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Earnings differentials between formal and informal employment in Thailand

Sukti Dasgupta, Ruttiya Bhula-or and Tiraphap Fakthong

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Preface

Informal employment is an important source of livelihoods for many people in Asia Pacific, in spite of good economic growth in the region. Even in some of Asia's middle income countries, where per capita incomes have risen and poverty has declined, informality continues to be a fact of life and a majority of the workforce are informally employed. Informal employment has helped to avoid high open unemployment despite adverse economic conditions. In fact, in some Asian countries, including in Thailand, informality rose during periods of economic crisis.

The ILO has been instrumental in shaping understanding of the informal economy. Based on the ILO's Decent Work Agenda, we thus work with our constituents (Governments, workers and employers) to create productive employment opportunities in the informal economy, to enhance rights, to improve social protection and to strengthen representation and voice in the informal economy.

In 2002, at the International Labour Conference, ILO constituents discussed 'Decent Work and the Informal Economy' and adopted conclusions that called upon the ILO to assist member States to help enable identification of specific groups of workers and economic units and their problems in the informal economy. At its 104th Session (2015), the International Labour Conference adopted the Recommendation, 'Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204)) based on strong tripartite consensus and a near-unanimous vote, following a two-year process of consultation. This is the first international labour standard to focus on the informal economy in its entirety and diversity and to point clearly to transition to the formal economy as the means for realizing decent work for all and achieving inclusive development.

This paper explores challenges faced by informal workers, in a middle income, moderately fast growing Asian country, Thailand. The study reviews the available evidence and uses available statistics and econometric analysis to assess the extent to which there is a disparity in earnings between workers in formal and informal employment in Thailand, and goes on to examine in greater depth these observed characteristics and the extent to which they influence earnings from formal and informal employment. The policy implications of the study relate to productive structural transformation in the Thai economy, the importance of education and the critical importance of gender equality in dealing with the problems of informal employment.

I hope that this study will contribute to the ongoing discussion on informality and earnings in the context of development.

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Tomoko Nishimoto
Assistant Director-General and
Regional Director for Asia and the Pacific

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Abstract

The paper estimates the earnings gap between formal and informal employment in Thailand, using a sample of workers that includes both wage and self- employed workers. It finds that while the major part of the earnings differential is attributed to observed characteristics, there is a significant unexplained component. The paper then applies a quantile regression method to an earnings function to understand the factors that explain differences in earnings for different quartiles. Controlling for other factors, it finds that informally employed workers systematically present lower earnings at all earnings levels, and the difference increases with level of earnings. Furthermore, the estimated marginal effect of gender on earnings is negative and remains more or less constant across the different quartiles, while returns to education are positive and increase with income quartiles. The premium of working in services or manufacturing is higher at the lower end of the income distribution and the non-farm self-employed worker is likely to earn more than others. The findings of this study have implications for policies for productive transformation in the country, along with a focus on education and gender equality.

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Abbreviations

ADB	Asian Development Bank
BOT	Bank of Thailand
ICLS	International Conference of Labour Statisticians
IES	Informal Employment Survey, Thailand
ILO	International Labour Organization
LFS	Labour Force Surveys, Thailand
NESDB	Office of the National Economics and Social Development Board
NSO	National Statistical Office, Thailand
SES	Household Socio-Economic Survey, Thailand
TDRI	Thailand Development Research Institute

1. Introduction

This paper examines differences in earnings between formal and informal employment in Thailand, which is a high middle income country. Thailand has been noted as one of Asia's success stories, based on an export-led growth strategy reflected in a relatively high export GDP ratio[1]. Yet, official figures show that in spite of good economic growth, over 60 per cent of Thailand's workers in the past decade (NSO, 2013b) are informally employed. This paper probes the differences in earnings between workers in formal and informal employment in Thailand, and analyses the impact of different factors on this earnings difference.

Thailand's economy grew at an impressive rate of 7.9 per cent on average during the 1990s until the Asian economic crisis in 1997 when growth rates plummeted. However, growth recovered quickly by 2000 though many believe that the 1997 crisis left a deep mark on the Thai economy (Jetin, 2012). From 2000 to 2007, the economy grew on average at some 5.2 per cent. Growth rates fell during the global economic crisis of 2008 and 2009 (-1.1 per cent in 2009) and rebounded again in 2010 reaching up to 6.3 per cent. The growth rate was 1.6 percent in 2011, and increased to 6.4 per cent in 2012. Thailand's growth over the years has resulted in rising per capita GDP which grew at an average rate of 3.8 per cent between 2001 and 2012 (NESDB, 2013)[2].

The World Bank upgraded Thailand's income categorization from a lower-middle income economy to an upper-middle income economy in July 2011. This upgrade was in recognition of Thailand's economic achievements in the past decade, its "prudent macro-economic management" and its "friendly business environment that has been successful in attracting foreign direct investments and achieving greater diversification in manufacturing production, both in terms of higher value-added production and expansion into new emerging export markets" (World Bank, 2011).

As is typical of many developing countries with a large rural sector, Thailand's unemployment rate has remained low and has shown a declining trend in recent years – in 2010 the rate was 1.04 per cent and in 2011, 2012, 2013 the rates were 0.68, 0.66, and 0.72 per cent respectively (NSO, 2013c). Yet, alongside all these positive features of good economic growth, and close to zero unemployment rate, the share of informal employment in Thailand remains high - the official rate is 64.3 per cent in 2013 increasing from 63.7 per cent in 2008 (NSO, 2013b). It is also noteworthy that informal employment expanded during the economic crises – both during the 1997 Asian crisis as noted by Lathapipat (2010)[3], and during the 2008-9 crisis when it climbed up to 63.4 per cent in 2009 (NSO, 2009b).

Thailand presents one of the highest figures for inequality in Asia – with an urban Gini coefficient of 0.49 and a rural Gini coefficient of 0.43 in 2011 (NESDB, 2011). Furthermore, over half (51.3 per cent) of all workers in 2013 had, at the most, an elementary education, and 41.9 per cent of all workers were engaged in agriculture in 2013 (NSO, 2013c). As noted by Jetin (2012), opportunities for employment in manufacturing, the sector that has driven growth, has been especially poor – characterised by low job

[1] Thailand's trade/GDP ratio in 2008-10 was 138.3 and in 2009 -11 was 138.8, from World Trade Organization (WTO)'s Trade Profile.

[2] All growth rates are calculated based on the chain volume measures at a constant price.

[3] Lathapipat (2010) evaluates the impacts of the 2008/2009 global recession on Thailand's labour market. He argues that Thailand's informal sector cushioned the unfavourable impact of the exogenous shock on the unemployment rate, which reached its peak of 2.15 per cent during the first quarter of 2009. He estimates that the informal sector expanded by 1.59 percentage points during the Asian 1997 crisis, while the corresponding expansion during the 2008/2009 downturn was 0.39 percentage points

growth, a segmented labour market between high skilled Thai workers and low skilled migrants, repressed wages and a relatively poor union voice (Jetin, 2012).

In recent years, the high share of informal employment has raised some concerns in policy circles. Thailand's Eleventh National Economic and Social Development Plan (2012–15) emphasises an integrated approach to the alleviation of poverty, which includes the extension of social insurance to those in informal employment, as part of the conceptual framework of sustainable economic development and community strengthening (NESDB, 2012).

In this paper we categorise workers by their level of earnings across the earnings distribution. In what follows, we undertake a detailed comparison of earnings differentials between those who are formally employed and those who are informally employed in Thailand, based on data from the Household Socio-Economic Survey (SES) in 2011. Given this, we are able to identify more clearly the impact of social policies and institutions, as distinct from structural factors that explain these differences in earnings. A Quantile regression analysis is used to capture the heterogeneity among the informally employed workers. This detailed analysis of the disparity in earnings between formal and informal employment and factors that contribute to differential earnings provides an evidence-based understanding of earnings from informal employment in Thailand and underlines the relevance of specific labour market institutions in the country, an analysis that has not been attempted earlier.

The paper therefore contributes to a better understanding of: (i) how do earnings from informal employment compare with those who are formally employed; (ii) what factors contribute to their earnings; and (iii) what could be the policy approach towards informal employment in Thailand.

The chapter is organized as follows: Section 2 explains how informal employment is defined and measured, internationally and in Thailand; Section 3 explains the method used to impute earnings from the SES database and highlights some specific characteristics of earnings from informal work. Section 4 examines the existence of disparity in earnings between formal and informal employment, and then analyses an earnings function in order to understand factors that determine earning by quantile groups. Finally, Section 6 highlights the main findings of the study.

2. Defining and measuring informal employment in Thailand

Measuring informal employment has been a challenge for labour statisticians. The 17th International Conference of Labour Statisticians (ICLS), in 2003, endorsed a definition of informal sector employment based upon a building block approach. It integrates the production-based approach with a job based approach as noted in ILO (2012). It includes not only employment in the informal sector but also other workers who may be working in formal enterprises but without a formal job.

Accordingly, ILO (2012a) described informal employment as the total number of informal jobs, whether carried out in formal sector enterprises, informal sector enterprises or households and includes employees working in informal sector enterprises and those who are informally employed in the formal sector; employers and own-account workers employed in their own informal sector enterprises; members of informal producers' cooperatives; contributing family workers in formal or informal sector

enterprises; and own-account workers engaged in the production of goods for own end use by their household (ILO, 2012a).

In practice, often because of a lack of data on variables recommended for measuring informal employment as recommended in the ILO (2012a) matrix, informality is defined by either work status, or size of enterprises, or access to social protection. Despite their shortcomings and weaknesses, these indirect estimates remain a widely-used means of obtaining macro and sectoral indicators on the informal sector. Charmes (2009) argues that the need for data on the informal sector justifies the interest of policy-makers and users for indirect estimates though the type of measure or variables used affects the measures and often creates problems for cross country comparison of the data.[4]

Thailand conducts regular labour force surveys (LFS) every quarter that provide comprehensive data and details of employment activity, status, industry and occupation. However, wages in the labour force surveys relate only to those who are actively working as government/ public enterprises and private sector employees.

Since 2005, the third quarter LFS has an informal employment survey module (IES) attached to it. In this module informal employment is defined as employment (or workers) not covered by social security.[5] Formal employment, on the other hand, represents workers who are protected by existing labour legislation and social security and includes the following – government employees, state enterprise employees, teachers based in private schools, employees of foreign governments and private employees who are under the coverage of labour laws. This definition is not entirely in line with the recommendations of the 17th ICLS. But it provides an approximate picture of workers who are likely to be informal, though it may have problems of both underestimation as well as overestimation of the true size of informal employment. According to this definition, and based on the official informal employment surveys (IES), the share of informal employment was 62.3 per cent of the total employment in 2010 and gradually increased to 62.5, 62.7 and 63.7 per cent in 2011 2012 and 2013 (NSO, 2010-2013b). Most existing analyses of informal employment in Thailand is based on this definition (see, for example, TDRI (2008) and Leelawattananun et al., 2008).

When examining earnings from informal employment, data from the Labour Force Surveys is inadequate. The LFS only provides data on the earnings of wage and salaried workers. It does not provide any data on earnings of self-employed workers. Therefore, the IES, which is conducted as an additional module to estimate the share of informal employment of every third quarter of the LFS, has the same limitation.[6]

The Socio Economic Survey (SES), on the other hand, provides details on household characteristics including earnings from self-employment, albeit without details on many other employment characteristics. These self-employed workers are a significant share of total employment in Thailand (see, table 1).[7] The SES data is therefore used to understand earnings in this study.

[4] Henley, Arabsheibani and Carneiro (2006) illustrate that the type of definition used in these indirect methods affects the estimates of informality significantly.

[5] Under the Social Security Act, the insured persons will receive up to seven benefits, namely injury or sickness; maternity; invalidity; death; child, old-age and unemployment benefits (Section 54, Social Security Act 1990). Thai citizens, who are not covered under any public scheme, will automatically fall into the Universal Coverage Scheme, which provides health protection at public hospitals at free of charge (Sakunphanit and Suwanrada, 2011).

[6] The data from the Labour force survey relates only to quarter three (July-September) since it coincides with the harvesting period that reducing a seasonal effect.

[7] See also Jetin and Kurt who make the same argument of Thailand in 2011.

Table 1: Share of worker by work status in 2011 (%)

Work status	2011
Employee	
Government employee	8.64
State enterprise employee	0.64
Private company employee	33.27
Self-employed worker	
Employer	3.03
Own-account worker	34.14
Member of producers' cooperative	0.03
Contributing family worker	
Contributing family worker	20.25

Source: Authors' estimation based on SES, NSO (2011)

For consistency with past studies on informality in Thailand, we have also used the Thailand National Statistical Office definition of informally employed – which is those workers who are not covered by social security measures. Applying this definition to the SES 2011 survey, we estimate that 67.6 per cent of total employment was informal.[8] Among informal workers, the male share is 52 per cent and the female share is 48 per cent. Furthermore, the economic sector breakdown suggests the majority of informal workers in the agricultural sector at 53.5 per cent while only 7.6 per cent in the industry sector and 38.9 per cent in the service sector. In the 15-24 age group, 29.9 per cent are informally employed, as compared to 70.1 per cent in the 24+ age group.

3. Research question, data and methodology

In the literature, informal employment is often synonymous with low earnings and poor job quality. An established view, propounded by Tokman (1992) and others is that informal sector (or informal employment) acts as a buffer between formal employment and open unemployment – when formal jobs are scarce informality rises in developing countries because workers simply cannot afford to be unemployed. This leads to labour market segmentation – returns in the different sectors of the economy differ for workers who are otherwise equal in terms of characteristics (Dickens and Lang, 1985). On the other hand, there has also been an increasing focus on the 'voluntary' nature of informal employment – that many are engaged in informal employment voluntarily and that they are not necessarily poor because earnings from informal employment are not necessarily low and that workers often prefer informality for a variety of reasons (i.e. workers are satisfied with their informal jobs, and they do not want to undertake requirements to be formal (Maloney, 2004: p. 1160-1164). This implies a competitive market scenario, not a segmented market. The ILO, in 2002, noted that the informality is a heterogeneous and complex phenomenon and that there is no simple relationship between working informally and being poor, and working formally and escaping poverty (ILO, 2002: p. 2–3).

In the context of Thailand, an upper middle income country where more than 60 per cent are informally employed as per official statistics, and where there is widespread informality in the agriculture and

[8] This is close to the estimation for 2011 from the LFS which was 62.6 per cent.

services sectors in particular, whether or not there is a systematic difference between earnings from formal and informal employment merit thorough review. From the SES 2011 we find that on the average workers who are informally employed earn less than those in formal employment (see table 2).

There is some literature, albeit limited, on earnings differential between formal and informal employment. Most of the literature on earnings differentials relate to gender earnings gap, and is devoted to understanding whether productivity and human resource theory (For example see, Reder 1962; Card and Lemieux, 2001; Bhula-or and Kripornsak, 2008; Benita, 2014) or institutional issues (Oaxaca, 1973; Siddiqui and Siddiqui, 1998; Rice, 1999; Ogloblin, 2005; Wang and Cai, 2008) account for these differences. The principal methodology in the latter context utilizes the decomposition method and the Mincerian regression.

The literature on formal informal earnings differential confirms that informally employed workers are at a disadvantage. At the national level, in Turkey, Tansel and Kan (2012)[9] employ panel data sets drawn from the 2006-2009 Income and Living Conditions Survey (SILC). Using standard Mincer earnings equations, they find that the unexplained informal penalty for female workers is twice of that for the male workers, suggesting gender discrimination as well as discrimination for informal workers. Their results are in line with the traditional theory that formal-salaried workers are paid significantly higher than their informal counterparts and self-employed persons. They also estimated quantile regressions which demonstrate the decrease in informal penalty with the earnings level.

Previous studies in developing countries have found evidence to support the existence of earning differentials in many countries; for example, in Brazil, Mexico, South Africa, Vietnam, and Tajikistan. Bargain and Kwenda (2013) utilized the panel data of Brazil, Mexico, South Africa for 2002 to 2007 and confirmed that informally employed workers earn much less than formal workers primarily because of lower observable and unobservable skills. An empirical study, conducted by Rand and Torm (2012) in Vietnam, focuses on the firm characteristics of Vietnamese manufacturing household firms in the informal sector, and confirm the formal informal wage gap. Using traditional Blinder–Oaxaca decomposition, they demonstrate that average wages are between 10–20 per cent higher in formal firms compared to informal ones. Staneva and Arabsheibani (2014) provide an analysis in Tajikistan. using the 2007 Tajikistan Living Standard Measurement Survey and employ decomposition analysis to examine the extent to which the observed earnings differential is attributable to differences in the observable characteristics and differences in returns to these characteristics. They have found that the uncorrected wage differential estimates indicate a strong wage penalty for formal sector workers throughout the whole earning distribution. The penalty is especially large at the lower end of the distribution. In a paper examining the earnings differential between formal and informal employees in urban China, Zuo (2013) finds that only 33 per cent of observed earnings differentials can be explained by worker characteristics and 67 per cent is attributable to the segmentation effect. They also conclude that female informal employees suffer from labour segmentation and these issues need urgent policy attention.

In the context of the research that exists as noted above we extend the analysis for Thailand – and examine the following questions:

a) Is there is an earnings disparity between formal and informal employment after controlling for other characteristics? In particular, are those in informal employment typically subject to lower earnings than similar workers in formal employment?

[9] They also employ the fixed effect models and, interestingly, find that unobserved individual fixed effects when combined with controls for observable individual and employment characteristics explain the pay differentials between formal and informal employment. They then conclude that formal/informal segmentation may not be applicable to the Turkish labour market.

b) What factors contribute to this disparity, and to what extent do these factors and their effects vary across the income distribution.

Accordingly, the empirical analysis in this paper spans two exercises:

a) A decomposition analysis of earnings capture the existence of earnings disparity between informal and formal employment.

b) A quantile regression analysis to understand how socio-economic factors contribute to this disparity, and how these change across different quartiles.

We use micro data sets of the Household Socio-economic Survey (SES), conducted by the Thailand National Statistical Office (NSO) for 2011, which relates to employed workers aged 15 and more. The SES provides information on wages, earnings and number of working hours/days of both wage and non-wage workers and the socio-economic characteristics of household members. The SES is conducted by the NSO in all provinces and in both municipal and non-municipal areas. The survey includes information on social and economic aspects of the household such as income, expenditures and debt.

We estimate average earnings from all sources of income from work, with formal or informal status being defined by the principal job. The principal job refers to the job that an employed person identifies as her/his main job. Since the earnings are reported based on work status (table 2 and figure 1), we calculate workers' earnings as described below:

(i) Wage employees: We derive a monthly earnings equivalent for daily wage workers, and use monthly incomes of salaried workers.

(ii) Self-employed workers engaged in farm or non-farm enterprises: We calculate monthly earnings from the SES data. their earnings type is classified into non-farm and farm earnings which are given by IB06, IB08, IA07, and IA28 questions in the survey.[10]

(iii) Contributing family workers: We use a strategy similar to Amara and Belsar's (2012) paper to impute earnings. Where there is one unpaid family worker with an owner, we assume that 70 per cent of total monthly earnings from the enterprise goes to the employer, and the rest goes to the contributing family worker. In the few cases (1.01 per cent of total sample) where there are more than one contributing family worker working in the enterprise, earnings from an enterprise is equally divided between the contributing family workers and the owner[11].

[10] We calculate monthly earnings. In the SES data set these workers are documented as employers, own-account workers and contributing family workers, their earnings type is classified into non-farm and farm earnings which are given by IB06, IB08, IA07, and IA28 questions in the survey. The specific questions from the SES that were used for the earnings part are

Part 2 Income from Non-Farm Business (During the past 12 months) Ask only household member who reported the work status in Q.22 or Q.25, Part 1 SES.2, as employer or own – account worker or member of producers group which is in non-farm business.

- [IB06] How many workers were usually working in this enterprise? (including the owner and unpaid workers)
- [IB08] How much were gross receipts from sales of goods or services produced or purchased for resale? (in money term)

Part 3 Income from Farm Business (During the past 12 months) Ask only household member who reported the work status in Q.22 or Q.25, Part 1 SES.2, as employer or own – account worker or member of producers group which is in farm business.

- [IA07] How many members of the household worked on this farm?
- [IA28 and IA29] During the last month, please specify amount of income and expense from farm (in cash or in kind)

[11] This method of imputing earnings for the 'contributing family worker' is based on assumptions on how much of the total earnings need to be imputed for the 'contributing family worker' and is a proxy at best, but is supported by literature such as Amara and Belsar (2012).

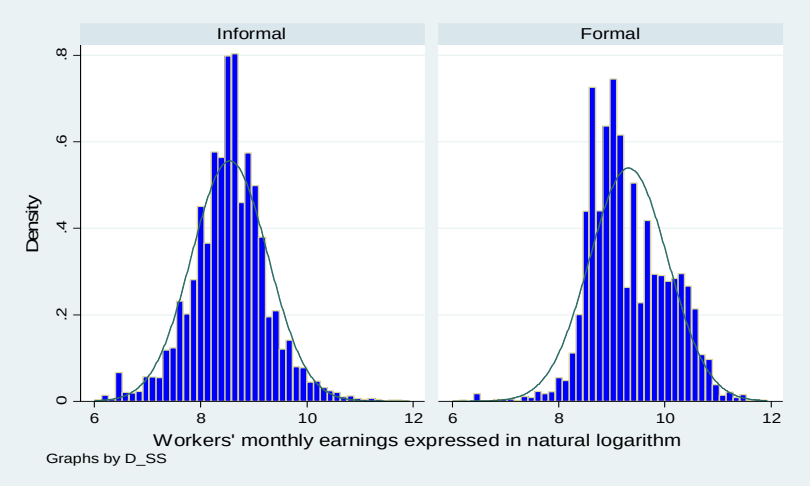
Table 2: Average monthly earnings by categories of formal and informal employed in 2011

			Average monthly earnings		
	Type	**Sex**	**Informal**	**Formal**	**Total**
Employees	Wage workers	Male	6 742.76	15 496.91	0 596.86
		Female	5 900.32	13 358.98	9 479.14
	Total		6 400.42	14 544.89	10 122.77
Self-employed workers	Farm	Male	4 173.74	7 808.43	4 309.36
		Female	4 061.34	7 676.46	4 212.33
	Non-farm	Male	6 302.47	9 832.52	6 609.66
		Female	5 807.01	9 089.19	6 058.04
	Total		4 989.36	8 735.61	6 254.19
Contributing family workers (Imputed wage)	Farm	Male	3 799.58	4 189.27	3 807.02
		Female	3 359.73	4 118.02	3 428.82
	Non-farm	Male	4 954.72	9 051.44	5 215.45
		Female	5 918.85	6 676.48	6 002.30
	Total		4 630.10	6 756.90	4 769.84
Total			4 437.49	10 237.11	5 839.30

Note: Member of households only. The number of total observations after using survey weight is 1,160,336.

Source: Authors' compilation based on SES, NSO (2009)

Figure 1: Earnings distributions of workers in the formal and informal employment in 2011



Source: Authors' compilation based on SES, NSO (2011)

Table 3 shows that those in formal employment earn more on the average. The earnings distribution is shifted towards the left for informal workers compared to formal workers and shows much greater variation.

An important aspect of informal employment as noted in the literature is multiple jobs (Ernst and Berg, 2009; Banerjee and Duflo, 2007). In terms of the number of jobs held, we find that 27.4 per cent of the total employed work in multiple jobs- i.e. at least one more job in addition to the principal job. The share with multiple jobs is higher amongst those who report their main job as being in informal

employment (33 per cent) compared to that those who report that their main job is in formal employment (12.7 per cent).

Though they work at more than one job, the total earnings of multiple job-holders are lower than those of single-job workers. As noted in the literature, the necessity of finding secondary employment arises from the fact that the main source of income is inadequate to meet family's needs. Clearly, too, women's earnings are less than men's across the board. (Table 3).

Table 3: Average monthly earnings by number of jobs in 2011

		One Job			*Multiple Job*		
		Average	**Median**	**No. Obs.**	**Average**	**Median**	**No. Obs.**
Male	Informal	5 430.12	6 002.91	3 639 917	3 430.18	3 983.83	1 024 823
	Formal	11 276.71	9 996.59	2 630 846	8 009.67	8 022.45	212 031
	Total	7 071.47	7 480.08	6 270 763	3 810.91	4 402.81	1 236 853
Female	Informal	4 401.28	5 014.05	5 874 244	3 115.48	3 498.18	3 120 252
	Formal	9 836.58	8 022.45	3 256 169	6 174.83	6 502.87	433 386
	Total	6 192.81	6 247.89	9 130 412	3 503.90	3 983.83	3 553 638
Total for both sexes	Informal	5 010.20	5 597.07	9 514 161	3 349.55	3 827.62	4 145 075
	Formal	10 607.87	8 955.29	5 887 015	7 361.13	7 480.08	645 417
	Total	6 698.79	6 974.38	15 401 175	3 729.30	4 188.09	4 790 491

Note: Member of household only. The number of total observation is 36,365,327.
Source: Authors' compilation based on SES, NSO (2011)

4. Earnings differential between formal and informal employment

In Section 3 we have reviewed the relevant literature on earnings differential between formal and informal employment. In this section we carry out a decomposition analysis to estimate the differential in earnings between formal and informal employment in Thailand as well as the extent to which this can be explained by observable factors.

We summarize the variables used in the study in table 4. The variables are selected based on our intuitive understanding of what affects earnings of formal and informal workers and findings of previous studies. Total monthly earnings of each observed individual derived from the both wage and self-employed workers (as mentioned above) are transformed into natural log. The basic characteristics of workers is proxied by the following variables: (a) a dummy variable which is 1 if worker is employed in the formal employment; (b) a dummy variable which is 1 if the worker is a female; (c) age in terms of number of years of the workers; (d) four dummy variables to capture different levels of educational attainment of the workers from primary schooling to higher education; (e) location is captured by a dummy variable which is 1 if the worker is from rural Thailand; (f) four dummy variables to present different regions in Thailand; (g) two dummy variables to present different economic sectors of the workers; (h) a dummy

variable which is 1 if worker has more than one job; and (i) a dummy variable which is 1 if worker is holding non-farm self-employed working status.

Table 4: List of variables

Variable	Description
ln(total earnings)	Natural log of total monthly earnings
Formal	Based on social security coverage (formal=1, informal=0)
Female	(yes=1 and no=0)
Age	Number of age (The data is screen to age 15 to 64)
Age^2	Age square
Education: primary school and less (Reference case)	Complete primary school or lower (yes=1 and no=0)
Education: lower secondary school	Complete lower secondary school (yes=1 and no=0)
Education: upper secondary school	Complete upper secondary school (yes=1 and no=0)
Education: bachelor	Complete bachelor (yes=1 and no=0)
Education: master and doctoral degree	Complete master and doctoral degree (yes=1 and no=0)
Rural	(yes=1 (rural) and no=0 (urban))
Bangkok (Reference case)	(yes=1 and no=0)
Central area	(yes=1 and no=0)
Northern area	(yes=1 and no=0)
Northeast area	(yes=1 and no=0)
Southern area	(yes=1 and no=0)
Agriculture (Reference case)	(yes=1 and no=0)
Industry	(yes=1 and no=0)
Service	(yes=1 and no=0)
Multiple-job worker	(yes=1 and no=0)
Self-employed type	(Non-farm=1 and Farm=0)

Source: Authors' variable selection

When faced with a disparity in mean outcomes between two groups, the frequently asked question is how much of the disparity can be explained by differences in observable characteristics, and how much by other non – observable characteristics. A common approach to distinguish between explained and unexplained components follows the seminal papers of Oaxaca and Blinder (1973), with the original "Oaxaca–Blinder"(O-B) decomposition based on separate linear regressions for the two groups (Elder, Goddeeris and Haider, 2010). In order to understand the reason for earnings differential between formal and informal workers, we apply the standard Oaxaca-Blinder[12](O-B) decomposition technique. This method is widely used in economic and socio-analysis.[13] The three-fold decomposition technique is used in order to avoid problems of inappropriate weighting design in the model and to ensure that there is no unexplained component generated from unobservable factors between workers in informal and formal employment. We consider two groups - *Informal* and *Formal*, an outcome variable *Y* which is average monthly earnings, and a set of explained regressors (earnings determination factors). Given *R* the average monthly earnings differentiation, the O-B decomposing the group differences in the regressors is as follows:

[12] Blinder and Oaxaca (1973) use the method to decompose differences in average earnings, says earnings in the original papers, between two groups of sample into twofold: an explained part usually refers to the difference in fundamental characteristics between groups; and an unexplained part or a residual part that cannot be accounted by other determinants. The latter part is somewhat a measure of discrimination.

[13] See World Bank, 2013; Jann, B., 2008.

$$R = E(Y_{formal}) - E(Y_{Informal}), \quad (1)$$

where $E(Y)$ denotes the expected value of the average monthly earnings variable. Based on linear model and zero means of the error terms, the difference in the mean value of average monthly earnings can be rearranged into three parts (folds):

$$\begin{aligned} R &= [E(X_{Formal}) - E(X_{Informal})]' \beta_{Informal} + E(X_{Informal})' (\beta_{Formal} - \beta_{Informal}) \\ &\quad + [E(X_{Formal}) - E(X_{Informal})]' (\beta_{Formal} - \beta_{Informal}), \quad (2) \\ R &= E + C + I, \end{aligned}$$

where *E, C*, and *I* represent each term of *R*, respectively. *E* is the difference due to the group differences in the explained variables. *C* describes the difference in the coefficient (including the differences in the intercept) from the viewpoint of group *formal*. *I* represents the interaction term accounting for the differences in the explanatory variables and the coefficients. It has to be noted that this method focuses on differences between the average values of the two distributions.[14]

The earning decomposition using O-B decomposition method is presented in table 5. For the average monthly earnings differentiation (R), there is a difference in average monthly earnings between working in informal and formal employment in Thailand in 2011 where average monthly earnings from informal employment is significantly less (at the 5 per cent level) than average monthly earnings from formal employment.

The decomposition analysis shows that explained factors, or the characteristics of workers, account about 67.9 per cent for average monthly earnings differentials in 2011. Average monthly earnings of workers in informal employment can be improved significantly by 3.4 per cent, if workers in informal employment have the same characteristics as the workers in formal employment. The difference in coefficients (or unexplained factors) contributes to 28.1 per cent of the differences. In 2011, if this "unexplained difference" did not exist; there will be 1.6 per cent increase in average monthly earnings for the informally employed workers.

The interaction (I) factor contributes only 4 per cent to the earnings differential and is not statistically significant, therefore it could be claimed that the bulk of the differences between earnings of workers in the formal and informal segments is determined by the difference in their characteristics and partly by other 'unexplained' factors which could relate to those that arise from the worker's contacts, the discrimination she/he faces and unobservable characteristics that arise from their vulnerability and the lack of relevant labour market institutions that can protect and promote earnings of these workers, such as minimum wages.

[14] However, there are some limitations of using this method – the results from the model yield differentials of a specific variable at the average. Therefore it cannot be applied to investigate different discrimination levels in the different quartiles in the distribution of the specific variable (i.e. earnings). Secondly the choice of the reference group in the model affects the results produced by the decomposition in which the interpretation of the intercept becomes meaningless.

Table 5: Earnings decomposition via formal and informal employment in 2011

Dependent variable - Natural log of total earnings in 2011		
Overall	Observed coefficient	
Group 1: Formal employment	8.719	
Group 2: Informal employment	8.306	Contribution (%) to total difference
Difference of total earnings***	0.413	
Endowments (Explained)***	0.280	67.9%
Coefficients (Unexplained)**	0.116	28.1%
Interaction (Explained and Unexplained)	0.016	4.0%

Note: Number of observation is 73,382. Population size is 36,365,327 after weighted. *** denotes 1% significance; ** for 5%; and * for 10%.
Source: Authors' estimation based on SES, NSO (2011)

The detailed O-B decomposition is presented in table 6 as we further investigate the effects of each covariate. The results reveal that the strong effect of workers characteristics on earnings disparities. This can be described mainly by the differences in having a non-farm self-employed work status, age, and bachelor degree education. The average monthly earnings of the non-farm self-employed workers is higher than farm self-employed workers. The variable "age" also plays a significant role in disparity as it represents years of experience of the worker – and older workers are more likely to earn more than younger ones. The importance of a bachelor degree education is highlighted as one of the main factors contributing to earnings disparity between employment types. Moreover, the urban variable also contributes to explaining the earnings differential – with those in urban areas earning more.

Table 6: Oaxaca-Blinder decomposition via formal and informal employment in 2011: detailed effects

Dependent variable : Natural log of total earnings		Endowments (Explained)		Coefficients (Unexplained)		Interaction (Explained and Unexplained)	
		Effects	SD	Effects	SD	Effects	SD
Aggregate effect		0.280***		0.116**		0.016	
Individual characteristics	Female	-0.008	0.007	-0.021	0.028	0.001	0.002
	Age	0.186**	0.116	-0.482	1.501	0.038	0.120
	Age^2	-0.260	0.117	0.382	0.793	-0.058	0.121
Education level	Lower secondary	0.009	0.006	0.021	0.018	-0.005	0.005
	Upper secondary	0.025**	0.011	0.006	0.023	-0.003	0.011
	Bachelor	0.062***	0.013	0.019	0.015	-0.015	0.012
	Master and higher	0.008	0.005	-0.0001	0.005	0.0001	0.004
Type of industry	Industry	0.003	0.005	-0.0001	0.015	0.0004	0.005
	Services	0.037	0.029	-0.057	0.090	0.018	0.029
Area of living and working	Rural area	-0.020**	0.012	-0.030	0.056	-0.007	0.012
	Central region	-0.0003	0.005	-0.026	0.029	0.0001	0.002
	Northern region	0.006	0.008	0.002	0.037	0.0001	0.001
	Northeast region	0.058	0.019	0.077	0.049	0.024	0.015
	Southern region	0.005	0.014	-0.039	0.041	0.013	0.015
Type of jobs	Multiple-job worker	0.013	0.014	-0.019	0.032	-0.009	0.015
	Non-farm self-employed worker	0.112***	0.026	-0.067	0.097	0.016	0.023
Constant		-	-				
				0.352	0.777	-0.777	0.023

Note:. Standard errors are in parentheses. *** denotes 1% significance; ** for 5%; and * for 10%. The reference case of this earnings function is an informally employed person aged 15-64 with a primary level of education or less. These representative persons are working in Bangkok having multiple jobs, and holding farm/non-farm self-employed jobs.

Source: Authors' estimation based on SES, NSO (2011)

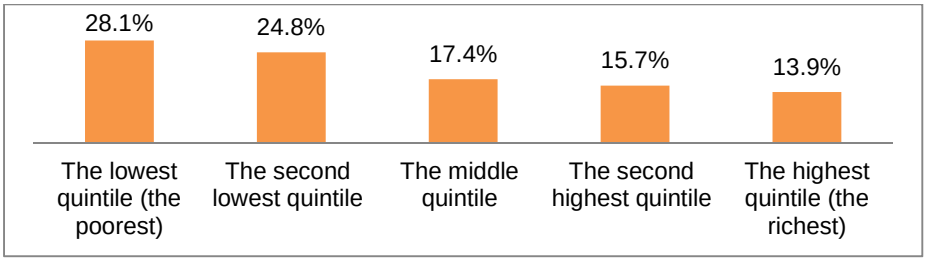
5. Determinants of earnings by quantile

The results in the previous estimation using the decomposition analysis show that "observable" characteristics of workers explain 71.9 percent of the differential in earnings while the 'unexplained' part remains significant at 28.1 percent.

Therefore, we carry out further analysis in this section using an OLS (Ordinary Least Square) method, to observe factors affecting earnings differentials between informal and formal workers, using the same set of explanatory variables as used in the earlier section, now utilizing a traditional Mincerian earnings equation[15].

As the earnings distribution reveals significant heterogeneity[16] (see Figure 2), we apply a Quantile Regression Model (QRM)[17] to capture a complete picture of earnings differentials and the influence of the explanatory variables on the dependent variables at *different levels of the quantile distribution* (Koenker and Basset, 1978; Koenker and Hallock, 2001).[18] We hypothesize that the effect of the formal 'earnings premium' and other earnings determination factors on monthly earnings vary across the earning distribution. Therefore, a more comprehensive picture of the effect of the independent variables as listed in table 4 on log of earnings can be obtained by using Quantile regression by modelling the relation between the set of independent variables and specific quantiles of the log of earnings which specifies changes in the quantiles of the dependent variable. In a linear regression, the regression coefficient represents the increase in the dependent variable produced by a one unit increase in the independent variable associated with that coefficient. The quantile regression parameter estimates the change in a specified quantile of the dependent variable produced by a one unit change in the independent variable. This allows comparing how some quartiles of earnings may be more (or less) affected by certain independent variable than other quartiles. This is reflected in the change in the size of the regression coefficient.

Figure 2: Share of informal employed individual by income group, 2011



Note: This figure includes 13,244,192 observations of members from every household. For the unpaid-family workers, the data imputation is done with the total household's income per member.

Source: Authors' compilation based on SES (2011)

[15]See, for example, Bargain and Kwenda, 2009; Ileanu and Tanasoiu, 2008.

[16] The fraction of formal employment in the lowest quintile is almost 2 times higher than the fraction of formal employment in the highest quintile. Meanwhile, the average monthly total earnings of workers is increasing at the faster rate as we move to the higher earnings quintiles.

[17] See Cameron, A. C., and, P. K. Trivedi, 2005; and Cameron, A. C., and P. K. Trivedi, 2009.

[18] about 28 per cent, are concentrated in the bottom quintile, with 25 per cent in the next poorest group, while we find that about 14 per cent of the informally employed are in the top quintile

Equation (3) estimates the marginal effect of formal and informal employment and other determination factors on monthly earnings - defined as follows:

$$Ln(E) = \alpha + \boldsymbol{\beta} X' + \theta\, formal + \varepsilon . \quad (3)$$

The parameter 'θ' in Equation (1) represents the formal 'earnings premium' as a dummy variable, *formal*, that is set to '1' when an individual is formally employed and '0' if they are informally employed. Vector X' contains a specific set of other related explanatory variables. These variables were selected on the basis of the previous discussion. Vector **β** is a set of parameters corresponding with the determinant factors in Vector X'. The parameter, α, denotes a fixed average monthly earnings that is unaffected by the exogenous variables.

The QRM models the relation between the set of independent variables and specific quartiles of the dependent variable. It specifies for example, the changes in log earnings on employment characteristic (formal or informal) for the different quartiles as a function of the independent variables. With this technique, Equation (3) can be estimated conditional on a given specification at various quartiles of monthly earnings (Chamberlain, 1994). The objective function that the q^{th} quantile regression estimator $\hat{\beta}_q$ minimizes with respect to β_q, that is:

$$Q_N(\beta_q) = \sum_{i:y_i \geq \mathbf{x}_i'\beta}^{N} q\left|y_i - \mathbf{x}_i'\beta_q\right| + \sum_{i:y_i < \mathbf{x}_i'\beta}^{N} (1-q)\left|y_i - \mathbf{x}_i'\beta_q\right|, \quad (4)$$

where, β_q is a coefficient at that different choices of the q^{th} quartile estimate different values of β.[19]. Therefore, the method of QRM in this case is better than the standard OLS model.

Results of earnings determination

Table 7 presents results from all four estimated earnings equations, which are the standard estimation and desegregated estimations at 20th (low), 50th (median), and 80th (high) quartiles. The first equation (from the left) estimated using the standard regression model with conditional mean of - monthly earnings. The other three estimations are the estimations using the method of QRM with conditional quantile of monthly earnings at 20th (low), 50th (median), and 80th (high) quartiles. These four equations include a dummy variable, 'θ', which represents the differences in average monthly earnings between formal and informal employees.

The results confirm findings from many previous works on earnings differential between formal and informal employment (see also similar findings for studies done by Koo and Smith, 1983; Marcouiller et.al, 1997; Badaoui et.al, 2008; Baskaya and Hulagu, 2011; Chen and Shigeyuki, 2009). Since the earnings are estimated in the natural log of monthly total earnings, the results shown in Table 7 are discussed in the exponential values. The analyses of findings from the QRM are noted below.

a) The average – monthly earnings (the intercept term) increase as workers get higher monthly earnings except in the 20th quartile. A similar finding was noted by Tansel and Kan (2012) using a QRM for respondents in Turkey. At 1 per cent significance level, the average monthly earnings are 1,800.8 Thai Baht (THB) for 50th (median), and THB4,084.7 for 80th (high)

[19] By applying a Heteroskedasticity test on the data set, the problem of Heteroskedasticity occurs where variance of the dependent variable is not constant over each level of the determinant factors. Breusch-Pagan/Cook-Weisberg test for Heteroskedasticity - H_0: Constant variance or No Heteroskedasticity chi2(17) = 453.51 Prob > chi2 = 0.0000 – therefore, we reject H_0 and conclude that the Heteroskedasticity problem exists at 5 per cent confident interval.

quartile respectively. Where all to be considered together, we get an estimated average of THB1,562.4 (or approximately US$50 per month), which obviously hides the quartile differences.

b) The relative earnings penalty of working in informal employment is much higher for the highest earnings group of workers than the median and lowest earnings group of workers. While the standard model gives the penalty of working in informal employment by 9.6 per cent, at 1 per cent significant level, the QRM's dummy variable accounting for type of employment shows that premium of monthly earnings of a person in formal employment is 9.9 and 13.3 per cent, for the 50th (median), and 80th (high) quartile respectively, ceteris paribus. According to the regression, the monthly earnings of the workings in the 20th (low) quartile is not significantly different between formal and informal employment.

c) From both table 7 and figure 3, women, on average, significantly earn less than men around 23.2 to 26.6 per cent, ceteris paribus. The estimated marginal effect of gender on earnings is negative. As workers get higher monthly earnings, the gender effect on the earnings becomes smaller. Part of this can perhaps be explained by the educational qualifications which at higher levels of earnings, plays a key role in reducing the earning gaps as women with higher human capital endowments reduce the gender earnings differentials (See, for example, Rice, 1999; Ogloblin, 2005).

d) Age or experience contribute to better earnings across the distribution - the premium to being more experienced is 7.7, 5.4, and 4.8 per cent, for the 20th (low), 50th (median), and 80th (high) quartile respectively. A similar study in the context of Columbia, found similar results – amongst the lower income group, the premium on longer experience is more pronounced than amongst those in the higher income groups (Adolfo and Cruz, 2014).

e) The estimates show, as expected, that workers with higher educational degree are likely to have higher monthly earnings, on average. All of the estimates in this category are statistically significant and positive. Compared with those holding primary education or less, workers in each group who have lower secondary degree can have incremental changes of 22 per cent, approximately, in average monthly earnings. For the workers who have upper secondary degree, the incremental changes in average monthly earnings is around 34.4 to 41.9 per cent where the workers who received the highest earnings enjoy the benefit from this education level the most. The estimators are doubled when we look at those who have bachelor degree, and becomes four times larger for those with master's education. Education level, therefore, plays a very significant role in determining monthly earnings the workers received, this is particularly true for the 80th group. Within the 80th quartile, the premium of those who have the master or higher degree is about 4 times, while those who have Bachelor degree, and upper secondary degree earn 97 and 42 per cent greater than those holding primary education or less, respectively.

f) Workers in industry and services sector earn significantly higher than those working in the agricultural sector. Compared with those holding jobs in agricultural sector, the QRM results are as follows: For the 20th (low) quartile, workers who are working in the industry and services sector have incremental changes of 19.1 and 68.5 per cent, respectively, in average monthly earnings. The premium reduces for the 50th (median) quartile but goes up again for the highest income group. In other words, there is a high premium for working in the services sector as compared to the other groups. Amongst the lowest income group there is an earnings incentive for workers in the poorest group to move from working in agricultural sector to the service sector. The relative difference in earnings between those working in industry and services is far less for the highest income group.

g) Region specific variables have significant impact as well. At 1 per cent significance level, workers who are dwelling and working in the rural areas earn around 7.5 to 8.7 per cent less than those who are located in urban areas. Furthermore, from both table 7 and figure 3, the marginal effects of living and working in different regions are constant across group where workers who are living and working in Central, Northern, Northeast, and Southern region earn lower average earnings than those who are living and working in Bangkok. Moreover, workers receiving high monthly earnings tend to stay and work in Bangkok, rather than in other regions.

h) Workers who have one job as opposed to multiple jobs are likely to be higher earners in every group. The results confirm the fact that part-time workers and those who have longer work-hours receive lower earnings (Rosen, 1976; Brown, 1980). Our results show that the multiple-job holders earn, on average, 9.8, 14.2, and 13.0 per cent less, for the 20th (low), 50th (median), and 80th (high) quartile respectively, than one-job holding workers.

i) Self-employed workers in a non-farm business received higher earnings than those who are holding a work status of self-employed in a farm business. However, the earnings premium of holding a work status of self-employed in a non-farm business declines in the higher earnings groups.

Table 7: Determinants of Earnings in 2011[20]

Dependent variable : Natural log of monthly total earnings		Standard regression		Q20th regression		Median regression		Q80th regression	
		Coefficient	SD	Coefficient	SD	Coefficient	SD	Coefficient	SD
Employment	Formal employment ($\theta = 1$)	0.092***	0.029	0.036	0.043	0.094***	0.028	0.125***	0.034
Individual characteristics	Female	-0.308***	0.018	-0.309***	0.027	-0.287***	0.017	-0.264***	0.021
	Age	0.056***	0.005	0.074***	0.007	0.053***	0.004	0.047***	0.005
	Age^2	-0.001***	0.0001	-0.001***	0.0001	-0.001***	4.580	-0.001***	0.0001
Education level	Lower secondary	0.204***	0.028	0.197***	0.042	0.196***	0.027	0.198***	0.034
	Upper secondary	0.311***	0.028	0.296***	0.041	0.313***	0.026	0.350***	0.033
	Bachelor	0.625***	0.042	0.578***	0.061	0.597***	0.040	0.680***	0.049
	Master and higher	1.312***	0.147	1.071***	0.214	1.181***	0.139	1.651***	0.171
Type of industry	Industry	0.155***	0.043	0.175***	0.064	0.160***	0.041	0.277***	0.051
	Services	0.410***	0.032	0.522***	0.048	0.335***	0.030	0.291***	0.037
Area of living and working	Rural area	-0.070***	0.019	-0.078***	0.029	-0.085***	0.018	-0.091***	0.022
	Central region	-0.283***	0.046	-0.171**	0.068	-0.228***	0.044	-0.259***	0.054
	Northern region	-0.614***	0.046	-0.505***	0.068	-0.507***	0.044	-0.601***	0.055
	Northeast region	-0.773***	0.046	-0.716***	0.067	-0.630***	0.044	-0.605***	0.055
	Southern region	-0.115**	0.048	0.065	0.072	-0.136***	0.046	-0.192***	0.056
Type of jobs	Multiple-job worker	-0.118***	0.020	-0.103***	0.030	-0.153***	0.019	-0.139***	0.024
	Non-farm self-employed worker	0.857***	0.030	0.962***	0.044	0.816***	0.028	0.702***	0.035
Constant		7.354***	0.141	6.059***	0.209	7.496***	0.135	8.315***	0.166
Adjusted / Pseudo R^2			0.38		0.26		0.23		0.19
F Sig.			0.00						

Note: Number of observation is 17,434. Standard errors are in parentheses. *** denotes 1% significance; ** for 5%; and * for 10%. The reference case of this earnings function is an informally employed person aged 15-64 with a primary level of education or less. This representative person works in a relatively low-skilled occupation, living in Bangkok with multiple jobs, and farm/non-farm self-employed.

Source: Authors' estimation based on SES (NSO, 2011a)
Source: Authors' estimation based on SES, NSO (2011)

[20] We are aware of a Multicollinearity problem, a statistical phenomenon that arises when explanatory variables in a multiple regression model are highly correlated with one another. However, the VIF test shows that the presence of this problem does not significantly affect the fitted model. We found heteroskedasticity problem in the overall regression. The QRM estimators are more robust than the method of the ordinary least square (Deaton, 1997) when the problem of Heteroskedasticity exists.Therefore the Quantile regression method is validated. For the age squared variable, the zero marginal effects occur because the data on elderly people have been truncated, since they cannot generate their own earning from work in most cases. Hence, the relationship between age and earning is a quasi-concave line.

6. Concluding remarks

Thailand has had moderately high growth which has lifted the country to an upper middle income status. But in spite of this economic growth and Thailand's high middle income status, 64.3 per cent of Thailand's labour force in 2013 was informally employed and over 64 per cent of these informal workers had only an elementary education and less (NSO, 2013b).

Given that informal employment is the source of earnings for such a large share of workers in Thailand, what is the nature of earnings from informal employment and how does it compare with earnings from formal employment? Is there disparity in earnings in formal and informal employment and how does one account for this disparity? What are the factors that affect earnings in formal and informal employment? These are the questions that this paper sets out to explore.

The findings from the analysis supports the fact that there is much heterogeneity in informal employment earnings. The Oaxaca-Blinder test establishes that there is a systematic and statistically significant disparity between earnings from formal and informal employment. Most of it is explained by observed characteristics (68 per cent), but about 28 per cent remains unexplainable, and could be attributed to various forms of labour market discrimination and lack of relevant labour market institutions that can promote these workers voice and bargaining power. Jetin (2011) notes that the labour share of income in Thailand has experienced a historical downward trend, largely because of weak wage setting institutions and weak workers' voice. Deyo (2012) notes in his commentary of Thailand's labour systems that while Thailand has a fairly comprehensive social security system, it covers mainly non- agricultural formal workers while large numbers of those outside of this group are left out. Furthermore, he goes on to note that increased competitive pressures have pushed Thai employers to hire larger numbers of contingent workers in order to enhance flexibility, reduce costs, evade labour law provisions and sometimes to forestall unionsization or to weaken existing unions" (Deyo, 2012: p. 102).

The second empirical exercise delves into these observed differences between formal and informally employed workers using a Quantile regression method using a Mincerian earnings function. We also find that earnings of workers in informal employment are significantly lower than that in formal employment across the income distribution, controlling for other factors. The common characteristics that explain the earnings differential are gender (men earn more than women other things remaining the same), the higher educated are likely to have higher earnings, those living in urban areas and in Bangkok earn more than those living elsewhere, earnings in the agriculture sector is the lowest, those in non-farm self-employed are likely to earn more, and those with multiple jobs are likely to earn less than those with a single job.

But there are important differences in terms of variables which affect earnings for the different income groups. We find that the largest gap between earnings from formal and informal employment is observed at the highest income group, and the least gap between the earnings of these two categories is at the lowest income group. Furthermore, the estimated marginal effect of gender on earnings is negative and remains more or less constant across the different quantile groups, as does education. The premium of working in services or manufacturing is highest for those in the highest income group, followed by those in the lowest income group. The penalty of having multiple jobs is highest for the middle quartile compared to the other two, and the non-farm self-employed worker is likely to earn more than other work statuses. The analysis is carried out on the SES survey of 2011 and this finding could be explained

by the low average and minimum wages in Thailand, until the new minimum wage was introduced in 2013.[21]

Overall, while informal employment is not found only amongst the low income, as per Thailand's official definition of informality, the largest share of informally employed are in the lowest income group. Furthermore, the informally employed earn significantly less than the formally employed in all income groups across the income distribution.

This analysis is limited to examining earnings differentials and its causes from a supply side. The findings indicate that along with formality or informality of employment, there are several interrelated complex factors that affect earnings, such as gender, education, age and sector of employment.

Policies that promote productive transformation – a shift from the low earnings agriculture sector, where informality is widespread, to industry and higher-end services, would improve earnings for many workers in Thailand, by increasing productivity and incomes. Furthermore, there is a strong policy implication of moving beyond primary education – towards secondary and tertiary education, to improve incomes. Indeed education reform has been discussed in policy circles in Thailand for some time. Lastly tackling gender related issues is critical, since women consistently, across the income distribution, earn less than men. Overall, the transition to formality is immensely important for Thailand to improve the existing disparities in earnings. Towards that end, a combination of demand and supply side measures would need to be in place – investment to promote jobs in higher value added sectors, along with a focus on improved education, gender equality, and access to rights and benefits.

[21] See ILO (2011) "Wage policy in Thailand" opinion piece, *Bangkok Post*, 24 Aug. 2011.

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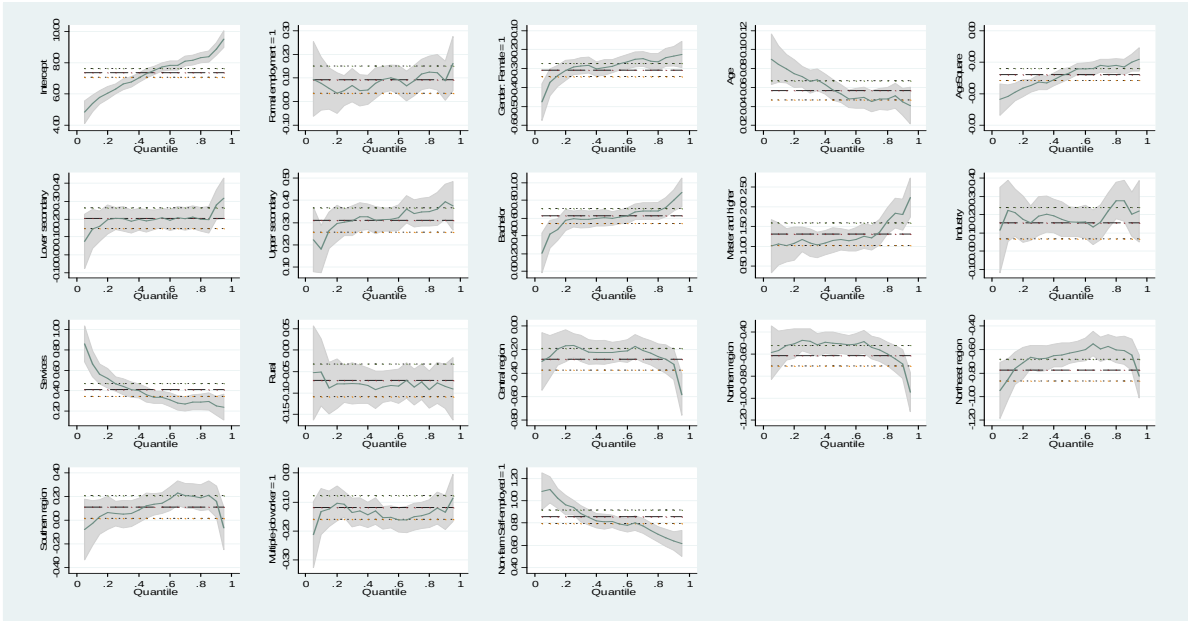
Appendix 1: Plots of estimated coefficients of the 2011 dataset by quantile



Earnings differentials between formal and informal employment in Thailand

The paper estimates the earnings gap between formal and informal employment in Thailand, using a sample of workers that includes both wage and self- employed workers. It finds that while the major part of the earnings differential is attributed to observed characteristics, there is a significant unexplained component. The paper then applies a quantile regression method to an earnings function to understand the factors that explain differences in earnings for different quartiles. Controlling for other factors, it finds that informally employed workers systematically present lower earnings at all earnings levels, and the difference increases with level of earnings. Furthermore, the estimated marginal effect of gender on earnings is negative and remains more or less constant across the different quartiles, while returns to education are positive and increase with income quartiles. The premium of working in services or manufacturing is higher at the lower end of the income distribution and the non-farm self-employed worker is likely to earn more than others. The findings of this study have implications for policies for productive transformation in the country, along with a focus on education and gender equality.

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