

Is Thailand's urban labor market segmented?

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Abstract

The purpose of this paper is to show a particular feature of the Thai labor market along the lines of the theory of labor market segmentation. Contrary to previous studies applied to data from Thailand, this study aims at identifying the two distinct earnings functions in urban areas which could be explained using the dual mechanism of wage determination. Using the switching model with unknown regime, the results confirm the duality of Thai labor market to the extent that there are two different wage equations related to the external and internal labor markets. Consequently, the rate of return to schooling for males in 2002 is estimated at 8.8 % for the internal market compared to only 2.9 % for the external one. For females, more than 9.6 % of the rate of return to schooling is given to the upper tier in 2002 compared to only 4.5 % for the lower tier in the same year. The overall results call for policy implementations to cope with the increasing wage inequality and deepening job instability in the low wage sector.

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1. Introduction

There has been an increasing debate on the persistence of earnings inequality in the urban labor market in Thailand. Several studies tend to address this crucial issue by searching for outcomes of the labor market segmentation as sources of wage disparities in urban areas (Isra, 2001; Krongkeaw & Kakwani, 2003; NIDA, 2005). Indeed, during the economic crisis in 1997, the employment in urban areas was strongly affected through wage decompression and rising unemployment across the whole country. This event immediately calls for particular attention on the improvement of human resource strategies in order to endow individuals with the requisite skills that would facilitate job accessibility. In doing so, many studies specifically stress the importance of workers' skill differences, namely the level of schooling and training, believing that the major factor behind earnings inequality is the difference in individual's stock of human capital. Consequently, the closed look of the political responses mainly emphasized promoting job training at workplaces, as well as enhancing the educational system since the crisis (World Bank, 2001). Accordingly, there has been a series of empirical studies that tend to estimate a standard earnings function using data from Thailand (Hawley, 2000; Blunch, 2004; Yamauchi, 2001). Despite the popularity of the earnings function, the major concern which remains unresolved is the validity of this single form of rates of return on human capital variables since workers and labor characteristics become more heterogeneous. Since the labor market cannot be clear as assumed by neoclassical theories, one could expect the differentiation of earnings functions across different segments. This study attempts to examine the possible distinction of the wage distribution's forms by showing the double mechanism of earnings fixation between the high and low wage sectors.

The theoretical controversy about poverty and persistent inequality is based on the trade-off between labor productivity and earnings. The human capital theory emphasizes that labor productivity resides in personal attributes such as education achievement, experience in the labor market, general and specific training. Low wage workers are thus always considered as those whose labor productivity remains relatively low compared to those with high pay whose productivity is still high. Contrary to this approach, advocates of labor market duality stipulate that the access to the high paid job has been unequal and the labor productivity resides in the characteristics of jobs, rather than in the individual attributes. In this view, labor market has been divided into two distinct segments, from internal to external segments. In fact, the internal sector contains all good jobs while the external sector covers bad jobs. The external market is characterized by the low rate of return on human capital, the existence of the routine tasks, low pay and particularly bad working conditions. In contrast, the good jobs, mainly observed in the internal sector, are identified by the high rate of return on human capital, high pay and other non pecuniary opportunities such as career promotions and training. To this effect, individuals with equal endowment of human capital could receive different gains in labor market,

depending on which sector they are confined to. In other words, the discrepancy in terms of rates of returns on human capital between each sector may be due to different mechanisms of earnings determination as a result of divergence in wage trajectories (Leontaridi, 1998, p. 69).

The main reason why we tend to renew the duality concept is the perspective of structural evolution of the labor market to create the distinct low and high salary jobs. In recent years, economic and social changes modified the job relationship leading to particular forms of employment, such as the non-standard or non regular, the temporary and part-time jobs, which probably contribute to enhance the labor segmentation assumption (Reid and Rubin, 2002; Kalleberg *et al.*, 2000; CERC, 1991; Guégnard and Mériot; 2007). To this effect, it seems relevant to verify the duality of the urban labor market in Thailand by adopting the *good* and *bad* job concepts borrowed from Doeringer and Piore (1971). Although it is a dated concept, it is discussed in contemporary literature. The empirical tests for this hypothesis might show, on the one hand, that the two-distinct earnings function rather than single one, and on the other hand, the outcome of the labor market duality regarding job classification and wage inequality.

We adopted the switching model with unknown regime, developed by Dickens and Lang (1985a, 1985b, 1987, 1988, & 1992) for the test of labor market duality. Several reasons for choosing this model need to be mentioned. First, this econometric technique allows one to eliminate the selection and truncation biases. The selectivity bias results from the individual's self-selection into certain segments rather than the arbitrary mechanism of random selection while the truncation problem arises from the fact that sectors are subjectively divided by any threshold of wage. These issues, that will be discussed further in subsequent sections, lead to the over or under-estimation of earnings functions and bad specification of models. In addition, the switching model only needs a small number of independent variables compared with other techniques such as cluster and factor analysis whose application needs a greater number of the introduced variables. Finally, with regard to the increasing job duality in most of countries, as mentioned above, the switching model is considered as a suitable approach to capture the effect of the duality of labor market by testing the two distinct earnings function. The paper is organized as follows. Section 2 provides theoretical backgrounds with respect to the human capital and dual labor market models. Reviews of literature will also be integrated in this section. Section 3 presents the data used, namely the Labor Force Survey (*LFS*) collected by the National Statistics Office of Thailand. Moreover, once the model specification is considered, the results of the test will clarify our hypothesis of the dual labor market. Section 4 describes the individuals' distribution by personal characteristics, industries and occupational categories.

2. Human capital and dual labor market theories

2.1. Theoretical background

The core theories which begin the debate on wage inequality and poverty are both the human capital and labor market segmentation approaches. In spite of the older discussion on those issues, current mutations in the urban labor market structure call upon the renewal of those relevant theories, this should be noted.

The human capital approach, pioneered by Schultz (1961) and Becker (1964) suggests that all human activities are likely to have a certain impact on further returns. For instance, investment in schooling is a result of individual decisions made to anticipate greater labor income in the future. The relationship between related costs of investments in human capital (schooling, experience, migration, etc.) and returns on those investments was mathematically resumed by the earnings function, developed by Mincer (1974). In fact, in a competitive labor market, highly educated workers have earned relatively more income than those with low education, due to differential investments in human capital. Although individuals with identical abilities earn different wages at the beginning of their career, the differences tend to decrease with time because of the automatic mechanism of the clear labor market. Under this assumption, the relationship between cost of investment and returns on human capital becomes simultaneously linear. Technically, one only needs to estimate the rates of returns on human capital, using the standard earnings function of Mincer. At the same time, in Thailand, the deep changes in labor market structure following social and economic transformations create questions about the causes of labor market duality, particularly identified by the increasing of temporary jobs with low pay and existing barriers to entry into highly paid jobs. Thus, our analysis borrows the concept of the labor duality from the labor market segmentation theory.

According to the institutional theory, there are two types of labor markets, namely competing and non-competing group. The first one refers to the type of labor market described by the neoclassical theory and the second one involves individuals who stay less competitive with regard to wage and job access. Beyond this concept, Doeringer and Piore (1971) define the internal and external based industrial relations as follows....an administrative unit, ..., within which the pricing and allocation of labor is governed by a set of administrative rules and procedures. The internal labor market governed by administrative rules, is to be distinguished from the external labor market of conventional economic theory where pricing, allocating and training decisions are controlled directly by economic variables. These two markets are interconnected however and movement between them occurs at certain job classifications which constitute ports of entry and exit to and from the internal market. (Doeringer & Piore, 1971, p. 2).

Following this description, one can divide the labor market into *good* and *bad* jobs. As to the internal sector, since institutional law and specific customs within enterprises substitute all mechanisms of the labor market, the job reallocation and the wage have been determined by collective

bargaining or conventional system of wage negotiation. Therefore, the average wage level is relatively high conditions at workplace are good. Contrary to the internal market, the external segment consists of bad jobs and low wages because of the intensive wage competition within the sector. As a result, not only are jobs in the external market are badly paid but also the return on human capital remains relatively low as labor competition is rough. The labor market segmentation theory associates such persisting wage inequality to the existence of barriers to entry to the internal segment that prevents the labor market from equalizing wages. It is thus likely that poverty and inequality in the labor market is related to the fact that poor workers have limited access to the good jobs in the internal market. The consideration of policies should allow them to easily reach the internal sector (Piore, 1970, p. 55)². All in all, in order to cope with the validity of the duality of the labor market, one should show whether there are, on the one hand, two mechanisms of wage determination rather than one, and on the other hand, the existence of barriers to entry to the internal sector. Such an approach requires methodological techniques so as to achieve a decisive conclusion.

2.2. Methodological approaches of dual labor market

During the past three decades, there have substantial empirical literature on tests for the labor market segmented using *a priori* definitions of segments. We include in *a priori* definitions of labor segments the techniques of classification by industrial or occupational categories. Moreover, both techniques of cluster and factor analysis will be considered not as presupposed methods, but *a posteriori* definition of segments. We will briefly describe those two approaches and their corresponding methodological criticisms.

We qualify *a priori* definition techniques when the demarcation has been arbitrary either by self-definition of low and high wages or using industrial/occupational classification. In general, the first step of the process consists of dividing the labor market into two or more distinct segments by wage threshold or job criteria³. Then, one estimates earnings functions for each segment so as to verify whether rates of return on human capital variables show the same story as claimed by the duality model. Most of tests for the validity of the dual labor market confirm the bimodal wage structure (Boston, 1990; Leontarifi, 1998; Theodossiou, 1995). This means that wages and rates of return on human capital tend to differ from the lower to upper tiers. In other words, the duality assumption is statistically accepted by the use of *a priori* demarcation of sectors.

In using the strictly sorting segments, those methods suffered from technical problems related to *truncation* and *selection* biases. In fact, using *a priori* definition of segments exposes to truncation

² For instance, to gain information on employment as well as social network enables workers to escape the situation of confinement in external sector (Wial, 1991, p. 41).

³ For instance, studies of Psacharopoulos(1978), McNabb and Psacharopoulos(1981) were based on *occupational rating scale*, developed by Goldthorpe and Hope (1974).

bias, noted by Cain (1976), and to selection bias, commented by Heckman (1979). With respect to the truncation issue, the econometric regression of earnings function on data subjectively truncated on the values of dependent variables gives biased coefficients of independent variables. This is due to the fact that some groups of the population at the top or at the bottom of threshold were excluded from the estimation processes (Cain, 1976, p. 1246). As a result, the validity of the labor market duality was simply accepted by the existence of the high degree of dependence between high wage and high capacities in the internal sector. For instance, individuals with high pay have more incentives to invest in human capital than those with low pay. The validity of the labor market duality merely arises from this dependence, not from outcome of labor market segmented.

Besides allowing for the above technical shortcoming, the coefficients from estimated wage equations could also be badly affected by the selection bias. According to Heckman (1979), such an issue occurs because a given sample has been arbitrarily selected in order to establish economic comprehension with regard to human behavior. There are two sources of selectivity. First, it concerns a process of collecting cross-sectional samples. For instance, there could be an overrepresentation of women and poorly educated workers in a specific survey such as informal sector or lowly wage studies. Second, the selection bias could be related to auto-selection mechanisms of researchers or pollster's decisions with respect to *a priori* demarcation. For instance, the self-selection of some low wage jobs generates an overrepresentation of young workers with low education attainment. Thus, low returns on human capital variables in the external market directly derive from this self-selection.

To correct those shortcomings, one needs to consider other statistical approaches with *a posteriori* definition of segments. We refer to the cluster and factor analysis techniques whose advantage is to escape from the prior problems. The cluster analysis consists of sorting individuals into segments by using the algorithmic optimization. This final process of sorting generally gives several clusters, depending on the similarity of individual or job characteristics. This method requires a substantial number of introduced variables so that the algorithm manages to shape each sector of similar samples. With regard to the results from the cluster approach, it remains difficult to reconcile them to the theoretical predictions (Anderson et al., 1986; Sloane et al., 1993). For instance, Anderson et al. (1986) found that their second cluster, considered as an internal market, contained a substantial number of casual workers that were not indicated by the duality model. Moreover, although cluster analysis solves the problem of *a priori* segment determination, the results are highly dependent upon the number or type of variables used to determine the cluster and the kind of algorithms used (Leontaridi, 1998, p. 61).

As to the factor analysis technique, most empirical researchers⁴ failed to reject the duality of the labor market. They found, however, that such analysis only served to reinforce the perceived homogeneity of the labor market... This technique has been used most widely to test a 'strict'

⁴ Buchele (1983) and McNabb (1986) used the factor analysis as so to separate labor segments and then the authors preceded the estimation of wage functions. Those studies confirmed the existence of dual labor market.

industrial dualism model (Thomson, 2002, p. 19). As a result, all the above methods have been strongly criticized with regards to their technical limitations and economic interpretations⁵.

As mentioned above, our study follows the contribution of Dickens and Lang (1985a, 1985b, 1987, 1988 & 1992) in order to correct the methodological shortcomings of selectivity and truncation biases. In fact, the switching model with unknown regime manages to address all above criticisms since the sorting process of individuals into segments is based on the probability of being confined into specific sector. In fact, this statistical probability is internally computed by the algorithmic optimization in the use of the sorting variables in the selection equation. In doing so, the switching model suffers neither from the *a priori* demarcation of sectors nor the truncation issue. However, one should pay attention to its dual forms of labor, and hence Dickens and Lang (1988) argue that “we do not propose that the labor market consists of exactly two distinct segments. Only that dualism is a useful simplification” (Dickens & Lang, 1988, p. 131). Moreover, we are not indifferent to the specificity of labor markets in developing countries according to which there are likely be more than two segments. This depends on objectives of studies⁶.

3. Model specification and sample selection

This section consists of specifying econometric models and labor data used. As mentioned above, the test for segmentation will be conducted under the switching model with unknown regime using the LFS from 2002 and 2003.

3.1. General setting

The switching model derives from the endogenous econometric approach⁷ while individuals will be classified into segments by taking into account unobserved factors tending to affect the parameters of earnings function. To begin, consider a worker who maximizes the lifetime utility functions over wage and non-pecuniary characteristics of the job. The standard form of switching model with one sorting equation and two regimes equations could be described as follows:

$$\ln W_{ip} = X_i \lambda_p + v_{pi} \quad (1-1)$$

$$\ln W_{is} = X_i \lambda_s + v_{si} \quad (1-2)$$

$$Z^*_i = D_i \Pi + v_{wi} \quad (1-3)$$

⁵ See also the technical method proposed by Lachaud (1994) based on jobs and workers characteristics, namely protection, regularity and autonomy, suggest that most of urban labor markets in Africa are segmented, particularly caused by discrimination in workplace.

⁶ See recent research on this field in developing countries for instance, Bowles and Dong (2002) and ADB (2005).

⁷ See Maddala (1983) for the original version of all endogenous switching methods.

Sorting equation (1-3) reflects the probability of an individual's attachment to the internal sector. In other words, it serves as a selection criterion that sorts workers into internal or external segments according to their observed characteristics. In this sense, data are not primarily truncated and the sorting process of individuals into sectors uses the probability rather than the exogenous selection. $\ln W_{ip}$ and $\ln W_{is}$ are both logs of wage associated to upper and lower tier, respectively. X_i and D_i are independent variables. The vector X_i of independent variables represents human capital variables such as education attainment (in years of schooling), experience (in years), and squared experience and so on. Generally, the literature tends to include other dummy variables likely to affect wage determination such as gender, residence in Bangkok, and employment with big companies. The vector D_i contains all variables likely to increase the propensity of being employed in the internal market such as education, household headship and occupation. In our study, those independent variables will be further discussed. Then, λ_p , λ_s and Π represent the coefficients related to two regimes equations and sorting equation. Finally, v_{pi} , v_{si} and v_{wi} are considered as error terms of the three equations. In fact, as Z^* is a latent variable and non-observable, it could be defined through W_i :

$$\ln W_{ip} \text{ if } Z^* > 0 \quad (1-4)$$

$$\ln W_{is} \text{ if } Z^* \leq 0 \quad (1-5)$$

With respect to this specification, Z^* simply derives from utilities differences between internal and external segments. Indeed, the probability to be attached to the internal sector reflects those differences. To establish the log likelihood function, some assumptions might be introduced. The strong hypothesis of this standard model, that would be worth being further discussed, concerns the actual form of error terms distribution. In fact, in this paper, error terms follow the normal distribution. Then, the log-likelihood function for this model is given by:

$$\sum_{i=1}^N \ln \left\{ 1 - \theta \left[\frac{-D_i \Pi - \frac{\sigma_{pw}}{\sigma_{pp}} v_{pi}}{\left(1 - \frac{\sigma_{pw}^2}{\sigma_{pp}^2}\right)^{1/2}} \right] \cdot \phi \left(\frac{v_{pi}}{\sigma_{pp}^{1/2}} \right) \cdot \sigma_{pp}^{-1/2} + \theta \left[\frac{-D_i \Pi - \frac{\sigma_{sw}}{\sigma_{ss}} v_{si}}{\left(1 - \frac{\sigma_{sw}^2}{\sigma_{ss}^2}\right)^{1/2}} \right] \cdot \phi \left(\frac{v_{si}}{\sigma_{ss}^{1/2}} \right) \cdot \sigma_{ss}^{-1/2} \right\} \quad (1-6)$$

It is technically shown that the variance of error terms in a switching equation has to be normalized to one since variance-covariance matrix requires an identification⁸. Regarding the function (1-6), σ_{pw} and σ_{sw} are covariances between v_{pi} and v_{wi} and between v_{si} and v_{wi} , respectively; σ_{pp} and σ_{ss} are variances of error terms for wage equations of the internal and external sectors respectively. $\theta(\cdot)$ and $\phi(\cdot)$ are the normal density and accumulative distribution. Furthermore, the results given by the

⁸ The variance-covariance matrix described as follows :

$$Cov(v_p, v_s, v_w) = \begin{bmatrix} \sigma_p^2 & \sigma_{ps}^2 & \sigma_{pw}^2 \\ \sigma_{sp}^2 & \sigma_s^2 & \sigma_{sw}^2 \\ \sigma_{wp}^2 & \sigma_{ws}^2 & \sigma_w^2 \end{bmatrix}$$

switching model with unknown regime will be compared with those stimulated by the Ordinary Least Square method (thereafter, OLS) in order to show which of them better represents the sample. To this end, the OLS has to be replaced by the log-likelihood method so as to make it comparable with the switching model. Thus, the alternative hypothesis is the existence of only one wage equation. The log-likelihood (1-6) with these restrictions⁹ collapses to:

$$LFR = \prod_{i=1}^N \left[\sigma^{-1/2} \phi \left(\frac{Y_i - \tilde{X}_i \tilde{\beta}}{\sigma^{1/2}} \right) \right] \quad (1-7)$$

Maximization of log-likelihood functions must be made with sample selection as so to maintain the credibility of the test.

3.2. Data selections

Data from Labor Force Survey (LFS) for the years 2002 and 2003 are used since the sample from these two years are considered the most reliable and relevant by international standards.. The LFS is a nationwide and representative survey annually collected by the National Statistics Office of Thailand. The first LFS was conducted in 1963. Two rounds of the survey have been conducted each year from 1971: the first round enumeration was held during January-March corresponding to the non-agricultural season and the second round during July-September coinciding with the agricultural season. From 1998 to 2000, the LFS had been undertaken four rounds a year; the first round in February, the second in May, the third and the fourth round in August and November respectively. Since 2001, the LFS has been conducted monthly. The data have been collected by using a series of questionnaires intended for more than 60000 households each year.

The LFS allows for the main variables in relation to work conditions such as employment, unemployment, the number of work hours, the wage, the industrial and professional types, and the educational achievement and so on. Although this data have been based on international standards in terms of concept, definition and classification, there are a large number of technical limits. At one point, it is possible that an account of employed persons has been overestimated with regard to numbers of work hours. This is due to the general definition of employed that refers to all persons who work for at least one hour paid or unpaid during a week (Anon Juntavich, 2000, p. 7). Then, since 2001, the classification in terms of industrial and occupational types has been modified to update the survey in response to international classification changes. It is thus difficult to compare the data between 1961-2000 and 2001-2004, particularly with respect to the industrial and occupational classification. This is one of the reasons why we consider the data from 2002 to 2003. Finally, the

⁹ It means that there is one set of parameters: $\tilde{\beta}_s = \tilde{\beta}_p = \tilde{\beta}$; $v_s = v_p = v$; $\sigma_{ss} = \sigma_{pp} = \sigma$.

counting of unemployed suffers from a seasonally adjusted bias. Unemployment rates differ from one period to another due to the individual mobility between urban and rural areas.

One of the specificities of the switching model concerns a crucial assumption relative to the non-pecuniary characteristics of a job. In fact, the non-pecuniary components are important for people's well being. However, the model supposes that these elements do not explain workers' choices of segment because their contribution to utility does not change with the observable characteristics of the individual (Cipollone, 2001, p. 10). This assumption says that two different individuals will make the same evaluation of jobs' non-pecuniary characteristics. The test becomes less credible if workers are heterogeneous. The way to reduce this effect is to make the population more homogeneous. In other words, a homogeneous group of people should have the same preferences for jobs' non-pecuniary aspects. Thus, the selection will explicitly include workers in private companies, non agricultural, in urban areas, aged between 15 and 64 years old. For males, the sample contains only heads of household in order to respect the homogeneity of workers' evaluation of jobs. One should expect it to be harder to find evidence for the dual labor market among heads of household than mixed population. For females, representative individuals could be either head of household or spouse. With respect to work hours and the wage, individuals considered might have at least 20 hours a week. The wage is the hourly wage¹⁰ including all benefits.

The selection of relevant independent variables could be pointed out as follows. We include in the earnings function the highest educational achievement which is one of the survey's categorical variables. The number of years of schooling are computed according to Thailand's educational classification. Experience is then constructed as potential experience and experience squared is simply the product vector of the latter¹¹. We also introduce the variable of potential experience multiplied by educational attainment as a complementary effect between experience and education in the earnings functions¹². Regarding the sorting equation, besides years of schooling, we introduce three dummy variables such as *highly skilled worker*, *size of firm* and *residence in Bangkok*. The International Standard Classification of occupation (ISCO-88) classifies all occupations according to skill levels (ILO, 1990). In this analysis, *highly skilled worker* could be defined as persons whose jobs meet the third and fifth skill level, namely (1) *legislators, senior*, (2) *officials and managers*, (3) *Professionals*, (4) *Technicians and associate professionals*. Therefore, if the worker has a mentioned job, *highly skilled job* = 1 and 0 otherwise. Regarding *size of firm* variable, we follow the evidence from Suehiro

¹⁰ To compute hourly wage, monthly wage registered in LFS is divided by 4 as so to get a weekly wage and then numbers of working hours by week is used for dividing weekly wage.

¹¹ We note that those independent variables are defined following the standard earnings function, see Mincer (1964). The potential experience is computed by age-6-years of schooling. The experience² is introduced for capturing the depreciation of human capital.

¹² Futoshi (2004) shows that schooling and destination experience are complementary in migrants' wage adjustment in Thai urban labor market. Following this study, we will closely look at the complementary effect by introducing this variable.

and Wailerssak (2004)¹³ that shows high probabilities of large firms to promote internal labor market, especially among managers. If an individual works in a firm whose size is more than 50 persons, *size of firm*=1 and 0 otherwise. The last dummy variable concerns residence in Bangkok, the capital of Thailand, where there is a great concentration of economic activities. If the worker reside in Bangkok, *Bangkok*=1 and 0 otherwise.

4. Results

Two steps of testing for the existence of a dual labor market were required. First, the labor market must consist of two distinct wage equations rather than one single function. To do so, estimation results should confirm that two wage equations given by switching model with unknown regime are more relevant than one standard equation set by the OLS. Then, estimated coefficients must allow us to check if returns on human capital in the internal segment are largely more than those in the external segment. Moreover, this last segment should show that returns on human capital are nearly nil.

4.1. Estimate results

The optimization process of the log-likelihood function is obtained with difficulties. This is mainly due to the fact that optimizations largely depend on types of algorithms used. Some basic algorithms failed to reach the maximum of log-likelihood. Among basic optimization algorithms under the program Limdep version 7¹⁴, we used two algorithms, namely BFGS for the first run and Newton's for reaching the maximum. Several starting values were tested in order to avoid unbounded areas or inexistent maxima. Tables 1 and 2 report results of estimates for men and women, respectively. We note that the first column derives from the OLS estimation, replaced by the maximum likelihood. The next three columns report two wage equations for the internal and external sectors and one sorting equation, respectively. We include in our tables all variances of wages equations, except for covariances of error terms. As mentioned above, our variances of switching equation were normalized to one in order to respect the identification of variance-covariances matrix. Those tables also show the values of log-likelihood and log-likelihood ratios that we need to compute our statistical test.

¹³ Suehiro and Wailerssak (2004) claims that there are internal labor market within the great enterprise in Thailand, such as public company *Siam Cement Public Company Limited*. This firm, one of the most modern companies, promotes manager carriers development and internal mobility that generate internal labor market.

¹⁴ The basic algorithms in LIMDEP v.7 (Green, 1995) are Broyden-Fletcher-Goldfarb-Shanno(BFGS); Dadidon-Fletcher-Powell (DEP); Steepest ascent; Newton's and Berndt-Hall-Hall-Hausman (BHHH).

Table 1
Switching regression model: males (2002-2003)

	Males							
	2002				2003			
	OLS	Internal	External	Switching	OLS	Internal	External	Switching
Constant	0.7561	0.1028	1.1860	-1.1608	0.6579	-0.0900	1.1172	-1.3836
	9.222***	0.737	13.797***	-8.782***	8.023***	-0.562	11.701***	-9.806***
Education (years)	0.0556	0.1080	0.0166	0.0180	0.0657	0.1285	0.0193	0.0447
	9.347***	11.372***	2.387**	1.304	11.277***	11.224***	2.432**	2.823***
Experience (years)	0.0191	0.0735	0.0057		0.0171	0.0696	0.0095	
	3.746***	8.895***	1.109		3.444***	7.581***	1.777	
Experience ²	-0.0004	-0.0009	-0.0002		-0.0003	-0.0007	-0.0002	
	-5.562***	-7.460***	-2.513**		-4.520***	-5.528***	-3.033***	
Experience*Education	0.0015	-0.0008	0.0006		0.0014	-0.0013	0.0005	
	5.683***		2.135*		5.325***	-3.032***	1.656	
Highly skilled worker				1.0805				0.7632
				10.268***				8.735***
Size of firm (>50)				0.3417				0.3253
				5.400***				5.493***
Residence in Bangkok				0.3475				0.3492
				5.616***				6.020***
Standard error	0.1131	0.0670	0.0543	one	0.1162	0.0855	0.0558	one
	28.636***	11.654***	14.229***		30.619***	9.610***	12.086***	
Log-likelihood	-539.7693		-186.4610		-642.4238		-281.1392	
Log-likelihood ratio			706.6166				722.5692	
N			1640				1875	

Note: *significant at 10%; ** significant at 5%; *** significant at 1% and t-student is indicated under coefficients.

Source: Labor Force Survey (LFS), 2002-2003.

Table 2
Switching regression model: females (2002-2003).

	Females							
	2002				2003			
	OLS	Internal	External	Switching	OLS	Internal	External	Switching
Constant	0.8030	0.5305	1.0592	-1.2322	0.8054	0.5924	1.3158	-2.1813
	11.802***	2.900***	13.043***	-7.409***	10.450***	3.482***	17.595***	-12.285***
Education (years)	0.0547	0.0879	0.0266	0.0070	0.0558	0.0779	-0.0019	0.1250
	11.239***	7.716***	4.222***	0.3880	10.421***	7.042***	-0.293	8.238***
Experience (years)	0.0131	0.0321	0.0052		0.0065	0.0263	0.0008	
	2.844***	2.396**	0.9590		1.268***	2.365**	0.179	
Experience ²	-0.0004	-0.0004	-0.0003		-0.0003	-0.0003	-0.0002	
	-5.784***	-1.851	-3.850***		-3.585***	-1.479	-2.836***	
Experience*Education	0.0013	0.0005	0.0010		0.0018	0.0006	0.0009	
	5.451***	0.723	3.0190***		7.005***	1.141	3.257***	
Highly skilled worker				0.6917				0.5536
				6.893***				4.554***
Size of firm (>50)				0.4509				0.5994
				6.850***				7.583***
Residence in Bangkok				0.2826				0.3891
				4.400***				5.189***
Standard error	0.0876	0.0769	0.0555	one	0.1022	0.1344	0.0341	one
	29.1380***	9.474***	15.856***		28.644***	14.806***	13.152***	
Log-likelihood	-341.9806		-52.0109		-457.1117		-90.0015	
Log-likelihood ratio			579.9395				734.2205	
N			1698				1641	

Note: *significant at 10%; ** significant at 5%; *** significant at 1% and t-student is indicated under coefficients.

Source: Labor Force Survey (LFS), 2002-2003.

According to our regression, attention should be drawn to relevant coefficients of switching equation. At first glance, most coefficients seem to be statistically significant at convention level for both males and females, except for the coefficients of education variable for 2002 that are significantly nil for all sexes. In other words, it means that our selected variables are merely relevant with regard to the model specification.

The simultaneous estimation gives remarkable findings for the probability of access to the highly paid jobs. In Thailand's urban labor market, getting a job in the internal market primarily requires a certain stock of human capital, particularly a high level of schooling. Table 1 and 2 indicate that, in 2003, having an additional year of schooling leads to the high probability of reaching a highly paid job. For male head-of-household and females, coefficients of schooling are statistically positive and significant at one percent in 2003. Thus, all things being equal, individuals have a greater chance of finding a job in the internal sector when they achieve the high education achievement. This could reveal the role of the human capital in job allocation in the internal market as long as the recruiting process is based on the intensive selection of persons with high education. Particularly, this relevant effect is strongly remarkable for females since the coefficient of schooling in the sorting equation is estimated to 0,125 compared to 0,044 for males in 2003. Thus results show that the market functioning makes it more difficult for females to access highly paid job than males with the same year of schooling. To this effect, we could talk about the sexual discrimination in terms of job availability.

Moreover, in this study we tend to show the role of job attributes and firm structure in determining the probability of getting jobs in the internal sector. Significant results need to be noted as follows. The urban labor market in Thailand shows that having a highly skilled job substantially increases, all things being equals, the opportunity of accessing to the internal sector. Belonging to Table 1 and 2, the variables explaining highly skilled worker are significantly positive at one percent for all sexes from 2002 to 2003. In effect, only certain occupations such as legislators, officials, managers, technicians and associate professionals easily give access to high-paid jobs. Such effect particularly occurs among male head-of-household compared to females since the coefficients of this variable are estimated to 1,080 and 0,763, compared to 0,691 and 0,553 for females in 2002 and 2003, respectively. Intuitively, those important findings confirm our specific assumption according to which the internal market has been covered by high skilled jobs leading to career promotions and best conditions at workplace.

The positive value of coefficients of variables *size of firm* and *residence in Bangkok* reflects the positive impact of being in a great firm and working in Bangkok on the probability of having a job in the upper tier of the labor market. In fact, the size of the firm has been taken into account in order to emphasize the impact of firm's organization on job relationships. The particular assumption is the fact that the low wage sector encompasses the majority of small firms with less than 50 employees. Since this type of organization generally calls upon the low skilled workers and routine tasks, one could expect that the small companies establish short employment relationships and low wage jobs. Our estimation confirms this tendency suggesting that working in the big firms with more than 50 persons compared to those with less than 50 employees enhance the chance of finding jobs in the internal sector as well as for men and women in 2002 and 2003. In addition, in spite of the economic and political decentralization allowed by Thai authorities since the financial crisis, one would observe the remained effect of the centralized industrial activities around Bangkok on job allocation. The investigation of job accessibility in terms of geographical disparities suggests that having job in

Bangkok, in reference to the rest of regions, seems to improve the probability of getting jobs in the high-pay sector. This last result specifically validates the regional disparities in terms of economic development across the country. To this effect, the industrial concentration around the capital of Thailand remains the primary handicap for the conduct of wage inequality policies between regions.

As mentioned above, one of the central points of this analysis is to compare the role of the human capital variables to job attributes in the contribution to the access to high-pay jobs. Tables 1 and 2 show the comparison of estimated coefficients relative to human capital and job characteristics. We remark that the coefficients of education variables in sorting equation are rather low as compared to others. This finding suggests that being more educated has a relatively slight impact on the probability of obtaining a good job, compared to job characteristics. Therefore, taking into account these differences, we can say that entry to the internal segment depends not only on the important stock of human capital, but also closely on other factors such as occupational, firm types and geographical area.

Moreover, as to wage equations, the complementary hypothesis saying the trade-off between education and experience in the wage determination is surprisingly invalidated as we expected. The coefficient of variable *experience*education* drawn from OLS method appears to be positively significant at convention level while in switching model, it differs from one sector to another. In effect, the impact of this complementarity on wage seems to be negative for male head-of-household in the internal market during 2003 while it is significantly positive for females in 2002 and 2003 in both sectors. Given such results, one should emphasize the sexual disparities in terms of wage distribution in the urban labor market in Thailand: for females, due to the low stock of human capital, in order to improve their earnings, years of schooling need to affect in complementarity with years of experience on wages in all sector while, for males, given the important stock of human capital, the effect of the complementarity on earnings necessarily seems to be nil or negative, particularly for the internal sector. We associate this distinct paradox to the difference in employer's evaluation of job relationships across sex of workers. Male career paths are based on the capacities to adapt for current job by means of existing skills while, for females, job evaluations require both significant years of schooling and experience. Despite those divergent career paths, our analysis does not pretend to show job discrimination but the way that firms seek to establish the different mechanisms to evaluate their employee's productivities.

One of the remarkable results from earnings function insists on the values of the constant which differ from one to another. One can see that the coefficients of constants are all lower in the internal sector than those of external sector. This is partly due to the fact that the shorter term relationship between workers and firms in the external sector entails a substantial wage premium while the employment relationship in the internal sector is likely to be long term. Then, since workers in external sector start working younger than workers in the internal market, the high level of the

constant may be explained by experience accumulated between the actual age and entry age for external workers.

Table 3
Returns (%) to human capital variables in the internal and external sectors and predicted wages

		Schooling		Experience		Log wage	
		Internal	External	Internal	External	Internal	External
Males	2002	8.8	2.9	2.2	0.3	2.4	1.4
	2003	10.0	3.0	2.5	0.4	2.4	1.4
Females	2002	9.6	4.5	2.2	0.2	2.3	1.4
	2003	8.7	1.6	2.6	0.0	2.2	1.3

One should claim the endogeneity of human capital variables, especially education attainment and experience¹⁵. Cipollone(2001) takes into account this specific problem in the regression. The author found that the effect of endogeneity on human capital is quite strong but it does not have a significant impact on human capital variables in the switching model. Thus, the endogeneity does not alter the overall qualitative picture by comparison with the standard model.

4.2. Test results

As noted above, to test the dual labor market hypothesis according to which there are two distinct segments, we need to show that the internal wage equation is different from that of the external sector. The standard approach calls for the likelihood ratio test¹⁶ used by Dickens and Lang. Such a method requires an alternative hypothesis that is the single wage equation. To do so, some coefficients in switching regression have to be restricted. The problem arises from the fixation of a degree of freedom since two covariances of error terms remain non-identified¹⁷. Dickens and Lang (1985a) suggest that Monte Carlo results consist in using a chi-squared distribution with degrees of freedom equal to the difference between the number of parameters in the unconstrained and constrained equations (Goldfeld & Quint, 1975). In the case of this study, the degrees of freedom are equal to 13: 6 parameters constraints to equality for two wag equations; 5 parameters constraints to zero in sorting equation and 2 non-identified covariances.

The log-likelihood ratio indicated in tables 1 and 2 reveal that the two-equation model clearly fits the data better than the single-equation model. In fact, as observed in those tables, log-likelihood ratios are largely far away from 34.53, the critical value with 13 degree of freedom at one percent for 2002

¹⁵ This leads to the fact that labor market experience and educational attainment may be correlated with unobservable individual ability component. In this case, the coefficients from OLS will be biased.

¹⁶ The log-likelihood ratio test (LRT) could be mentioned as follow:

$$LRT = -2 \log \frac{M_{\beta}^{max} \prod_{i=1}^N LFR_i}{M_{\beta}^{max} \prod_{i=1}^N LFUN_i} = -2 \log \frac{M_{\beta}^{max} LFR}{M_{\beta}^{max} LFUN}$$

¹⁷ It concerns the covariances of error terms between the sorting equation and the internal wage equation on the one hand, sorting equation and external wage equation on the other hand.

and 2003: 706.61 and 722.56 for males in 2002 and 2003, respectively, and 579.93 and 734.22 for females in 2002 and 2003, respectively. Thus, it can be argued that the two-equation model fixes the data better than the single equation. However, it would be better to note that the assumption of normal distribution of error terms in this model was strongly criticized by Heckman and Hotz (1986). In fact, according to authors, the error terms of the switching equation may follow other forms. The validity of this test would derive from the distributional assumption. Dickens and Lang (1992) apply a goodness of fit test in order to reply to this criticism. They fail to reject the distributional assumption at the 0.05 level. The recent study by Baffoe-Bonnie (2003) allows for Weibull distribution of error terms that avoids the normality assumption. The results of the estimation are similar to those obtained by the normal distribution model.

The next step of the test consists of verifying whether these equations resemble the prediction of the dual labor market. In other words, we show that the internal segment gives more returns on human capital than those in the external one, on the one hand, and the impact of human capital variables on the wage is not significant in the external sector, on the other hand. To this end, we need to compute the rates of return on each variable of human capital.

Consider our standard earning function as follows:

$$E(\log W_i | W_i = W_{ip}) = \beta_{p0} + \beta_{p1}s_i + \beta_{p2}e_i + \beta_{p3}e_i^2 + \beta_{p4}e_i s_i \quad (1-8)$$

The implied rate of return to schooling is

$$\partial E(\log W | W = W_p) / \partial s = \beta_{p1}s_i + \beta_{p4}\bar{e} \quad (1-9)$$

And the rate of return to experience is

$$\partial E(\log W | W = W_p) / \partial e = \beta_{p2} + 2\beta_{p3}\bar{e} + \beta_{p4}\bar{s} \quad (1-10)$$

The rates of return on human capital for the external sector are analogically expressed. The rates of returns on human capital variables and the predicted wages (in log) for the internal and external sectors are reported in table 3.

To the explicit assumption according to which the urban labor market in Thailand is segmented into two sectors, the results from the statistical approximation of rates of return clearly show the dual structure of wage determination. The returns on human capital variables are different across sectors. For both men and women, the rates of return to schooling and experience are higher for the upper tier than the lower tier.

With respect to the return to schooling, Table 3 indicates that the rate of return to education for men is estimated to 8 % and 10 % for the internal sector in 2002 and 2003, respectively, compared to only 3 % in the external sector at the same years. For females, one additional year of schooling increases 9.6 % and 8.7 % for the internal sector in 2002 and 2003, respectively, compared to only 4.5 % and 1.6 % for the external sector. Those findings lead to the crucial conclusion with regard to the current debate on wage inequality in the urban labor market. Given the same level of schooling, wage inequality remains persistent due to the existing duality in earnings fixation between the internal

and external markets. In fact, an individual getting a job in the lower tier tends to undergo the small rate of return to schooling while enjoying higher rate for an individual having access to job in the upper tier. The theoretical literature on labor segmentation explains such different mechanisms by the fact that there have been barriers to the mobility between the two segments. The increasing difference of return to schooling between the bad and good jobs could typically be intensified by new organizations of firms in response to flexible management of manpower [Farber (1997), Monks et Pizer (1998), Neumark *et al.* (1999)].

In addition to the return to education, we insist on the substantial disparities in terms of rates of returns to experience. According to the human capital theory, years of working experience could reflect a measure of the general and specific components of human capital. Note that the general human capital refers to general knowledge, not specifically related to the firm. It argues that such stock of human capital is transferrable from one firm to another. The specific human capital corresponds to specific skills in given firms or given jobs while I could not naturally be transferred to other firms (Becker, 1964). The statistical approximation of returns to experience between the two sectors permits confirming the impact of experience on wages across sectors. Table 3 points out the difference in rates of return to experience between sectors as a result of the labor market segmentation. For male head-of-household, there has been a remarkable difference. Rates of return to experience are estimated to more than 2.2 % and 2.5 % for male workers in the internal sector in 2002 and 2003, respectively, in comparison to 0.3 % and 0.4 % for workers in the external market. As expected, return to experience for females in the external segment is nil whereas it is positively significant across the internal segment: for instance, in 2003, females in the internal sector have 2.6 % of the rate of return to experience, compared to zero per cent in the external sector. To this effect, given the same level of years of experience, individuals with similar characteristics have different earning incomes. This crucial result recognizes the different mechanisms of wage fixation and the existing barriers to entry to high-pay jobs.

We could note that in the internal market, employers tend to offer higher wage to obtain the real effort of their employees while in the external market, the short term relationship is not based on employee's loyalty but on the variety of temporary contracts. As a result, the predicted wages are on average higher in the internal sector than in the external sector. Table 3 shows that values of logarithm of wages are about 2.4 for males in the internal sector in both years, compared to only 1.4 in the external market. Despite slightly low approximated values of wages in comparison to male workers, the average logarithmic wage of female workers in the internal market is about two time of that of the external sector. Regarding all outcomes of the urban labor market in Thailand, one could not deny the increasing intensity of labor market duality. Furthermore, the form of distribution of workers for each segment should give more information about wage disparities.

5. Distribution of workers in the internal and external segments

The model does not say which sector workers belong to. We need to compute the probability of being in the internal sector using the conditional probability as follows¹⁸.

$$\frac{\Pr \{v_{wi} > -D_i \Pi | D_i, X_i, v_{pi}\} \cdot f(v_{pi})}{\Pr \{v_{wi} > -D_i \Pi | D_i, X_i, v_{pi}\} \cdot f(v_{pi}) + \Pr \{v_{wi} \leq -D_i \Pi | D_i, X_i, v_{si}\} \cdot f(v_{si})} \quad (1-11)$$

This equation (1-11), which is borrowed from Bayesian conditional probability, enables one to compute the probability of being in the internal sector which closely depends on the unobserved factors and estimated coefficient values of earnings function. We say the conditional probability since we accept that the probability of sorting into the internal sector follows the fact that $z^* > 0$ (equation 1-4) or again $v_{wi} > -D_i \Pi$ (equation 1-3). Thus, the probability of being in the internal sector given all observed individual and job characteristics is the ratio of the probability of such event (numerator) and the total probability (denominator). Note that the total probability also includes the probability of being classified in the external sector which is computed using the condition contrary to that of the internal market: $z^* \leq 0$ (equation 1-5) or again $v_{wi} \leq -D_i \Pi$ (equation 1-3).

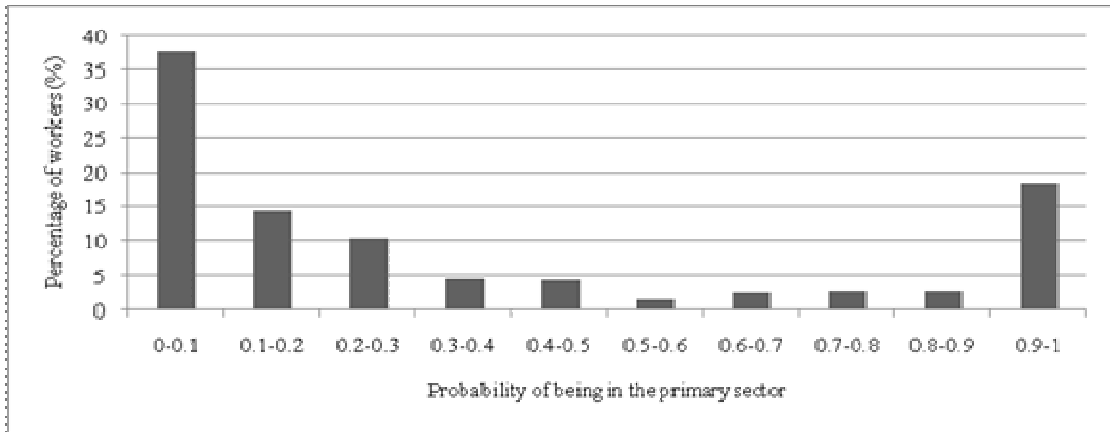


Fig. 1. Distribution of workers according to the predicted probability of being in the internal sector.

Based on this statistical computation, we now build Fig. 1 that reports the distribution of workers in percentages according to their probability of belonging to the internal sector for males in 2002 using the equation (1-11). Fig. 1 shows that the distribution of workers is bimodal, meaning that there has been a bipolar concentration of individuals around two tails of the distributional structure. One fraction of the population is less attached to the internal sector while the other seems to be more covered by this segment, giving less “middle class” people. To this effect, it seems impossible to determine a worker’s segment if the predicted probabilities have been evaluated around fifty per cent. Consequently, we classify all workers into segment by using the following threshold. The external

¹⁸ This expression is simply a mathematical formula by Bayes’ Theorem.

sector contains workers whose probabilities are in the ranges 0-0.3 percent. The internal sector includes workers whose probabilities are in the ranges 0.70-1.0 percent. If the probabilities remain between 0.3 and 0.7 percent, workers will be considered as not classified. Contrary to studies from developed countries¹⁹, most Thai workers are classified into the external sector. Only one-third of individuals are confined into the internal sector. According to Table 4, only 24.2 % of individuals are classified into the internal sector in comparison with 62.6 % in the external sector, giving 13.2 % of unknown classified individuals. Table 4 shows the worker's distribution across individual and job characteristics, some important remarks need to be noted.

On the first point, the likelihood of having a job in the internal sector rises with the education level. This result confirms the prior analysis in terms of access to highly paid jobs according to the selection analysis. Almost all individuals with no education work in the external market: 80 % of individuals are classified into the latter tier compared to only 20.1 % of those having the university certificate being at the same sector. The greater the number of schooling years, the higher is the probability of being in the internal segment. Thus, we observe that individuals with a university education have relatively more chances of working in the internal sector than those having achieved less schooling level. Additionally, Table 4 reveals the fact that there have been differences between the general and vocational secondary educations in terms of access to well-paid jobs. We observe that the opportunity of being in the internal market is rather higher for the latter than the first since more than 40 % of workers with vocational certificate compared to only 20.8 % of those having general education have systematically a job in the internal market. Such disparity could be interpreted as a result of the different amount of investments in human capital with regard to the employment accessibility. The port of entry into the internal market is partly built up by the higher level of schooling.

Moreover, as expected, the results shown in Table 4 reveal that having a job in Bangkok and neighboring vicinities reduces the risk of falling into low wage jobs since the share of workers in the internal sector for Bangkok remains statistically substantial, evaluated to 28 % compared to only 14 % of individuals for northeast. Further, there is a relatively high share of individuals with a residence in the central and southern regions in the internal market when comparing to those working in the northern and northeastern areas. This difference underscores the importance of the fact that those latter regions have been less economically developed, together with a substantial number of poor paid workers in urban areas. More specific than in other countries, this regional disparity in terms of economic development in Thailand has persistently handicapped further poverty strategies, as well as future socio-economic development plans for whole country.

Finally, it is worth noting that the probability of belonging to the internal sector rises as working experience increases. Workers with high experience in the labor market have in fact relatively more opportunity of gaining access to the high-paid job than those with less years of experience, except for

¹⁹ Dickens and Lang (1985a) and Cipollone (2002) found that a substantial number of workers were classified in internal sector.

workers having more than 41 years of working experience who surprisingly enjoy low share in the internal market. As shown in Table 4, the percentage of individuals with 31-40 years of working experience in the high-pay sector is estimated to 34.2 % compared to 17 % for those with less than 10 years of experience, and even 17 % for those with the highest experience. We associate this sharp downward trend to the low educational level of seniors. Although the latter gain more experience at work, their productivity tends to gradually decrease as a result of the small amount of human capital, particularly in terms of formal education achievement.

Table 4
Composition of the sample by workers' characteristics, by Industry and occupation category, males and head of household for 2002 (%)

	<i>Internal</i>	<i>Not classified</i>	<i>External</i>	<i>Total</i>
Schooling				
No education	0.0	20.7	79.3	100
Primary	10.1	13.7	76.2	100
Lower secondary	15.8	15.4	68.9	100
Upper secondary (general)	20.8	14.9	64.3	100
Upper secondary (vocation)	39.5	8.4	52.1	100
Diploma level	34.3	13.9	51.8	100
University	70.8	9.1	20.1	100
total	24.2	13.2	62.6	100
Region				
Bangkok and vicinity	27.9	16.0	56.2	100
Centre	23.7	12.6	63.8	100
North	12.2	6.3	81.5	100
Northeast	14.3	3.9	81.8	100
South	24.2	13.2	62.6	100
total	24.2	13.2	62.6	100
Experience				
0-10	16.9	16.0	67.2	100
11-20	22.2	16.9	60.8	100
21-30	27.5	10.1	62.4	100
31-40	34.2	7.1	58.7	100
>41	17.0	10.5	72.5	100
Occupational Category⁽²⁾				
Senior officials and managers	83.9	4.8	11.3	100
Professionals	77.7	14.9	7.3	100
Associate professionals	61.5	17.0	21.4	100
Clerks	37.4	13.0	49.6	100
Service and sales workers	8.4	7.9	83.7	100
Craft and related trades workers	8.3	10.7	81.1	100
Machine operators	16.2	18.3	65.5	100
Elementary occupations	3.8	13.2	83.0	100
Industry Category⁽¹⁾				
Industry	23.5	16.9	59.7	100
Construction	11.5	5.7	82.8	100
Electricity, gas and water supply	79.5	12.1	8.4	100
Wholesale trade	17.0	14.2	68.8	100
Transportation and communication	30.7	13.9	55.4	100
Business services	20.4	12.6	67.0	100
Banking and financial services	47.5	5.6	46.9	100
Total	24.2	13.2	62.6	100

Note: (1) Industry category follows the International Standard Classification of Industry (ISCI-88); (2) Occupational category follows the International Standard Classification of Occupation (ISCO-88).

Besides the impact of individual characteristics on job access, attention needs to be devoted to the distribution of workers by industrial and occupational category. Table 4 shows that some industries and occupations contain a large number of jobs in the internal market to the detriment of other categories. With regard to occupational distribution, the majority of high wage jobs belong to the first three occupational categories, such as senior officials and managers, professionals and associate

professionals. This result is not surprising since those jobs are indeed considered as highly skilled jobs, which generally yield a better pay. At the same time, most individuals with low skilled jobs such as sale and trade workers and elementary occupations have more risk of being in the external segment. These findings confirm the prediction of the theory of segmentation which traditionally suggests the distinction between good and bad jobs in the labor market. The good jobs are in fact mostly found in highly skilled professions, especially in the internal sector while the bad jobs correspond to low skilled professions. Such an idea reaches an important point of our studies since it refutes most previous studies' conclusion with regard to resources of increasing earning inequality²⁰. As to workers' distribution by industry type, most individuals seem to be equally distributed by each sector of production, except for certain sectors. Having a job in the electricity, gas and water supply or banking and financial services' sector substantially increases the probability of being classified in the internal sector while working in the construction sector largely diminish this likelihood. In addition to getting jobs in the internal market, it should be of special interest to stress on the job characteristics across the external sector. We observe in effect that certain industries particularly encompass the large share of low wage jobs: 82.8 % of workers in the construction sector are confined into the external market, and 68.8 % and 67 % for wholesale trade and business services sector, respectively. As mentioned above, those specific sectors of production tend to suffer from the low return to investments in human capital, as well as unstable jobs. While substantially facing the barriers to entry into high wage jobs, certain poor workers have been forced to accept any jobs just to earn enough to survive.

6. Conclusion

The objective of this study consists of clarifying the sources of persistent earning inequality along the lines of the theory of the labor market segmentation. Contrary to previous research in the human capital field, the analysis investigates the existence of dual structure of the wages determination, using the switching method with unknown regime.

First, we explain the persistent wage inequality by adopting the idea that the potential labor market duality leads to entail different wage paths. Using the switching model with unknown regime, the empirical test of the duality of the labor market aims at rejecting the assumption of the human capital model, according to which there is only one standard earnings function for the all heterogeneous population. While borrowing the prediction of the segmentation theory, the wage dispersion is partially explained by the duality in terms of income distribution to the extent that the returns to human capital differ from one sector to another, consequence of a dynamic process of wage determination in each segment.

²⁰ The neoclassical view with respect to earning disparities claims that the increasing earnings inequality is mainly related to the differences in workers' qualification. In Thailand, there are a number of economic literatures in line with this idea. See for instance Medhi et al. (2006).

Second, when called for statistical technique to sort individuals into segments, we investigate the probabilities attached to the internal segment, which enable one to carry out an analysis of the workers' distribution across segments. Indeed, the internal sector is overrepresented by people having reached a higher education level and having highly skilled work, whereas the external sector is characterized by a substantial number of employees who obtain an internal education level and having low skilled employment. Consequently, we adopt an idea according to which the access to the internal sector depends not only on the level of education, but also on the geographical area and size of firm and other job features. Although investments in human capital substantially contribute to enhancing the comprehension of earnings inequality in the labor market, the recent changes in terms of labor structures tend to intensify the complexity of wage dynamics. Throughout this analysis, we consider the impact of different job attributes on subsequent wage, as well as job access. The overall results seem to accept the assumption of Sobel (1982) which stresses the complementarity of the human capital and labor market segmentation theories. Policy implications with regard to the reduction of wage inequality should thus take into account not only the reinforcement of educational and trainee systems as to endow individuals with high skills, but also the role of structural changes of labor market in assessing the increasing wage inequality. Therefore, of particular interest in this regard is to focus on different combinations of policy strategies by the means of the human capital improvement and labor market regulations.

All above empirical results tend to show the general need for policy implication. Since the effect of the job polarization, leading to separate the good from bad jobs become the increasing issues of recent years in Thailand. Such a phenomenon occurs parallel to the increasing labor market flexibility which generates a process of social exclusion in the labor market (see Autor *et al.*, 2006)²¹. Our findings claim several potential policy actions which should especially consider the situation of lowly paid workers in the external segment. First, public policies aiming to reduce poverty and inequality should take into account the effective targeting with regard to vulnerable groups, characterized by those who have fewer opportunities to access to some precious jobs with suitable wage and better working conditions. Programs need to be set up to ensure the labor fluidity such as job search facilities and common access to certain type of sectors for workers who mainly suffer from the barriers to entry to the internal sector. The poor are not only poor because they lack money, but they are poor because they lack access to and bargaining power in attaining resources (Shao Zhiqin, 2001, p. 10). The pauperization and the persistence of wage inequalities are closely associated with individuals' incapacity to reach the internal sector through access to social or informational resources.

Second, the ongoing concern for most developing countries is the chronic and structural inequalities in the urban labor market which seems to reinforce the social exclusion from the good jobs

²¹ Most recent literature focuses on how the low paid occupation trend such as the temporary and the part-time jobs causes a raising proportion of low wage workers (Reid and Rubin, 2002; Kalleberg et al., 2000; Guégnard & Mériot; 2007).

for disadvantaged people. Particular attention needs to be devoted to the long term wage disparity likely to be harmful to the economic growth.

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