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Effects of Self-Efficacy on Individual Earnings: A Preliminary Study of the Thai Labor Market

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Abstract

This study estimates the earnings differences in the Thai labor market that are related to workers' non-cognitive skills by examining the psychological characteristic of self-efficacy. Self-efficacy is defined as a person's belief in his or her ability to organize and execute courses of action necessary to achieve a goal. The Thai Mental Health Survey measures both basic socio-economic factors and two psychological indicators of self-efficacy and affective state, drawn from 15 items of the Thai Mental Health Indicator. The effect of self-efficacy on an individual's annual earnings is estimated using both OLS and IV techniques. From the selected sample, the study confirms that the Thai labor market values self-efficacy, even though it is endogenous. Self-efficacy is independent of gender, religion and marital status, and its effect on earnings is unrelated to years of schooling or work experience. Omitting self-efficacy from the model results in underestimation of female earnings, underestimation of earnings in occupations, and overestimation of earnings in the countryside. Self-efficacy likely contributes to additional earnings (such as earnings from overtime and bonuses) made through intense effort, compared with traditional human capital of schooling or work experience. Policy recommendations aimed at improving self-efficacy and areas for further studies are suggested.

Keywords

Self-efficacy; earning differences; non-cognitive skills; Thai Mental Health Survey

Introduction

In traditional labor economics, it is believed that differences in earnings result from individual cognitive skills or intelligence. These differences are explained using human capital theory, where people are seen to accumulate skills through formal education and through work experiences. Skills are important in increasing productivity and hence earnings capacity. However, since the 1970s, a number of studies focusing on factors that contribute to differences in earnings have highlighted the importance of personal psychological characteristics such as personality and attitude. However the impact of the latter, collectively referred to as non-cognitive skills, on economic and social outcomes have not been fully accepted in the literature. Additionally, if the labor market values these skills, questions have been raised as to how they can be improved or invested in.

Studies on the effects of psychological characteristics on economic outcomes have defined several important factors. Andrisani (1977) for example, examined the influences of *locus of*

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control[2] (LOC) on six different outcomes for men in the American labor market, namely, occupational attainment, average hourly earnings, annual earnings, occupational advancement, growth of average hourly earnings and growth of annual earnings. The study found that LOC significantly influences all outcomes except growth of annual earnings among young men and growth of average hourly earnings among middle-aged men. This effect is independent of skills, abilities and demographic characteristics. Goldsmith, Veum and Darity (1997) examined the influence of *self-esteem*[3] on monthly wages. Using the U.S. National Longitudinal Survey for Youth (NLSY), they found that both wages and self-esteem were determined simultaneously by traditional human capital factors such as education and work experience. Interestingly, individual wages were more responsive to changes in self-esteem than changes in human capital factors. Semykina and Linz (2007) investigated how LOC and the need for *challenge* or *affiliation*[4] (C-A) explained the gender wage gap in Russia. Surveys from workplaces in eight cities between 2000 and 2003 found that the Russian labor market rewards those who are *internal*[5] and exhibit preferences for challenge, particularly women. Controlling for personality traits also reduced the unexplained part of the gender wage gap.

Heckman, Stixrud and Urzua (2006) found that cognitive and non-cognitive skills co-determine economic outcomes, for example, wages, probabilities of college graduation and probabilities of employment—as well as social outcomes such as the probability of involvement in illegal activities, being imprisoned and teenage pregnancy. Heckman (2008) emphasized that "as is intuitively obvious and commonsensical, much more than smarts is required for success in life" (p. 296).

Case studies on the role of non-cognitive skills and their impact in the Thai labor market are very rare. Most focus on the work performance of school teachers and university lecturers. Sukin (2008) investigated the teaching performance of engineering lecturers at twelve leading Thai universities and found that the psychological characteristics of *creative personality*[6] and *perceived control*[7] influenced their teaching behavior. Boonprakob and Boonprakob's (2007) study on retired government officials from Srinakharinwirot University in 2003 found that retirees with higher self-efficacy continued working post retirement. Mohan's (2007) case study on job satisfaction of teachers at international schools in Bangkok found that locus of control directly affected the level of work-related stress while indirectly affecting job well-being significantly.

From the foregoing, it is clear that non-cognitive skills are as important as cognitive skills in determining economic outcomes. However, knowledge of how non-cognitive skills

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2 Previously called the internal-external attitude (introduced by Julian Rotter (1966)), locus of control was simplified by Cebi (2007) as "the social psychological concept...which measures the extent to which an individual believes she has control over her life (internal control) as opposed to believing that luck controls her life (external control)" (p. 919).

3 Morris Rosenberg (1965) defines self-esteem as "a favorable or unfavorable attitude toward oneself" (p. 15) or simply a sense of personal worth.

4 The need for challenge is linked to "getting ahead" while the need for affiliation is linked to "getting along" (Linz and Semykina, 2009, p. 72).

5 Referred to those who believe that they are masters of their own lives, as opposed to *external* (Rotter, 1966).

6 Personality relates to "independence, non-conformity, a wide set of interests, openness to new experiences, flexibility and risk taking" (Sukin, 2008, p. 4).

7 Personality relates to "participative decision making and job autonomy" (Sukin, 2008, p. 5).

influence outcomes in the Thai labor market is still relatively unexplored. Using the Thai Mental Health Survey, this study identifies psychological characteristics of generalized *self-efficacy* and investigates how the latter influences the earning capacity of individuals.

Self-Efficacy

Introduced by psychologist Albert Bandura (1977), the term self-efficacy is defined as a person's belief in his or her ability to organize and execute the courses of action necessary to achieve a goal. Self-efficacy has a significant impact on personal goals and accomplishments as it determines how people behave, feel, think and motivate themselves. It also directly influences the level of effort and persistence that people demonstrate when facing obstacles. The stronger the perceived self-efficacy is, the more effort is generated. Self-efficacy is also related to persistence, as Bandura (1977) states that "those who persist in subjectively threatening activities that are in fact relatively safe will gain corrective experiences that reinforce their sense of efficacy" (p. 194).

Classification of Self-Efficacy. Self-efficacy can be classified into three levels of generality of assessment (Bandura, 1997). At the most specific level, perceived self-efficacy is rated for a particular performance under specific situations. For example, Mavis (2001) conducted a study among second year medical students who were asked to rate their confidence in their abilities in practices such as interviewing a female patient, performing an abdominal examination, and identifying a heart murmur, just before clinical examination. At the intermediate level, perceived self-efficacy is rated for a class of performances of the same activity under a class of situations with the same conditions. Ayuppa and Kong (2010) conducted a case study among full-time employees in supermarkets and department stores; they were asked to rate their work competency through statements such as "I feel confident that my skills and abilities equal or exceed those of my colleagues" and "I feel that I am overqualified for the job I am doing". At the most general level, perceived self-efficacy is rated for performances without specifying the activities or situations. For example, in a study by Judge, Erez, Bono and Thoresen (2002), participants were asked to respond to such statements: "When I make plans, I am certain I can make them work" and "When I decide to do something, I go right to work on it".

Sources of Self-Efficacy. Self-efficacy is not a gifted trait. To recognize and realize their ability, individuals must rely on self-knowledge. According to Bandura (1997), this is gained from four sources of information:

Enactive Mastery Experiences or Performance Accomplishments. A person's experiences of success and failure influences expectations of perceived ability. The latter may be delivered in upcoming situations, which may be similar to or substantially different from past experiences. High expectations of one's ability are developed through repeated success of a particular behavior while low expectations result from failures.

Vicarious Experience or Social Modeling. By observing how others deal with challenging or threatening activities without adverse consequences, individuals begin to compare attributes and form expectations of their own ability. Without direct experiences, individuals are still able to calculate which goals are achievable and how much effort is needed. The more similar the attributes, the higher the expectations.

Verbal Persuasion or Social Persuasion. Individuals who are verbally persuaded that they are capable of achieving given activities are more likely to generate greater effort and to sustain it than those who doubt their own ability. However, verbal persuasion is considered a weak inducer of efficacy if one's experiences of past failures dominate self-belief.

Physiological and Affective States or Emotional Arousals. An individual's expectations of his or her own ability can be distorted by negative emotional arousals such as stress or fear and the physiological state of fatigue, since they directly decrease performance and lead to other avoiding behaviors. The more sensitive a person is to these arousals, the lower the expectations are. Consequently, by training or practicing to cope with stress and fear, individuals become less sensitive and are able maintain their performance.

How Self-Efficacy Influences Labor Market Outcomes

Self-efficacy is a psychological characteristic that signals the skills or abilities in providing individual effort. The latter is as important as cognitive skills or abilities since effort generates increased productivity which results in higher wages. However, previous research on the relationship between mental states or emotions and labor market outcomes has concluded that positive or desired mental states have direct effects on the outcomes, without discussing how this effort is induced. For example, Mohanty (2009) examined the effects of positive attitude on happiness and wages and found that "happiness also affects the worker's earnings both directly and indirectly" (p. 884).

The hypothesis of this study is that, all other things being equal, individuals with stronger self-efficacy earn more than those with weaker self-efficacy. Using two psychological theories, we expect that mental states or emotions do not directly influence labor market outcomes, but rather influence them indirectly through improving self-efficacy, which induces effort contributing to increased productivity and higher wages.

Goldsmith, Veum and Darity (2000) acknowledged that level of effort (E) depends on how motivated the individual is (T). This can be formulated as:

$$E = e(T), \text{ for } 0 \leq E \leq 1.$$

According to Atkinson's theory of achievement motivation, the strength of motivation is influenced by both pre-determined and situational factors. First, the *motives* to achieve success (M) are connected with the characteristics and personality of an individual in approaching or avoiding certain behaviors (Dunifon and Duncan, 1998). These are pre-determined and continue from one situation to another (Atkinson, 1964). Motivation is also influenced by situational factors. The strength of *expectancy* or probability of success (P) is how strongly individuals believe in the situation they are being confronted with ultimately allowing them to achieve the goal. Lastly, the *incentive* value of success (I) is how attractive the success appears to them in a particular situation (Atkinson, 1964). Atkinson (1964) described this relationship in a multiplicative form as:

$$T = M \times P \times I.$$

Hence the individual motivation function is defined as:

$$T = t(M, P, I(\mathbf{R})), \quad (1)$$

where **R** is the goal, that is, a vector of the foreseen rewards which will be awarded at the end of an activity.

Performance expectation and outcome expectation are not the same, according to Bandura's theory of self-efficacy. Bandura explained that "expectations influence action focused almost exclusively on outcome expectations" (1997, p. 19), and "an outcome is the consequence of an act, not the act itself" (2002, p. 94). Figure 1 illustrates this.

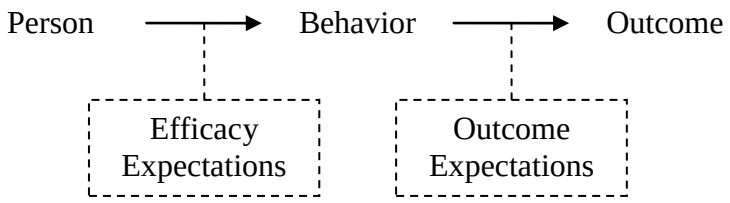

Figure 1: Diagrammatic Representation of the Difference between Efficacy Expectations and Outcome Expectations (Bandura, 1977, p. 193).

Therefore, the belief that performances will lead to the goal or *expectancy* (the strength of expectancy in Atkinson's theory of achievement motivation) is influenced by both the belief concerning whether one can perform required actions or perceived *self-efficacy* (*S*), and the belief as to whether the actions will lead to the desired outcomes or *outcome expectation* (*O*). Belief in efficacy accounts for most of the variance in expected outcomes when outcome is determined by one's own performance, not by fate, luck, external circumstances or unknown factors (Bandura, 1997). Therefore *T*, the individual motivation function and *E*, individual effort function can be reformulated as:

$$T = t(M, P(S, O), I(\mathbf{R})) \text{ and } E = e(t(M, P(S, O), I(\mathbf{R}))). \quad (2)$$

In an explicit form, the two functions become:

$$T = T(M, S, O, I(\mathbf{R})) \text{ and } E = E(M, S, O, I(\mathbf{R})). \quad (3)$$

Hence, the strength of individual motivation and level of effort are determined by four factors: *motive*, the existing individual characteristic to approach or avoid certain behaviors; *self-efficacy*, the belief whether the person can perform the required actions; *outcome expectation*, the belief whether the actions will lead to desired outcomes or rewards; and *incentive value*, the attractiveness of the foreseen outcomes or rewards. Since individuals with stronger self-efficacy generate more effort than those whose self-efficacy is weaker, the individual effort function constitutes a non-decreasing function of self-efficacy, $\partial E/\partial S \geq 0$. At this point, mental states or mood characteristics have a direct effect neither on individual motivation nor level of effort.

Taking into consideration that an important factor in determining self-efficacy is affective states (*A*) or emotional arousals, the individual effort function may be formulated as:

$$E = E(M, S(A), O, I(\mathbf{R})). \quad (4)$$

Therefore, individual effort is an implicit function of affective states or emotions. Negative emotional arousals can distort the individual's expectations of his or her own ability; in other words, the positive or desired mental states strengthen the individual's perceived ability, and self-efficacy is also a non-decreasing function of affective states, $\partial S/\partial A \geq 0$, so that mental states or emotions indirectly influence the individual's effort through changing self-efficacy:

$$\partial E/\partial A = \partial E/\partial S \times \partial S/\partial A. \quad (5)$$

The positive or desired mental states such as happiness are necessary but not sufficient to induce effort. In other words, if an individual is happy but has little faith in his or her own ability, the individual is likely to provide less effort, generate less productivity, and earn a smaller wage than those with a stronger belief in their ability. Therefore, affective states or emotions are a proxy for self-efficacy while the latter is a proxy for effort, productivity and wages.

Data and Variables

The Thai Mental Health Survey (MHS) was conducted, together with the routine Socio-Economic Survey (SES), for the first time by the National Statistical Office of Thailand (NSO) in 2009. According to National Statistical Office (2011), all household members aged 15 and over replied to the 15 items of the Thai Mental Health Indicator (TMHI-15), resulting in a nationwide sample of 81,019 observations. The data provided information on both basic socio-economic factors as well as useful psychological variables. TMHI-15 is a shorter version of a complete version containing 55 questions or items (TMHI-55), both of which were developed in 2007 by the Department of Mental Health, Ministry of Public Health (Mongkol et al., 2009).

Psychological Variables. TMHI-15 consists of 15 items in which the subjects assess their mental health condition in four domains—mental state, mental capacity, mental quality and supporting factors. Responses are based on a 4-point Likert-type scale ranging from 0 (*No*) to 3 (*Very Much*). In the mental capacity domain, this study identified three items namely, "Do you accept hard-to-solve problems (when a problem occurs)?", "Are you confident in controlling yourself in bad or serious situations?" and "Are you confident in facing extremely bad situations in your life?" The questions are aimed at revealing the psychological characteristics of generalized *self-efficacy*. A self-efficacy index (S_{index}), which is a proxy for generalized *self-efficacy*, was created from a linear combination of these three questions. Therefore the S_{index} ranged between 0 and 9. An affective state index (A_{index}), which is a proxy for momentary emotion, was also created from a linear combination of five items namely, "Are you happy with your life?", "Do you feel relaxed?", "Do you feel bored with your daily life?", "Do you feel disappointed with yourself?" and "Are you depressed?" The questions were designed to test the mental state domain.[8] Therefore the A_{index} ranged between 0 and 15.

8 Mental state domain is made up of two subdomains: general well-being and positive and negative affects. Positive affect ranges from 0 to 3 while negative affect ranges from 3 to 0.

Dependent Variables. Three different measures of annual earnings were used as labor market outcomes of interest. The narrowest measure, *Earn1*, is the maximum value of either the wages or salaries (in cash) received in the previous month multiplied by 12, or the wages or salaries (in cash) received in the past 12 months. *Earn2* is equivalent to *Earn1* plus overtime, bonus and other income (in cash) received in the past 12 months. The broadest measure, *Earn3*, is equivalent to *Earn2* plus the total value of non-cash benefits received in the past 12 months. *Earn1* is used in the models unless specified otherwise.

Traditional Human Capital Variables. Level of completed schooling is converted to years of completed schooling to measure educational attainment. Work experience was calculated from the present age less six years of pre-school and years of completed schooling. Cases with a negative value of work experience were discarded.

Demographic Variables. Gender was assigned as a dummy variable, 0 for male and 1 for female. Marital status was assigned as a dummy variable with four categories—never married, married, widowed and marital dissolution (including divorced, separated and unknown marital status). Religion was assigned as a dummy variable with three categories—Buddhist, Muslim and Christian.

Geographical Variables. Each location was assigned two sets of dummy variables. The first was residential area, either urban (municipal areas) or rural (non-municipal areas). The second was region, in five categories: central (25 provinces), north (17 provinces), northeast (19 provinces), south (14 provinces) and Bangkok.

Work Characteristic Variables. Work status was categorized into 14 categories—seven for economically active and the rest for economically inactive. Business or industry was categorized into 17 types based on the International Standard Industrial Classification of All Economic Activities (United Nations Statistics Division, 1989). Occupation was recorded as a three-digit code of 10 major groups, based on the International Standard Classification of Occupations (International Labour Organization (ILO), 1988). Based on the first two digits, occupation was reorganized into a two-digit code, reduced from 114 to 28 categories. This increased the number of observations in each occupational category while occupational variation was maintained. These categorical variables measuring work status, business/industry and occupation were included in the models as dummy variables.

Wage Equation and Selected Sample

This study adopted Mincer's (1974) wage equation with the estimation method of ordinary least squares (OLS). In addition to the traditional human capital variables, the control variables included the demographic, geographical and work characteristic variables described above. The psychological characteristic variable focused only on *self-efficacy* while the influences of *motives*, *outcome expectation* and *incentive value* were included in the error term. Theoretically, they are unrelated. The effect of self-efficacy on earnings was investigated by comparing an inclusive model, in which self-efficacy was controlled, with an exclusive model in which self-efficacy was omitted and its effect embedded in an error. The size of the effect and the model's explanatory power were estimated. The exclusive and inclusive models are specified as:

$$W = \boldsymbol{\beta}_H\mathbf{H} + \boldsymbol{\beta}_D\mathbf{D} + \boldsymbol{\beta}_G\mathbf{G} + \boldsymbol{\beta}_F\mathbf{F} + u, \quad (6)$$
$$W = \boldsymbol{\beta}_H\mathbf{H} + \boldsymbol{\beta}_D\mathbf{D} + \boldsymbol{\beta}_G\mathbf{G} + \boldsymbol{\beta}_F\mathbf{F} + \beta_S S + v, \quad (7)$$

where W is logarithmic annual earnings; **H**, **D**, **G**, **F** are the vectors of traditional human capital, demographic, geographic and work characteristic variables, while **β**s are the corresponding coefficient vectors; S and β_S are the self-efficacy index and its coefficient; and u and v are error terms. This study expected a positive and statistically-significant value of β_S.

Since self-efficacy is hypothesized to positively contribute to individual earnings through intense efforts and increased productivity, cases with complicating factors that may distort this relationship were removed from the analysis. Disabled individuals were not included, since there is a high likelihood that disability limits productivity.

Secondly, the analysis did not include those who changed jobs or had second jobs in the past 12 months. According to Bandura (1997), self-efficacy influences how individuals interpret situations, anticipate scenarios, and visualize the futures they construct. Those with strong efficacy would view situations as realizable opportunities, while those with weak efficacy may not, or may find them difficult. Therefore, all other things being equal, those with strong efficacy are likely to choose to take on opportunities such as new jobs and second jobs, while those with weaker efficacy are likely to hesitate to change jobs or take second jobs. However, there are many reasons why people decide to change jobs or have two jobs. These reasons are not measured by the survey and thus are treated as unobservable factors. Hence, keeping those who had changed jobs or had second jobs in the same sample with those who only had a single job would distort results.

Thus, the empirical analysis was limited to only non-disabled persons who earned wages and salaries from a single employer from one of three sectors—namely, the government sector, state enterprises and the private sector—in the past 12 months. As a result, sample size was reduced from the original 81,019 to 18,913 observations.

Alternative Estimation: The IV Technique

When estimating the coefficients in equation (7) with the OLS technique, self-efficacy must be assumed to be exogenous, i.e. self-efficacy must be "uncorrelated with the error term" (Wooldridge, 2006, p. 838). However, the literature insists otherwise. Bandura (1997) states clearly that self-efficacy is not an inborn trait and highlights the sources of information on self-efficacy. The OLS technique then would be inconsistent and produce biased estimators due to omitted variables, in which self-efficacy is correlated with other variables contained in an error term, i.e. the endogeneity problem.

Alternatively, the coefficients in equation (7) were re-estimated using an instrumental variable or IV technique for endogenous self-efficacy. Since the MHS provides information on self-efficacy such as enactive mastery experiences, physiological states and affective state, the new proxy for self-efficacy can be pre-estimated from these variables. The new proxy is no longer correlated with the error term and produces unbiased estimators, i.e. the unbiased coefficients in equation (7).

Some constraints exist in the selected sample. This technique cannot adopt years of schooling, work experience or work characteristics as the exclusion restriction of the mastery-experience element since they already appear in equation (7). This technique cannot use disability as the exclusion restriction of the physiological-state element either since the selected sample was limited to only the non-disabled. From the five questionnaire items of TMHI-15, the study finally adopted the affective state index as the exclusion restriction of the affective-state element.

In the alternative estimation, the first-stage regression to pre-estimate variable S in equation (7) can be formulated as:

$$\hat{S} = \boldsymbol{\alpha}_H\mathbf{H} + \boldsymbol{\alpha}_D\mathbf{D} + \boldsymbol{\alpha}_G\mathbf{G} + \boldsymbol{\alpha}_F\mathbf{F} + a_A A, \quad (8)$$

where $\hat{S}$ is expected self-efficacy; **H**, **D**, **G**, **F** are the vectors of traditional human capital, demographic, geographic and work characteristic variables similar to those in equation (7), while **α**s are the corresponding coefficient vectors; A and a_A are the affective state index and its coefficient. In the second-stage or the main regression—equation (7)—the self-efficacy index was replaced by the new proxy from equation (8). The re-estimated effect of self-efficacy on earnings should be more accurate than the OLS since this estimation is consistent with those found in the literature.

Individual Annual Earnings Unrelated to Affective States

While the MHS recorded individual wages, salaries, overtime and bonuses earned in the previous month, these were not used as dependent variables in the models. Instead, annual earnings were used to make the dependent variable unrelated to the exclusion restriction, i.e. affective state. This is because individual annual earnings and affective states are not related, as explained further below.

First, research by psychologists has indicated that subjective well-being (SWB) is not a permanent characteristic. Unlike personality, which is relatively more stable, well-being keeps changing according to life events. Kennedy-Moore, Greenberg, Newman and Stone (1992), and Egloff, Tausch, Kohlmann and Krohne (1995) found that moods of individuals keep changing across the time of the day and the day of the week. Moreover, Suh, Diener and Fujita (1996) reported that "only life events during the previous 3 months influenced life satisfaction and positive and negative affect" (p. 1091), and "events that had occurred more than 7 months previously failed to add significant increments to the prediction of current SWB level" (p. 1096). If the wage rate was raised in the previous month, the individual earnings in the previous month would definitely influence the worker's well-being. As a result, this study adopted individual annual earnings as the dependent variable.

Second, the research on happiness conducted by Easterlin (2001), in which the terms happiness and well-being were used interchangeably, revealed that happiness responded to household incomes. Based on basic economics, households own four different factors of production and acquire four different returns from them. Households obtain rent from their land and property; get wages or salaries from their labor; acquire interest from their financial capital; and make profits if they were entrepreneurs (Tucker, 2003). Since the analysis focuses on only the members of the household who work as employees, individual

wages or salaries, which are a portion of household income, were not related to affective states.

Third, workers do not only consider wages, salaries or earnings when applying for a job. Besides the labor market outcomes from economists' points of view, Bandura (1997) also suggests that "the range of [labor market] outcomes include such things as salary, security, social status, freedom to exercise initiative and use one's special abilities, variety in work assignments, chance to learn new competencies, opportunity for advancement and leadership, congenial associates, and the social benefits of the particular line of work" (p. 426). This is supported by Frank (1984), whose study showed that some workers traded off money for higher status in the workplace by accepting wages below their marginal products. This means that workers' satisfaction with their job is not completely based on money and in-kind incomes. In this analysis, the selected sample was limited to workers who had been working continuously with the same employer for 12 months. It assumes that these workers voluntarily stayed in their current jobs, implying that they were satisfied with the overall job attributes, and not only the wages, salary or earnings. Moreover, if they could not find a better job and had to stay in their current employment, the assumption is that their dissatisfaction would be a result of the failure to find a new job, not as a result of unsatisfactory earnings.

If these workers were not satisfied with their present earnings but could not find a better one, they could have taken a second job working on a full-time or part time basis with other employers or be self-employed. Since the selected sample excluded workers who had more than one job, this study assumed that workers in the sample were satisfied with current earnings. Therefore, in this selected sample, working in the same job for 12 months became a habit and changes in the worker's well-being resulted from other factors, not from annual earnings.

Lastly, one may argue that higher wages means a happy worker. This is true when comparing the earnings of the same worker at different times, i.e. when using longitudinal or panel data in studying the relationship between earnings and well-being. However, this study used cross-sectional data in which affective states represented a measurement of emotion at a single point in time. Thus earnings differences across observations are different from worker to worker, and cannot explain the well-being differences of different workers.

Results

To interpret the results, two coefficients—years of schooling and work experience—approximated the proportional additional earnings due to one more year of schooling or work experience, while the coefficients of the dummy demographic, geographical and work characteristic variables approximated the proportional additional earnings differently from the reference groups (Wooldridge, 2006). For generalized *self-efficacy*, those with the strongest self-efficacy would reply to all three questions from the mental capacity domain with *Very Much* and score 9, while those with the weakest self-efficacy should have replied to all of the same questions with *No* and scored 0 on the self-efficacy index. Hence, the coefficient of generalized *self-efficacy* approximates the proportional additional earnings due to self-efficacy improvement, one level out of nine.

Preliminary Study

Table 1 confirms that worker's generalized *self-efficacy* is rewarded in the Thai labor market. Overall, the coefficients of self-efficacy remained statistically significant at $p<.01$, even though demographic, geographical and work characteristic variables were controlled along with the traditional human capital measures. Between the exclusive model and Model A, an inclusion of self-efficacy cannot improve the R^2, which was around 0.681-0.682, while the R^2 in Model B dropped to 0.637 as expected. An inclusion of self-efficacy does not alter the effects of the traditional human capital on earnings either, as the coefficient of years of schooling was around 0.066-0.069 and that of work experience was around 0.047-0.048. This suggests that self-efficacy does not correlate with years of schooling or work experience and confirms that self-efficacy is rewarded independently of these two variables. However, self-efficacy may partially correlate with additional control variables.

Table 1: Results of models estimating the effect of self-efficacy on earnings, controlling for human capital measures and other factors[a]

Model		**(1)**	**(2)**	**(3)**	**(4)**
Estimation Technique		**Exclusive OLS**	**Model A OLS**	**Model B IV[b]**	**$\Delta\beta$ (3)-(1)**
Efficacy		-	0.010 ***	0.108 ***	0.108
Schooling		0.069 ***	0.069 ***	0.066 ***	-0.003
Experience		0.048 ***	0.048 ***	0.047 ***	-0.001
Experience²		-0.001 ***	-0.001 ***	-0.001 ***	0.000
Gender (Male)	Female	-0.161 ***	-0.156 ***	-0.111 ***	0.050
Religion (Buddhist)	Muslim	-0.116 ***	-0.116 ***	-0.118 ***	-0.002
	Christian	-0.035	-0.037	-0.058	-0.023
Marital Status (Single)	Married	0.040 ***	0.040 ***	0.039 ***	-0.001
	Widow	-0.058 ***	-0.059 ***	-0.062 ***	-0.004
	Marital dissolution	-0.017	-0.018	-0.027	-0.010
Residence (Urban)	Rural	-0.025 ***	-0.024 ***	-0.017 **	0.008
Region (Bangkok)	Central	-0.273 ***	-0.275 ***	-0.294 ***	-0.021
	North	-0.437 ***	-0.441 ***	-0.480 ***	-0.043
	Northeast	-0.411 ***	-0.418 ***	-0.485 ***	-0.074
	South	-0.282 ***	-0.286 ***	-0.325 ***	-0.043
Empl. Sector (Government)	State enterprise	0.248 ***	0.247 ***	0.239 ***	-0.009
	Private company	-0.262 ***	-0.264 ***	-0.278 ***	-0.016
Business or Industry (Extra-territorial organization and bodies)	Agriculture, hunting and forestry	-0.410 *	-0.403 *	-0.345	0.065
	Fishery	-0.315	-0.309	-0.250	0.065
	Mining and quarrying	-0.205	-0.199	-0.140	0.065
	Manufacturing	-0.239	-0.232	-0.173	0.066
	Electricity, gas and water supply	-0.149	-0.143	-0.088	0.061
	Construction	-0.231	-0.225	-0.175	0.056
	Wholesale and retail, repairing motor vehicles/ motorcycles/ personal goods/ household goods	-0.276	-0.269	-0.205	0.071
	Hotel and restaurant	-0.382 *	-0.376 *	-0.311	0.071
	Transport, storage and communication	-0.254	-0.248	-0.190	0.064
	Financial intermediate	-0.094	-0.089	-0.044	0.050

Model Estimation Technique		(1) Exclusive OLS	(2) Model A OLS	(3) Model B IV[b]	(4) $\Delta\beta$ (3)-(1)
	Real estate, renting and business activities	-0.213	-0.207	-0.150	0.063
	Public administration and defence, compulsory social security	-0.384 *	-0.381 *	-0.344	0.040
	Education	-0.394 *	-0.389 *	-0.345	0.049
	Health and social work	-0.402 *	-0.396 *	-0.341	0.061
	Other activities related to community/ social/ personal service	-0.474 **	-0.468 **	-0.412 *	0.062
	Private households with employed person	-0.505 **	-0.498 **	-0.437 *	0.068
Occupation (Armed forces)	Legislators and senior officials	-0.665 ***	-0.664 ***	-0.652 ***	0.013
	Corporate managers	0.453 ***	0.455 ***	0.473 ***	0.020
	General managers	0.305 ***	0.305 ***	0.307 ***	0.002
	Physical, mathematical and engineering, science professionals	0.261 ***	0.262 ***	0.272 ***	0.011
	Life science and health professionals	0.253 ***	0.253 ***	0.248 ***	-0.005
	Teaching professionals	0.151 ***	0.152 ***	0.163 ***	0.012
	Other professionals	0.040	0.041	0.057	0.017
	Physical and engineering science associate professionals	-0.146 **	-0.143 **	-0.117 *	0.029
	Life Science and health associate professionals	-0.220 ***	-0.217 ***	-0.195 ***	0.025
	Teaching associate professionals	-0.365 ***	-0.363 ***	-0.342 ***	0.023
	Other associate professionals	-0.091 *	-0.090	-0.073	0.018
	Office clerks	-0.275 ***	-0.272 ***	-0.238 ***	0.037
	Customer services clerks	-0.253 ***	-0.250 ***	-0.226 ***	0.027
	Personal and protective services workers	-0.341 ***	-0.337 ***	-0.298 ***	0.043
	Models, sales persons and demonstrators	-0.433 ***	-0.430 ***	-0.399 ***	0.034
	Market-oriented skilled agricultural and fishery workers	-0.441 ***	-0.436 ***	-0.395 ***	0.046
	Subsistence agricultural and fishery workers	-	-	-	-
	Extraction and building trades workers	-0.497 ***	-0.492 ***	-0.445 ***	0.052
	Metal, machinery and related trades workers	-0.357 ***	-0.353 ***	-0.323 ***	0.034
	Precision, handicraft, printing and related trades workers	-0.520 ***	-0.515 ***	-0.465 ***	0.055
	Other craft and related trades workers	-0.714 ***	-0.710 ***	-0.674 ***	0.040
	Stationary-plant and related operators	-0.380 ***	-0.378 ***	-0.354 ***	0.026
	Machine operators and assemblers	-0.460 ***	-0.456 ***	-0.415 ***	0.045
	Drivers and mobile-plant operators	-0.424 ***	-0.420 ***	-0.383 ***	0.041
	Sales and services elementary	-0.556 ***	-0.551 ***	-0.507 ***	0.049

Model Estimation Technique	(1) Exclusive OLS	(2) Model A OLS	(3) Model B IV[b]	(4) $\Delta\beta$ (3)-(1)
occupations				
Agricultural, fishery and related laborers	-0.708 ***	-0.705 ***	-0.673 ***	0.035
Laborers in mining, construction, manufacturing and transport	-0.654 ***	-0.649 ***	-0.598 ***	0.056
Constant	11.322 ***	11.262 ***	10.688 ***	
R^2	0.681	0.682	0.637	
Adjusted R^2	0.680	0.681	0.636	
RMSE	0.448	0.448	0.478	
N	18,913	18,913	18,913	

Note: *** p<0.01, ** p<0.05, * p<0.1; reference category in parentheses

[a] Dependent variable is log of *Earn1* - salaries (in cash) received in the past 12 months (see text for detailed definition)

[b] IV's for self-efficacy include schooling, experience, experience squared, sex, religion, marital status, rural/urban residence, region, employment sector, business/industry, occupation and affective state index.

Between the exclusive model and Model A, in which the effect of exogenous self-efficacy on earnings was estimated, the coefficient of exogenous self-efficacy was estimated at 0.010 while the inclusion of self-efficacy barely made a change in the coefficients of the additional controlled variables. In Model B, in which the effect of self-efficacy was estimated endogenously, the coefficient of endogenous self-efficacy rose to 0.108 while the coefficients of the additional controlled variables changed considerably. This confirms the partial correlations between self-efficacy and these variables.

Considering the additional controlled variables by groups, the inclusion of self-efficacy had diverse influences over the coefficients of these variables. The inclusion did not alter the coefficients of religion, marital status, residential area (urban-rural), or employment sector, confirming that self-efficacy did not correlate with them. It improves the coefficients of females as they became less negative by 5 percentage points, underlining the underestimation of female earnings. An inclusion improved most of the coefficients of occupations, as they became more positive or less negative, and were almost all statistically significant at $p<.01$. Only the coefficients of the occupation of 1) legislators and senior officials, 2) general managers, 3) physical, mathematical and engineering, science professionals, 4) life science and health professionals, and 5) teaching professionals barely changed. This also underlines the underestimation of earnings in other occupations and positive correlation between self-efficacy and occupations. All coefficients of business/industry also improved similarly but they were not statistically significant. The inclusion of self-efficacy worsened all of the coefficients of region as they became more negative and all were statistically significant at $p<.01$. This underlines the overestimation of earnings in Thailand's countryside and negative correlation between self-efficacy and the countryside.

Different Scopes of Earnings

Table 2 confirms the importance of worker's generalized *self-efficacy* in the Thai labor market. When widening the scope of earnings from the narrowest, *Earn1* (salaries in cash received in past 12 months), to the broadest, *Earn3* (salaries in cash plus overtime, bonus and others in cash plus the total value of non-cash benefits received in the past 12 months), all of the coefficients of self-efficacy remained statistically significant at $p<.01$, even though all of the control variables were included.

Table 2: Results of models estimating the effect of self-efficacy on various measures of earnings

Model (Estimation Technique)	**Exclusive (OLS)**			**Model B (IV[a])**		
Dependent Variables[b]	**Log of *Earn1***	**Log of *Earn2***	**Log of *Earn3***	**Log of *Earn1***	**Log of *Earn2***	**Log of *Earn3***
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Efficacy	-	-	-	0.108 ***	0.118 ***	0.121 ***
Schooling	0.069 ***	0.071 ***	0.069 ***	0.066 ***	0.068 ***	0.066 ***
Experience	0.048 ***	0.047 ***	0.047 ***	0.047 ***	0.046 ***	0.045 ***
Experience²	-0.001 ***	-0.001 ***	-0.001 ***	-0.001 ***	-0.001 ***	-0.001 ***
Female	-0.161 ***	-0.175 ***	-0.178 ***	-0.111 ***	-0.120 ***	-0.121 ***
Religion	X	X	X	X	X	X
Marital Status	X	X	X	X	X	X
Rural	X	X	X	X	X	X
Region	X	X	X	X	X	X
Employed Sector	X	X	X	X	X	X
Business or Industry	X	X	X	X	X	X
Occupation	X	X	X	X	X	X
Constant	11.322 ***	11.354 ***	11.386 ***	10.688 ***	10.662 ***	10.672 ***
R^2	0.681	0.677	0.665	0.637	0.630	0.614
Adjusted R^2	0.680	0.676	0.664	0.636	0.629	0.613
RMSE	0.448	0.471	0.477	0.478	0.504	0.512
N	18,913	18,913	18,913	18,913	18,913	18,913

Note: *** p<0.01, ** p<0.05, * p<0.1; X - Variables in these groups are additionally controlled.
[a] IV's for self-efficacy include schooling, experience, experience squared, female, religion, marital status, rural, region, employed sector, business/industry, occupation and affective state index.
[b] See text for detailed definition of dependent variables

The inclusion of self-efficacy does not alter the effects of traditional human capital on earnings. The coefficient of years of schooling was around 0.069-0.071 in the exclusive model and was around 0.066-0.068 in Model B. Similarly, the coefficient of work experience was around 0.047-0.048 in the exclusive model and was around 0.045-0.047 in Model B. This confirms that self-efficacy does not correlate with years of schooling or work experience and self-efficacy is rewarded independently of these two traditional human capital variables. Interestingly, the coefficient of self-efficacy slightly increased from 0.108 to 0.118 and 0.121 as the scope of earnings widened. The evidence highlights the importance of self-efficacy as it may bring about extra earnings beyond in-cash salaries.

Conclusion and Discussion

From the foregoing, it is clear that non-cognitive skills contribute to individual earnings in the Thai labor market, as has been found in western economies. The effect of the psychological characteristic of generalized *self-efficacy* regarding differences in earnings was statistically significant in all model specifications. The analysis of two different model specifications also confirms the endogenous nature of self-efficacy.

Self-efficacy positively contributes to annual earnings and its effect is independent of the demographic variables of gender, religion and marital status. Its effect on earnings is unrelated to years of schooling or work experience, implying that individuals can fully utilizes their latent abilities developed from schooling and working only when the latter experiences strengthen their perceived abilities. Since self-efficacy is a proxy for effort, it can be stated that effort is unrelated to gender, religion, marital status, years of schooling or educational level and work experience.

Omission of self-efficacy in the model proves the underestimation of female earnings, underestimation of earnings in occupations and overestimation of earnings in the countryside. Thus far, labor economists have recognized only the importance of cognitive skills or how smart people are, overlooking the importance of other abilities—non-cognitive skills—which can be seen in behavior, personality and attitude. In this particular study, the worker's effort, which can be observed from his or her psychological characteristic of self-efficacy, was overlooked.

The underestimation of female earnings indicates that productivity of female workers requires not only cognitive skills but also effort, similar to male workers, which was the baseline. However, this result cannot answer whether the Thai labor market values male and female effort equally.

The underestimation of earnings in most occupations shows that productivity requires both effort and cognitive skills, similar to the productivity of the baseline occupation (armed forces). Since changes in the coefficients were uneven, this study expects productivity from different occupations would require different combinations of cognitive skills and effort. However, the study would not conclude that productivity in the five occupations, namely, legislators and senior officials; general managers; physical, mathematical and engineering, science professionals; life science and health professionals; and teaching professionals, do not require effort. In contrast, productivity in these professional categories is related to better cognitive skills and relatively less effort than in the other occupations. In other words, productivity in the former is heavily *cognitive skill*-intensive.

The overestimation of earnings in the countryside shows that productivity in the countryside requires greater effort, i.e. it is *effort*-intensive. It may be the result of shortage of supportive factors such as infrastructure for instance, thus cognitive skills alone generate relatively low productivity. Therefore, workers in the countryside need to put greater effort, as the production's substitution factor, compared with workers in Bangkok. However, this result is unable to answer whether the Thai labor market values effort of workers in Bangkok higher than workers in the countryside.

Lastly, self-efficacy probably contributes to extra earnings through intense effort, through rewards beyond wages or salaries such as in the form of overtime and bonuses and other benefits.

Recommendations

Since worker's psychological characteristic of self-efficacy is as valuable as years of schooling and work experience in determining individual earnings, it would be worthwhile to improve this characteristic. The findings of this study should be made known to the public. People must be aware that not only cognitive skills accumulated from school and work experiences, but also the strength of their self-efficacy or belief in their own ability, contribute to earnings. Thus, the quality of schooling and training, which can strengthen a student's and employee's perceived abilities as well as his or her true cognitive and work skills, can be promoted. Thus, taking off from Bandura (1997), this study makes brief policy recommendations to improve self-efficacy at three different stages of life.

Preschool Level. Parents must be more responsive to their children. Children who successfully control their environment by their own actions become more thoughtful regarding their behavior. Intensive preschool programs that provide rich mastery experiences raise the level and academic attainment of children from economically disadvantaged and undereducated families.

School Level. In addition to building up cognitive and other non-cognitive skills, the fundamental goal of education should be to arm students with self-regulatory capabilities that enable them to educate themselves, including skills of planning, organizing, and managing instructional activities. Educational practices should also improve children's belief in their abilities, other than skills and knowledge, at all levels.

Mature Level. Work productivity can be improved by boosting the worker's competency rather than sending him or her back to school, i.e. to formal education. This can be done through mastery modeling, in which knowledge and skills are developed through direct experience. First, occupational skills are modeled by instructors to demonstrate basic rules and strategies. The learners then receive guided practice under a simulated condition and with feedback to improve their skills. Lastly, employees apply their newly-learned skill in real work while supervisors provide assistance in perfecting their skills and strengthening their confidence. Such programs and curricula should be promoted both at the industry and national level.

Recommendations for Further Studies

This study recommends further research on the determinants of self-efficacy. An investigation of the effects of self-efficacy on the gender wage gap is recommended, particularly since Mueller and Plug (2006), Semykina and Linz (2007) and Heineck and Anger (2010) reported that personality differences could explain the gender wage gap in the US, Russia and Germany. To explore how self-efficacy is valued in different employment sectors and occupations, an investigation into the effects of self-efficacy on earnings in sub-samples is also recommended. Osborne (2000) found that men from high-status occupations were rewarded but men from low-status occupations were penalized for being aggressive.

Lastly, an examination into how self-efficacy influences occupational choices is recommended as Jackson (2006) found that the choice of occupation was partly determined by personality.

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