableness is the behavior showing friendliness, highly adaptive characteristics, readiness in helping and sympathizing, gives inspiration, and encourages others

politely and effectively.

5) Neuroticism is the behavior that represents the traits of a sensitive person who is always upset, fearful, sad, anxious, stressful, or unstable anytime in every situation. She or he often look downs at themselves in a negative way, evaluating her/his own work lower than reality; when a neurotic person sees other people have attained a better performance, they will not happy or otherwise display envy.

2.2.2 Behavioral Traits

In this part, a few of these behavioral traits are focused on, especially those that employers expect and demand the most from their employees, the first one is 'Grit' (the best known source for research on grit is a study by Duckworth, Peterson, Matthews, and Kelly (2007), who emphasized that grit can predict the success of education), the second is 'Hostile' attribution bias and last one is 'Decision making'.

We can define these as following:

1) Grit refers to perseverance; it consists of a love to do or passion and endeavor to fulfill long-term goals. It is not a matter of talent, but it is a matter of patient commitment that must be trained for over a long time. Having grit supports a person in growing their mindset and allows them to overcome obstacles.
2) Decision making refers to the process of thought and action in learning, analyzing, evaluating the problems or opportunities, and lastly, making the decision by choosing one of the alternatives. False decisions, for instance, when a person makes a fast decision without fully thinking it through, or is careless and does not have perfect information, should be absent. On the other side, being too slow, or unable to make decisions, can have a negative impact on performance and paralyze a process that requires fast action; it may bring the threat of failure in a process of the organization. (Wang & Ruhe, 2007)
3) Hostile attribution bias is a tendency where some people interpret every situation in a negative way, more than it actually is; they define other's unclear behaviors as hostile or aggressive and threatening and respond in an aggressive way themselves.

2.3 Literature Review

Bowles, Gintis, and Osborne (2001) examined the levels of earning by considering the different determinants of individual earnings, such as years of schooling, years of work experiences occupation, socioeconomic background, and demographic factors. Therefore, years of schooling are not enough to explain the labor market outcome of the model. Other factors that may influence earnings should also be considered in the model.

Several economists have put more effort to identify the other determinants on wages beyond years of schooling. The main study, the one that is most discussed, is by Heckman et al. (2006), who employed the ordinary least square in two models; first, a model including cognitive skills with non-cognitive kills and second, a model without non-cognitive skills, using panel data from the National Longitudinal Survey of Youth in 1979. They presented new empirical results, reporting that both cognitive and non-cognitive skills explain social performances in many dimensions, and those skills strongly affect wages at a significant level. Related literature discloses that socio-emotional skills are not less and probably much more important than cognitive skills to predict labor earnings, especially in many high-income countries, for instance the United States, the Netherlands, Germany, and Sweden. Nonetheless, a recent longitudinal study for 11 OECD counties for the Organization for Economic Cooperation and Development recommended that in most countries, to increase cognitive skills is more important than increasing socio-emotional skills in raising income of a country, especially in Switzerland and Nordic countries, but not in the UK and Canada (Organisation for Economic Co-operation and Development [OECD], 2015).

There are many empirical studies that have used the “Big Five traits” as an explanation factor of earning., The evidence from Nyhus and Pons (2005) showed how personality traits or Big Five factors (agreeableness, extraversion, conscientiousness, autonomy, and emotional stability) influence earnings. The study indicated that conscientiousness shows a positive relationship with wages; moreover, emotional stability had positive influences on the earning of both male and female. Agreeableness shows a significant association with lower earnings for females.

Moreover, findings on non-cognitive skills revealed that openness to experience, grit and agreeableness had significant association with wages in three countries and in one country for decision-making. In evidence from Peru, where Lavado, Velarde, and Yamada (2013)

investigated the personality impacts on wages, the study found that emotional stability was positively correlated with the wages, while agreeableness and consistency of effort showed as a negative association. Following, another study from Peru led by Díaz, Arias, and Tudela (2013) indicated that non-cognitive skills are at least as important as cognitive skills, they found grit and emotional stability have a positive effect on wages, while agreeableness showed a negative effect.

Also, in Bangladesh the study conducted by Hilger, Nordman, and Sarr (2018) revealed that extraversion showed a positive significance, while hostile attribution bias showed, as expected, a negative impact. In addition, Hong-ngam (2012) also investigated how cognitive and non-cognitive skills influence income in Thailand. The model used was based on the Mincerian and Heckman Equation, with OLS introduced into the model with and without non-cognitive skills. The study revealed that Lotus of control and self-esteem have strongly significant impacts on income; when adding these non-cognitive variables into the model, it reduces the effect on the power of explanation of cognitive skills such as educational level. In other words, non-cognitive skills have positive relationships with higher income.

In another research study from Bangladesh by Normura and Adhikari (2017), who analyzed the relationship between personality traits and wages, the results revealed that emotional stability and wages have a positive relationship while grit shows a negative relationship on wages. They also broke down the sample into a four-subsample group based on job type, specifically, professional versus non-professional workers, industries, firm size, and educational attainment. The results were very varied; they found that among professionals, agreeableness is statistically correlated with wages while among non-professionals, the analysis shows a positive correlation for emotional stability and decision making and a negative correlation for grit. The finding is similarly mixed for hostile attribution bias, with a negative correlation in the education sector but positive correlations for non-professional job types and also a positive relationship in the commerce and manufacturing sectors.

In summary, from the various literature review articles we can conclude that cognitive and socio-emotional skills had strong influence on income in many dimensions. Nevertheless, there are still issues concerning non-cognitive skills and a lack of related literature in the context of Lao PDR regarding socio-emotional skills. Hence, all relevant literature review will be adapted for the methodology in this study to clearly attain the objective: to explore the impact of

cognitive and socio-emotional skills on wage difference in the context of Lao PDR.

3. Research Methodology

3.1 The Statistical Model

From the literature review, the year of schooling or level of education has been acknowledged as an essential variable to estimate the casual effect of education on wages or earnings. Thus, in this study, the author is using the cross-sectional data with the general Mincerian wage regression model from Mincer (1974) to find out the relationship of education, work experience, and wages in Laos as follows:

$$\text{Ln}\, W_i = \alpha + \beta_1 Ysch_i + \beta_2 Exp_i + \beta_3 {Exp_i}^2 + \varepsilon \quad (3)$$

where the endogenous variable in the above equation is ln W_i representing a natural log of hourly wage of individual. The estimate coefficients of the exogenous variables interpreted as the percentage change in the wage rate affected by unit changes in the independent variables. The exogenous variables are $Ysch_i$ where years of schooling represent a proxy of cognitive skills, and $Exp_i \; and \; Exp_i^2$ denote years of work experience and its square.

Moreover, the empirical formulation is expressed by added dummy variables for type of occupation to capture subgroup differences, shown as follows:

$$\ln W_i = \alpha + \beta_1 Ysch_i + \beta_2 Exp_i + \beta_3 {Exp_i}^2 + \beta_4 Type_i + \varepsilon \quad (4)$$

Type = 1 if an observed worker is a Non-Professional type signify to 1,
Otherwise signify to 0 (i.e., Professional type)

3.2 Mincer Earnings and adding Socio-Emotional skills into equation

As the study would like to estimate the power of socio-emotional skills on wages, then we implement the new expanded standard Mincer earnings equation by added eight of socio-emotional skills into the equation as below:

$$\ln W_i = \alpha + \beta_1 Ysch_i + \beta_2 Exp_i + \beta_3 {Exp_i}^2 + \beta_4 Open_i + \beta_5 Cons_i + \beta_6 Extra_i + \beta_7 Agree_i + \beta_8 stability_i + \beta_9 Grit_i + \beta_{10} Dec_i + \beta_{11} Hostile_i + \varepsilon \quad (5)$$

The analysis begins with a model that contains all samples as in the above equation, which is then divided into sub-samples based on job type in order to assess various effects. The regression using log of hourly wage of individual against subgroup of labor in professional occupation and non-professional occupation is as following:
Professional occupation equation:

$$\ln W_{Pi} = \alpha + \beta_1 Ysch_{Pi} + \beta_2 Exp_{Pi} + \beta_3 {Exp_{Pi}}^2 + \beta_4 Open_{Pi} + \beta_5 Cons_{Pi} + \beta_6 Extra_{Pi} + \beta_7 Agree_{Pi} + \beta_8 stability_{Pi} + \beta_9 Grit_{Pi} + \beta_{10} Dec_{Pi} + \beta_{11} Hostile_{Pi} + \varepsilon \quad (6)$$

Non-professional occupation:

$$\ln W_{Ni} = \alpha + \beta_1 Ysch_{Ni} + \beta_2 Exp_{Ni} + \beta_3 {Exp_{Ni}}^2 + \beta_4 Open_{Ni} + \beta_5 Cons_{Ni} + \beta_{N6} Extra_i + \beta_7 Agree_{Ni} + \beta_8 stability_{Ni} + \beta_9 Grit_{Ni} + \beta_{10} Dec_{Ni} + \beta_{11} Hostile_{Ni} + \varepsilon \quad (7)$$

To find out if independent variables in each regression model are highly correlated to each other or not, the Variance Inflation Factor (VIF) is being used for each independent variable to check multi-collinearity. We found that the VIF value of socio-emotional skills is lower than 10, thus, it is not considered to have a high correlation of socio-emotional skills' variables. For Exp year of work experience and Exp^2 its square, correlations are extremely strong, but since the relationship is non-linear, the model still can be estimated with both variables in same model.

3.3 Data overview

Measures of cognitive skills. The number of schooling years is represented as a cognitive skill, its scale from zero to 25 years of schooling - from having no education to a doctoral degree.

Measures of socio-emotional skills. The STEP Household Survey was designed by developmental and personality psychologists. The survey provides five measures of personality traits, where the core of the socio-emotional skills inventory is based on a widely accepted taxonomy of broad families of personality traits, the so called "The Big Five model". It consists of agreeableness, conscientiousness, extraversion, openness to experience, and the last one is emotional stability (which is the obverse of neuroticism). The survey also provides three measures of behaviors and attitude traits, which include the following

dimensions: grit, hostile attribution bias, and decision making. The survey provides the questionnaire item to interview respondents; for example, one questionnaire item mapping openness to experience asks, “Do you enjoy beautiful things such as nature, art, and music?”, then respondents are able to choose four possible responses. The scoring for each scale is straightforward, for instance, “almost always” is assigned to a score of 4, “most of the time” indicates 3, “some of the time,” signifies2, “almost never”, is given a1.

Table 1: Example of possible responses ranging and scoring for openness to experience

Question of openness to experience	Possible Answer			
	almost never	some of the time	most of the time	almost always
Do you come up with ideas other people haven't thought of before?	1	2	3	4
Are you very interested in learning new things?	1	2	3	4
Do you enjoy beautiful things such as nature, art, and music?	1	2	3	4

The aggregation of items into domains is done through an inter-item average—that is, a weighted average of pre-assigned items based on all possible pairs. The inter-item average approach has been empirically validated by leading psychologists who advised the World Bank STEP Core team and was performed with Stata’s alpha command, Pierre, Sanchez Puerta, Valerio, and Rajadel (2014).

3.4 Data source and type

The analysis in this study uses cross-section data which was collected from the Skills toward Employment and Productivity (STEP) Household Survey which is a multi-country study conducted by the World Bank. (The data used in this study is the latest data from the World Bank that the author has checked, dated on 25th June 2022). According to the CEIC report, the difference in the Laos labor force participation rate over the past 10 years, in 2011 was 78.09 percentage and 2020 was 77.33%, which shows not much has changed. Therefore, the data in year 2012 is still valid. In addition, Laos is not often surveyed, especially for information regarding cognitive and socio-emotional skills of labor.

The survey gathers a wide variety of background information regarding standard household surveys, including demographics, education, household wealth, employment and compensation, household size and composition. Moreover, individuals aged between 15 and 64, residing in both rural and urban areas, were randomly selected to be interviewed and tested for information related to basic cognitive skills, socio-emotional skills, personal health, use of skills on and off the job. The sample size was 2,845.

Table 2: Inventory of Socio-emotional Skills in the Lao PDR STEP Household Survey

		Definition	Questionnaire item
Personality traits	Openness to experience	Appreciation for art, learning, unusual ideas, and variety of experience	Do you come up with ideas other people haven't thought of before? Are you very interested in learning new things? Do you enjoy beautiful things such as nature, art, and music?
	Conscientiousness	Tendency to be organized, responsible, and hardworking	When doing a task, are you very careful? Do you prefer relaxation more than hard work? Do you work very well and quickly?
	Extraversion	Sociability, tendency to seek stimulation in the company of others, talkativeness	Are you talkative? Do you like to keep your opinions to yourself? Do you prefer to keep quiet when you have an opinion? R Are you outgoing and sociable? for example, do you make friends very easily?
	Agreeableness	Tendency to act in a cooperative, unselfish manner	Do you forgive other people easily? Are you very polite to other people? Are you generous to other people with your time or money?
	Emotional stability	Predictability and consistency in emotional reactions, with absence of rapid mood changes	Are you relaxed during stressful situations? Do you tend to worry? R Do you get nervous easily? R
Behaviors and attitudes	Grit	Perseverance with long-term goals	Do you finish whatever you begin? Do you work very hard? For example, do you keep working when others stop to take a break? Do you enjoy working on things that take a very long time (at least several months) to complete?
	Decision making	Manner in which individuals approach decision situations	Do you think about how the things you do will affect you in the future? Do you think carefully before you make an important decision?

	Definition	Questionnaire item
		Do you ask for help when you don't understand something?
		Do you think about how the things you do will affect others?
Hostile attribution bias	Tendency to perceive hostile intents in others	Do people take advantage of you?
		Are people mean/not nice to you?

Source: Quoted in Acosta et al.,(2015) based on Almlund et al. (2011), John and Srivastava (1999), and World Bank (2014).

4. Results

4.1 Sample profile

All of respondents were living in Lao PDR and were from 134 urban villages and 54 rural villages. Earnings per hour of this sample, on average, was 9,584.35 LAK or 1.25 USD, and years of schooling averaged 8.58 years. Years of experience on average for their sample was around 20.49 years and the average age was 38.28 years old.

According to gender, 57 percentage of the sample was female, and 43 percent males. The occupation of the sample was mostly classified as service and sale, equaling 27.25 percent, and skilled agriculture made up 25.36 percent, followed by elementary occupations at 13.72 percent, craft and related trade workers at 12.08 percent, while professionals, technicians and associate professionals, managers, plant and machine, and clerical support worker percentages show 7.05, 5.41, 4.28, 2.71, and 2.14, respectively. When categorized into 2 types of occupation, 83 percentage of the sample was non-professional, and 17 percentage was professional.

Table 3: Means and standard deviations of data.

Variable	Mean	Standard Deviation	Minimum	Maximum
Earnings per hour in LAK	9,584.35	30,551.56	54.73	718,390.80
Earnings per hour in USD	1.25	3.97	0.0071	93.39
Years of schooling	8.58	5.21	0	23
Years of work experience	20.49	11.86	0	54
Years of work experience its square	560.49	555.17	0	2916
Female	0.57	0.49	0	1
Age	38.24	11.03	15	64
Socio-emotional skills				
Openness to experience	2.63	0.59	1	4
Conscientiousness	2.79	0.46	1	4
Extraversion	2.76	0.53	1	4
Agreeableness	2.90	0.57	1	4
Emotional stability	2.69	0.52	1	4
Grit	2.62	0.56	1	4
Decision making	2.80	0.58	1	4
Hostile attribution bias	1.99	0.64	1	4

Source: Author's own calculation. Data from Skills toward Employment and Productivity (STEP) Household Survey

Table 4: Years of schooling by occupation

Occupation	Year of schooling Mean	Standard Deviation	Minimum	Maximum
Managers	14.01	3.89	2.5	19
Professionals	15.16	2.32	5	19
Technicians and associate professional	14.73	2.92	2.5	23
Clerical support	14.72	3.35	2.5	19
Service and sales	8.49	4.43	0	17
Skilled agriculture	5.16	3.99	0	17
Craft and related trade worker	7.39	4.31	0	15
Plant and machine	8.52	4.38	2.5	17
Elementary occupation	6.62	4.19	0	17
Professional type	14.73	2.99	2.5	23
Non-Professional type	7.17	4.59	0	19

Source: Author's own calculation. Data from Skills toward Employment and Productivity (STEP) Household Survey

Among the occupations, in terms of managers, professionals, technicians and associate professionals, these three occupations are classified as 'Professional' types of occupation by ISCO (International Standard Classification of Occupations). They require skills level 3 and 4 where formal education is used to measure the skills level of an occupation; normally those skill levels are obtained at a higher educational institution for a period of 1-3 years after completion of secondary education for skill level 3 and takes 3-6 years leading to the result of a first degree or higher qualification. In accordance with years of schooling means that show in table 4-2, the professional type is 14.73, and professionals show the highest average mean, about 15.16, followed by technicians and associate professionals, about 14.73, and managers had the lowest average mean, which is 14.01 years of education.

For the rest of the occupations, clerical support, service and sales, skilled agriculture, craft and related trade worker, plant and machine, and elementary occupation, these are classified to less than skill level 3 or called non-professional types of occupation. Those skills level generally indicated a completion of the first stage of secondary or primary schooling, or non-education, taking the time of around 6-8 years. As result, the table shows that the years of schooling mean for a non-professional type is 7.17, while it is noticeable that clerical support personnel have years of schooling on average at 14 years, which may imply that clerical support occupation in Laos requires a higher educational fulfillment than classified and categorized by ISCO.

4.2 Wage returns to Cognitive Skills

To discover the impact of cognitive skills on wages, the following Mincer equation consists of the independent variables that are commonly used, which are years of schooling and the amount of experience. In this study, type of occupation, as well as a dummy which is 'Non-professional and Professional', has been included into the second model to represent the independent variable.

Table 5: Estimated impact result of cognitive skills on wages

Dependent: ln wage	Coefficient
Years of schooling	0.0614***
	(0.0076)
Years of work experience	0.0212**
	(0.0087)
Years of work experience^2	-0.0005***
	(0.0002)
Constant	7.5861***
	(0.1328)
R-square	0.0643

Note: Standard error in parentheses, ***, **, * indicate the significant level at 0.01, 0.05, 0,10, respectively.

In table 5, estimations of cognitive skills in the wage regression without type of occupation reveals that the cognitive skills show a positive relationship and significant wage relationship. The results show the increasing return in wages, about 6.14 percent, for an additional year of schooling, while the relationship of one more additional year of work experience increases wage by 2.12 percent. The last variable of cognitive skills is the square of work experience and shows a negative association with wages, indicating diminishing returns to scales of wages.

Following the model with type of occupation variables, shown in Table 6, the estimated results still illustrate the positive correlation between years of schooling and wages; likewise, years of work experience. Looking at type of occupations, professional type earning is 4.36 times higher than non-professional earning.

Table 6: Estimated impact result of cognitive skills on wages

Dependent: ln wage	Coefficient
Years of schooling	0.0789***
	(0.0071)
Years of work experience	0.0155*
	(0.0080)
Years of work experience^2	-0.0003*
	(0.0002)
	Professional = Base
Non-professional	-1.4724***
	(0.0545)
Constant	8.1654***
	(0.1214)
R-square	0.5853

Note: Standard error in parentheses, ***, **, * indicate the significant level at 0.01, 0.05, 0,10, respectively.

4.3 Wage returns to Socio-Emotional skills

To find out the impact of Socio-emotional skills on wages, this study implemented the new expanded standard Mincer earnings equation by adding eight socio-emotional skills into the equation.

Shown in Table 7, the measures of socio-emotional skills in the wage regression reveals that the cognitive skills still show significant positive relationships related to wages. Years of schooling effects are significant but with lower power than model 6 above; work experience effects are significant but demonstrate more impact than model 6 above. There is diminishing power for work experience, but the size is smaller than in model 6.

Meanwhile, two factors of socio-emotional skills have shown a significant positive relationship with wages. The results show the increasing return of wages, about 21.30 percentage points, to an additional conscientiousness variable, and the increasing return in wages, about 19.56 percent, to an addition in agreeableness, while decision making, one of the other socio-emotional skills, shows a negative association with wages, at about 11.95 percentage points.

Table 7: Estimated impact result of Socio-emotional skills on wages

Dependent: ln wage	Coefficient
Years of schooling	0.0535***
	(0.0082)
Years of work experience	0.0199**
	(0.0088)
Years of work experince^2	-0.0005***
	(0.0002)
Openness to experience	0.0332
	(0.0600)
Conscientiousness	0.2130***
	(0.0068)
Extraversion	0.0288
	(0.066)
Agreeableness	0.1956***
	(0.0623)
Emotional Stability	0.0988
	(0.0625)
Grit	-0.0357
	(0.0597)
Decision making	-0.1191**
	(0.0612)
Hostile attribution	-0.0262
	(0.0524)
Constant	6.5638***
	(0.3479)
R-square	0.0808

Note: Standard error in parentheses, ***, **, * indicate the significant level at 0.01, 0.05, 0,10, respectively.

4.4 Wage returns to Socio-Emotional skills by job type

To find out if the value of socio-emotional skills varies depending on the job type, the result will not be divided by each of the nine ISCO job types, to ensure a sufficient sample, but has been aggregated into two types. The regression uses log of hourly wage of individual against subgroup of labor in professional occupation and non-professional occupation.

Table 8: Estimated impact result of Socio-emotional skills on wages by job type

Dependent: ln wage	Professional	Non-Professional
Years of schooling	-0.0025	0.0454***
	(0.027)	(0.0102)
Years of work experience	0.0584***	0.0122
	(0.0189)	(0.0116)
Years of work experience^2	-0.0014***	-0.0004*
	(0.0005)	(0.0002)
Openness to experience	-0.1359	0.0364
	(0.1169)	(0.0721)
Conscientiousness	0.2060	0.2068**
	(0.1693)	(0.0844)
Extraversion	0.2739*	-0.0994
	(0.1455)	(0.0745)
Agreeableness	0.1791	0.2074***
	(0.1574)	(0.0724)
Emotional Stability	0.0424	0.1202*
	(0.1285)	(0.0729)
Grit	-0.1661	-0.0383
	(0.1150)	(0.0713)
Decision making	-0.2570*	-0.1041
	(0.1423)	(0.0704)
Hostile attribution	0.2181*	-0.0749
	(0.1121)	(0.0593)
Constant	7.5693***	6.7731***
	(0.7515)	(0.4309)
R-square	0.1070	0.0572

Note: Standard error in parentheses, ***, **, * indicate the significant level at 0.01, 0.05, 0,10, respectively.

In Table 8, the estimated result reveals a significant association pattern between professional and non-professional. For the professional type, the cognitive skill, years of work experience, still shows a significant positive relationship with wages at about 5.84 percent, for an additional year of work experience and the square of work experience shows a negative association with wages, while years of schooling has not shown any significant impact on wage. Meanwhile, years of schooling is the only factor among the cognitive skills that show a positive relationship that is significantly related with wages, about 4.54 percentage points.

5. Conclusion and Recommendations

The main findings of this study are as follows: the results confirm Mincer's model of productivity. For cognitive skills there are positive, strong, and significant correlations between an additional year of schooling, years of work experience and wages. The coefficient for education is relatively higher; the effective size of an increase by one year of schooling is a 6.14 percentage increase in wages, compared to the coefficient of experience variable which has a 2.12 percent result. Within that, the result also confirms that the professional sample has earned more than non-professionals.

The analysis indicates the association between socio-emotional skills as measured through personality and behavior traits, and wages, as follows. Firstly, conscientiousness and agreeableness show a consistently positive relationship with wages. Surprisingly, the decision-making variable shows a relationship negatively with wages. This may reflect that the labor personnel with greater decision-making skills, those who apply a more alternative or consequence-based decision-making style, might be too slow or unable to make decisions which can have a negative impact on performance and paralyze a process that requires fast action; it may bring the threat of failure in a process of the organization (Wang, 2007).

Moreover, when aggregated into just two categories of occupation, the results show that for professionals, years of work prove more advantageous in determining wages, but years of schooling have not showed any significant impact on wages. In contrast, years of schooling has significant impact on wages for non-professionals.

The findings about socio-emotional skills reveal that extroversion shows a generally positive effect with wages for professionals, implying a positive incentive for a professional worker to be extroverted, the kind of social person who has a highly confidential attitude, is outspoken and the readiness to face any problem. Meanwhile, decision making still shows a negative correlation, particularly among professionals; this result may reflect unsuccessful outcomes of wage negotiations by more decision-making workers. However, regarding hostile attribution, which should affect wages negatively, it happens to have positive effects on wages for professionals.

According to our literature review, research from Bangladesh by Normura and Adhikari (2017) also found similar results for hostile attribution. They reported that it can have a positive

relationship on wages when aggregated into two categories of occupation, for non-professionals, but found a negative relationship for the education sector, which may imply the direction of the correlation between non-cognitive skills and wage may be positive or negative depending on the traits as well as on the occupation, industry, and size of firm.

Conscientiousness and agreeableness continue to show a generally positive relationship with wages for non-professionals. These results suggest that the statistically significant relationship between conscientiousness, agreeableness, and wages within firms for non-professional workers likely reflects the higher power to negotiate their wage rate, which is also consistent with the full-sample model. While emotional stability shows a positive relationship with wages, this relationship is not apparent in the full-sample model, suggesting that for non-professional workers seeking higher wages, emotional stability is particularly important.

Based on the results of this study we can confirm that cognitive skill and a socio-emotional variables play a potentially important role in labor market success. This is especially so for conscientiousness and agreeableness where the effective size of an increase of additional conscientiousness is a 21.30 percentage points increase in wages and there is a 19.56 percent effect for agreeableness. The results are partially aligned with most of the qualities Lao employer value, particularly conscientiousness, and is one of the most desirable traits among the Big Five personality traits for all occupations (World Bank, 2013).

Thus, this study has confirmed the empirical evidence for such a claim in the case of Laos. Therefore, it is important that both cognitive skills and socio-emotional skills should be strengthened and supported by policies of the Lao government and should be promoted early from childhood by family, school, and government. According to this paper's review of literature on the economics and psychology by OECD Kautz, Heckman, Piris, Well, & Borghans, (2014), it is indicated that both cognitive skills and socio-emotional traits can be changed and enhanced.

They are shaped by families, especially by parents, who should pay more attention to their children's socio-emotional traits, especially for the occupations which they are suited to, and prepare them before labor markets entry. Besides that, schools can also play an important role in providing socio-emotional skills by encouraging special activities that include emotional and behavioral skills learning and practice for children. The early years are critical

in building the skill foundations for successful investment success. There is strong evidence that before labor markets entry it is important in the early years for the shaping of all skills, especially the socio-emotional skills which are more flexible in shaping than cognitive skills at later ages. When they get older, the responsibility must shift to firms as the personality traits of workers will be shaped by the training courses of individual firms.

In terms of further recommended research, this study used the data of Laos PDR only. Therefore, in order to provide broader results that will be helpful for governments of countries to develop their own human resources, for future research, comparative studies regarding cognitive and socio-emotional skills across other ASEAN countries such as Cambodia, Myanmar, Vietnam, etc. should be carried out. If the data is updated that will add further value to future findings.

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