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Tomohiro Machikita

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Hitotsubashi University Research Unit
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Institute of Economic Research
Hitotsubashi University
Kunitachi, Tokyo, 186-8603 Japan
http://hi-stat.ier.hit-u.ac.jp/

Career Crisis? The Impacts of Financial Shock on Entry-Level Labour Market: Experimental Evidences from Thailand in 1997*

Tomohiro Machikita
Institute of Economic Research, Hitotsubashi University
Kunitachi, Tokyo 1868603 Japan
machi@ier.hit-u.ac.jp

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Abstract

Identifying the conditions of entry-level labour market on employment and wages is difficult because there is non-separability of match qualities from firm specific demand shock at the period of transition from school to work. We utilize Thailand's financial crisis in 1997 as a natural experiment which exogenously shifts labour demand temporally. This model provides three testable hypotheses: (1) entry-level labour market tightens after crisis; (2) disadvantage of newly entrants at the period after crisis decreases overtime; (3) senior or highly educated worker's job and wages are secured. Convincing evidences from Thailand Labor Force Survey support our empirical predictions.

Keywords: Crisis; Entry-Level Labour Market; Treatment Effects
JEL Classification Numbers: C21, D83, J63, J64, R23

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1 Introduction

Does financial crisis mean career crisis for newly entrants, youth, less educated groups at the period after crisis? This paper tries to examine the impacts of crisis on labour market outcomes utilizing the evidence from Thailand's financial crisis at fall in 1997 as natural experiment which exogenously shifts only the firm's labour demand. This exogenous and temporal macroeconomic shock is useful to identify the impacts of the matching market conditions on employment, wages, and career dynamics subsequent to the crisis. This shock is also useful to identify the complexity of relative importance between the returns to age (or potential labour market experience) and years of schooling at the period after crisis. To seek for the causal effects of financial crisis on aggregate labour market, we exclude not only the possibility of information problem on job search and recruiting process but also technological changes. This paper removes the possibility of the causal effects of financial crisis on frictional unemployment due to imperfect information of job and worker location. This paper also excludes the causal effects of financial crisis on structural unemployment due to mis-match between worker skills and firm technology. Exogenous aspects of financial crisis enable us to concentrate on cyclical unemployment due to voluntary unemployment with worker transition from declining industry to booming industry and involuntary unemployment like plant closing and demand shortage. Thanks to exogenous shifting the labour demand, we can show convincing evidences of the contribution of age and years of schooling on employment outcomes: labour force participation and wages. The benefit of using such kind of experiment is shown in study of by causal effects of government provided training program on the duration of participants' subsequent employment, unemployment spells, and earnings by Ham and LaLonde (1996) and Heckman et al. (1998). Rosenzweig and Wolpin (2000) and Angrist and Krueger (2001) summarize benefits and the shortcomings of natural experiment to compare the treatment group and the control group using experimental or empirical data.

The empirical bottom line of this paper is based on following works of empirical assessment of recent financial crisis on labour market and each household. One project focuses on economic and financial crisis in Indonesia. Another one project focuses on Argentina. Smith et al. (2002) studies the effects of Indonesian financial crisis on wages and employment using household panel data, Indonesian Family Life Survey (hereafter IFLS). They find that aggregate employment has remained robust because of industry-to-industry mobility. On the other hand, there was the dramatic declining of real hourly wages for urban workers, around 40%. Frankenberg et al. (2003) argues the question of household consumption response to the Indonesian financial

crisis. They show in full detail that households reduced spending on semi-durables while keeping expenditure of foods using IFLS. Thomas et al. (2004) extends the question of household response to the crisis to education expenditure of the next generation using IFLS. They examine that household spending on education declined among the poorest household. They also find the clear evidences of investment irreversibility in education. Educational spending is reduced among poor households with more young children while there was a tendency to keep education expenditure in poor households with older children. Finally, McKenzie (2004) examines the effects of the 2002 financial crisis on households in Argentina and urban labour market response using panel data from an urban area survey. He finds that the crisis was a large aggregate effect, with 63% suffering a real income fall of 20% or more while large job destruction.

Following above literatures about causal effects of financial crisis on labour market outcome, this paper carries this research line one step further by focusing on formation and continuation of job matching for newly entrants and longer slayers of labour market. Former studies have not paid much attention to this heterogeneity in aggregate labour market. The reason of doing this study is that we would like to solve (1) which more fragile between schooling and experience after macroeconomic shock to the labour market is and (2) a robust evidence of changing the wage-age profiles at the period after crisis. Our first question of this paper is examined by estimating the impacts of crisis on employment, wages, and subsequent career dynamics. Our second question is also examined by focusing the returns to age. Comparing period before and after crisis, we find that the return to age is decreasing sharply while the return to schooling is stable in the labour market utilizing the Thailand Labor Force Survey. Then, we find that the wage-age profile was steep in youth and slows down in elder at the period before crisis. On the other hand, the wage-age profile was gentle in youth and no big change in elder. There is possibility that the impacts of crisis on labour market can change the wage-age profiles and returns to age dramatically. Our theoretical framework to derive empirical hypotheses is very simple. The bottom line of our economy and search technology is similar to competitive equilibrium search model by Lucas and Prescott (1974), Wright (1986), Bull and Jovanovic (1988), Alvarez and Veracierto (1999), and Rogerson (2005). Based on their theoretical setting, especially we will directly extend models of Wright (1986) and Bull and Jovanovic (1988) to model unemployed search and job-to-job mobility with idiosyncratic productivity shock. We use the evidences of financial crisis from Thailand which exogenously and unexpectedly shifts the productivity to lower level.

Three testable implications are drawn from this theoretical framework: (1) selection tightens for newly entrants at the period after crisis because of less labour demand due to negative productivity shock; (2) the gap of employment opportunities and wages between newly entrants at the period before and after crisis persists; (3) selection and reallocation simultaneously occur especially for senior workers after crisis because of large job destruction due to negative productivity shock. To examine the impacts of financial shock on the transition from school to work and subsequent career dynamics, we try to combine search-theoretic framework with Mincerian wage regressions. We show our empirical implementation briefly. First, we identify the treatment group and the control group in the face of the crisis using the individual record of "years of labour market experience" in our dataset at the period after crisis. Treatment group covers the two types of sample of newly entrants at the period after crisis which is denoted by T_1. This group seems to be harder to get the job opportunities after entering the job search market due to shock. We also have another treatment group which is denoted by T_2 as newly entrants at the period before crisis with working at the period after crisis. They are also affected unexpected shock. On the other hand, the control group is newly entrants at the period before crisis with working at the period before crisis which is denoted by C_1. Group with Subscript 1 (C_1 and T_1) is newly entrants at the period before crisis. We can examine the impacts of financial shock on the entry-level job market by comparing the outcome between treatment and control group. Secondly, we examines whether both of the returns to age (or potential labour market experience) and years of schooling would change or not at the period after crisis. These parameters rule the labour market outcome.

From the view point of our empirical implementation using crisis as natural experiment, it is difficult for newly entrants to get a job opportunity at the period after crisis. This evidence supports an aspect of selection hypothesis. This is consistent with the statistical finding of Behrman et al. (2000). We summarize our empirical results: (1) selection of entry-level job market hypothesis is supported both of white collar and blue collar subsample; (2) gap of employment opportunities and wages between treatment (with shock) and control group (without shock) decreases overtime; (3) selection and reallocation hypothesis of senior worker are not supported because the returns to career specific experience also hold at the period after crisis. And we also do not observe any evidences of job instability for main age, over 33 years of old to 47 years of old at crisis.

The structure of this paper is following. Next section 2 introduces Thailand financial crisis at summer 1997 as experimental setting. Section 3 simply models our economy and equilibrium to derive empirical hypotheses. Section 4 presents our data source, descriptive statistics, and key variables. Section 5 shows empirical methodology. Our empirical results are shown in section 6. Concluding remarks and alternative explanations are discussed in the final section 7.

2 The Experimental Setting

Building the experimental setting is the main contribution of this paper. To begin with, we show the impacts of financial crisis on labour market outcome by using a new empirical methodology. We develop an econometric methodology that financial crisis is as a natural experiment for workers. This empirical methodology enables us to avoid selectivity bias with random assignment of treatment and control group. We present a simple model which exogenously shifts only the distribution of idiosyncratic productivity shock with endogenous labour force participation. This model provides some testable implications for entry-level job market, subsequent career dynamics, and job to job mobility. Next, we show the convincing evidences that the returns to schooling is not changed between period before and after crisis. On the other hand, the returns to age are changed between period before and after crisis. These evidences also enable us to focus on the fragility between years of market experience and years of schooling. These are our innovations.

2.1 Previous Studies on Labour Market under Financial Crisis in Thailand

Financial crisis in Thailand at 1997 changed the labour market outcomes, the labour force characteristics, and its wage-profiles drastically. Financial crisis occurred in early fall, 1997. Crisis had disturbed in the labour market since early 1998. Crisis affects the unemployment rate, the level of real wages, retention rate, and recruitment frequency through the large job destruction. Behrman and Tinakorn (2000) and Behrman et al. (2000) report and summarizes the labour market situations of those periods. They show the impacts of crisis on youth labour market and senior one: percentage changes of employment, under-employed, unemployment, and the level of real average wages during the period before (1995-1996) and the period after (1998-1999) crisis. Especially, there was large negative shock for youth to become an employed. Real wages is declined approximately 10% level. This paper formalizes the empirical evidences from previous literatures to create the treatment and control group.

Financial crisis started from the financial market. Crisis was spilled over from financial sector to manufacturing sector and commodity markets. It was unexpected and exogenous shock for most incumbent workers and new entrants to the labour market. This paper tries to consider Thailand' financial crisis as natural experiment. From the statistical point of view, it is useful to focus on longitudinal evidences for displacement workers. To search for strong identification of the contribution to wages level of schooling, years of labour market experience, sector tenure, and firm specific tenure.[1] Because this paper can not follow the longitudinal evidences of individual at the period before and after crisis, we try to find an another approach: seeking the difference of employment probability and wages level to identify the treatment group and control group using exogenous shock. Details are shown in the section of empirical methodology.

2.2 Wages Profiles and Returns to Potential Experience

Next, we compare the determinants of wages level at the period before crisis with the wages level at the period after crisis. Firms, workers, and potential entrants realized demand shortages and job destruction at the period after crisis. We assume that the distribution of unobserved individual abilities is not different between at the period before and after crisis. Due to the labour demand shortages at the period after crisis, it is difficult for new entrants to be employed and it is not easy for current incumbents to do job-to-job mobility. Table 1 reveals clear contrasts on the contribution of age effects between two periods. In short, the estimates of the coefficient of age and square of age are declined while keeping the effect of years of schooling at the period after crisis. These results initiate us into searching for the driving forces behind the two wages equations. There is a steep rise in intercept at the period after crisis. This can be explained by the unobserved abilities of youth at the period after crisis would be higher than that of youth at the period after crisis. Both of the two wages profiles have different curves. The former one, the wages profile at the period before crisis draws a wide arc. Financial crisis at 1997 changes an arc of curve. These evidences are eloquently spoken of the impact of financial crisis on the labour market outcomes.

Insert table 1 here.

[1] Our identification strategy is closely related to the literature of studying displacement worker, see Krueger and Summers (1988), Gibbons and Katz (1991), Gibbons and Katz (1992), Jacobson et al. (1993), Neal (1995), Parent (2000), Dustmann and Meghir (2005), and Kriechel (2003).

Before moving the theoretical modeling and implementing the empirical hypotheses, we shall have more to say about returns to age. The important point to note is that the curve of returns to age becomes gentle after crisis. This rule holds in all occupations, white and blue-collar. The two lines of the returns to age intersect around 20 or 25 years of old. The former one, the line of the period before crisis keeps steep decreasing after crossing. On the other hand, the latter one, the line of the period after crisis keeps moderate decreasing. This rule needs to be explained theoretically. Our hypotheses are induced by these structural changes on wages equation.

2.3 Industrial Heterogeneity in Employment and Wage Changes

Finally, we note the weaknesses of the experimental design. This paper utilizes the evidences from Thailand financial crisis in 1997 to examine the impact of aggregate shock on employment opportunity and wages. Thanks to the macroeconomic evidence, we simply distinguish between the treatment group which is affected by aggregate shock and the control group which is not affected by aggregate shock. Our empirical strategy simply estimates the impact of shock on labour market in aggregate (average) level. We do not mention about microeconomic heterogeneity or treatment group heterogeneity; however, there are large differentials of impact between industries at the period after crisis. This is our one weakness. Another weakness is that we ignore the spillover effect from financial sector to another export/import oriented-manufacturing sector et al to understand aggregate effect of crisis.

3 A Model of Job and Worker Flows with Layoffs Shock

Overview is provided as follows. Workers are assumed to be differentiated by years of potential labour market experience, their current match quality, and their employer's idiosyncratic productivity shock. Employed worker or unemployed can choose two alternatives at every period: (1) She stays in current employer (or unemployment pool for unemployed); (2) She separates from current employer and moves to another partner without being unemployed (or finds an employer for unemployed). They have an outside option on-the-job search while drawing (sampling) the match specific match quality. Firm also decides to hire (filling a vacant) and fire (matching with another partner while throwing current partner away). Exogenous layoff also exists. Laid off workers have to stay in unemployment pool to search another job opportunity. Using this framework, this paper considers the role of unexpected shock on the labour force participation and its subsequent labour market outcome. If negative shock stimulates selection and

job reallocation for a senior group and firm-specific skill is not useful under the new employer (partner), then the returns to years of labour market experience may be declined at the period after crisis. The realistic assumption that it is not easy to carry firm-specific human capital into new job opportunity is also needed to be tested by worker reallocation data at the period and after crisis. This paper concentrates on the identification of treatment and control group at the period after crisis without flow data between employers. We assume that firm offers new wages contract to worker at the period after crisis. If worker does not satisfied with new contract, worker will throw away a current match and find a new match. If firm does not satisfied with current match quality, firm will fire the worker and also find a new partner.

3.1 Setup

This section shows dynamic framework to understand the impacts of shock on the endogenous participation of labour force and wages. The bottom line of our model is very simplified version of Lucas-Prescott equilibrium search model. Based on Lucas and Prescott (1974), Wright (1986) presents its search-theoretic version, Bull and Jovanovic (1988) shows its job matching setup, Alvarez and Veracierto (1999) combines the industry equilibrium model with firm's labour adjustment and job search model for workers, and Rogerson (2005) develop new extension of Lucas-Prescott with sector specific human capital model. This paper also utilizes the one tractable dimension of Lucas-Prescott economy and search technology.

Our model combines Wright (1986) with Bull and Jovanovic (1988) to model job-to-job mobility with firm specific productivity shock. Because of seeking for simplicity, this paper abstracts the learning process about match specific quality for worker and firm.Three important elements; price fluctuations; job-to-job mobility; and dynamic selection combine together to produce our model. We model the search, matching, and job reallocation process with symmetric information.

We have two agents in the labour market to sell and to buy the effective labour productivity; worker and firm. Both of labour and firm are risk neutral and ex-ante homogenous. Time is discrete and agents are infinitely lived. Worker is also divided into wage employed worker and non wage employed worker. Firm is also divided into employer and vacant. Firm can hire at most one worker. All firm; matched and vacant receive idiosyncratic productivity shock from the cumulative price distribution $F(p)$ with support $[\underline{p},\ \overline{p}]$, $p \in [0, \infty)$ every period. Firm can post its

idiosyncratic productivity to worker when both of two agents randomly meet. When they meet at random, worker and firm draw the match specific quality from the cumulative distribution $G(q)$ with support $[\underline{q},\ \overline{q}]$, $q \in (0, \infty)$. This is symmetry for worker and firm. For matched agents, each payoff falls into their hands after matching. Labour and firm are ex-post heterogeneous after matching. Then employed worker decides whether accepting new arrival offer or rejecting to keep current matches. Unmatched workers and firm continue to search for partners. We have no difference of offer arrival rate between employed and unemployed. Finally, wages w are jointly determined by firm's productivity p and effective labour productivity q. Wages have the cumulative wage distribution $K(w)$. That is all of our basic structure.

3.2 Equilibrium

To seek for worker's optimal behavior, Bellman equation is useful. We show recursive formulation of employed worker and unemployed. The value function for employed worker who has a new offer w' is shown by following recursive formulation:

$$V(w') = \max\left[w' + \beta\{(1-\delta)V(w') + \delta V(b)\},\ w + \beta\{(1-\delta)V(w) + \delta V(b)\}\right], \tag{1}$$

where $\beta \in [0,1]$ is parameter of discount factor, $\delta \in [0,1]$ is exogenous layoff parameter, w and $V(w)$ are option to stay in current match and its value function respectively. If employed worker is laid off with probability δ, then she will be unemployed. She has no chance/or time to do job-to-job mobility in this case. $V(b)$ is the value function for unemployed worker which is described by unemployment benefit u and new draw from wage w' from wage distribution K at the next period: $V(b) = b + \beta \int V(w')\ dK(w') = b + \beta \iint V\left(p'q'\right)\ dF(p')dG(q')$.

Equilibrium in this economy is derived from worker's optimal search strategy. The Bellman equation has the following solution:

$$V(w') = \begin{cases} \dfrac{w' + \beta\delta V(b)}{1-\beta(1-\delta)} & \text{if } \ q' \geq q^* \\ \\ w + \beta\{(1-\delta)V(w) + \delta V(b)\} & \text{if } \ q^* \geq q', \end{cases}$$

where new offer is $w' = p'q'$ and current offer is $w = pq$ here. The optimal policy for employed worker is formulating reservation match quality q^*: accept this new offer $q' \geq q^*$, and reject to keep current match $q^* \geq q'$. This reservation solves

$$\frac{p'q^* + \beta\delta V(b)}{1-\beta(1-\delta)} = pq + \beta\{(1-\delta)V\left(pq\right) + \delta V(b)\}, \tag{2}$$

which can be rearranged as

$$q^* = \{1-\beta(1-\delta)\}\frac{p}{p'}q + \beta(1-\delta)\{1-\beta(1-\delta)\}V(pq) - \beta^2\delta(1-\delta)V(b) \tag{3}$$

We can check the firm's productivity effect on acceptance and rejection of outside new offer. If the productivity of new partner p' is quite higher than the productivity of current partner p, the reservation match quality q^* is decreasing. Employed worker has incentive to match with new firm who has bad match quality for her instead of high productivity. If the productivity of new partner p' is lower than the productivity of current partner, the result is reverse. Employed worker has no incentive to match with bad firm for her. We can derive following result: given fixed p, reservation match quality q^* is decreasing function of the new outside productivity p'.

3.3 Crisis

Let me apply our main result to crisis effect on job and worker flows here. We define shock as idiosyncratic productivity disturbance. Individual firm has high probability of receiving negative shock in recession period. We call this situation *rainy* season. Individual firm also has high probability of receiving positive shock in boom period. We also call this situation *sunny* season. To keep simplification, we assume that sunny and rainy seasons are exogenously determined by market productivity distribution. It is difficult to find a high productivity firm in rainy season. But it is easy to find a high productivity firm in sunshine season. The productivity ratio between inside and outside is defined by $r \equiv p'/p \Leftrightarrow 1/r \equiv p/p'$. Random draw (meeting) of firm's productivity p' and its outcome r will reflect whether economy is in sunshine or rainy season. The sunshine season is defined by the probability of finding a firm with higher productivity than current partner $Pr(r > 1) > \frac{1}{2}$. The rainy season is also defined by $Pr(r < 1) > \frac{1}{2}$. We can derive the following result: reservation match quality q^* is decreasing function of the relative productivity r.

This means that a shock rules job and worker reallocation. That is why, if negative shock suddenly comes to the product market, r will shift toward to lower. As r goes to small (expected outside option is less attractive), reservation match quality increases. If negative shock makes new match is more attractive for worker and firm, they will decide to break current match and to match with new partner. Job creation and destruction are accelerated by negative shock.

There is large *job reallocation* (JR) ($= JD + JC$) due to negative shock. On the other hand, if negative shock makes new match is less attractive for worker and firm and this force dominates, then there is no job and worker flows. Stable relationship is build by negative shock.

3.4 Wage Determination and Employment Opportunity

Because our empirical hypotheses have some implications on returns to years of potential labour market experience, we derive wage equation from our theory. We assume that s_i is years of schooling, x_{it} is years of worker's potential experience. The function of years of schooling and potential experience is shown by $f(s, x)$ with $f' > 0$ and $f'' < 0$ for individual i at the period t. Our theory restricts empirical wage determination like Bull and Jovanovic (1988) as follows;

$$\log W_{ijt} \quad = \quad \log f(s_i, x_{it}) + \log p_{ijt} + \log q_{ij} + \log \varepsilon_{ijt}$$

where $\log \varepsilon_{ijt}$ is i.i.d another shock and unobserved ability. The match specific quality $\log q_{ij}$ is time invariant. The idiosyncratic productivity shock $\log p_{ijt}$ is time variant. We assume that productivity shock and relation specific match quality are determined independently. All the variables except for x_{it} is unobserved for econometricians. Observable characteristics are gender, years of schooling, years of potential labour market experience, local labour market. Unobservable variables for econometricians are summarized by $u_{ijt} (= \log p_{ijt} + \log q_{ij} + \log \varepsilon_{ijt})$. At the period t, individual will choose to work as wages worker, $E_{it} = 1$ if the new wage offer exceeds the current value of not working as wages worker. This decision rule is determined by the current value of not working as wages worker $\log b$, new arrival of price p', new arrival of match quality q', individual years of schooling, years of potential experience, and unobserved shock and/or ability ε' as follows;

$$E_{it} = \begin{cases} 1 & \text{if} \quad u'_{ijt} > u^*_{ijt} \\ 0 & \text{if} \quad \text{otherwise} \end{cases}$$

where latent variable $u^*_{ijt} = \log b - \log f(s_i, x_{it})$ covers unobserved benefit for unemployed, working in agricultural sector, and self-employment sector. This is our structure of participation decision in wages worker.

3.5 Testable Hypotheses and Empirical Predictions

Now we can introduce hypotheses to be examined. To do this, we focus on the returns to years of labour market experience $f'(x)$ and $f''(x)$ in wages equation. The years of potential

labour market experience will reflect firm or industry specific human capital for each worker. If a worker is laid off during crisis or quit on her current match and moves to another firm or industry, her accumulated human capital will be obsolescence. The decline of the returns to experience in aggregate level is supported by job reallocation effect. If an incumbent is not laid off and does not quit during the crisis, it will be difficult to find entry into the tight-market except for a good-luck worker or a high able worker. Selection becomes extremely tight for mass of new entrants. Only a good-luck and a high able worker can entry and survive during the crisis. This selection effect pushes the returns to labour market experience down. The decline of the returns to experience in aggregate level is also supported by selection effect. Testing against the following hypotheses are purely empirical issues.[2]

Crisis as unexpected negative shock is an absolutely key assumption to do our empirical implementation. To use macroeconomic shock as a "natural experiment", the model provides a new understanding the relationship between on-the-job search and wages determination at the period before and after crisis.[3] First, if incumbents have a high probability to stay in office due to the less occurrence of the job reallocation at the period after crisis, then new entrants into the market are severely restricted (by small size of search market). This hypothesis **H.1** predicts that the returns to experience are declined at the period after crisis because of tight selection for new entrants.

Hypothesis 1 *Entry-selection; Selection in entry level tightens after crisis. It is difficult for new entrants to be employed at the period after crisis. Average productivity among newly employed is higher than newly employed at the period before crisis.*

Secondly, if negative shock creates large gap of employment probability between newly entrants at the period before and after shock, then it is not easy to fill the gap soon.

[2]We are able to propose an alternative explanation of the impacts of crisis on labour market adjustment; new wage contracts are posting. Firm and worker agree the new wage contract at the period after crisis while keeping current match. New wage contracts are adjusted by negative demand shock. This says that firm posts new wage contract and worker accept it against the loss of employment risk. Both of firm and worker can observe the match quality at the period before and during the crisis. They also know a fresh contract for the period after crisis at the period before quit or layoff decision. Econometrician does not have only the proxies of their match quality but also a fresh contract. Only the new realized wage contract at the period after crisis is observed by econometrician.

[3]We do not consider the direct effect of negative shock on matching quality. If matching quality is worse at the period after crisis than the period before crisis, the relationship between firm and worker will be unstable. This force expands the size of search market.

Hypothesis 2 *Persistency; The gap of employment probability and wages level persists between newly entrants at the period before and after shock overtime.*

Finally, if incumbents have a low probability to stay in current partner due to job reallocation, then there is a shuffle among firm's incumbent workers and new entrant workers due to the large job reallocation. This hypothesis **H.3** predicts that the returns to experience are declined at the period after crisis because of obsolescence of firm specific human capital due to job reallocation.

Hypothesis 3 *Reallocation; Job reallocation arises at the period after crisis in aggregate level. Shock stimulates quits and laid-offs at the period after crisis.*

4 The Thailand Labor Force Survey

4.1 Data collection

The data source used in this paper is The Thailand Labor Force Survey (hereafter LFS), 1994-2000 by National Statistical Office (NSO) of Thailand. This individual-level data provides the information on much of the individual characteristics: gender, structure of family, years of schooling, years of labour market experience, wages (or profit for self-employment household and profit for agricultural household), labour force status, migration status, hours and days of weekly work, occupation, industry, region, marital status; and its employer characteristics: firm size, industry, and fringe benefits.

LFS occurs the four times per year. The first round of survey is done in February, the dry season in Thailand. The third round is done in August, the monsoon (agricultural) season. We use only the third round survey because of neglecting seasonal labour migration at the dry season. The second and third rounds are done in May and November respectively. Because LFS does not follow the individuals from year to year, this study can not access the information on the labour mobility from the pre-crisis period to post crisis period. This study also uses pooled cross-sections as previous studies on aggregate labour market and urban immigration; Yamauchi (2002)'s study about migrants in the face of crisis at Bangkok, Kimura (2004)'s study on learning about own ability by youth migrants to Bangkok, Machikita (2004)'s study on identification of learning by migrating effect and self-selectivity for job-seekers (treatment group) and family migrants (control group) to Bangkok; Machikita (2005) studies the causal relationship between

job search method and wage dispersion in developing economy using data from Bangkok labour market to analyze the microfoundation of aggregate matching function.

The sample used in this paper comes from not only "Greater Bangkok Area" and other rural area: we use whole sample of the Kingdom of Thailand, year 1994 to year 2000. We would like to mention about geographic characteristics. This paper constructs GBA (Greater Bangkok Area) dummy variable equals to 1 if each province is included in Bangkok metropolitan area. Almost of all industry and occupation tend to agglomerate in GBA. This classification of regional dummy reflects the geographic distribution of industry and occupation in the face of crisis.

4.2 Definition and Construction of Key Variables

Let me summarize our data generating process to draw strong power of identification. Details are shown in the section of empirical methodology. This paper constructs one unique variable on the basis of the information in the LFS, 1994-1996 and 1998-2000. This variable and some assumptions play important roles to identify the treatment group and control group respectively. We construct a shock-dummy variable which identifies the *treatment* (newly entrants at the period after crisis) and *control* group (newly entrants at the period before crisis) using the information of the length of working life after graduating. This paper chooses the variable "years of potential labour market experience" to examine the impacts of crisis.[4] We identify the treatment group and the control group in the face of the crisis using the individual record of "years of potential labour market experience". For treatment group, shock-dummy variable(s) equals to 1 if the labour force who has less than 1 years of experience at the survey year 1998, less than 2 years of experience at the survey year 1999, and less than 3 years of experience at the survey year 2000. This group seems to be harder to get the job opportunities after entering the market due to unexpected exogenous shock. On the other hand, the control group already enters the labour market at the period before crisis.

Additionally, we define that age at shock dummy variables equal to 1 if the individual's age at crisis is a. Finally, we also define that years of schooling at shock dummy variables equal to 1 if the individual's years of schooling at crisis is e. We use both of two dummy variables

[4]The variable "years of labour market experience" is calculated by age minuses years of schooling completion minuses six years old. A person who is 35 years of old and holds 12 years of schooling (suitable to high school level)'s years of labour market experience is 17 years.

to check the parameter changes; returns to age and returns to years of schooling due to the crisis. *Treatment* groups are wage employed at the period after crisis and *control* groups are wage employed at the period after crisis respectively.

4.3 Descriptive Statistics

Table 2 shows the aggregate consequences of crisis to the labour market. The variables are individual characteristics, industry categories, and occupation categories. Individual characteristics covers age, gender, household size, years of schooling, living in Greater Bangkok Area, wage employed, log of weekly wage, log of profit for self-employment household, log of profit for agricultural household, number of working days per week, number not working days per week, number of family workers in household, and union status. I would like to emphasize four points in the changes of individual characteristics. First, urban population is decreasing at the period after crisis: 8.4% to 7.8%. Secondly, log of weekly wage and log of profit for self-employment household are decreasing at the period after crisis. On the other hand, log of profit for agricultural household is increasing at the period after crisis: 6.08 to 6.14. Thirdly, number of working days is decreasing from 6.27 days per week to 6.14 days per week at the period after crisis. Number of not working days is increasing from 0.16 days per week to 0.21 days per week at the period after crisis. But both of standard deviations of working and not working days are increasing at the period after crisis. Finally, union status is sharply increasing at the period after crisis. The percentage that workers belong to firm with union is increasing from 4.5% to 8.9% at the period after crisis. The percentage that workers are member of union is also increasing from 2.7% to 9.6%.

Insert table 2 here.

The features of industry are summarized in table 3. The highlight is decreasing the population of construction sector at the period after crisis: 5.5% to 4.1%. Heavy industry demands a lot of job opportunities at the period after crisis. The features of occupation are also summarized in table 4. The population of craftsman decreased at the period after crisis: 12% to 10%. The professional, technical, administrative, and managerial workers increased at the period after crisis. These are an outline of the labour market at the period before and after crisis. These

tables speak that aggregate employment opportunities seem to be stable between period before and after crisis. We look more carefully into the entry level through this paper.

Insert table 3 and table 4 here.

We would like to focus attention on the years of schooling and wages level here. We decompose aggregate level into occupation categories: white-collar and blue-collar simply. White-collar job covers the occupation of professional, technical, administrative, executive, managerial, and clerical works. Blue-collar job covers the occupation of sales, miners, transport and communication workers, production, and service workers. Agricultural workers are excluded from blue-collar workers. Both of table 5 and 6 present means and standard deviations for the our main variables of our interests; years of schooling and log of weekly wages. Because of showing clear contrast between the two situations: at the period before and at the period after crisis, our sample of this summary is restricted by age and working status. Age is restricted from 13 years of old to 59 years of old. Column 1 represents data for wage employed at the period before crisis. Column 2 also shows data for wage employed at the period after crisis. The table reports the data of years of schooling for two types of new entrants. Row 1 shows that there is steep rise of average years of schooling for wage employed at the period after crisis. This reflects the trend that educational attainment is increasing. Average years of schooling for white-collar worker, blue-collar worker, GBA worker, and rural area worker are also rising for employed at the period after crisis. This is observation for wage employed. This table contains the market selection and trend of educational attainment. The average years of schooling among whole population and the average years of schooling among wage employed are 7.02 years and 8.63 years at the period before crisis respectively. The average years of schooling among whole population and the average years of schooling among wage employed are 7.61 years and 9.27 years at the period after crisis. The increasing in 0.39 years of schooling is contribution of aggregate trend during the periods. The market selection requires more 1.61 years at the period before crisis to be wage employed and more 1.66 years at the period after crisis to be wage employed.

Insert table 5 here.

Table 6 shows data of the log of weekly wages for wage employed at the period before crisis and wage employed at the period after crisis. Both of the wages for white collar and blue collar are decreasing at the period after crisis. But this is not sharply decreasing. The levels of wages are quite similar between the two periods for GBA workers and rural workers. The rigorous analysis of wages level will be shown in the section of empirical results.

Insert table 6 here.

5 Empirical Methodology

5.1 Crisis as Natural Experiment

We examine the effect of the crisis on employment for less-experienced worker, especially, for newly entrants to the labour market. We assume that the crisis is unexpected shock for every worker and every new graduate. No worker can expect which the occupation, the industry, and the employment status is going to have a negative shock at the period before crisis. Table 7 shows the dates of entry and the years of potential labour market experiences for individual worker. The years of potential labour market experience means that age of individual minuses the years of schooling completion at each survey year. Newly entrants to the labour market at the period before crisis are briefly summarized in a C_1 (*control*). The difference between two types of newly entrants is whether individual is working at the period after crisis or not. Newly entrants accumulate the labour market experience every year. On the other hand, newly entrants at the period before crisis with working at the period after crisis are summarized in a T_1 (*type1 treatment group*). Newly entrants at the period after crisis are also summarized in a T_2 (*type 2 treatment group*). We can observe that newly entrants at year 1994 have seven years of experience in the labour market at year 2000 and newly entrants at year 1997 have four years of experience at year 2000 from Table 7. Unexpected shock comes once at summer and fall in 1997, Thailand. We expect it is more difficult for each T_2 entrants to enter the labour market at the period during and after crisis than newly entrants at the period before crisis who is in C_1 or T_1.[5]

[5]Our empirical strategy is quite similar to Duflo (2001)'s Indonesian school construction between 1973-1978 and Crepon and Kramarz (2002)'s the 1982 mandatory reduction of the workweek in France.

Insert table 7 here.

Our empirical methodology requires following two assumptions to build experimental setting that is suggested by Angrist et al. (1996); random assignment and exclusion restrictions. *Random assignment* means that crisis is unexpected shock to the incumbent workers and newly entrants in labour market and the treatment assignment T is random. *Exclusion restriction* means that every individual has no incentive to delay the timing of entry during the crisis period. Our strategy is straightforward because the financial crisis as experiment was done at random. This randomization gives us reduced-form approach to estimate the effect of crisis on less-experienced worker. The reduced form effect of crisis can be shown here by comparing the means of the labour market outcomes (employment and wages) in newly entrants at the period after crisis and new entrants at the period before crisis.

We define the E_{lit} as an employment dummy variable equal to 1 if the individual i is wages worker at the length of potential labour market experience is l at year t. D_{lit} as a *Shock* dummy variable equal to 1 if the potential labour market experience l at year t is less than 1 year at year 1998 (that is, $D_{1i1998} = 1$), less than 2 years at year 1999 (that is, $D_{2i1999} = 1$), and less than 3 years at year 2000 (that is, $D_{3i2000} = 1$). D_{lit} covers all newly entrants of T-label. This is the central point of the data collection. The reduced form difference is:

$$E\left(E_{li}^{T_1} + E_{li}^{T_2} |\ D_{lit} = 1\right) - E\left(E_{li}^{C_1} |\ D_{lit} = 0\right),$$

where $E_{li}^{T_1}$ and $E_{li}^{T_2}$ are employment dummy for treatment group (T) who is employed at the periods after crisis t=1998, 1999, 2000. On the other hand, $E_{li}^{C_1}$ is employment dummy for control group (C_1) who is employed at the periods before crisis, t=1994, 1995, and 1996.

We can run the following regression to test empirical hypothesis that selection at entry level tightens after crisis especially for newly entrants at the period after crisis with less than 1 year of potential labour market experience (that is, the new graduates from each level of school):

$$E_{1it} = X_{1it}\beta_1 + D_{1i1998}\gamma_{1998} + D_{1i1999}\gamma_{1999} + D_{1i2000}\gamma_{2000} + v_{1it}, \tag{4}$$

where the vector of individual characteristics with 1 year of potential labour market experience is defined by X_{1it} (such as gender, age, years of schooling, and region), and v_{1it} is the mixture of

unobserved individual characteristics who has 1 year of potential labour market experience. The coefficient of D_{1it} dummy variable γ_t captures the impacts of timing of entry on employment probability for newly entrants at the period after crisis ($t = T_2$) relative to newly entrants at the period before crisis ($t = C_1$). Control group is expected to have higher employment probability than treatment group. We expect each γ_t is significantly negative. We summarize testable hypotheses: selection at entry level tightens after crisis for newly entrants.

We turn to the next reduced-form difference of labour market outcomes:

$$E\left(\log W_{li}^{T_1} + \log W_{li}^{T_2} |\ E_{li}^{T_1},\ E_{li}^{T_2}\ D_{lit} = 1\right) - E\left(\log W_{li}^{C_1} |\ E_{li}^{C_1},\ D_{lit} = 0\right),$$

where $\log W_{li}^{C_1}$ is log of weekly wages at the period before ($t = C_1$). $\log W_{li}^{T_1}$ and $\log W_{li}^{T_2}$ are log of weekly wages at the period after crisis. $E_{li}^{C_1}$, $E_{li}^{T_1}$, $E_{li}^{T_2}$ are an employment dummy variable at the period before ($t = C_1$) and after ($t = T_1$ and $t = T_2$) crisis respectively. The following wages regression is also to test our empirical hypothesis that selection tightens after crisis especially for newly entrants who have 1 year of potential labour market experience:

$$\log W_{1it} = X_{1it}\beta_1 + D_{1i1998}\eta_{1998} + D_{1i1999}\eta_{1999} + D_{1i2000}\eta_{2000} + u_{1it}, \tag{5}$$

where the u_{1it} is unobserved characteristics and/or quality of match. The coefficient of D_{1it} dummy variable η_t captures the impacts of crisis on level of wages for newly entrants at the period after crisis relative to newly entrants at the period before crisis. The latter group could enter the market without a negative shock. On the other hand, we expect it is more difficult to be employed (that is, $E_{1i}^{T_2} = 1$) for newly entrants at the period after crisis. Because of this selection at entry level, we also expect that average productivity and/or quality of match of newly employed at the period after crisis is higher than newly employed with working at the period before crisis. We present the testable hypothesis: average productivity and/or quality of match is higher for the newly entrants at the period after crisis. The level of each η_t captures this.

That is all of our empirical methodology to test the hypothesis that selection at entry level tightens in the labour market for newly entrants at the period after crisis. If selection matters, average productivity and quality of match is higher for newly employed at the period after crisis than newly employed at the period after crisis.

5.2 Good timing, Bad timing, and its Persistency

When do disadvantages in entry at bad time disappear? We check the dynamic impacts of crisis on employment probability and level of wages. Our empirical methodologies apply to this question. First, we already have the coefficient of D_{1it} dummy variable γ_t captures the impacts of timing of entry on employment probability for newly entrants at the period after crisis ($t = T_2$) relative to newly entrants at the period before crisis ($t = C_1$). Secondly, we need to get the coefficient of D_{2it} and D_{3it} dummy variables respectively. Finally, we can compare the level of coefficients to examine persistency of the difference between entrants at the period before and after crisis. Our theory predicts this difference will not persist overtime as long as shock is temporary.

We can run the following regression to test empirical hypothesis that difference of labour market outcome E_{2it} persists overtime:

$$E_{2it} = X_{2it}\beta_2 + D_{2i1998}\theta_{1998} + D_{2i1999}\theta_{1999} + D_{2i2000}\theta_{2000} + v_{2it}, \tag{6}$$

and

$$E_{3it} = X_{3it}\beta_3 + B_{3i1998}\pi_{1998} + B_{3i1999}\pi_{1999} + D_{3i2000}\pi_{2000} + v_{3it}, \tag{7}$$

where D_{2i1998} is equal to 1 if the potential labour market experience l is 2 years at year 1998. $D_{2i1998} = 1$ sample is newly entrants at the period before crisis but they are affected from shock. D_{3i1998} and D_{3i1998} are equal to 1 if the potential labour market experience l is 3 years at year 1998 or 1999. $D_{3i1998} = 1$ sample and D_{3i1999} are also newly entrants at the period before crisis but they are affected from shock. The vector of individual characteristics with 2 years or 3 years of potential labour market experience is defined by X_{2it} or X_{3it} respectively. The term v_{2it} or v_{3it} are the mixture of unobserved individual characteristics and/or quality of match who has 2 years or 3 years of potential labour market experiences. The coefficient of D_{2it} dummy variable θ_t captures the impacts of timing of entry on employment probability for newly entrants with the 2 years at the period after crisis ($t = T_1$ and T_2) relative to newly entrants with the 2 years at the period before crisis ($t = C_1$). The coefficient of D_{3it} dummy variable π_t also captures the impacts of timing of entry on employment probability for newly entrants with the 3 years at the period after crisis ($t = T$) relative to newly entrants with the 3 years at the period before crisis ($t = T_1$ and T_2). Control group keeps expected to have higher employment probability than treatment group. We expect that $\gamma_{1998} < \theta_{1999} < \pi_{2000}$ as long as the impact of crisis

is negatively highest at year 1998 and shock is temporary. We follow same cohort who entries the labour market at year 1998. If shock occurs temporary and disappears soon, individual are able to be wage employed. We also expect that $\gamma_{1999} < \theta_{2000}$. We also follow same cohort who entries the labour market at year 1999. The empirical results are shown in the next section.

This way holds for examining the time-variant difference of treatment and control group. We can run the following regression to test empirical hypothesis that difference of productivity and/or quality of match persists overtime:

$$\log W_{2it} = X_{2it}\beta_2 + D_{2i1998}\rho_{1998} + D_{2i1999}\rho_{1999} + D_{2i2000}\rho_{2000} + u_{2it}. \tag{8}$$

and

$$\log W_{3it} = X_{3it}\beta_3 + D_{3i1998}\xi_{1998} + D_{3i1999}\xi_{1999} + D_{3i2000}\xi_{2000} + u_{3it}. \tag{9}$$

where the u_{2it} or u_{3it} are unobserved characteristics and/or quality of match with 2 years or 3 years of potential labour market experience. We also expect $\eta_{1998} > \rho_{1999} > \xi_{2000}$ as long as tight selection at entry level in year 1998 and shock is temporary. If shock occurred temporary, every individual can enter the labour market when shock disappears. Average productivity is decreasing overtime. We also expect that $\eta_{1999} > \rho_{2000}$. We also follow same cohort who entries the labour market at year 1999.

5.3 Returns to Age: Before and After Crisis

Finally, we shall now look into another aspect of crisis; impacts on senior workers. Our theory also predicts that reservation quality of match is higher for senior than junior worker. Because senior worker is also hard to find an outside option with high price during the crisis, senior workers stay in current matches. The testable hypothesis is that junior's jobs are not more stable than senior's jobs even in the period of crisis.

Our empirical strategy is also straightforward because we know individual ages at shock. Every worker can not adjust her age at shock in 1997. This randomization gives us reduced-form approach to estimate the effect of age at crisis on labour market outcome. The reduced form effect of age at crisis can be shown here by comparing the means of the outcomes in workers who have nine age categories at the period before and after crisis. That is why, the key point of the data collection is to identify a treatment group as age a at the period after crisis and a

control group as age a at the period after crisis. We define A_{ait} as a dummy variable equals to 1 if the individual i's age at year t is included in age categories a. We also use D_{it} as a dummy variable equals to 1 if individual i is recorded in the data at the period after crisis. We make interaction variable of "age at crisis" $A_{ait} * D_{it}$ now. E_{it} as an employment dummy variable equal to 1 if the individual i is wages worker at year t. E_{it} is equal to $E_i^{T_1}$ and $E_i^{T_2}$ in the individual i is employed at year 1998, 1999, and 2000 as treatment group but is equal to $E_i^{C_1}$ at year 1994, 1995, 1996 as control group. The reduced form difference is:

$$E\left(E_i^{T_1} + E_i^{T_2} |\ A_{ait} * D_{it} = 1\right) - E\left(E_i^{C_1} |\ A_{ait} * D_{it} = 0\right).$$

We can also run the following regression to test empirical hypothesis that reallocation occurs especially for senior worker at the period after crisis:

$$E_{it} = X_{it}\boldsymbol{\beta} + \sum_a (A_{ait} * D_{it})\phi_a + v_{it}, \tag{10}$$

where v_{it} as the composite of unobserved individual productivity and/or quality of job match. The coefficient ϕ_a captures the impacts of individual's age at crisis on employment probability relative to same age individual at the period before crisis. Because of negative shock on the labour market, we expect that $\phi_a < 0$ and $\partial\phi_a/\partial a > 0$. The former $\phi_a < 0$ means that it is difficult to be employed at the period after crisis for individual who has age a relative to the period before crisis for individual who has age a. The latter means that the negative impacts of *age at shock* are decreasing with age.

Turn to the next reduced-form difference of labour market wages:

$$E\left(\log W_i^{T_1} + \log W_i^{T_2} | E_{it},\ A_{ait} * D_{it} = 1\right) - E\left(\log W_i^{C_1} | E_{it},\ A_{ait} * D_{it} = 0\right).$$

where $\log W_{it}$ is equal to $\log W_i^{T_1}$ and $\log W_i^{T_2}$ in the individual i is employed at year 1998, 1999 as treatment group, and 2000 but is equal to $\log W_i^{C_1}$ at year 1994, 1995, 1996 as control group. The following wages regression is also to test our empirical hypothesis that wage premium of *age at shock* is positive due to tight selection into the labour market:

$$\log W_{it} = X_{it}\boldsymbol{\beta} + \sum_a (A_{ait} * D_{it})\psi_a + u_{it}, \tag{11}$$

where the coefficient ψ captures the impacts of *age at shock* on wages for treatment group as employment at the period after crisis relative to control group as employment at the period before crisis. We expect ψ_a is significantly positive and it is higher for youth than elder, $\partial\psi_a/\partial a < 0$.

5.4 Returns to Schooling: Before and After Crisis

Finally, we shall now look into another aspect of crisis; impacts on senior workers. Our theory also predicts that reservation quality of match is higher for senior than junior worker. Because senior worker is also hard to find an outside option with high price during the crisis, senior workers stay in current matches. The testable hypothesis is that junior's jobs are not more stable than senior's jobs even in the period of crisis.

Our empirical strategy is also straightforward because we know individual ages at shock. Every worker can not adjust her age at shock in 1997. This randomization gives us reduced-form approach to estimate the effect of age at crisis on labour market outcome. The reduced form effect of age at crisis can be shown here by comparing the means of the outcomes in workers who have nine age categories at the period before and after crisis. That is why, the key point of the data collection is to identify a treatment group as years of schooling m at the period after crisis and a control group as years of schooling m at the period after crisis. We define S_{mit} as a dummy variable equals to 1 if the individual i's age at year t is included in education categories m. We also use D_{it} as a dummy variable equals to 1 if individual i is recorded in the data at the period after crisis. We make interaction variable of "years of schooling at crisis" $S_{mit} * D_{it}$ now. E_{it} as an employment dummy variable equal to 1 if the individual i is wages worker at year t. E_{it} is equal to $E_i^{T_1}$ and $E_i^{T_2}$ in the individual i is employed at year 1998, 1999, and 2000 as treatment group but is equal to $E_i^{C_1}$ at year 1994, 1995, 1996 as control group. The reduced form difference is:

$$E\left(E_i^{T_1} + E_i^{T_2} |\ S_{mit} * D_{it} = 1\right) - E\left(E_i^{C_1} |\ S_{mit} * D_{it} = 0\right).$$

We can also run the following regression to test empirical hypothesis that reallocation occurs especially for senior worker at the period after crisis:

$$E_{it} = X_{it}\boldsymbol{\beta} + \sum_m (S_{mit} * D_{it})\mu_m + v_{it}, \tag{12}$$

where v_{it} as the composite of unobserved individual productivity and/or quality of job match. The coefficient μ_m captures the impacts of individual's years of schooling at crisis on employment probability relative to same years of schooling at the period before crisis. Because of negative shock on the labour market, we expect that $\mu_m < 0$ and $\partial\mu_m/\partial m > 0$. The former $\mu_m < 0$ means that it is difficult to be employed at the period after crisis for individual who has years of schooling m relative to the period before crisis for individual who has same years of schooling

m. The latter means that the negative impacts of *age at shock* are decreasing with years of schooling.

The next reduced-form difference of labour market wages:

$$E\left(\log W_i^{T_1} + \log W_i^{T_2} | E_{it},\ S_{mit} * D_{it} = 1\right) - E\left(\log W_i^{C_1} | E_{it},\ S_{mit} * D_{it} = 0\right).$$

where $\log W_{it}$ is equal to $\log W_i^{T_1}$ and $\log W_i^{T_2}$ in the individual i is employed at year 1998, 1999 as treatment group, and 2000 but is equal to $\log W_i^{C_1}$ at year 1994, 1995, 1996 as control group. The following wages regression is also to test our empirical hypothesis that wage premium of *years of schooling at shock* is positive due to tight selection into the labour market:

$$\log W_{it} = X_{it}\boldsymbol{\beta} + \sum_m (S_{mit} * D_{it})\zeta_m + u_{it}, \tag{13}$$

where the coefficient ζ captures the impacts of *years of schooling at shock* on wages for treatment group as employment at the period after crisis relative to control group as employment at the period before crisis. We expect ζ_m is significantly positive and it is higher for more educated, $\partial\zeta_m/\partial m > 0$.

6 Results

6.1 Selection Tightens for Newly Entrants after Crisis

Thanks to the randomization, we can identify newly entrants at the period after crisis $D_{1it} = 1$ as treatment group and the newly entrants at the period before crisis $D_{1it} = 0$ as control group. That is why, our estimation, testing, and empirical results are also straightforward to understand.

First, we test entry-selection hypothesis to check the marginal effects on D_{1it} dummy in probability model of employment and to check the estimates of D_{1it} dummy in wages equation. Entry-selection hypothesis tells us that market selection for newly entrants is tight at the period after crisis. This means that the realized average productivity and/or quality of match for newly entrants may be higher than the newly entrants at the period before crisis. Table 8 provides support for entry-selection hypothesis: the marginal effect in row 1 (D_{1i1998}) shows that newly entrants at the period after crisis have approximately 10.5% smaller probability of employment

than newly entrants at the period before crisis with the same 1 year of potential labour market experience. This means that the probability of employment is 10.5% lower when timing of newly entrants moves from the period before crisis ($D_{1i1998} = 0$) to the period after crisis ($D_{1i1998} = 1$). Row 2 of D_{1i1998} also shows the marginal effect for white-collar subsample: newly entrants at the period after crisis also experience approximately 9.6% smaller probability of employment than newly entrants at the period before crisis with the same 1 year of potential labour market experience. Row 3 of D_{1i1998} also presents the marginal effect for blue-collar subsample: newly entrants at the period after crisis also experience approximately 6.5% smaller probability of employment than newly entrants at the period before crisis with the same 1 year of potential labour market experience. These results mean that it is difficult for newly entrants at the period after crisis to be wages worker (or to find a good firm). The possibilities are negative price shock due to the negative demand shift in the face of crisis. The negative price shock will be compensated for the high quality of match. Newly entrants do not seem to find a good partner with high price or high quality of match. Especially, it is difficult for newly entrants at the period after crisis to be white-collar.

Secondly, row 1 of D_{1i1999} reveals that newly entrants at the period after crisis have approximately 3.3% smaller probability of employment than newly entrants at the period before crisis with the same 1 year of potential labour market experience. But this is insignificant. Row 2 of D_{1i1999} also shows the marginal effect for white-collar subsample: newly entrants at the period after crisis also experience approximately 7.9% smaller probability of employment than newly entrants at the period before crisis with the same 1 year of potential labour market experience. It is also difficult to be white-collar worker for newly entrants at year 1999. But there is quite different situation for blue-collar workers. Row 3 of D_{1i1999} presents the marginal effect for blue-collar subsample: newly entrants at the period after crisis also experience approximately zero percent smaller probability of employment than newly entrants at the period before crisis with the same 1 year of potential labour market experience. Newly blue-collar entrants do not face of crisis at year 1999.

Finally, row 1 of D_{1i2000} means that newly entrants at the period after crisis have approximately 11.3% smaller probability of employment than newly entrants at the period before crisis with the same 1 year of potential labour market experience. But this is insignificant. Row 2 of D_{1i2000} appears the marginal effect for white-collar subsample: newly entrants at the period after crisis also experience approximately 7.1% smaller probability of employment than newly

entrants at the period before crisis with the same 1 year of potential labour market experience. There is also similar situation for blue-collar workers. Row 3 of D_{1i1999} reveals the marginal effect for blue-collar subsample: newly entrants at the period after crisis also experience approximately 7.3 % smaller probability of employment than newly entrants at the period before crisis with the same 1 year of potential labour market experience. It is quite difficult to be wage employed for both of white and blue-collar subsample.

Highly interesting point in the result is the effect of years of schooling on employment probability. This is not significant for white collar and blue collar subsample with 1 year of potential labour market experience. We will back to this point at stage of wages regression.

Insert table 8 here.

On wages regression, table 9 does not provide support for an aspect of entry-selection hypothesis: the estimates for the whole sample, white-collar subsample, and blue collar-subsample (row1 of D_{1i1998}, row2 of D_{1i1998}, and row3 of D_{1i1998}): newly entrants at the period after crisis have approximately zero percent larger wages level than newly entrants at the period after crisis with 1 year of potential labour market experience.

Row 1 of D_{1i1999} shows that newly entrants at the period after crisis experience approximately 12% smaller wages level than newly entrants at the period after crisis with 1 year of potential labour market experience. The estimate for white-collar subsample in row 2 reveals that newly entrants at the period after crisis experience approximately 6.4% smaller wages level than newly entrants at the period after crisis with 1 year of potential labour market experience. The estimate of row 3 shows that newly entrants also experience 16% smaller wages level than newly entrants in blue-collar worker at the period before crisis.

For whole sample, row 1 of D_{1i2000} captures that newly entrants at the period after crisis experience approximately 14.9% smaller wages level than newly entrants at the period after crisis with 1 year of potential labour market experience. The estimate for white-collar subsample in row 2 of D_{1i2000} shows that newly entrants at the period after crisis experience approximately 9.1% smaller wages level than newly entrants at the period after crisis with 1 year of potential labour market experience. The estimate of row 3 of D_{1i2000} also shows that newly entrants also

experience 17.2% smaller wages level than newly entrants in blue-collar worker at the period before crisis.

In short, we can not support fully the entry-selection hypothesis in the face of crisis to test the marginal effects on dummy variable in employment probability model and the estimates of coefficient of dummy variable in wages equation respectively. The effect of schooling on employment equation and wages equation are not significant for white and blue collar subsample with 1 year of potential labour market experience. We compare these results with the results from subsample with 2 year and 3 year of potential labour market experiences at next stage.

Insert table 9 here.

6.2 Rain or Drizzle then Cloudy for Newly Entrants?

We check the marginal effect of employment probability for individuals who have 2 years of potential labour market experience and 3 years of potential labour market experience.

Table 10 suggests that we can not observe persistency gap between newly entrants at the period before and after crisis with 2 years of potential labour market experience. The marginal effect in row 1 of B_{2i1998} shows that newly entrants with 2 years of experience at year 1998 have approximately 6.7% smaller probability of employment than newly entrants with 2 years of experience at the period before crisis. The marginal effect in row 3 of B_{2i1998} shows that newly entrants in blue-collar occupation with 2 years of experience at year 1998 have approximately 6.2% smaller probability of employment than newly entrants with 2 years of experience at the period before crisis. There is no disadvantage for newly entrants at the period after crisis until they have 2 years of potential labour market experience. Row 2 of D_{2i1999} and row 3 of D_{2i1999} also show the marginal effect for white-collar subsample: newly entrants at the period after crisis with 2 years of potential labour market experience also do not have smaller probability of employment than newly entrants at the period before crisis with the same 2 year of potential labour market experience. There is no disadvantage for newly entrants in white collar market at the period after crisis at year 1999. The marginal effect in row 2 of D_{2i2000} means that newly entrants in white-collar occupation with 2 years of experience at year 2000 have approximately

6.1% smaller probability of employment than newly entrants with 2 years of experience at the period before crisis.

These results in table 10 mean that there is no difference of employment probability between newly entrants at the period before and after crisis with same 2 years of potential labour market experience. The years of schooling has insignificant effect on employment for whole, white, blue collar subsample with 2 years of potential labour market experience.

Insert table 10 here.

Table 11 also shows the result of wages equation for subsample with 2 years of potential labour market experience: the estimates for the whole sample, row 1 of B_{2i1998} has approximately 13% smaller wages level than newly entrants at the period after crisis with 2 year of potential labour market experience. Row 2 of B_{2i1998} (white-collar subsample) has approximately 10% smaller wages level than newly entrants at the period after crisis with 2 year of potential labour market experience. Row 3 of B_{2i1998} (blue-collar subsample) has approximately 14.8% smaller wages level than newly entrants at the period after crisis with 2 year of potential labour market experience.

Newly entrants at the period after crisis (D_{2i1999}) have approximately 13.7% smaller wages level than newly entrants at the period after crisis with 2 year of potential labour market experience. But the estimate for white-collar subsample in row 2 of D_{2i1999} reveals that newly entrants at the period after crisis experience approximately 8.2% smaller wages level than newly entrants at the period after crisis with 2 years of potential labour market experience. The estimate of row 3 of D_{2i1999} shows that newly entrants also experience 18.3% smaller wages level than newly entrants in blue-collar worker at the period before crisis.

Newly entrants at the period after crisis (D_{2i2000}) also have approximately 23.6% smaller wages level than newly entrants at the period after crisis with 2 year of potential labour market experience. The estimate for white-collar subsample in row 2 of D_{2i2000} shows that newly entrants at the period after crisis experience approximately 15.6% smaller wages level than newly entrants at the period after crisis with 2 years of potential labour market experience. The estimate of row 3 of D_{2i2000} also shows that newly entrants also experience 24.2% smaller

wages level than newly entrants in blue-collar worker at the period before crisis. The effect of schooling on employment equation was insignificant but the effect of schooling on wages level is significant here.

Insert table 11 here.

Table 12 also reveals that we can not observe any gap between newly entrants at the period before and after crisis with 3 years of potential labour market experience for white collar and blue collar subsample except for blue collar workers who entry the market at year 2000 (D_{3i2000}). The marginal effect in row 3 of D_{3i1998} (blue-collar subsample) shows that newly entrants with 3 years of experience at the period after crisis have approximately 2% smaller probability of employment than newly entrants with 3 years of experience at the period before crisis. There is some disadvantage for newly entrants in blue-collar occupation at the period after crisis until they have 3 years of potential labour market experience.

These results in table 12 show that there is no difference of employment probability between newly entrants at the period before and after crisis with same 3 years of potential labour market experience for white collar and blue collar. The years of schooling has also insignificant effect on employment for all subsample with 3 years of potential labour market experience.

Insert table 12 here.

Finally, table 13 also presents the result of wages equation for subsample with 3 years of potential labour market experience: the estimates for the whole sample, newly entrants at the period after crisis D_{3i2000} have approximately 16% significantly smaller wages level than newly entrants at the period after crisis with 3 years of potential labour market experience. This is significant because employment selection become tight when newly entrants at the period after crisis have 3 years of potential labour market experience relative to newly entrants at the period before crisis. The estimate for white-collar subsample in row 2 of D_{3i2000} means that newly entrants at the period after crisis have approximately 25.9% insignificantly smaller wages level than newly entrants at the period after crisis with 3 years of potential labour market experience.

The estimate of row 3 of D_{3i2000} shows that newly entrants also experience 8.8% significantly smaller wages level than newly entrants in blue-collar worker at the period before crisis.

The effect of schooling on employment equation is also insignificant at this stage. But the effect of schooling on wages equation is highly significant for all subsample with 3 years of potential labour market experience.

Insert table 13 here.

It follows from what has been shown that we can not observe persistent difference of employment probability between treatment and control group overtime. The gap of probability of employment for newly entrants at year 1998 would decrease from -10.5% at entry level to zero % at 2 or 3 years later after the shock. On the other hand, wages level is decreasing over time.

6.3 No Evidences of Job and Wages Instability for Main Age Groups

Now we must draw attention to our data coverage to deal with selection by age at the shock. Each age group is categorized by every 5 years of old from 13 years old to 59 years of old. Table 14 provides the results of the marginal effect on each *age at shock* dummies in probability model of employment. Row 1 in table 14 shows the result of whole sample. Junior or young workers experience approximately 5.7% significantly smaller probability of employment for 13 to 17 years of old at shock than group of 13 to 17 years of old at the period before shock. The same is true for 18 to 22 years of old at shock, for 23 to 27 years of old at shock, for 28 to 32 years of old at shock in whole sample. This is also true for white a blue collar subsample. On the other hand, main groups experience approximately 0.9% larger probability of employment for 33 to 37 years of old at shock. This is true for 38 to 42 years of old at shock and for 43 to 47 years of old at shock. The elder groups experience 1.1% smaller probability of employment for 48 to 52 years of old at shock than group of 48 to 52 years of old at the period before shock. For over 53 years of old at shock experience 4.1% smaller probability of employment.

The probability of job secured is unstable for white collar subsample. For 33 to 37 years of old at shock have 2.5% smaller probability of employment and for 38 to 42 years of old at shock

have 1.2% smaller probability of employment. Blue collar subsample experiences similar results of whole sample.

Insert table 14 here.

Finally, we present the results of age premium in wages regression. The estimates for the whole sample presented in table 15 does not show some support for an aspect of reallocation hypothesis. The estimate in row 1 in table 15 reveals that senior workers have approximately 8.5% smaller wages level for 33 to 37 years of old, 3.9% smaller wages level for 38 to 42 years of old, 3.9% smaller wages level for 43 to 47 years of old, 4.1% smaller wages level for 48 to 52 years of old at shock than wage employed at the period before crisis. This is true for white and blue collar subsample. Junior workers experience negative wage shock at the period after crisis.

Insert table 15 here.

In brief, we can support the selection hypothesis especially for youth. Senior workers keep job opportunities even in the crisis. Senior workers do not face on the more wage reduction than junior workers at the period after crisis.

6.4 Returns to Schooling Change at the Period After Crisis

We shall discuss the returns to schooling in detail. We argue selection by schooling level at the shock. Each level of schooling is categorized by every 2 years or 3 years of schooling from 2 years of schooling level to 18 years of schooling level. We have eight categories now. Table 16 shows the results of the marginal effect on each *years of schooling at shock* dummies in probability model of employment equation. The estimates of very lower education levels are sharply declined at the period after crisis. For whole sample and blue-collar subsample, it is difficult for individuals with less than 8 years of schooling at the period after crisis to be wage employed. For white-collar worker, it is quite difficult for individuals with less than 13 years of schooling (high school level) to be white-collar worker at the period after crisis. Shock affects especially for individuals with lower level of schooling.

Insert table 16 here.

We show the results of returns to schooling in wages regression. We can understand that returns to schooling changed in each category from the estimates for the whole sample presented in table 17. The estimate in row 1 in table 17 shows the workers with less than 11 years of schooling have 15% to 68% smaller wages level at the period after crisis than similar wage employed at the period before crisis. The estimate in row 2 in table 17 also shows the workers with less than 13 years of schooling have 30% to 90% smaller wages level at the period after crisis than similar wage employed at the period before crisis.

Insert table 17 here.

It is clear that employment selection by schooling tightens for less schooling individuals. Wage reductions occur especially for individuals with less schooling level.

7 Conclusion

We are now in a conclusion. This paper proposes three testable hypotheses to explain the impact of crisis on labour market outcomes, returns to age, and returns to years of schooling. The first one is entry-selection hypothesis that employment selection tightens for newly entrants at period after crisis with 1 year of potential labour market experience. This hypothesis predicts average productivity or unobserved match quality is higher than newly entrants at the period before crisis. The second one is persistent-gap hypothesis that the gap of employment probability and wages level between newly entrants at the period before and after shock overtime. The last one is selection for senior worker hypothesis that senior worker separates from current employer and moves to another employer (job-to-job mobility) through large job destruction and job creation at the period after crisis. If worker moves to another employer, then she will lost her employer specific match quality (or firm specific human capital), this hypothesis predict the returns to age is declining at the period after crisis.

In conclusion, (1) our empirical results partially support entry-selection hypothesis for newly entrants at the period after crisis; (2) our empirical results do not support persistent-gap hypothesis because the gap between treatment and control group tends to decrease overtime; (3)

our empirical results do not support reallocation (or selection for senior worker) hypothesis because we can not observe no evidences of declining employment probability for main age labour force. These results leave us one possibility; senior movers tend to same occupation and industry or senior workers tend to stay in current employer without moving at the period after crisis. Years of labour market experience have an important proxy of career specific match quality. If she only moves within same career in her life, the years of labour market experience provides information of career specific match quality. To focus on senior worker, we find no evidences of job and wages insecurities at the period after crisis.

The further extension which can be drawn from our theory and data is understanding the behaviour towards the employment and wages risk. For example, studying workers' search intensity, unemployment duration, shifts in researvation wages, internal migration decision from rural to urban/urban to rural, and intra-household allocation of labour supply during the crisis are our future works.

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Table 1: Wages equation at the period before and after crisis

Variable	Before Crisis	After Crisis
Age	***.050***	***.044***
	(.003)	(.002)
Age squared	***-.0003***	***-.0002***
	(.000)	(.000)
Years of schooling	.087	.085
	(.001)	(.001)
Male	.196	.134
	(.008)	(.006)
GBA dummy	.264	.291
	(.011)	(.007)
Intercept	4.881	5.007
	(.090)	(.057)
Adjusted R^2.	0.559	0.570
Obs.	80511	74768

Note. Dependent variable is log of weekly wages. Explanatory variables which are excluded in this table are industry dummy variables. Ages are restricted from 13 years old to 59 years of old. GBA dummy means Greater Bangkok Area dummy is equal to 1 if individual are living in Bangkok metropolitan area. Standard deviations are in parentheses. All explanatory variables are significantly different from zero at 99% confidence. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

Table 2: Descriptive Statistics

Variable	Before crisis	After crisis
Age	33.097	33.711
	(12.741)	(12.667)
Male	.466	.468
	(.499)	(.499)
Household size	4.371	4.240
	(3.097)	(3.066)
Years of schooling	7.025	7.616
	(4.316)	(4.498)
GBA	.0839	.0783
	(.277)	(.269)
Wage employed	.392	.396
	(.488)	(.489)
Log of weekly wage	7.191	7.179
	(.747)	(.740)
Log of profit for self-employed	7.380	7.239
	(.930)	(.855)
Log of profit for farmer	6.083	6.145
	(1.038)	(.964)
Number of working days	6.278	6.142
	(1.037)	(1.130)
Number of not working days	.160	.211
	(.658)	(.773)
Number of family workers	1.886	1.868
	(1.013)	(.952)
Union	.045	.089
	(.208)	(.284)
Union member	.027	.096
	(.163)	(.297)

Note. Standard deviations are in parentheses. The age is restricted from 13 years of old to 59 years of old. Source: Thailand Labor Force Survey, 1998-2000.

Table 3: Descriptive Statistics (Industry)

Variable	Before crisis	After crisis
Agriculture, forestry, hunting, and fishing	.359	.348
	(.480)	(.476)
Mining and quarrying	.002	.001
	(.042)	(.038)
Light manufacturing	.073	.072
	(.260)	(.258)
Heavy manufacturing	.062	.065
	(.241)	(.246)
Construction, repair, and demolition	.055	.041
	(.227)	(.198)
Electricity, gas, water, and sanitary	.008	.007
	(.088)	(.086)
Commerce	.187	.195
	(.390)	(.396)
Transport and communication	.034	.032
	(.181)	(.175)
Services	.221	.238
	(.415)	(.426)
Other	.0005	.0003
	(.021)	(.017)

Note. Standard deviations are in parentheses. The age is restricted from 13 years of old to 59 years of old. Source: Thailand Labor Force Survey, 1998-2000.

Table 4: Descriptive Statistics (Occupation)

Variable	Before crisis	After crisis
Professional and technical workers	.082	.093
	(.274)	(.291)
Administrative, executive, and managerial workers	.036	.040
	(.187)	(.197)
Clerical workers	.050	.045
	(.218)	(.207)
Sales workers	.179	.190
	(.383)	(.393)
Farmers and fisherman	.360	.349
	(.480)	(.477)
Miners and quarryman	.0004	.0005
	(.020)	(.022)
Workers in transport and communication	.043	.041
	(.203)	(.198)
Craftsmen	.117	.103
	(.321)	(.304)
Machine operators	.063	.067
	(.244)	(.249)
Service workers	.070	.071
	(.258)	(.256)

Note. Standard deviations are in parentheses. Ages are restricted from 13 years of old to 59 years of old. Source: Thailand Labor Force Survey, 1998-2000.

Table 5: Years of schooling for wage employed at the period before and after crisis

Variable	Before crisis	After crisis
Schooling	8.626	9.274
	(4.978)	(5.043)
Schooling of white-collar	13.249	13.682
	(3.963)	(3.780)
Schooling of blue-collar	6.6301	7.276
	(3.936)	(4.205)
Schooling of GBA worker	9.562	10.177
	(5.038)	(5.045)
Schooling of rural area worker	8.511	9.170
	(4.959)	(5.032)

Note. Standard deviations are in parentheses. Ages are restricted from 13 years of old to 59 years of old. Sample is restricted by wage employed. Source: Thailand Labor Force Survey, 1998-2000.

Table 6: Wages for employed workers at the period before and after crisis

Variable	Before crisis	After crisis
Log(wages)	7.327	7.328
	(.745)	(.733)
Log(White-collar wages)	7.815	7.777
	(.618)	(.629)
Log(Blue-collar wages)	6.945	6.932
	(.598)	(.572)
Log(GBA dwages)	7.550	7.541
	(.693)	(.695)
Log(Rural area wages)	7.294	7.298
	(.746)	(.733)

Note. Standard deviations are in parentheses. Ages are restricted from 13 years of old to 59 years of old. Sample is restricted by wage employed. Source: Thailand Labor Force Survey, 1998-2000.

Table 7: Years of Entry and Length of Experience: Treatment and Control Group

Year	1994	1995	1996	1997	1998	1999	2000
1	C_1	C_1	C_1	C_1	T_2	T_2	T_2
2		C_1	C_1	C_1	T_1	T_2	T_2
3			C_1	C_1	T_1	T_1	T_2
4				C_1	T_1	T_1	T_1
5					T_1	T_1	T_1
6						T_1	T_1
7							T_1

Note: Each column means years of entry. Each row shows years of potential labour market experiences are calculated by her age minuses her years of schooling completion at survey years. Financial crisis comes to the market at summer and fall in 1997. Each T_1 means means the group of newly entrants at the period before crisis but working at the period after crisis (treatment group 1). Each T_2 means the group of newly entrants at the period after crisis (treatment group 2). On the other hand, each C_1 means the group of newly entrants at the period before crisis (control group).

Table 8: Marginal effects on shock dummy in employment equation at entry level

Sample	Whole	White	Blue
D_{1i1998} (T_2)	$-.105^{***}$	$-.096^{***}$	$-.065^{***}$
	(.026)	(.042)	(.025)
D_{1i1999} (T_2)	$-.033$	$-.079^{***}$	$-.001$
	(.027)	(.032)	(.029)
D_{1i2000} (T_2)	$-.113^{***}$	$-.071^{**}$	$-.073^{**}$
	(.028)	(.039)	(.028)
Age	$-.024$	$.127^{**}$	$-.035$
	(.037)	(.058)	(.040)
Age squared	$.001^{**}$	$-.002^{*}$	$.001^{*}$
	(.001)	(.001)	(.001)
Male	$-.105^{***}$	$-.019$	$-.052^{***}$
	(.019)	(.023)	(.020)
Years of Schooling	$.038^{*}$	$-.029$	.036
	(.021)	(.019)	(.023)
GBA	$.295^{***}$	$-.007$	$.351^{***}$
	(.028)	(.020)	(.039)
Adjusted R^2	0.255	0.040	0.153
Obs.	8943	2601	6342

Note. Dependent variable is wage employment dummy is equal to 1 if individual i is a wage worker. This is equal to zero if individual i is unemployment, self-employment, farmer, and working in agricultural sector. D_{1it} dummy variable equal to 1 if the individual labour market experience is less than 1 year at year t=1998, 1999, and 2000. D_{1it} dummy variable equal to zero if the individual labour market experience is less than 1 year at year t=1994, 1995, and 1996. We restrict all sample is in their entry level. That is, treatment group is newly entrants at the period after crisis who have less than 1 year of potential experience of labour market in year 1998. Control group covers newly entrants who are less than 1 year of potential labour market experience at the period before financial crisis. GBA means Greater Bangkok Area dummy variable. Industry dummy variables are not included in explanatory variable. Numbers in parentheses are standard errors. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

*** significantly different from zero at 99 % confidence.

** significantly different from zero at 95 % confidence.

* significantly different from zero at 90 % confidence.

Table 9: Coefficients on shock dummy in wages equation at entry level

Sample	Whole	White	Blue
D_{1i1998} (T_2)	$-.052$	$-.064$	$-.000$
	(.037)	(.040)	(.062)
D_{1i1999} (T_2)	$-.128^{***}$	$-.064^{*}$	$-.159^{***}$
	(.028)	(.036)	(.042)
D_{1i2000} (T_2)	$-.149^{***}$	$-.091^{**}$	$-.172^{***}$
	(.029)	(.039)	(.043)
Age squared	$-.004^{***}$	$-.008^{***}$	$-.002$
	(.001)	(.003)	(.001)
Male	.030	$.099^{***}$	.053
	(.024)	(.034)	(.039)
Years of Schooling	$.047^{**}$	.031	.037
	(.023)	(.029)	(.035)
GBA	$.322^{***}$	$.312^{***}$	$.280^{***}$
	(.028)	(.032)	(.044)
Intercept	3.153^{***}	2.233^{*}	3.976^{***}
	(.574)	(1.176)	(.707)
Industry dummy	yes	yes	yes
Adjusted R^2	0.513	0.334	0.491
Obs.	3935	2274	1661

Note. Dependent variable is log of weekly wage. This is equal to zero if individual i is unemployment, self-employment, farmer, and working in agricultural sector. D_{1it} dummy variable equal to 1 if the individual labour market experience is less than 1 year at year t=1998, 1999, and 2000. D_{1it} dummy variable equal to zero if the individual labour market experience is less than 1 year at year t=1994, 1995, and 1996. We restrict all sample is in their entry level. That is, treatment group is newly entrants at the period after crisis who have less than 1 year of potential experience of labour market in year 1998. Control group covers newly entrants who are less than 1 year of potential labour market experience at the period before financial crisis. GBA means Greater Bangkok Area dummy variable. Industry dummy variables are not included in explanatory variable. Numbers in parentheses are standard errors. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

*** significantly different from zero at 99 % confidence.

** significantly different from zero at 95 % confidence.

* significantly different from zero at 90 % confidence.

Table 10: Marginal effects on shock dummy in employment equation with the 2 years after shock

Sample	Whole	White	Blue
D_{2i1998} (T_1)	$-.067^{**}$	.006	$-.062^{**}$
	(.029)	(.033)	(.026)
D_{2i1999} (T_2)	.003	.034	$-.001$
	(.030)	(.027)	(.029)
D_{2i2000} (T_2)	$-.032$	$.061^{***}$	$-.033$
	(.028)	(.023)	(.027)
Age squared	.001	$-.001$	.001
	(.001)	(.001)	(.001)
Male	$-.118^{***}$	.007	$-.086^{***}$
	(.021)	(.027)	(.020)
Years of Schooling	.010	.041	.015
	(.038)	(.062)	(.029)
GBA	$.317^{***}$	$-.013$	$.377^{***}$
	(.037)	(.028)	(.040)
R^2	0.23	0.024	0.126
Obs.	7718	1897	5821

Note. Dependent variable is wage employment dummy is equal to 1 if individual i is a wage worker. This is equal to zero if individual i is unemployment, self-employment, farmer, and working in agricultural sector. D_{2i1998} dummy variable equal to 1 if the individual labour market experience is 2 year at year 1998. D_{2it} dummy variable equal to 1 if the individual labour market experience is less than 2 year at year t=1999 and 2000. D_{2it} dummy variable equal to zero if the individual labour market experience is less than 2 year at year t=1994, 1995, and 1996. That is, treatment group is newly entrants at the period after crisis who have 2 years of potential experience of labour market in year 1999. Control group covers newly entrants who have 2 years of potential labour market experience at the period before financial crisis. GBA means Greater Bangkok Area dummy variable. Industry dummy variables are not included in explanatory variable. Numbers in parentheses are standard errors. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

*** significantly different from zero at 99 % confidence.

** significantly different from zero at 95 % confidence.

* significantly different from zero at 90 % confidence.

Table 11: Coefficients on shock dummy in wages equation with the 2 years after shock

Sample	Whole	White	Blue
D_{2i1998} (T_1)	$-.130^{***}$	$-.100^{***}$	$-.148^{***}$
	(.037)	(.047)	(.054)
D_{2i1999} (T_2)	$-.137^{***}$	$-.082^{**}$	$-.183^{***}$
	(.032)	(.042)	(.044)
D_{2i2000} (T_2)	$-.236^{***}$	$-.156^{***}$	$-.242^{***}$
	(.036)	(.048)	(.049)
Age squared	$-.003^{***}$	$-.006^{***}$	$-.003^{**}$
	(.001)	(.002)	(.001)
Male	$.044^{*}$	.063	$.092^{***}$
	(.026)	(.039)	(.035)
Years of Schooling	$.251^{***}$	$.362^{***}$	$.209^{***}$
	(.041)	(.098)	(.0485)
GBA	$.320^{***}$	$.368^{***}$	$.278^{***}$
	(.028)	(.037)	(.037)
Intercept	5.195^{***}	5.096^{***}	5.632^{***}
	(.289)	(.334)	(.128)
Industry dummy	yes	yes	yes
Adjusted R^2	0.578	0.386	0.549
Obs.	3184	1647	1537

Note. Dependent variable is log of weekly wage. This is equal to zero if individual i is unemployment, self-employment, farmer, and working in agricultural sector. D_{2i1998} dummy variable equal to 1 if the individual labour market experience is 2 year at year 1998. D_{2it} dummy variable equal to 1 if the individual labour market experience is less than 2 year at year t=1999 and 2000. D_{2it} dummy variable equal to zero if the individual labour market experience is less than 2 year at year t=1994, 1995, and 1996. That is, treatment group is newly entrants at the period after crisis who have 2 years of potential experience of labour market in year 1999. Control group covers newly entrants who have 2 years of potential labour market experience at the period before financial crisis. GBA means Greater Bangkok Area dummy variable. Numbers in parentheses are standard errors. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

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Table 12: Marginal effects on shock dummy in employment equation with the 3 years after shock

Sample	Whole	White	Blue
D_{3i1998} (T_1)	$-.047^{*}$	$-.014$	$-.029$
	(.0249)	(.0283)	(.024)
D_{3i1999} (T_1)	$-.020$	.010	.000
	(.026)	(.026)	(.026)
D_{3i2000} (T_2)	$-.044$	$-.019$	$-.019^{***}$
	(.027)	(.026)	(.027)
Age squared	.001	.000	.000
	(.001)	(.001)	(.001)
Male	$-.060^{***}$	.010	$-.031$
	(.019)	(.019)	(.019)
Years of Schooling	.031	$-.001$	.038
	(.031)	(.047)	(.032)
GBA	$.304^{***}$	$-.011$	$.347^{***}$
	(.030)	(.020)	(.037)
Adjusted R^2	0.195	0.01	0.104
Obs.	8935	2153	6782

Note. Dependent variable is wage employment dummy is equal to 1 if she is a wage worker. This is equal to zero if individual i is unemployment, self-employment, farmer, and working in agricultural sector. D_{3it} dummy variable equal to 1 if the individual labour market experience is 3 years at year t= 1998 and 1999. D_{3i1998} and D_{3i1999} are newly entrants at the period before crisis but working at the period after crisis. D_{3i2000} dummy variable equal to 1 if the individual labour market experience is 3 years at year 2000. That is, treatment group is newly entrants at the period after crisis who 3 years of potential experience of labour market in year 2000. Control group covers newly entrants who have 3 years of potential labour market experience at the period before financial crisis. GBA means Greater Bangkok Area dummy variable. Industry dummy variables are not included in explanatory variable. Numbers in parentheses are standard errors. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

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Table 13: Coefficients on shock dummy in wages equation with the 3 years after shock

Sample	Whole	White	Blue
D_{3i1998} (T_1)	$-.120^{***}$	$-.197^{***}$	$-.046$
	(.034)	(.041)	(.049)
D_{3i1999} (T_1)	$-.114^{***}$	$-.145^{***}$	$-.089^{**}$
	(.031)	(.038)	(.044)
D_{3i2000} (T_2)	$-.160^{***}$	$-.259^{***}$	$-.088^{*}$
	(.038)	(.058)	(.050)
Age squared	$-.002^{*}$	$-.005^{**}$	$-.000$
	(.001)	(.002)	(.001)
Male	$-.006$	$.077^{*}$	$-.025$
	(.028)	(.045)	(.036)
Years of Schooling	$.177^{***}$	$.311^{***}$	$.115^{**}$
	(.038)	(.091)	(.049)
GBA	$.305^{***}$	$.331^{***}$	$.270^{***}$
	(.028)	(.037)	(.037)
Intercept	5.504^{***}	5.353^{***}	5.859^{***}
	(.079)	(.216)	(.099)
Industry dummy	yes	yes	yes
Adjusted R^2	0.560	0.463	0.426
Obs.	3892	1863	2029

Note. Dependent variable is log of weekly wage. This is equal to zero if individual i is unemployment, self-employment, farmer, and working in agricultural sector. D_{3it} dummy variable equal to 1 if the individual labour market experience is 3 years at year t= 1998 and 1999. D_{3i1998} and D_{3i1999} are newly entrants at the period before crisis but working at the period after crisis. D_{3i2000} dummy variable equal to 1 if the individual labour market experience is 3 years at year 2000. That is, treatment group is newly entrants at the period after crisis who 3 years of potential experience of labour market in year 2000. Control group covers newly entrants who have 3 years of potential labour market experience at the period before financial crisis. GBA means Greater Bangkok Area dummy variable. Numbers in parentheses are standard errors. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

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Table 14: Marginal effects on age at shock dummy in employment equation

Sample	Whole	White	Blue
13 to 17 years of old at Shock	$-.057^{***}$	$.034$	$-.039^{***}$
	(.009)	(.020)	(.008)
18 to 22 years of old at Shock	$-.046^{***}$	$-.012$	$-.020^{***}$
	(.006)	(.0130)	(.006)
23 to 27 years of old at Shock	$-.025^{***}$	$-.011$	$-.010^{**}$
	(.005)	(.007)	(.005)
28 to 32 years of old at Shock	$-.023^{***}$	$-.030^{***}$	$-.003$
	(.008)	(.008)	(.005)
33 to 37 years of old at Shock	$.009^{**}$	$-.025^{***}$	$.014^{***}$
	(.005)	(.007)	(.005)
38 to 42 years of old at Shock	$.027^{***}$	$-.012^{*}$	$.026^{***}$
	(.005)	(.008)	(.005)
43 to 47 years of old at Shock	$.019^{***}$	$-.001$	$.019^{***}$
	(.005)	(.008)	(.005)
48 to 52 years of old at Shock	$-.011^{**}$	$-.009$	$-.004$
	(.006)	(.011)	(.005)
53 years + of old at Shock	$-.041^{***}$	$-.001$	$-.028^{***}$
	(.006)	(.012)	(.006)
Industry dummy	yes	yes	yes
Adjusted R^2	0.163	0.045	0.088
Obs.	503677	85985	417692

Note. Dependent variable is wage employment dummy is equal to 1 if she is a wage worker. This is equal to zero if individual i is unemployment, self-employment, farmer, and working in agricultural sector. Treatment group is that *Age at Shock* is equal to 1 at the period after crisis. Control group is that *Age at Shock* is equal to zero at the period before financial crisis. Age is restricted from 13 years of old to 59 years of old during the sample periods. GBA means Greater Bangkok Area dummy variable. Numbers in parentheses are standard errors. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

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Table 15: Coefficients on age at shock dummy in wages equation

Sample	Whole	White	Blue
13 to 17 years of old at Shock	$-.156^{***}$	.005	$-.229^{***}$
	(.021)	(.080)	(.022)
18 to 22 years of old at Shock	$-.129^{***}$	$-.082^{***}$	$-.120^{***}$
	(.010)	(.020)	(.012)
23 to 27 years of old at Shock	$-.149^{***}$	$-.147^{***}$	$-.069^{***}$
	(.008)	(.013)	(.009)
28 to 32 years of old at Shock	$-.116^{***}$	$-.111^{***}$	$-.049^{***}$
	(.008)	(.012)	(.010)
33 to 37 years of old at Shock	$-.086^{***}$	$-.109^{***}$	$-.037^{***}$
	(.009)	(.014)	(.010)
38 to 42 years of old at Shock	$-.039^{***}$	$-.034^{**}$	$-.036^{***}$
	(.011)	(.016)	(.014)
43 to 47 years of old at Shock	$-.039^{***}$	$-.032$	$-.070^{***}$
	(.013)	(.017)	(.017)
48 to 52 years of old at Shock	$-.041^{**}$	$-.019$	$-.122^{***}$
	(.017)	(.021)	(.022)
53 years + of old at Shock	$-.111^{***}$	$-.140^{***}$	$-.164^{***}$
	(.028)	(.030)	(.039)
Industry dummy	yes	yes	yes
Adjusted R^2	0.567	0.507	0.360
Obs.	152837	68698	84139

Note. Dependent variable is log of weekly wage is equal to 1 if individual i is a wage worker. This is equal to zero if she is unemployment, self-employment, farmer, and working in agricultural sector. Treatment group is that *Age at Shock* is equal to 1 at the period after crisis. Control group is that *Age at Shock* is equal to zero at the period before financial crisis. GBA means Greater Bangkok Area dummy variable. Numbers in parentheses are standard errors. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

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Table 16: Marginal effects on years of schooling at shock dummy in employment equation

Sample	Whole	White	Blue
2 to 3 years of schooling at Shock	$-.115^{***}$	$-.173^{***}$	$-.050^{***}$
	(.006)	(.067)	(.006)
4 to 5 years of schooling at Shock	$-.093^{***}$	$-.114^{***}$	$-.033^{***}$
	(.003)	(.013)	(.003)
6 to 8 years of schooling at Shock	$-.066^{***}$	$-.061^{***}$	$-.025^{***}$
	(.004)	(.014)	(.004)
9 to 11 years of schooling at Shock	$.105^{***}$	$-.062^{***}$	$.119^{***}$
	(.005)	(.010)	(.005)
12 to 13 years of schooling at Shock	$.230^{***}$	$-.037^{***}$	$.225^{***}$
	(.008)	(.010)	(.009)
14 to 15 years of schooling at Shock	$.439^{***}$	$.032^{***}$	$.291^{***}$
	(.007)	(.005)	(.012)
16 to 17 years of schooling at Shock	$.498^{***}$	$.021^{***}$	$.434^{***}$
	(.007)	(.005)	(.019)
18 + years of schooling at Shock	$.424^{***}$	$-.013$	$.372^{***}$
	(.010)	(.009)	(.016)
Industry dummy	yes	yes	yes
Adjusted R^2	0.123	0.032	0.076
Obs.	503991	86043	417948

Note. Dependent variable is wage employment dummy is equal to 1 if individual i is a wage worker. This is equal to zero if individual i is unemployment, self-employment, farmer, and working in agricultural sector. Treatment group is that *Years of schooling at Shock* is equal to 1 at the period after crisis. Control group is that *Years of schooling at Shock* is equal to zero at the period before financial crisis. Age is restricted from 13 years of old to 59 years of old during the sample periods. GBA means Greater Bangkok Area dummy variable. Numbers in parentheses are standard errors. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

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Table 17: Coefficients on yeas of schooling at shock dummy in wages equation

Sample	Whole	White	Blue
2 to 3 years of schooling at Shock	$-.684^{***}$	$-.928$	$-.351^{***}$
	(.023)	(.126)	(.020)
4 to 5 years of schooling at Shock	$-.542^{***}$	$-.992^{***}$	$-.195^{***}$
	(.010)	(.040)	(.010)
6 to 8 years of schooling at Shock	$-.278^{***}$	$-.558^{***}$	$-.106^{***}$
	(.009)	(.0316)	(.009)
9 to 11 years of schooling at Shock	$-.145^{***}$	$-.524^{***}$	$.070^{***}$
	(.010)	(.022)	(.011)
12 to 13 years of schooling at Shock	$-.007$	$-.316^{***}$	$.172^{***}$
	(.010)	(.016)	(.012)
14 to 15 years of schooling at Shock	$.357^{***}$	$-.012$	$.270^{***}$
	(.010)	(.011)	(.017)
16 to 17 years of schooling at Shock	$.632^{***}$	$.230^{***}$	$.650^{***}$
	(.011)	(.011)	(.0270)
18 + years of schooling at Shock	$.344^{***}$	$-.037^{**}$	.432
	(.013)	(.015)	(.024)
Industry dummy	yes	yes	yes
Adjusted R^2	0.424	0.442	0.290
Obs.	152911	68719	84192

Note. Dependent variable is log of weekly wage is equal to 1 if individual i is a wage worker. This is equal to zero if she is unemployment, self-employment, farmer, and working in agricultural sector. Treatment group is that *Years of schooling at shock* is equal to 1 at the period after crisis. Control group is that *Years of schooling at shock* is equal to zero at the period before financial crisis. GBA means Greater Bangkok Area dummy variable. Numbers in parentheses are standard errors. Source: Thailand Labor Force Survey, 1994-1996 and 1998-2000.

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