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The gender pay gap in Vietnam, 1993–2002: A quantile regression approach

Thai-Hung Pham *, Barry Reilly

Department of Economics, University of Sussex, Falmer, Brighton BN1 9SN, UK

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Abstract

This paper uses mean and quantile regression analysis to investigate the gender pay gap for the wage employed in Vietnam over the period 1993–2002. It finds that the Doi moi reforms appear to have been associated with a sharp reduction in gender pay gap disparities for the wage employed. The average gender pay gap in this sector halved between 1993 and 2002 with most of the contraction evident by 1998. There has also been a narrowing in the gender pay gap at most selected points of the conditional wage distribution, an effect most pronounced at the top end of the conditional wage distribution. However, the decomposition analysis suggests that the treatment effect is relatively stable across the conditional wage distribution and little evidence of a 'glass-ceiling' effect is detected for Vietnamese women in the wage employment sector in any of the years examined.

JEL classification : J31; J71; C14

Keywords: Gender pay gap; Quantile regression; Vietnam

1. Introduction

Vietnam's economic restructuring process, commonly known as *Doi moi*, has proved relatively successful for Vietnam placing it among the top economic performers in the developing world (Glewwe, Agrawal, & Dollar, 2004). The Vietnamese economy has grown at an average annual rate of over seven percent over the period 1990 to 2004, and the incidence of poverty has more than halved over this same period.[1] The process of economic transition from a

* Corresponding author. Tel.: +44 1273 606755x2209; fax: +44 1273 673563.
E-mail address: t.pham@sussex.ac.uk (T.-H. Pham).

[1] The average growth rate over the period 1990–2004 was 7.3% (own calculations from GSO statistics), while the proportion of people with a per capita consumption expenditure below the nationally defined poverty line reduced dramatically from 58% in 1993 to 29% in 2002 (World Bank, 2005).

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centrally planned to a market-based economy impacted on the labour market in Vietnam across a number of different dimensions (see Brassard, 2004; Croll, 1998; World Bank, 2005). For instance, the dismantling of a centrally determined wage system, which in the past limited the degree of gender wage inequality, created potential for a widening of the gender pay gap. The reform process, as in other transitional economies, led to a reduction in a variety of public services that more adversely affected female then male labour market participants. For example, enterprise kindergartens, schools and other health-care facilities, which were relatively commonplace under the centrally planned system, have steadily disappeared with the increased emphasis on market reform (Long, Le, Truitt, Mai, & Dang, 2000).

The creation of a private sector labour market ended the dependence on the state sector as the primary source of formal employment. As of 2004, the share in employment of the state sector (including the administration system and state-owned enterprises (SOEs)) reduced to roughly 10% of total employment, while formal private sector enterprises and household non-farm businesses provided jobs for nearly 42% of the employed labour force (World Bank, 2005). However, female workers were found to be more vulnerable in the restructuring of the state-owned enterprise sector. The reduction in the number of SOEs from more than 12,000 to around 5,500 in the first 10 years of the reform process displaced large numbers of workers. Women with limited work experience and low educational attainment were the main victims of the early redundancy programmes with about 70% of laid-off workers being female (Rama, 2001). Beresford (1994) reveals that over half-a-million female workers were made redundant from SOEs in 1990/1991. Liu (2004b) suggests that the downsizing in the SOE sector provided a potential channel through which the gender pay gap could widen given that workers were more formally protected in the SOEs than in the private sector.

Vietnamese women are currently accorded a wide range of rights and privileges at work under the Vietnam Labour Code. Maternity leave is fully paid and time-off during either pregnancy or when nursing a child aged less than 12 months is also regulated (see Chapter X of the 2002 Labour Code (SRV, 2002). Female employees are generally exempt from the unilateral termination of their contracts during this period (Article 27 of the Labour Code). As enterprises now possess greater autonomy in managing their business activities, including the management of human resources, there may be a tendency for employers to favour male workers (Brassard, 2004) and this may result in a worsening relative position of women in the labour market.

In contrast to these potentially more negative impacts of the *Doi moi* reforms on the female position in the labour market, there are also improvements evident in terms of new employment opportunities for women. The impressive growth over the past 15 years has been partly driven by light manufacturing exports, a sector dominated by female workers. For instance, the exports of the garment industry accounted for almost a quarter of total manufacturing exports over the past 15 years (GSO, 2005). This sector is one of the major employment sources for female workers, including rural female migrants (Thornburn & Jones, 2002; Thoburn, Nguyen, & Nguyen, 2003). Although the proportion of agricultural exports has steadily decreased over time, agricultural products still remain a major export commodity. The fact that women are more dependent on agricultural employment than men may suggest that the growth in agricultural exports has resulted in more income-generating activities for women.

Given the foregoing, it is uncertain whether women have been gainers or losers during Vietnam's transition process. The experience in other transitional economies tends to suggest a mixed picture. The reduction in female participation was a stylized fact for the transitional economies of Central and Eastern Europe (CEE), Russia, and other countries of the Former Soviet Union (see Allison & Ringold, 1996). However, evidence on the gender pay gap has been

less clear-cut. For instance, Newell and Reilly (2001) report that the gender pay gap widened in Bulgaria and Romania, was relatively stable in Yugoslavia, Slovenia, Russia, Kyrgyzstan, but fell in the Czech Republic, Slovakia, Poland, and Hungary.

The current paper examines the evolution of the gender pay gap for the wage employed in Vietnam over the period 1993–2002. The primary objective of this paper is to provide some clearer insights on the impact of the reform or post-reform process on the gender pay gap among the wage employed. Most of the recent literature on gender in Vietnam to date has emphasized the negative effects on women of the transition process in terms of their access to public services and their workforce participation (Brassard, 2004; Gallup, 2004; Long et al., 2000). The recent studies of Liu (2004a, 2004b), using data drawn from household surveys conducted in 1993 and 1998, arguably provided the first systematic pieces of research on the gender pay gap in Vietnam. The contribution of the current paper, however, compared to Liu (2004a, 2004b), is two-fold. Firstly, our analysis focuses on a longer time period given our use of data drawn from a more recent survey. Secondly, in contrast to the mean regression approach used by Liu, we enhance the analysis by using a quantile regression approach that allows us to explore the gender pay gap at selected points of the conditional wage distribution. In addition, this study also offers a modest contribution to the empirical literature on the temporal decomposition of the gender pay gap using the quantile regression approach by suggesting a very simple decomposition that may have application in other contexts.

The structure of the paper can now be outlined. Section two provides a description of the datasets to be used in investigating the gender pay gap and notes some facts on female participation, female employment, and the gender pay gap using these data. The empirical methodology is detailed in section three. The empirical results are reported in section four, which is then followed by a section containing some concluding remarks.

2. Data and overview of the gender pay gap in Vietnam

2.1. Data

This paper draws on data from three household surveys comprising the first two rounds of the Vietnam Living Standard Surveys (commonly referred as the VLSS 1992/93 and 1997/98) and the Vietnam Household Living Standard Survey 2002 (hereafter VHLSS 2002).[2] These surveys were conducted by the General Statistics Office (GSO) under the technical assistance of the World Bank with funding from the United Nations Development Program (UNDP) and the Swedish International Development Cooperation Agency (Sida). The overall approach used in these surveys is compliant with the framework used in the World Bank's Living Standard Measurement Surveys. These surveys are thus widely recognized as of high quality and nationally representative.

The VLSS 1992/93 was undertaken using a sample of 4,800 households, of which 4,000 were re-interviewed in the VLSS 1997/98, which comprised a sample of 6,000 households in total. Although these surveys have been widely used to explore the impact of *Doi moi*, they have been subject to criticism regarding their relatively small sample sizes. This was a primary motive for the launch of the second phase of household surveys in 2002 designed to cover the period 2002–

[2] The VLSS 1992/93 dataset was officially released in 1995, the VLSS 1997/98 in 2000 and the VHLSS 2002 in December 2004.

2010. The first survey of this second phase, the VHLSS 2002, collected information from a sample of 30,000 households. However, there was no re-interview of households from the original VLSS panel as the sampling frame for this new wave was substantially different from earlier rounds.[3]

The three surveys included two types of questionnaire: (i) a household questionnaire; and (ii) a community questionnaire. The household questionnaire provides a wide range of questions on household size and composition, health, education, housing characteristics, employment, expenditure and food consumption, ownership of consumer durables, and savings. The community questionnaires consist of questions on basic physical and demographic characteristics, general economic conditions and economic activities, physical infrastructure conditions and transportation, agricultural production at the communal level, as well as information on schooling and health facilities in each commune (see World Bank, 2000, 2001 for details). Although the VHLSS 2002 questionnaires were simplified relative to the earlier VLSS, the basic content of the survey remained intact and thus allow, for the purpose of the current exercise, the construction of a set of variables that are compatible across all three surveys. The next sub-section describes some features of the Vietnamese labour market from a gender perspective using data drawn from these surveys.[4]

2.2. *Overview of the gender pay gap in Vietnam*

Vietnam's labour market is characterized by high participation rates among both men and women. Around 84% of Vietnamese men and 82% of women aged 15–60 were working in the 1993–2002 period (see Table 1). In rural areas, gender-specific participation rates were even higher. These high participation rates are consistent with evidence from the former Soviet Union and other CEE centrally planned economies prior to transition. However, the relatively stable participation rates for female workers in Vietnam is in contrast to these countries, where the contraction in labour force participation was relatively large during the transition period (Newell & Reilly, 2001).

Nearly one-and-a-half million new entrants have joined the labour force annually in Vietnam during the 1990s. The rising trend in the unemployment rate, however, suggests that the impressive economic growth associated with the reforms has been insufficient to absorb this fast growing labour force. As a result, unemployment, defined as those in the labour force and actively looking for work, has steadily risen over the 1993–2002 period.[5] On average, the male unemployment rate was two percentage points higher than the female rate. An explanation for this gender differential could be the rapid growth of female worker-intensive exports such as garments, footwear, and agricultural products over the past decade (Thoburn et al., 2003) but

[3] The VLSS used the 1989 Population Census as the sampling frame, while the VHLSS 2002 exploited the Population and Housing Census from 1999.

[4] This paper presents analysis for the period covering 1993–2002 using these three surveys. As most of the major reforms were actually implemented prior to, or in the early part of, this period, the empirical analysis reported is likely to reflect the evolution of the gender pay gap in the post *Doi moi* era (i.e., since the official launch of *Doi moi* at the Sixth Communist Party's Congress in 1986). However, the process of transition to a fully market-based economy remains incomplete in Vietnam, so it is difficult to argue that the country's economy over the period reviewed here had settled on a steady-state equilibrium.

[5] The unemployment rate rose from roughly 4.4% in 1993 to 8.4% in 2002. Note that these estimates from the surveys are slightly higher than the official statistics reported by the GSO (2006), where the unemployment rate was six percent in 2002.

Table 1
Labour force participation and unemployment

	1993	1998	2002
Labour force participation (%)	82.31	80.51	83.44
Male participation	84.49	81.56	84.26
Rural	87.28	85.09	86.17
Urban	74.65	73.14	78.07
Female participation	80.38	79.55	82.64
Rural	82.95	84.72	86.05
Urban	71.58	67.62	72.04
Unemployment rate (%)	4.39	3.93	8.59
Male unemployment rate	5.8	5.81	9.77
Rural	3.63	4.03	8.31
Urban	9.62	8.18	12.93
Female unemployment rate	3.41	2.36	7.55
Rural	2.97	1.94	7.38
Urban	4.3	2.82	7.83
Structure of employment (%)			
Employment in agriculture	64.06	54.91	52.45
Male	61.28	51.10	49.30
Female	66.64	58.51	55.57
Wage employment	17.78	22.92	27.64
Male	22.45	28.45	34.33
Female	13.44	17.69	21.04
Self-employment and others	18.16	22.18	19.90
Male	16.27	20.46	16.37
Female	19.92	23.81	23.39

Source: Authors' calculations from the VLSS 1992/93; VLSS 1997/98; and VHLSS 2002. *Notes*: (a) Labour force consists of those aged from 15 to 60 years old; (b) employment is defined as having jobs over the past 7 days before the surveys; unemployment is defined as those in the labour force, who were not working over the past 7 days before the surveys, but were looking for a job; (c) employment outcomes are classified on the basis of primary employment; 'others' include those who are employed by household businesses and household enterprises.

could also reflect the role of 'discouraged worker' effects with women more likely to leave the labour force than men.

Table 1 also reveals some notable features regarding Vietnam's labour market dynamics over the period 1993–2002. Non-farm employment has become an increasingly important activity.[6] On average, the employment share in agriculture has fallen by roughly one-fifth for both male and female workers. Most of this decrease in agricultural employment appears to have been absorbed by an increase in the wage employment sector (see Minot, Epprecht Tran, & Le (2006); Pham, 2006; World Bank, 2006).

[6] Off-farm employment refers to income-generating activities distinct from working on one's own farms, forest plots, and watersurface, *etc*. See, for instance, Minot et al. (2006) and Pham (2006) for a discussion on the different types of non-farm activities in Vietnam.

Despite the change in the structure of employment, female workers are still more dependent on agriculture and self-employment activities than their male counterparts. For instance, wage employment accounted for one-fifth of female employment and one-third of male employment in the most recent year for which data are available to us. Tran and Le (1998) and UNDP (1996) report that the downsizing of the SOEs impacted more adversely on women than men (see above). Other studies on Vietnam also reveal that women are more likely to be employed in the informal sector than men, a sector largely comprising self-employment and agricultural activities (World Bank, 1999). As this sector is generally composed of lower paid jobs, the dependence of women on these two sources of employment suggests they may be poorly placed in terms of labour market wage rewards compared to men.[7] However, this is not an issue investigated in this paper given our exclusive emphasis on the wage employment sector.

The average real wage rate has grown rapidly by an average of 12% per annum over the period 1993–2002. Other studies on Vietnam's labour market during the 1990s also reported a rapid growth in wages rates. Nga (2002) and Gallup (2004), using data from the first two rounds of the household living standard surveys, report a 10% increase in the annual growth rate of hourly wages. It is notable that the increasing wage trend observed for Vietnam is contrary to what was found for other transitional economies in the earliest phases of their transition to a market economy (Rutkowski, 1996).

The rapid growth in real average wages in Vietnam was accompanied by a sharp improvement in the relative female position in the labour market over time (see Table 2). In 1993, an average female worker earned roughly three-quarters of the average male in terms of hourly wages. Ten years on, the average female earned 88% of this average. The same pattern of change in the gender pay gap is also observed when comparing gender pay gaps across regions, educational attainment levels and employment sectors over time. The relative female wage position is better in the public than in the private sector, which is consistent with evidence from other transitional economies (see Jurajda, 2003 for the case of the Czech Republic). There is almost no difference in the earnings levels of those with less than upper secondary education and those with tertiary educational qualifications in the early years of the transition. This reflects the low return to education widely observed in many transitional economies in the early stages of reform (Newell & Reilly, 1999). The raw returns to education appear highest in the latter half of the 1998–2002 period. Among the five different educational attainment levels, the mean wage rate of those with tertiary level education has grown faster than those with lower levels. Workers with tertiary educational qualifications earn considerably more than those with secondary education. In terms of the gender pay gap across educational levels, though the female disadvantage appears to have slightly widened between the last 2 years reviewed, it narrowed over the entire 1993–2002 period.

The same pattern of a comparative improvement in the female relative wage position was also found in many transitional economies in Central and Eastern Europe such as Hungary, Poland, the Czech Republic and Slovakia (Newell & Reilly, 2001). Brainerd (2000) also reports six of the eight post-communist countries she examined experienced an improvement in their female relative wage position. This pattern is also in line with the empirical evidence reported for the gender pay gap in early stages of economic reform in China (Kidd & Meng, 2001; Liu, 1998; Ying, 2007). It is important to note that the amelioration in the relative female wage position, as suggested by the temporal change in the ratio reported in Table 2, does not imply a decrease in

[7] See Pham (2006) for a discussion on the gender dimension to rural employment over the post *Doi moi* era.

Table 2
The structure of wage and gender way gap, 1993–2002

	1993			1998			2002		
	Male	Female	F/M ratio	Male	Female	F/M ratio	Male	Female	F/M ratio
Real hourly wage rates	1.9570 (1.097)	1.4810 (0.909)	0.7568	3.2514 (2.198)	2.8493 (2.212)	0.8763	4.2698 (2.963)	3.7629 (2.783)	0.8813
Wage by sector									
Private sector wage	1.9796	1.4184	0.7165	3.1517	2.4796	0.7868	3.6878	3.0366	0.8234
Public sector wage	1.9063	1.5623	0.8195	3.4314	3.3223	0.9682	5.4758	4.7764	0.8723
Rural vs. urban									
Urban wage	2.0281	1.5148	0.7469	3.8020	3.2130	0.8451	5.2800	4.4854	0.8495
Rural wage	1.9018	1.4409	0.7576	2.7463	2.4040	0.8754	3.5940	3.1525	0.8772
Mean wages by education levels									
Lower secondary and below	1.9073	1.4949	0.7838	2.9678	2.3573	0.7943	3.4872	2.8798	0.8258
Upper secondary education	2.0815	1.4488	0.6961	3.4535	3.1607	0.9152	4.5288	4.0319	0.8903
Higher education	1.8551	1.4818	0.7988	4.2169	3.8665	0.9169	5.9858	5.1836	0.8660
Mean wages by regions									
Northern Uplands	1.4537	0.9756	0.6711	2.5901	2.5271	0.9757	4.2361	4.1997	0.9914
Red River Delta	1.6616	1.2791	0.7698	3.0607	3.0101	0.9835	3.9873	3.6582	0.9175
North Central Coast	1.6014	1.1925	0.7447	2.7194	2.4063	0.8849	3.8449	3.5605	0.9260
South Central Coast	1.6666	1.4101	0.8461	2.7974	2.2986	0.8217	4.1830	3.5604	0.8512
Central Highlands	2.3414	1.4188	0.6060	2.8478	2.7256	0.9571	6.3600	5.5126	0.8668
Southeast	2.4413	1.8275	0.7486	4.2492	3.3726	0.7937	4.5040	3.6758	0.8161
Mekong River Delta	2.1149	1.5275	0.7223	2.9165	2.5215	0.8646	4.0131	3.1849	0.7936

Source: Authors' calculations from the VLSS 1992/93; VLSS 1997/97; and VHLSS 2002. *Notes*: (a) Hourly wage rates include all payments in cash and in-kind; (b) 'public sector' includes those who work in the public services sectors; (c) 'lower secondary school and others' include those with educational attainment level from lower secondary; (d) F/M ratio is calculated as the ratio of average female hourly pay to its average male counterpart; (e) standard deviations for continuous variables are reported in parentheses.

gender inequality more broadly defined. For instance, Hunt (2002) noted that the dramatic contraction in the gender pay gap among East German women was largely attributable to the selective withdrawal from wage employment of less qualified women in terms of both observables and unobservables. In the context of Vietnam, Le (2006) demonstrates that while the gender pay gap in the formal sector narrowed during the transition, gender inequality across other dimensions remains a significant policy issue. And other studies reveal that, although women were generally better-off as a result of the comprehensive reforms undertaken during *Doi moi*, gains were not distributed equally across income groups, regions, and ethnic groups (see Goodkind, 1995; Le, 2006; Long et al., 2000; PTF, 2002).[8]

3. Econometric methodology

Following the seminal work of Mincer (1974), it is conventional to specify log wages as a function of a set of wage determining characteristics, which in its most austere form includes controls for human capital. The specification is then augmented to capture other variables interpreted as important to the wage determination process. In the empirical literature on the gender pay gap, the separation of the data points by gender is widely adopted in undertaking gender pay gap decomposition analysis. The gender-specific wage equations for the *i*th individual are specified as follows:

$$W_{\mathrm{m}} = X'_{\mathrm{m}}\beta_{\mathrm{m}} + \mu_{\mathrm{m}} \tag{1}$$

$$W_{\mathrm{f}} = X'_{\mathrm{f}}\beta_{\mathrm{f}} + \mu_{\mathrm{f}} \tag{2}$$

where X_j is a $(k \times n)$ matrix of productivity and other characteristics (e.g., education, labour force experience, etc.) and j is the gender subscript; β is a $(k \times 1)$ vector of unknown parameters representing the effect of various covariates on the log wage (W); μ is a $(n \times 1)$ vector of random error terms; and m and f denote male and female sub-samples, respectively.

The Oaxaca (1973) methodology has been widely used to decompose the average gender pay gap between men and women using the OLS estimation of gender-specific wage equations. The mean gender difference in log wages is conventionally given by:

$$\bar{W}_{\mathrm{m}} - \bar{W}_{\mathrm{f}} = (\bar{X}_{\mathrm{m}} - \bar{X}_{\mathrm{f}})'\hat{\beta}_{\mathrm{m}} + \bar{X}'_{\mathrm{f}}(\hat{\beta}_{\mathrm{m}} - \hat{\beta}_{\mathrm{f}}) \tag{3}$$

where the 'bars' denote mean values and 'hats' denote the OLS coefficient estimates in this case. This allows the overall average differential in wages between the two gender groups to be decomposed into a part attributable to differences in characteristics (known as the 'explained' or 'endowment' effect) and a part attributable to differences in the estimated relationship between men and women (alternatively defined as the 'unexplained', 'treatment' or 'residual' effect). The latter part of expression (3) is sometimes taken to capture the effect of unequal treatment (or discrimination) in the labour market.

The use of this approach is subject to the conventional 'index number' problem. It is clear that expression (3) could be re-computed using the 'basket' of average male characteristics, which

[8] As the primary focus of this paper is on the gender pay gap in the wage employment sector, other dimensions of gender inequality are not discussed. See Goodkind (1995), Croll (1998), Tran and Le (1998), Tran (1999), PTF (2002), Long et al. (2000), Le (2006) for other issues germane to Vietnamese gender inequality.

potentially yields different numerical values than (3). Thus[9]:

$$\bar{W}_{\mathrm{m}} - \bar{W}_{\mathrm{f}} = (\bar{X}_{\mathrm{m}} - \bar{X}_{\mathrm{f}})'\hat{\beta}_{\mathrm{f}} + \bar{X}'_{\mathrm{m}}(\hat{\beta}_{\mathrm{m}} - \hat{\beta}_{\mathrm{f}}) \tag{4}$$

The foregoing decompositions are situated within a mean regression framework. An exclusive focus on the average, however, provides an incomplete account of the gender pay gap. The quantile regression approach allows the gender pay gap to be estimated at particular quantiles of the conditional wage distribution as opposed to simply the mean. The estimation of a set of conditional quantile functions allows for a more detailed portrait of the relationship between the conditional distribution of the wage and selected covariates than provided by a mean regression. In contrast to the OLS approach, the quantile regression procedure is less sensitive to outliers and provides a more robust estimator in the face of departures from normality (Koenker, 2005; Koenker & Bassett, 1978). In addition, Deaton (1997, pp. 80–85) notes that quantile regression models may also have better properties than OLS in the presence of heteroscedasticity. Using this methodology, the log wage equation may be estimated conditional on a given specification and then calculated at various percentiles of the residuals (e.g., 10th, 25th, 50th 75th or 90th (see Chamberlain, 1994)).

In the current case, the quantile regression for the male sub-sample can be defined as:

$$W_{\mathrm{m}} = X'_{\mathrm{m}}\beta_{\theta\mathrm{m}} + \mu_{\theta\mathrm{m}} \tag{5}$$

where $Q_\theta(W_{\mathrm{m}}|X_{\mathrm{m}}) = X'_{\mathrm{m}}\beta_{\theta\mathrm{m}}$ and $Q_\theta(\mu_{\theta\mathrm{m}}|X_{\mathrm{m}}) = 0$, $\beta_{\theta\mathrm{m}}$ denotes the unknown male parameter vector for the θth quantile, and θ denotes the chosen quantile. Similarly, the quantile regression for the female sub-sample can also be defined as:

$$W_{\mathrm{f}} = X'_{\mathrm{f}}\beta_{\theta\mathrm{f}} + \mu_{\theta\mathrm{f}} \text{ with } Q_\theta(W_{\mathrm{f}}|X_{\mathrm{f}}) = X'_{\mathrm{f}}\beta_{\theta\mathrm{f}} \text{ and } Q_\theta(\mu_{\theta\mathrm{f}}|X_{\mathrm{f}}) = 0. \tag{6}$$

From Eqs. (5) and (6):

$$Q_\theta(W_{\mathrm{m}}) = E(X_{\mathrm{m}}|W_{\mathrm{m}} = Q_\theta(W_{\mathrm{m}}))'\hat{\beta}_{\theta\mathrm{m}} + E(\mu_{\theta\mathrm{m}}|W_{\mathrm{m}} = Q_\theta(W_{\mathrm{m}})) \tag{7}$$

and

$$Q_\theta(W_{\mathrm{f}}) = E(X_{\mathrm{f}}|W_{\mathrm{f}} = Q_\theta(W_{\mathrm{f}}))'\hat{\beta}_{\theta\mathrm{f}} + E(\mu_{\theta\mathrm{f}}|W_{\mathrm{f}} = Q_\theta(W_{\mathrm{f}})) \tag{8}$$

In these expressions, characteristics are evaluated conditionally at the unconditional quantile log wage value and not unconditionally as in the case of the mean regression approach. The two expressions $E(\mu_{\theta\mathrm{m}}|W_{\mathrm{m}} = Q_\theta(W_{\mathrm{m}}))$ and $E(\mu_{\theta\mathrm{f}}|W_{\mathrm{f}} = Q_\theta(W_{\mathrm{f}}))$ are non-zero. From (7) and (8), the gender pay gap at the θth quantile is defined as Δ_θ and this can be decomposed into three parts:

$$\begin{aligned}\Delta_\theta = {} & [E(X_{\mathrm{m}}|W_{\mathrm{m}} = Q_\theta(W_{\mathrm{m}})) - E(X_{\mathrm{f}}|W_{\mathrm{f}} = Q_\theta(W_{\mathrm{f}}))]'\hat{\beta}_{\theta\mathrm{m}} + [E(X_{\mathrm{f}}|W_{\mathrm{f}} = Q_\theta(W_{\mathrm{f}}))]' \\ & \times (\hat{\beta}_{\theta\mathrm{m}} - \hat{\beta}_{\theta\mathrm{f}}) + [E(\mu_{\theta\mathrm{m}}|W_{\mathrm{m}} = Q_\theta(W_{\mathrm{m}})) - E(\mu_{\theta\mathrm{f}}|W_{\mathrm{f}} = Q_\theta(W_{\mathrm{f}}))]\end{aligned} \tag{9}$$

This can be re-written more compactly as:

$$\Delta_\theta = \Delta\Omega'_\theta\hat{\beta}_{\theta\mathrm{m}} + \Omega'_{\theta\mathrm{f}}\,\Delta\hat{\beta}_\theta + R_\theta \tag{10}$$

[9] Given the linear nature of the components, the computation of the sampling variances for the two parts is a relatively straight-forward exercise.

where $\Delta\hat{\beta}_\theta = (\hat{\beta}_{\theta\mathrm{m}} - \hat{\beta}_{\theta\mathrm{f}})$

$$\Delta\Omega_\theta = \Omega_{\theta\mathrm{m}} - \Omega_{\theta\mathrm{f}} \quad \text{where } \Omega_{\theta\mathrm{f}} = E(X_\mathrm{f}|W_\mathrm{f} = Q_\theta(W_\mathrm{f})) \quad \text{and}$$
$$\Omega_{\theta\mathrm{m}} = E(X_\mathrm{m}|W_\mathrm{m} = Q_\theta(W_\mathrm{m}))$$

$$R_\theta = [E(\mu_{\theta\mathrm{m}}|W_\mathrm{m} = Q_\theta(W_\mathrm{m})) - E(\mu_{\theta\mathrm{f}}|W_\mathrm{f} = Q_\theta(W_\mathrm{f}))]$$

The estimates for this procedure are also sensitive to the structure assumed under equal treatment and the gender pay gap can also be decomposed as:

$$\Delta_\theta = \Delta\Omega'_\theta\,\hat{\beta}_{\theta\mathrm{f}} + \Omega'_{\theta\mathrm{m}}\,\Delta\hat{\beta}_\theta + R_\theta \tag{11}$$

Using mean characteristics in the computation of expressions (10) and (11) may provide misleading realizations for the basket of characteristics at points other than the conditional mean wage to which they actually relate. Therefore, it is necessary to use realizations for a basket of gender-specific characteristics that more accurately reflect the relevant points on the conditional wage distribution. The auxiliary regression-based framework outlined in Gardeazabal and Ugidos (2005) provides one approach that has been used in other studies to obtain the empirical realizations for these characteristics (see Hyder & Reilly, 2005 for an application). In this paper, however, we use a variation of an approach originally suggested by Machado and Mata (2005) to derive the characteristics at different quantiles of the wage distribution. From each of the male and female sub-samples, 100 observations are randomly drawn with replacement. Each observation once ranked comprises a percentile point on the wage distribution. The full set of characteristics for the observation at the θth wage quantile is then retrieved. This process is replicated 200 times to obtain 200 observations at the θth quantile.[10] The mean characteristics of these observations at each quantile are then used to construct the realizations for $\Omega_{\theta\mathrm{m}}$, $\Omega_{\theta\mathrm{f}}$ in Eqs. (10) and (11) above.[11]

In the context of the quantile regression approach, we use a relatively *ad hoc* method for the temporal decomposition of the gender pay gap at selected quantiles. The overall gender pay gap at the θth quantile can be expressed as:

$$\Delta_{\theta 0} = \Delta\Omega'_{\theta 0}\hat{\beta}_{\theta\mathrm{m}0} + \Omega'_{\theta\mathrm{f}0}\,\Delta\hat{\beta}_{\theta 0} + R_{\theta 0} \tag{12}$$

$$\Delta_{\theta 1} = \Delta\Omega'_{\theta 1}\,\hat{\beta}_{\theta\mathrm{m}1} + \Omega'_{\theta\mathrm{f}1}\,\Delta\hat{\beta}_{\theta 1} + R_{\theta 1} \tag{13}$$

where 0 denotes the early and 1 the later year. The temporal decomposition of the gender pay gap is as follows:

$$\Delta_{\theta 1} - \Delta_{\theta 0} = (\Delta\Omega_{\theta 1} - \Delta\Omega_{\theta 0})'\hat{\beta}_{\theta\mathrm{m}1} + (\Omega_{\theta\mathrm{f}1} - \Omega_{\theta\mathrm{f}0})'\Delta\hat{\beta}_{\theta 1} + \Delta\Omega'_{\theta 0}(\hat{\beta}_{\theta\mathrm{m}1} - \hat{\beta}_{\theta\mathrm{m}0})$$
$$+ \Omega'_{\theta\mathrm{f}0}(\Delta\hat{\beta}_{\theta 1} - \Delta\hat{\beta}_{\theta 0}) + (R_{\theta 1} - R_{\theta 0}) \tag{14}$$

Thus, the overall change in the gender pay gap between 2 years at the θth quantile can be decomposed into five parts. The first part is attributable to the temporal change in the gender

[10] These represent more modest numbers for both draws and replications than used by Machado and Mata (2005) in their analysis.

[11] The sampling variances for the quantile regression estimates are obtained using bootstrapping with 200 replications. Given the linear nature of the 'treatment' and 'endowment' components in (12) and (13), the sampling variances are again easily computable. However, it is acknowledged that the use of the bootstrapped variance-covariance matrix may not be entirely desirable here for the computation of the sampling variance of a point estimate, since the bootstrap procedure is best interpretable as providing a confidence interval for the point estimate.

differential in realizations of observable characteristics at the θth quantile of the wage distribution evaluated using male coefficients. The second part is attributable to the temporal change in the realizations of the observable female characteristics at the θth quantile of the wage distribution. The third part is attributable to the temporal change in the male wage structure at the θth quantile of the wage distribution. The fourth term is attributable to the temporal change in unequal treatment (or wage discrimination) at the θth quantile of the wage distribution. The final term is unexplained and may be attributable to the changing role of unobservables over time. As expression (14) is subject to an 'index number' problem, the temporal gender pay gap can also be re-cast as:

$$\Delta_{\theta 1} - \Delta_{\theta 0} = (\Delta\Omega_{\theta 1} - \Delta\Omega_{\theta 0})'\hat{\beta}_{\theta \mathrm{f}1} + (\Omega_{\theta \mathrm{m}1} - \Omega_{\theta \mathrm{m}0})'\Delta\hat{\beta}_{\theta 1} + \Delta\Omega'_{\theta 0}(\hat{\beta}_{\theta \mathrm{f}1} - \hat{\beta}_{\theta \mathrm{f}0}) + \Omega'_{\theta \mathrm{m}0}(\Delta\hat{\beta}_{\theta 1} - \Delta\hat{\beta}_{\theta 0}) + (R_{\theta 1} - R_{\theta 0}) \quad (15)$$

The temporal decomposition suggested by Juhn, Murphy, and Pierce (1991) could be used to decompose the average pay gap over time and estimates based on this procedure using the mean regression analysis are reported below (see footnote 24).

4. Specification issues and empirical results

4.1. Wage specification issues

Real hourly wage rates are used in the regression analysis undertaken in this study. The wage measure includes basic rates and other payments in terms of bonuses, allowances, subsidies in cash and kind.[12] This definition of the wage has been widely used in studies on Vietnam such as Glewwe, Gragnolati, and Zaman, 2002 and Liu (2004a, 2004b). The nominal hourly wage rates are deflated by the monthly CPI to yield a real hourly wage rate.[13] The natural logarithms of these real wage rates are then used in the augmented Mincerian wage equations, which control for, *inter alia*, human capital, ethnicity and other characteristics (see Table A1 for variable descriptions and selected summary statistics).

A 'years of schooling' variable has often been used in the standard human capital wage specification as this is most compatible with basic Mincerian theory (see Psacharopoulos, 1994; Psacharopoulos & Patrinos, 2002). In our case, the schooling years would have to be computed from information on the highest educational qualifications attained as reported in the household surveys.[14] However, as demonstrated in other studies, this might introduce noise into the measurement of this variable with consequences for a downward bias in the corresponding schooling estimate (for instance see Duraisamy, 2002). We thus exploit a set of mutually exclusive dummies for educational attainment to capture human capital effects.[15] In addition, as actual labour force experience was not reported in the surveys, the age of an individual (and its quadratic term) is used to proxy for labour market experience rather than using a potential labour force measure as in Liu (2004a). It should be noted that the inclusion of an age variable does not

[12] These 'other payments' are, on average, 9% in the total earnings overall over the 1993–2002 period.

[13] The deflation has no material impact on our analysis of the gender pay gap, since inflation effects are likely to be gender-neutral. However, it facilitates a comparison of wages over time (see Table 2).

[14] These surveys do not report years-in-school information. Instead, only the highest qualifications obtained or an individual's current level of study is reported (see World Bank, 2000, 2001 for details).

[15] This approach is adopted by Newell and Reilly (1999) in their analysis of selected transitional economies.

fully capture the effect of labour market experience on wages, but it avoids potential problems that could be introduced into our analysis if a potential labour force experience measure was actually used in its place.[16] The use of age and its quadratic to proxy for actual labour force experience is clearly more problematic and is obviously less accurate for females than males. Its use in preference to an actual measure may over-state the magnitude of the unequal treatment effect as Wright and Ermisch (1991) detected when comparing discrimination effects based on potential and actual labour force measures using data for the United Kingdom. This measurement issue is acknowledged as a constraint in the current application but data limitations prevent use of a more accurate variable.[17]

The set of other regressors in the wage equations include worker characteristics (such as marital and health status)[18]; social exclusion which is proxied by ethnic origin; and ownership type. A set of seven regional dummies are also included in the wage regression models. Furthermore, it is reasonable to argue that adjusting the nominal wage rates by the monthly price deflator does not fully capture potential seasonal effects. This is particularly the case for rural non-farm activities, which can be linked to harvest time during a particular year. Consequently, a set of dummies for the interview date are also included to control for potential seasonal effects in the wage determination process.[19]

The data available do not allow us to fully capture an individual's unobserved ability, school quality or socio-economic background. The failure to control for these factors potentially results in overestimated returns to the education variables (Bauer & Haisken-DeNew, 2001; Bennel, 1996; Card, 1999; Heckman & Hotz, 1986). However, as the primary interest of the current paper is on the gender wage gap, it could be argued that the over-estimation of these effects is gender-neutral and thus might not seriously impact on the gender pay gap effects reported in this paper.

The problem of selectivity bias, as mediated through either participation or selection into wage employment, is a potential issue for both the mean and quantile regression models. The selection effects associated with participation may be of less importance given the high participation rates already noted for both gender groups in Vietnam. The wage employment selection process is clearly more of an issue. The fact that there are more than two possible employment outcomes in the labour market (see Table 1) suggests use of the Lee (1983) method,

[16] The use of a potential labour force variable, measured as age minus years of schooling minus the enrolment age, suffers from two major problems. Firstly, the coefficient corresponding to the education variable, when this measure is used, can be shown to be downward biased. Secondly, as an individual's years in schooling were not reported, using the computed years of schooling to construct potential experience would thus introduce measurement error providing another source of bias in the wage equation estimates.

[17] In the VLSS 1992/93 and the VLSS 1997/98, there is information on the length of experience in the current job. However, this information provides an inaccurate measure of the actual labour force experience because the information on experience from previous jobs is not reported. In addition, information on current job tenure is unavailable in the most recent VHLSS 2002 thus vitiating the use of compatible wage specifications across the three years.

[18] Long et al. (2000) report an important role for marital status in the labour market behaviour of women, especially in rural areas. Previous studies on wages in Vietnam also report a sizable effect of marital status on wages (see Brassard, 2004; Liu, 2004a). The inclusion of this variable in the wage equation represents a judgement call but allows us to determine whether employers use this indicator to exercise gender discrimination in terms of the wage. In addition, it could also be argued that both marital and health status are endogenous outcomes. However, given that both outcomes are likely to predate the wage outcomes observed, we believe their treatment as exogenous measures in the current specification is relatively innocuous.

[19] As seasonality effects on the gender pay gap are likely to be negligible, control for seasonality is more a wage specification issue rather than an attempt to capture any effect on the gender wage gap. As rural employment and wages might be subject to seasonality, it is thus desirable to include this variable in the wage regression models.

which extends the more standard Heckman two-step procedure to multiple-outcome cases. Following Liu (2004a), the identification of the selection effect was explored using household structure variables (i.e., the number of children and the dependency ratio within the household, *etc*.) and non-labour income.[20] The educational levels of household heads and household socio-economic background, variables that potentially capture some form of 'network' effects, were also used as additional instruments. However, the estimates corresponding to the selection correction terms were not well determined, a finding that proved invariant to the use of a dichotomous selection process within the more standard Heckman two-step procedure (i.e., whether an individual is in wage employment or not).[21] There is a suspicion that the instruments used may be weak as they were poorly correlated with the probability of wage employment and efforts to obtain superior instruments proved futile given the limited nature of the data available. This outcome is unsurprising given the fact that the two-step procedures have been subject to criticism given their sensitivity to both distributional assumptions and identifying restrictions (Manski, 1995). In addition, the techniques required to correct for selectivity bias in quantile regression models are less well developed, though Buchinsky (2001) suggests an approach that exploits the work of Newey (1999). However, there remain complications that arise in regard to identifying the constant term in quantile wage regression models when higher order terms are used to capture the selection effects as suggested by Newey (1999). This is a relatively important issue in any pay gap application (see Hyder & Reilly, 2005). Given the difficulties encountered in obtaining plausible and relevant instruments to identify the selection effects and potential complications in modelling selection within a quantile framework, we eschew the use of selection correction procedures for either the mean or quantile log wage regression models.

The econometric specification used in the current study differs slightly from that of Liu (2004a) in a number of key respects that go beyond issues relating to the correction for selection bias. Firstly, educational levels and the individual's age are used instead of years in schooling and potential labour force experience, respectively. This is to avoid the introduction of a possible measurement error in key explanatory variables (see footnote 16 above). Secondly, occupation controls for the wage-employed workers are not included in our regression models. This is a judgement call and we take the view that the inclusion of controls that may reflect the outcome of a labour market discriminatory process is undesirable in this case. In addition, there is also a concern regarding the potential endogeneity of the occupational attachment variables. Finally, in contrast to Liu (2004a), we also introduce controls for the interview date to capture possible seasonality effects and introduce an individual's health status to capture human capital depletion effects.

4.2. Empirical results

The wage regression estimates, using the mean and the quantile regression models, are provided in Tables A2–A7 of Appendix A but are not the subject of detailed discussion

[20] The use of non-labour income but particularly household structure and family background in the employment selection process is relatively common in the labour economics literature. The non-labour income in our case includes government pension, subsidies, remittances, interest from savings, grants and scholarships and is thus unrelated to past labour activity.

[21] It should be noted that defining employment outcomes dichotomously using whether an individual is in wage employment or not is statistically rejected on the basis of Wald tests using estimates from the three-category multinomial logit model. These test results are not reported here for brevity but available from the authors on request.

here. However, it is worth reporting that the fits of the augmented Mincerian equations have improved for both gender groups over the time period reviewed and the point estimates for the *ceteris paribus* returns to the higher levels of formal human capital have increased sharply relative to the no schooling base group. This could be taken to reflect the enhanced role of the labour market in valuing human capital assets in Vietnam over and beyond the reform period.[22]

The first rows of Tables A2–A4 report *ceteris paribus* gender pay gaps estimated over the period 1993–2002 using a pooled wage regression model with a gender intercept term. The estimates reflect the improvements in the relative female wage position already noted from the raw data. For instance, in 1993 a male wage employee earned 31% more than a comparable female, on average and *ceteris paribus*, but by 1998 the 'mark-up' had declined to 19% and exhibited stability thereafter to 2002. The findings on the gender pay gap in regard to the two earlier years are in line with other empirical studies on the gender pay gap for Vietnam (Gallup, 2004; Liu, 2004a; Nga, 2002).

The first rows of Tables A2–A4 also provide the estimated gender effects at different quantiles of the conditional wage distribution. These estimates suggest considerable improvements in the female relative wage position in the Vietnamese labour market. The gender pay gap tends to display a modest decrease with movement across the conditional wage distribution. This tentatively suggests that gender pay inequality is larger in the low-paid than the high-paid jobs though this is interrogated more closely using the decompositions reported below. The decreasing *ceteris paribus* gender pay gap across the different quantiles of the conditional wage distribution, however, is in marked contrast to what is commonly observed in other transitional economies where a 'glass-ceiling' effect is evident at higher points of the conditional wage distribution (see Reilly, 1999 and Newell & Reilly, 2001).

The separation of the data points between the male and female sub-samples is statistically justified on the basis of Wald test values for both the mean and quantile regression models for all 3 years.[23] The estimation of separate wage equations allows for the implementation of the various gender pay gap decomposition methodologies both at the mean and selected quantiles. In reviewing the estimates reported in Tables 3a–3c, the contraction in the gender pay gap between 1993 and the later years is again evident. In all years, the greater part of the gender pay gap is attributable to unequal treatment with respect to gender. However, in contrast to the results reported in Tables A2–A4, which uses an intercept shift to capture gender effects, the treatment effects appear stable across the selected quantiles of the conditional wage distribution. This finding is invariant to which wage structure is assumed in the absence of unequal treatment.

There is a substantial contraction in the average gender pay gap over time. The raw gender pay gap contracted by 0.14 log points between 1993 and 2002, which represents almost a halving of the gap.[24] The contraction in the gender pay gap over these 2 years is also evident at selected

[22] As noted earlier, as this paper does not control for ability, schooling quality, socio-economic background, and selection bias (see text), the returns to educational level may be overestimated, and thus need to be interpreted with some degree of caution.

[23] The relevant Wald tests for separation by gender are reported in Tables A2–A4 of Appendix A.

[24] This mean contraction was examined using the procedure suggested by Juhn et al. (1991). The greatest part of the reduction was found to be assigned to the unobservables that improved the percentile ranking of the average Vietnamese female in the male residual wage distribution. This may reflect the fact that Vietnamese women poorly qualified in terms of both observables and unobservables selectively withdrew from wage employment over the time period reviewed here.

Table 3a
Decomposition results at mean and quantiles, 2002

	10th	25th	50th	75th	90th	Mean
Actual wage gap	0.2453*** (0.015)	0.1934*** (0.012)	0.1538*** (0.011)	0.1093*** (0.013)	0.1097*** (0.019)	0.1503*** (0.009)
Oaxaca-Blinder						
Female characteristics[a]						
Explained effect	−0.0391*** (0.005)	−0.0256*** (0.005)	−0.0402*** (0.005)	−0.0330*** (0.006)	−0.0301*** (0.007)	−0.0241*** (0.005)
Unexplained effect	0.2051*** (0.017)	0.1711*** (0.012)	0.1650*** (0.011)	0.1577*** (0.012)	0.1406*** (0.016)	0.1744*** (0.009)
Unobservable effect	0.0794	0.0479	0.0289	−0.0154	−0.0008	0.0000
Male characteristics[b]						
Explained effect	−0.0455*** (0.006)	−0.0457*** (0.006)	−0.0565*** (0.006)	−0.0274*** (0.007)	−0.0677*** (0.008)	−0.0346*** (0.006)
Unexplained effect	0.2115*** (0.014)	0.1912*** (0.010)	0.1814*** (0.010)	0.1521*** (0.010)	0.1782*** (0.013)	0.1849*** (0.008)
Unobservable effect	0.0794	0.0479	0.0289	−0.0154	−0.0008	0.0000

Notes: (1) *** refers to the variables of which the estimated coefficients are statistically significant at level of 0.01. (2) Standard errors are in parentheses.

[a] Using expression (3) for mean regression model and expression (10) for quantile regression models.

[b] Using expression (4) for mean regression model and expression (11) for quantile regression models.

Table 3b
Decomposition results at mean and quantiles, 1998

	10th	25th	50th	75th	90th	Mean
Actual wage gap	0.1971*** (0.038)	0.1480*** (0.024)	0.1461*** (0.023)	0.1159** (0.047)	0.1551** (0.056)	0.1474*** (0.022)
Oaxaca-Blinder						
Female characteristics[a]						
Explained effect	0.0500*** (0.016)	−0.0133 (0.011)	−0.0493*** (0.011)	−0.0541*** (0.013)	−0.0415** (0.016)	−0.0162 (0.011)
Unexplained effect	0.1112** (0.043)	0.1894*** (0.028)	0.1817*** (0.027)	0.1756*** (0.032)	0.1580*** (0.041)	0.1636*** (0.022)
Unobservable effect	0.0359	−0.0280	0.0137	−0.0006	0.0386	0.0000
Male characteristics[b]						
Explained effect	−0.0080 (0.016)	−0.0048 (0.014)	−0.0579*** (0.013)	−0.0652*** (0.016)	−0.0304 (0.024)	−0.0370*** (0.013)
Unexplained effect	0.1692*** (0.030)	0.1808*** (0.020)	0.1903*** (0.021)	0.1867*** (0.026)	0.1469*** (0.035)	0.1844*** (0.017)
Unobservable effect	0.0359	−0.0280	0.0137	−0.0006	0.0386	0.0000

Notes: (1) *** and ** refer to the variables of which the estimated coefficients are statistically significant at level of 0.01 and 0.05, respectively. (2) Standard errors are in parentheses.

[a] Using expression (3) for mean regression model and expression (10) for quantile regression models.

[b] Using expression (4) for mean regression model and expression (11) for quantile regression models.

Table 3c
Decomposition results at mean and quantiles, 1993

	10th	25th	50th	75th	90th	Mean
Actual wage gap	0.3311*** (0.080)	0.3167*** (0.041)	0.2968*** (0.037)	0.3056 (0.035)	0.3031*** (0.050)	0.2897*** (0.029)
Oaxaca-Blinder						
Female characteristics[a]						
Explained effect	0.0470 (0.029)	0.0552** (0.021)	−0.0052 (0.017)	0.0179 (0.018)	−0.0011 (0.017)	0.0273* (0.016)
Unexplained effect	0.2245*** (0.065)	0.2460*** (0.044)	0.3312*** (0.035)	0.2850*** (0.040)	0.2519*** (0.056)	0.2624*** (0.030)
Unobservable effect	0.0596	0.0155	−0.0292	0.0027	0.0523	0.0000
Male characteristics[b]						
Explained effect	0.0280 (0.029)	0.0100 (0.024)	−0.0506** (0.018)	−0.0084 (0.020)	0.0371 (0.030)	−0.0077 (0.017)
Unexplained effect	0.2435*** (0.046)	0.2912*** (0.034)	0.3766*** (0.028)	0.3113*** (0.031)	0.2138*** (0.045)	0.2974*** (0.024)
Unobservable effect	0.0596	0.0155	−0.0292	0.0027	0.0523	0.0000

Notes: (1) ***, ** and * refers to the variables of which the estimated coefficients are statistically significant at level of 0.01, 0.05 and 0.1, respectively. (2) Standard errors are in parentheses.

[a] Using expression (3) for mean regression model and expression (10) for quantile regression models.

[b] Using expression (4) for mean regression model and expression (11) for quantile regression models.

Table 4a
Temporal decomposition of the gender pay gap: quantile regression approach, 1993–2002

	10th	25th	50th	75th	90th
Actual changes in differential	−0.0858 (0.081)	−0.1233*** (0.042)	−0.1430*** (0.038)	−0.1962*** (0.038)	−0.1934 (0.053)
Female characteristics[a]					
Change in observable gender differentials	−0.0308* (0.016)	−0.0341*** (0.003)	−0.0458*** (0.006)	−0.0265** (0.007)	−0.0566*** (0.017)
Change in observable characteristics	−0.0678*** (0.003)	−0.0473*** (0.003)	0.0156*** (0.002)	0.0492*** (0.002)	0.0612*** (0.005)
Change in wage structure	−0.0183 (0.014)	−0.0324*** (0.006)	−0.0238** (0.009)	−0.0732*** (0.006)	−0.0546*** (0.010)
Change in unequal treatment	0.0114 (0.062)	−0.0475*** (0.016)	−0.1305*** (0.035)	−0.1008** (0.047)	−0.0546 (0.055)
Change in unobservables	0.0198	0.0379	0.0415	−0.0450	−0.0887
Male characteristics[b]					
Change in observable gender differentials	−0.0628*** (0.005)	−0.0098** (0.005)	−0.0630*** (0.002)	−0.0983*** (0.003)	−0.1357*** (0.004)
Change in observable characteristics	−0.0358*** (0.011)	−0.0716*** (0.007)	−0.0139*** (0.005)	−0.0330*** (0.009)	0.0072 (0.013)
Change in wage structure	−0.0108 (0.017)	−0.0480*** (0.008)	0.0571*** (0.011)	−0.0476*** (0.006)	−0.0856*** (0.010)
Change in unequal treatment	0.0038 (0.018)	−0.0784** (0.029)	−0.1813*** (0.012)	−0.1263*** (0.031)	−0.0428 (0.044)
Change in unobservables	0.0198	0.0845	0.0581	0.1089	0.0635

Notes: (1) ***, ** and * refers to the variables of which the estimated coefficients are statistically significant at level of 0.01, 0.05 and 0.1, respectively. (2) Standard errors are in parentheses.

[a] Using expression (14) in the text.

[b] Using expression (15) in the text.

Table 4b
Temporal decomposition of the gender pay gap: quantile regression approach, 1993–1998

	10th	25th	50th	75th	90th
Actual changes in differential	−0.1340 (0.088)	−0.1687*** (0.047)	−0.1507*** (0.043)	−0.1897*** (0.059)	−0.1480* (0.075)
Female characteristics[a]					
Change in observable gender differentials	−0.0099 (0.035)	0.0335*** (0.007)	−0.0109 (0.008)	−0.0188*** (0.005)	−0.0832*** (0.015)
Change in observable characteristics	−0.0215 (0.021)	−0.0622*** (0.015)	0.0156*** (0.004)	0.0387*** (0.007)	0.0612** (0.029)
Change in wage structure	−0.0428** (0.017)	−0.0583*** (0.007)	−0.0345*** (0.011)	−0.0649*** (0.006)	−0.0546*** (0.012)
Change in unequal treatment	−0.1034 (0.108)	−0.0901** (0.036)	−0.1158*** (0.037)	−0.0800** (0.037)	−0.0108 (0.058)
Change in unobservables	0.0436	0.0085	−0.0051	−0.0647	−0.0607
Male characteristics[b]					
Change in observable gender differentials	−0.0620** (0.023)	0.0351* (0.019)	0.0445*** (0.006)	0.0371*** (0.009)	0.1502*** (0.025)
Change in observable characteristics	0.0306* (0.015)	−0.0639*** (0.021)	−0.0080 (0.013)	−0.0171 (0.014)	−0.0715* (0.039)
Change in wage structure	−0.0413** (0.019)	−0.0520*** (0.009)	−0.0217* (0.013)	−0.0565*** (0.008)	−0.1246*** (0.012)
Change in unequal treatment	−0.1050*** (0.022)	−0.0964*** (0.024)	−0.1330*** (0.044)	−0.0884 (0.074)	0.0047 (0.037)
Change in unobservables	0.0436	0.0085	−0.0325	−0.0647	−0.1067

Notes: (1) ***, ** and * refers to the variables of which the estimated coefficients are statistically significant at level of 0.01, 0.05 and 0.1, respectively. (2) Standard errors are in parentheses.

[a] Using expression (14) in the text.

[b] Using expression (15) in the text.

Table 4c
Temporal decomposition of the gender pay gap: quantile regression approach, 1998–2002

	10th	25th	50th	75th	90th
Actual changes in differential	0.0482 (0.041)	0.0454* (0.027)	0.0077 (0.026)	−0.0066 (0.049)	−0.0454 (0.059)
Female characteristics[a]					
Change in observable gender differentials	−0.0280*** (0.006)	−0.0551*** (0.005)	−0.0398*** (0.004)	−0.0017 (0.007)	−0.0365*** (0.013)
Change in observable characteristics	−0.0169** (0.006)	−0.0690*** (0.004)	−0.0141*** (0.002)	0.0492*** (0.002)	0.0612*** (0.014)
Change in wage structure	−0.0049 (0.015)	0.0567*** (0.018)	−0.0219*** (0.009)	−0.0149** (0.007)	−0.0546** (0.026)
Change in unequal treatment	0.1218* (0.062)	0.0368* (0.019)	−0.0071 (0.007)	−0.0267** (0.013)	0.0192 (0.024)
Change in unobservables	−0.0238	0.0759	0.0906	−0.0123	−0.0347
Male characteristics[b]					
Change in observable gender differentials	−0.0234** (0.009)	−0.0858*** (0.006)	−0.0468*** (0.003)	−0.1347*** (0.003)	−0.2529*** (0.011)
Change in observable characteristics	−0.0214** (0.011)	−0.0382*** (0.004)	−0.0072** (0.003)	−0.0038 (0.005)	−0.0167** (0.007)
Change in wage structure	0.0532*** (0.015)	0.0450* (0.024)	0.0180 (0.012)	0.0083 (0.010)	0.0060 (0.022)
Change in unequal treatment	0.0638* (0.035)	0.0486*** (0.012)	−0.0470 (0.099)	−0.0499 (0.057)	0.0480 (0.073)
Change in unobservables	−0.0238	0.0759	0.0906	0.1736	0.1702

Notes: (1) ***, ** and * refers to the variables of which the estimated coefficients are statistically significant at level of 0.01, 0.05 and 0.1, respectively. (2) Standard errors are in parentheses.

[a] Using expression (14) in the text.

[b] Using expression (15) in the text.

points on the conditional wage distribution, though it is more pronounced at the top rather than the bottom end of the distribution (see Tables 4a–4c). In fact, the change in the overall gender difference between 1993 and 2002 is poorly determined at the 10th percentile. The quantile gender pay gaps between 1993 and 2002 are decomposed using both expressions (14) and (15). The change in observable characteristics at the 10th percentile and changes in observable gender differentials account for most of the contraction. This suggests that the narrowing gender pay gap at the bottom end of the distribution might again be attributable to the selective withdrawal from the Vietnamese labour market of the more poorly qualified woman in terms of their observable characteristics. At the top end of the wage distribution the gender pay gap contracted by 0.19 log points over these 2 years with changes in observable gender differentials and wage structure exerting an important narrowing role regardless of whether expression (14) or (15) is used to undertake the decomposition. The change in unobservables appears important in explaining the contraction in the gap over time at the 90th percentile. The reduction in unequal treatment of men and women appears an important driver for the reduced gender pay gap at the 25th, the median and 75th quantiles. Thus, the underlying narrative regarding the contraction of the gender pay is somewhat nuanced and interpretation is sensitive to the selected point on the conditional wage distribution examined.

5. Conclusions

The *Doi moi* reforms have had a significant impact on the labour market in Vietnam and appear to have acted to reduce gender pay disparities in the wage employment sector. The average gender pay gap in this sector halved between 1993 and 2002 with most of the reduction achieved by 1998. There is thus some evidence that over more recent years the average gap has been characterised by a degree of stability. It is difficult to isolate the factors responsible for this contraction but the selective withdrawal from wage employment of poorly qualified Vietnamese women, in terms of both observable and unobservable characteristics, is flagged as one possible source for this phenomenon (see footnote 24). Hunt (2002) assigned much of the improvement in the relative wage position of East German women post-unification to the selective withdrawal from the labour market of the most poorly qualified. Alternatively, the contraction in the pay gap may also be attributable to the labour market valuing the unobervables characteristics of women who selecting into wage employment more highly than was the case pre-reform. However, a definitive conclusion on this matter is beyond the scope of the current paper and would require more detailed analysis of the Vietnamese case than that offered here, and, moreover, could only be usefully informed by exploitation of panel data.

A novel contribution of this paper has been the examination of the degree to which the gender pay gap varies across the conditional wage distribution. The decompositions suggest that, in contrast to many transitional economies, the gender pay gap attributable to the treatment effect is relatively stable across the conditional wage distribution. In comport with the mean regression findings, there has also been a contraction in the gender pay at most selected points of the conditional wage distribution with the observed effect most pronounced at the top end of this distribution. The change in unobservables appears important in explaining the contraction in the gap over time at the 90th percentile which is again resonant of our unreported findings for the mean regression. However, the reduction in the unequal labour market treatment of women only appears an important driver for the reduced gender pay gap in the central parts of the conditional wage distribution.

The observed reduction in gender wage disparity overall is, from a policy perspective, interpretable in a positive light. However, it is not clear if this improvement is attributable to deliberate policies targeted at gender main-streaming, as the issue of the gender pay gap has not been highlighted or emphasized in the government's gender development strategy documents. For instance, the country's Comprehensive Poverty Reduction and Growth Strategy (CRPGS) incorporates gender perspectives in all fields (SRV, 2003), but the strategy is not transparent as to how the gender wage gap features in this framework. This omission is also characteristic of the National Action Plan for the Advancement of Women 2001–2005, and 2006–2010 (see UNDP, 2004 for summary of these Plans).[25] It may be taken to suggest that though gender development has been emphasized in the country's development strategy, the gender pay gap has not been considered as an important part of the gender main-streaming process. As Vietnam continues its economic growth, the wage employment sector will, in all likelihood, rapidly expand. Given the country's economic development, it is likely to undergo a more radical structural change away from light labour-intensive export-oriented industries towards more heavier capital-intensive industries. This might have entirely different impacts on the labour market than heretofore, and the effects for female workers and their wages are thus unclear. In this context, it appears reasonable to encourage a stronger government focus on the gender pay disparity within the country's overall gender main-streaming framework.

We believe our analysis provides an informative portrait of the gender pay gap in the Vietnamese wage employment sector over a recent time period, but this sector only comprised a quarter of those at work in Vietnam in 2002. It should be stressed, therefore, that this study offers only a partial insight into the effect of the *Doi moi* reforms on women within the Vietnamese labour market. The sizeable contraction in the gender wage gap among the wage employed is a welcome aspect of the transformation process. However, this finding should not be over-emphasized and some perspective is clearly required. For instance, our analysis did not examine the impact of the reform process on other important female employment sectors (e.g., the self-employed or those employed in the informal sector) or the implications for those women discouraged from retaining links with the formal labour market. The impact of enterprise re-structuring, the re-shaping of social safety nets and child-care facilities, and the changing demands on female non-market time may exert more important influences on the quality of women's lives in Vietnam in the near future than the evolution of the gender pay gap in the wage employment sector. These issues clearly merit investigation in their own right in order to document and understand more fully the changing position of women in the Vietnamese labour market.

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[25] These two documents contain the key strategies adopted by Vietnam in promoting gender mainstreaming within the Beijing Platform as endorsed at the 1995 Bejing UN Conference on Women (see UNDP, 2004 for more details).

Appendix A

Table A1
Description of variables and summary statistics

Variables	Variable description	1993 samples			1998 samples			2002 samples		
		Pooled	Male	Female	Pooled	Male	Female	Pooled	Male	Female
Hourly real wage (ln)	Hourly wage rate adjusted by CPI and regional price index	0.3920 (0.629)	0.5056 (0.612)	0.2159 (0.616)	0.9372 (0.613)	0.9947 (0.614)	0.8498 (0.603)	1.2093 (0.623)	1.2669 (0.601)	1.1165 (0.644)
Married	=1 if married, 0 otherwise	0.5427	0.5927	0.4651	0.5606	0.6151	0.4776	0.6154	0.6445	0.5684
Age	Age (years)	30.307 (10.55)	30.589 (10.44)	29.870 (10.71)	32.119 (10.66)	32.660 (10.65)	31.298 (10.63)	32.604 (10.63)	33.091 (10.61)	31.819 (10.61)
Age squared	Age squared (years)	1029.7 (718.5)	1044.6 (720.6)	1006.7 (715.1)	1145.3 (741.1)	1180.1 (753.8)	1092.53 (718.5)	1176.1 (737.3)	1207.68 (743.9)	1125.2 (723.7)
Illiteracy	=1 if no schooling, 0 otherwise	0.2013	0.1954	0.2105	0.0404	0.0403	0.0406	0.1215	0.1115	0.1378
Primary education	=1 having primary education, 0 otherwise	0.2688	0.2872	0.2404	0.2181	0.2123	0.2268	0.2284	0.2415	0.2074
Lower secondary	=1 having lower secondary education, 0 otherwise	0.2342	0.2404	0.2248	0.3521	0.3707	0.3237	0.2400	0.2674	0.1958
Upper secondary	=1 having upper secondary education, 0 otherwise	0.0926	0.0862	0.1024	0.1977	0.1976	0.1978	0.1282	0.1245	0.1343
Higher education	=1 having higher education, 0 otherwise	0.2030	0.1908	0.2219	0.1918	0.1791	0.2111	0.2818	0.2552	0.3247
Health	=1 if having a treatment at hospital over the past 4 weeks	0.0284	0.0220	0.0384	0.0407	0.0305	0.0563	0.0395	0.0341	0.0482
Kinh	=1 if belonging in the Kinh majority	0.8929	0.8807	0.9118	0.9018	0.9020	0.9015	0.9389	0.9433	0.9319
Private	=1 if being employed in the public sector	0.6414	0.6908	0.5647	0.6108	0.6434	0.5613	0.4922	0.5213	0.4453
Public	=1 if being employed in the private sector	0.3586	0.3092	0.4353	0.3892	0.3566	0.4387	0.3518	0.4787	0.5547
Urban	=1 if living in urban areas	0.4785	0.4367	0.5434	0.5071	0.4785	0.5505	0.4227	0.4008	0.4579
Northern Uplands	=1 if residing in Northern Uplands	0.0937	0.0862	0.1053	0.0650	0.0637	0.0671	0.1169	0.1178	0.1154
Red River Delta	=1 if residing in Red River Delta	0.1907	0.1991	0.1778	0.1754	0.1867	0.1581	0.2328	0.2450	0.2131
North Central Coast	=1 if residing in North Central Coast	0.0597	0.0642	0.0526	0.0929	0.0969	0.0869	0.0801	0.0882	0.0669
South Central Coast	=1 if residing in South Central Coast	0.1255	0.1358	0.1095	0.1484	0.1595	0.1316	0.1454	0.1542	0.1312
Central Highlands	=1 if residing in Central Highlands	0.0106	0.0128	0.0071	0.0164	0.0136	0.0207	0.0815	0.0739	0.0937
Southeast	=1 if residing in Southeast	0.2632	0.2459	0.2902	0.2995	0.2760	0.3353	0.1180	0.1059	0.1375
Mekong River Delta	=1 if residing in Mekong River Delta	0.2566	0.2560	0.2575	0.2023	0.2036	0.2003	0.2254	0.2150	0.2422
Quarter 1	=1 if interviewed in 1st quarter	0.1573	0.1367	0.1892	0.2624	0.2510	0.2798	0.2436	0.2426	0.2453
Quarter 2	=1 if interviewed in 2nd quarter	0.2811	0.2899	0.2674	0.3008	0.2999	0.3022	0.2677	0.2656	0.2711
Quarter 3	=1 if interviewed in 3rd quarter	0.2225	0.2358	0.2020	0.2811	0.2858	0.2740	0.2536	0.2506	0.2584
Quarter 4	=1 if interviewed in 4th quarter	0.3391	0.3376	0.3414	0.1557	0.1633	0.1440	0.2351	0.2412	0.2252
Number of observations		1793	1090	703	3045	1837	1208	17063	10531	6532

Note: These are raw figures computed without controlling for any characteristics; standard deviations of continuous variables are reported in parentheses.

Table A2
Pooled regression model, 1993

	Mean	Q10	Q25	Q50	Q75	Q90
Male	0.2774** (0.029)	0.3125*** (0.048)	0.3157*** (0.037)	0.3060*** (0.035)	0.2990*** (0.032)	0.2814*** (0.053)
Married	−0.0828** (0.035)	−0.0656 (0.075)	−0.0721 (0.056)	−0.0517 (0.039)	−0.1565*** (0.039)	−0.1327** (0.061)
Age	0.0313*** (0.009)	0.0577*** (0.018)	0.0330*** (0.011)	0.0180* (0.011)	0.0160* (0.009)	0.0094 (0.013)
Age squared	−0.0004*** (0.000)	−0.0008*** (0.000)	−0.0005*** (0.000)	−0.0002 (0.000)	−0.0002 (0.000)	−0.0001 (0.000)
Primary education	0.0200 (0.044)	0.0053 (0.081)	−0.0455 (0.051)	0.0505 (0.043)	0.0518 (0.040)	0.0870 (0.064)
Lower secondary	0.0279 (0.048)	0.0082 (0.094)	0.0408 (0.065)	0.0972** (0.042)	0.0417 (0.049)	0.0886 (0.077)
Upper secondary	0.0694 (0.059)	0.0682 (0.112)	0.0743 (0.094)	0.1244** (0.064)	0.0745 (0.080)	0.1851* (0.103)
Higher education	0.0638 (0.057)	0.1332 (0.107)	0.0972 (0.070)	0.0764 (0.057)	0.0178 (0.073)	0.0709 (0.099)
Health	−0.0588 (0.074)	−0.0767 (0.180)	−0.1175 (0.077)	−0.0169 (0.086)	−0.0613 (0.085)	−0.0422 (0.131)
Kinh	0.0104 (0.048)	0.0461 (0.120)	0.0934** (0.048)	0.0245 (0.049)	0.0074 (0.045)	0.0278 (0.081)
Private	0.0742** (0.039)	0.1214* (0.072)	0.1038* (0.059)	0.0102 (0.040)	−0.0065 (0.046)	0.0274 (0.062)
Urban	0.0471** (0.023)	0.1341** (0.064)	0.0280 (0.042)	0.0428** (0.021)	0.0388 (0.042)	0.0722 (0.055)
Northern Uplands	−0.5818*** (0.056)	−0.6725*** (0.086)	−0.7831*** (0.077)	−0.7297*** (0.076)	−0.4883*** (0.069)	−0.3436*** (0.131)
Red River Delta	−0.5018*** (0.045)	−0.7225*** (0.087)	−0.5585*** (0.064)	−0.5571*** (0.056)	−0.3774*** (0.060)	−0.3502*** (0.092)
North Central Coast	−0.4967*** (0.064)	−0.7544*** (0.163)	−0.4770*** (0.085)	−0.4638*** (0.073)	−0.4631*** (0.061)	−0.3646*** (0.139)
South Central Coast	−0.4569*** (0.048)	−0.5527*** (0.100)	−0.5032*** (0.064)	−0.5421*** (0.056)	−0.4035*** (0.069)	−0.3282*** (0.085)
Central Highlands	−0.1689* (0.095)	−0.1687 (0.166)	−0.2932** (0.152)	−0.1968 (0.180)	−0.0765 (0.137)	−0.1601 (0.111)
Mekong River Delta	−0.2343*** (0.042)	−0.4082*** (0.088)	−0.2884*** (0.054)	−0.2240*** (0.043)	−0.1287*** (0.047)	−0.1242* (0.072)
Interviewed in 1st quarter	0.0353 (0.043)	0.0963 (0.074)	0.0213 (0.069)	0.0976* (0.054)	0.0036 (0.057)	0.0206 (0.077)
Interviewed in 2nd quarter	0.0210 (0.035)	0.0305 (0.077)	0.0276 (0.045)	0.0219 (0.042)	0.0200 (0.045)	0.0138 (0.062)
Interviewed in 3rd quarter	0.0249 (0.043)	0.0432 (0.075)	0.0318 (0.056)	0.0258 (0.048)	0.0163 (0.057)	0.0197 (0.072)
Constant	−0.2498 (0.161)	−1.3289*** (0.343)	−0.4906** (0.206)	0.0177 (0.195)	0.2694* (0.152)	0.6616*** (0.191)
R^2 or Pseudo R^2	0.2014	0.1416	0.1491	0.1372	0.1242	0.0868
Wald test (1) $\sim \chi^2_{20}$	39.329***	44.325***	54.597***	45.454***	25.303	35.270**
Wald test (2) $\sim \chi^2_{21}$	130.09***	76.657***	167.10***	140.18***	124.36***	89.243***
Number of observations	1793	1793	1793	1793	1793	1793

Notes: ***, ** and * refers to the variables of which the estimated coefficients are statistically significant at level of 0.01, 0.05 and 0.1 respectively. Standard errors are in parentheses. The OLS standard errors are based on Huber (1967) and the quantile regression model estimates are based on bootstrapping with 200 replications. Wald tests (1) and (2) are tests for the statistical significance of the estimated coefficients across gender groups. Wald test (1) tests for gender differences in all coefficients excluding the constant term, and Wald test (2) tests for gender differences in all coefficients including the constant term.

Table A3
Pooled regression model, 1998

	Mean	Q10	Q25	Q50	Q75	Q90
Male	0.1711*** (0.021)	0.2193*** (0.033)	0.1823*** (0.024)	0.1622*** (0.024)	0.1257*** (0.026)	0.1446*** (0.046)
Married	−0.0140 (0.027)	−0.0206 (0.055)	−0.0377 (0.033)	−0.0118 (0.033)	0.0268 (0.032)	−0.0234 (0.048)
Age	0.0363*** (0.007)	0.0494*** (0.013)	0.0513*** (0.010)	0.0261*** (0.008)	0.0081 (0.010)	0.0226** (0.011)
Age squared	−0.0004*** (0.000)	−0.0007*** (0.000)	−0.0007*** (0.000)	−0.0003** (0.000)	0.0000 (0.000)	−0.0002 (0.000)
Primary education	0.0105 (0.053)	−0.0167 (0.083)	0.0179 (0.061)	0.0196 (0.049)	0.0401 (0.047)	0.0542 (0.073)
Lower secondary	0.0494 (0.054)	0.0042 (0.089)	0.0231 (0.063)	0.0644 (0.054)	0.1239** (0.053)	0.1386* (0.076)
Upper secondary	0.2039*** (0.059)	0.1486* (0.089)	0.1331* (0.074)	0.1930*** (0.059)	0.2565*** (0.066)	0.3149*** (0.095)
Higher education	0.3868*** (0.061)	0.2730*** (0.090)	0.2726*** (0.069)	0.3702*** (0.068)	0.4941*** (0.072)	0.5830*** (0.093)
Health	−0.0202 (0.051)	−0.1380 (0.124)	−0.0930* (0.056)	−0.0066 (0.055)	−0.0396 (0.060)	0.0225 (0.106)
Kinh	0.0397 (0.036)	0.0145 (0.050)	0.0790* (0.045)	0.0283 (0.040)	0.0310 (0.038)	0.0248 (0.064)
Private	0.0538** (0.028)	0.0930** (0.043)	0.0720** (0.032)	0.0002 (0.029)	0.0210 (0.034)	0.0466 (0.050)
Urban	0.1077*** (0.024)	0.0315 (0.042)	0.0386 (0.032)	0.0746** (0.030)	0.1062*** (0.032)	0.1654*** (0.052)
Northern Uplands	−0.3813*** (0.042)	−0.3926*** (0.073)	−0.3731*** (0.065)	−0.3574*** (0.044)	−0.4715*** (0.059)	−0.3137*** (0.085)
Red River Delta	−0.3893*** (0.035)	−0.5562*** (0.070)	−0.4293*** (0.045)	−0.3707*** (0.038)	−0.3321*** (0.040)	−0.2462*** (0.063)
North Central Coast	−0.4488*** (0.042)	−0.5409*** (0.071)	−0.4207*** (0.061)	−0.4647*** (0.041)	−0.4531*** (0.055)	−0.3696*** (0.081)
South Central Coast	−0.3314*** (0.030)	−0.2559*** (0.050)	−0.2886*** (0.045)	−0.3154*** (0.039)	−0.3624*** (0.036)	−0.3824*** (0.051)
Central Highlands	−0.1754** (0.077)	0.0213 (0.230)	−0.1117 (0.088)	−0.1416*** (0.054)	−0.3019*** (0.068)	−0.3133** (0.139)
Mekong River Delta	−0.2462*** (0.030)	−0.2002*** (0.046)	−0.2551*** (0.036)	−0.2371*** (0.036)	−0.2588*** (0.040)	−0.2568*** (0.053)
Interviewed in 1st quarter	−0.0077 (0.035)	−0.0683 (0.065)	−0.0670 (0.045)	−0.0224 (0.039)	0.0273 (0.038)	0.0342 (0.059)
Interviewed in 2nd quarter	0.0228 (0.033)	0.0160 (0.065)	−0.0202 (0.042)	0.0142 (0.035)	0.0327 (0.039)	0.0310 (0.051)
Interviewed in 3rd quarter	0.0049 (0.034)	0.0477 (0.069)	0.0356 (0.042)	0.0176 (0.036)	0.0544 (0.035)	0.0284 (0.051)
Constant	0.1298 (0.135)	−0.5157** (0.244)	0.3307* (0.177)	0.3525** (0.169)	0.7901*** (0.158)	0.7750*** (0.202)
R^2 or Pseudo R^2	0.1798	0.0843	0.0821	0.1044	0.1360	0.1598
Wald test (1) $\sim \chi^2_{20}$	79.045***	77.126***	83.535***	85.725***	66.812***	45.534***
Wald test (2) $\sim \chi^2_{21}$	175.37***	106.67***	137.15***	172.27***	141.02***	65.037***
Number of observations	3044	3044	3044	3044	3044	3044

Note: See Table A2.

Table A4
Pooled regression model, 2002

	Mean	Q10	Q25	Q50	Q75	Q90
Male	0.1783*** (0.009)	0.2026*** (0.018)	0.1940*** (0.012)	0.1643*** (0.009)	0.1354*** (0.010)	0.1279*** (0.016)
Married	−0.0703*** (0.012)	−0.0754*** (0.023)	−0.0780*** (0.014)	−0.0664*** (0.013)	−0.0494*** (0.014)	−0.0756** (0.021)
Age	0.0365*** (0.003)	0.0613*** (0.006)	0.0417*** (0.003)	0.0305*** (0.003)	0.0280*** (0.004)	0.0201*** (0.006)
Age squared	−0.0004*** (0.000)	−0.0008*** (0.000)	−0.0005*** (0.000)	−0.0003*** (0.000)	−0.0003*** (0.000)	−0.0002* (0.000)
Primary education	0.0782*** (0.015)	0.1356*** (0.029)	0.1092*** (0.019)	0.0800*** (0.017)	0.0593*** (0.019)	0.0575*** (0.025)
Lower secondary	0.1074*** (0.016)	0.1645*** (0.029)	0.1456*** (0.020)	0.1128*** (0.018)	0.0911*** (0.019)	0.0627** (0.026)
Upper secondary	0.2882*** (0.019)	0.2711*** (0.034)	0.2662*** (0.022)	0.2655*** (0.022)	0.2959*** (0.025)	0.3530*** (0.036)
Higher education	0.5304*** (0.018)	0.5043*** (0.030)	0.5243*** (0.022)	0.5342*** (0.021)	0.5547*** (0.022)	0.5645*** (0.028)
Health	−0.0581*** (0.023)	−0.0194 (0.048)	−0.0630** (0.031)	−0.0653*** (0.026)	−0.0607*** (0.022)	0.0919** (0.042)
Kinh	0.0979*** (0.020)	0.1147** (0.047)	0.0393* (0.022)	0.0713*** (0.021)	0.0730*** (0.018)	0.1102*** (0.030)
Private	0.0498*** (0.011)	0.1328*** (0.021)	0.0921*** (0.015)	0.0260** (0.013)	0.0026 (0.012)	0.0023 (0.017)
Urban	0.1074*** (0.011)	0.1025*** (0.021)	0.1025*** (0.014)	0.0758*** (0.012)	0.0970*** (0.012)	0.1578*** (0.019)
Northern Uplands	−0.1621*** (0.018)	−0.1767*** (0.033)	−0.1627*** (0.025)	−0.1914*** (0.021)	−0.1925*** (0.021)	−0.1844*** (0.032)
Red River Delta	−0.1879*** (0.015)	−0.2222*** (0.028)	−0.1825*** (0.019)	−0.2183*** (0.016)	−0.2088*** (0.018)	−0.1753*** (0.023)
North Central Coast	−0.2325*** (0.019)	−0.2697*** (0.035)	−0.2434*** (0.025)	−0.2662*** (0.019)	−0.2346*** (0.025)	−0.1708*** (0.041)
South Central Coast	−0.0791*** (0.015)	−0.0683** (0.031)	−0.0447** (0.020)	−0.1086*** (0.016)	−0.1230** (0.020)	−0.1170*** (0.026)
Central Highlands	0.1761*** (0.021)	0.0333 (0.038)	0.1441*** (0.029)	0.1830*** (0.025)	0.2454*** (0.027)	0.2988 (0.032)
Mekong River Delta	−0.0632*** (0.015)	−0.1263*** (0.031)	−0.0577*** (0.019)	−0.0870*** (0.018)	−0.0545*** (0.018)	0.0091 (0.023)
Interviewed in 1st quarter	−0.0367*** (0.012)	−0.0536** (0.023)	−0.0524*** (0.016)	−0.0516*** (0.014)	−0.0282** (0.013)	0.0137 (0.022)
Interviewed in 2nd quarter	0.0097 (0.012)	0.0110 (0.021)	−0.0108 (0.015)	−0.0037 (0.013)	0.0028 (0.013)	0.0303 (0.018)
Interviewed in 3rd quarter	0.0284** (0.012)	0.0415 (0.039)	0.0413 (0.035)	0.0281 (0.023)	0.0006 (0.013)	0.0311 (0.019)
Constant	0.0378 (0.056)	−0.5012*** (0.103)	−0.3196*** (0.064)	0.2230*** (0.055)	0.5552*** (0.064)	0.8659*** (0.097)
R^2 or Pseudo R^2	0.2419	0.0991	0.1157	0.1515	0.1735	0.1724
Wald test (1) $\sim \chi^2_{20}$	101.75***	84.018***	145.674***	95.973***	60.183***	35.507**
Wald test (2) $\sim \chi^2_{21}$	550.81***	246.87***	430.88***	402.66***	311.80***	169.49***
Number of observations	17063	17063	17063	17063	17063	17063

Note: See Table A2.

Table A5
Male and female regression models, 1993

	Male sample						Female sample					
	Mean	Q10	Q25	Q50	Q75	Q90	Mean	Q10	Q25	Q50	Q75	Q90
Married	−0.1151***	−0.1482*	−0.1522**	−0.0450	−0.1422**	−0.1462**	−0.0590	−0.0134	−0.0251	−0.0308	−0.0506	−0.1442
	(0.052)	(0.090)	(0.076)	(0.055)	(0.065)	(0.077)	(0.051)	(0.084)	(0.068)	(0.057)	(0.075)	(0.104)
Age	0.0335***	0.0748***	0.0334**	0.0241	0.0110	0.0023	0.0248*	0.0905***	0.0230	0.0157	0.0305*	0.0122
	(0.013)	(0.023)	(0.016)	(0.016)	(0.014)	(0.016)	(0.013)	(0.028)	(0.018)	(0.018)	(0.017)	(0.025)
Age squared	−0.0005**	−0.0012***	−0.0005**	−0.0002	−0.0001	0.0000	−0.0003*	−0.0012***	−0.0003	−0.0002	−0.0004	−0.0003
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	0.0632	0.0078	−0.0489	0.1065*	0.0738	0.1583*	0.0605	0.0031	−0.0914	−0.0366	0.0007	−0.0364
	(0.055)	(0.124)	(0.060)	(0.058)	(0.058)	(0.085)	(0.068)	(0.131)	(0.102)	(0.073)	(0.081)	(0.135)
Lower secondary	0.0305	0.0739	0.0271	0.1129*	0.0517	0.0866	0.0135	0.0079	0.0621	0.0190	0.0440	0.1716
	(0.060)	(0.144)	(0.078)	(0.062)	(0.069)	(0.086)	(0.078)	(0.151)	(0.123)	(0.070)	(0.096)	(0.144)
Upper secondary	0.1109	0.0698	0.0357	0.1221*	0.1539	0.2031*	0.0254	0.0754	0.0642	0.0133	0.0960	0.1175
	(0.076)	(0.176)	(0.118)	(0.076)	(0.111)	(0.119)	(0.095)	(0.158)	(0.131)	(0.108)	(0.120)	(0.191)
Higher education	0.1080	0.0997	0.1282	0.1406*	0.0842	0.0921	0.0113	0.1267	0.1487	0.1891	0.0007	0.0532
	(0.076)	(0.180)	(0.097)	(0.076)	(0.105)	(0.120)	(0.086)	(0.159)	(0.128)	(0.097)	(0.116)	(0.144)
Health	−0.0073	−0.0577	0.0925	−0.0082	−0.0846	−0.0559	−0.0632	−0.1134	−0.2051	−0.0772	−0.0069	−0.0231
	(0.109)	(0.270)	(0.142)	(0.126)	(0.165)	(0.146)	(0.095)	(0.193)	(0.129)	(0.135)	(0.136)	(0.178)
Kinh	0.0362	0.0915	−0.0434	−0.0592	0.0195	0.0966	0.1099	0.0859	0.0727	0.1186	0.0326	0.3198**
	(0.060)	(0.154)	(0.063)	(0.057)	(0.066)	(0.080)	(0.077)	(0.131)	(0.122)	(0.089)	(0.134)	(0.155)
Private	0.1925***	0.2353**	0.2647***	0.1272**	0.0776	0.0321	−0.1135**	−0.0630	−0.1556*	−0.1727***	−0.1320*	−0.0866
	(0.054)	(0.117)	(0.076)	(0.050)	(0.076)	(0.081)	(0.053)	(0.102)	(0.087)	(0.058)	(0.074)	(0.084)
Urban	0.0811**	0.2322***	0.0459	0.0558	0.0351	0.0662	0.0052	0.0296	0.1613**	0.0881	0.0776	0.0585
	(0.043)	(0.083)	(0.054)	(0.046)	(0.058)	(0.056)	(0.052)	(0.101)	(0.077)	(0.062)	(0.073)	(0.106)
Northern Uplands	−0.5131***	−0.6285***	−0.6857***	−0.6394***	−0.4191***	−0.3788***	−0.6647***	−0.6609***	−0.8629***	−0.7676***	−0.5817***	−0.4728**
	(0.078)	(0.114)	(0.114)	(0.107)	(0.091)	(0.141)	(0.082)	(0.110)	(0.101)	(0.119)	(0.129)	(0.223)
Red River Delta	−0.4667***	−0.5914***	−0.4621***	−0.5440***	−0.3857***	−0.3384***	−0.5684***	−0.9104***	−0.7240***	−0.4995***	−0.3981***	−0.2981**
	(0.059)	(0.112)	(0.087)	(0.068)	(0.085)	(0.092)	(0.073)	(0.126)	(0.119)	(0.102)	(0.090)	(0.143)
North Central Coast	−0.4728***	−0.4991**	−0.4193***	−0.4816***	−0.4663***	−0.5438***	−0.5475***	−0.8386***	−0.5850***	−0.5330***	−0.3845***	−0.4063**
	(0.085)	(0.213)	(0.090)	(0.089)	(0.073)	(0.182)	(0.099)	(0.171)	(0.202)	(0.139)	(0.117)	(0.181)
South Central Coast	−0.4565***	−0.6384***	−0.4438***	−0.5298	−0.4311***	−0.3151***	−0.4414***	−0.5845***	−0.4568***	−0.5499***	−0.2910**	−0.1093
	(0.060)	(0.128)	(0.081)	(0.075)	(0.084)	(0.099)	(0.082)	(0.170)	(0.095)	(0.084)	(0.133)	(0.168)

Table A5 (*Continued*)

	Male sample						Female sample					
	Mean	Q10	Q25	Q50	Q75	Q90	Mean	Q10	Q25	Q50	Q75	Q90
Central Highlands	−0.0981	0.1353	−0.1930	−0.1659	−0.0853	−0.1919	−0.3484	−0.4069	−0.6225	−0.4162	−0.1104	0.0321
	(0.095)	(0.140)	(0.136)	(0.163)	(0.158)	(0.151)	(0.229)	(0.327)	(0.402)	(0.398)	(0.397)	(0.451)
Mekong River Delta	−0.1972***	−0.3842***	−0.2220***	−0.2182***	−0.1236**	−0.1125*	−0.3016***	−0.4494***	−0.3410***	−0.2743***	−0.1576*	−0.1866*
	(0.054)	(0.124)	(0.070)	(0.058)	(0.062)	(0.068)	(0.066)	(0.113)	(0.093)	(0.066)	(0.100)	(0.118)
Interviewed in 1st quarter	0.0319	−0.0667	0.1202	0.0704	0.0271	0.1270*	0.0355	0.0599	0.0775	0.0671	0.0147	−0.1273
	(0.061)	(0.151)	(0.103)	(0.070)	(0.084)	(0.075)	(0.062)	(0.094)	(0.093)	(0.088)	(0.078)	(0.135)
Interviewed in 2nd quarter	0.0231	0.0330	0.0278	0.0197	0.0216	0.0172	0.0151	0.1488	0.0181	0.0192	0.0146	0.0591
	(0.043)	(0.087)	(0.056)	(0.051)	(0.055)	(0.065)	(0.060)	(0.111)	(0.091)	(0.067)	(0.078)	(0.113)
Interviewed in 3rd quarter	0.0215	0.0320	0.0247	0.0215	0.0166	0.0202	0.0333	0.0499	0.0390	0.0310	0.0254	0.0276
	(0.053)	(0.137)	(0.079)	(0.065)	(0.073)	(0.086)	(0.070)	(0.119)	(0.100)	(0.075)	(0.093)	(0.138)
Constant	−0.2106	−1.4328***	−0.4461*	0.1289	0.5274**	0.8888***	0.1708	−1.6742***	−0.0597	0.4047	0.2373	1.1259**
	(0.233)	(0.454)	(0.276)	(0.282)	(0.233)	(0.249)	(0.223)	(0.503)	(0.329)	(0.280)	(0.321)	(0.444)
R^2 or Pseudo R^2	0.1643	0.1380	0.1224	0.1134	0.1003	0.0785	0.1877	0.1689	0.1468	0.1321	0.0995	0.0791
Number of observations	1090	1090	1090	1090	1090	1090	703	703	703	703	703	703

Notes: ***, ** and * refers to the variables of which the estimated coefficients are statistically significant at level of 0.01, 0.05 and 0.1, respectively. Standard errors are in parentheses. The OLS standard errors are based on Huber (1967) and the quantile regression model estimates are based on bootstrapping with 200 replications.

Table A6
Male and female regression models, 1998

	Male sample						Female sample					
	Mean	Q10	Q25	Q50	Q75	Q90	Mean	Q10	Q25	Q50	Q75	Q90
Married	−0.0038	−0.0472	−0.0350	−0.0263	−0.0398	−0.0171	−0.0040	−0.0885	−0.0695	−0.0258	−0.0070	−0.0364
	(0.037)	(0.070)	(0.047)	(0.038)	(0.049)	(0.060)	(0.038)	(0.062)	(0.050)	(0.043)	(0.060)	(0.078)
Age	0.0358***	0.0695***	0.0519***	0.0295***	0.0093	0.0236*	0.0158	0.0252	0.0265**	0.0170	−0.0078	−0.0132
	(0.010)	(0.017)	(0.011)	(0.011)	(0.013)	(0.015)	(0.012)	(0.021)	(0.014)	(0.014)	(0.016)	(0.017)
Age squared	−0.0004***	−0.0010***	−0.0007***	−0.0004**	0.0000	−0.0002	−0.0001	−0.0003	−0.0003	−0.0002	0.0003	0.0004*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	0.0195	0.0410	0.0047	0.0041	0.0155	0.0244	0.0985*	0.0180	0.0645	0.0531	0.1465*	0.2985***
	(0.069)	(0.280)	(0.070)	(0.071)	(0.060)	(0.104)	(0.062)	(0.127)	(0.082)	(0.085)	(0.082)	(0.098)
Lower secondary	0.0320	0.0181	0.0476	0.0212	0.1094	0.1987*	0.1486**	0.0392	0.1080	0.1239	0.1983**	0.2919***
	(0.070)	(0.277)	(0.070)	(0.076)	(0.075)	(0.115)	(0.064)	(0.115)	(0.092)	(0.084)	(0.079)	(0.110)
Upper secondary	0.1725**	0.1269	0.1512**	0.1570*	0.2162**	0.3003**	0.3017***	0.1207	0.2077**	0.2713***	0.4010***	0.6451***
	(0.075)	(0.274)	(0.076)	(0.084)	(0.088)	(0.126)	(0.076)	(0.133)	(0.100)	(0.094)	(0.109)	(0.131)
Higher education	0.3563***	0.2289	0.2917***	0.2824***	0.4905***	0.6043**	0.4709***	0.3415	0.3853***	0.4543	0.5681***	0.8801***
	(0.079)	(0.287)	(0.085)	(0.086)	(0.098)	(0.126)	(0.079)	(0.135)	(0.107)	(0.094)	(0.102)	(0.156)
Health	−0.0285	−0.0298	−0.1264**	−0.0941	−0.1032	−0.0415	−0.0036	−0.0640	−0.0444	−0.0783	−0.0408	−0.0012
	(0.072)	(0.163)	(0.066)	(0.061)	(0.093)	(0.144)	(0.063)	(0.155)	(0.095)	(0.077)	(0.079)	(0.107)
Kinh	0.0619	0.0237	0.0418	0.1048**	0.1064**	0.0289	0.0373	0.0199	0.0502	0.0333	0.1299*	0.1667*
	(0.044)	(0.082)	(0.051)	(0.052)	(0.052)	(0.078)	(0.057)	(0.077)	(0.069)	(0.074)	(0.071)	(0.095)
Private	0.1902***	0.2717**	0.2499***	0.1393***	0.1044**	0.1746***	−0.1562***	−0.1482**	−0.1859***	−0.1513***	−0.1119**	−0.0452
	(0.035)	(0.064)	(0.042)	(0.040)	(0.041)	(0.060)	(0.042)	(0.063)	(0.053)	(0.045)	(0.053)	(0.078)
Urban	0.1549***	0.0138	0.0772**	0.1272***	0.1479***	0.2645***	0.0514	0.0031	0.0291	0.0021	0.0118	0.1171*
	(0.030)	(0.050)	(0.039)	(0.036)	(0.040)	(0.064)	(0.036)	(0.062)	(0.050)	(0.047)	(0.052)	(0.064)
Northern Uplands	−0.4110***	−0.4037***	−0.4309***	−0.4193***	−0.4953***	−0.3865***	−0.3745***	−0.2948**	−0.3914***	−0.3591***	−0.3650***	−0.3858***
	(0.056)	(0.089)	(0.068)	(0.077)	(0.069)	(0.084)	(0.063)	(0.116)	(0.095)	(0.064)	(0.126)	(0.120)
Red River Delta	−0.4076***	−0.5431***	−0.4585***	−0.3674***	−0.3674***	−0.2869***	−0.3730***	−0.5613***	−0.3909***	−0.3331***	−0.3206***	−0.1871
	(0.043)	(0.085)	(0.063)	(0.047)	(0.055)	(0.068)	(0.059)	(0.131)	(0.072)	(0.073)	(0.090)	(0.126)
North Central Coast	−0.4884***	−0.6937***	−0.4983***	−0.5224***	−0.4750***	−0.3329***	−0.4254***	−0.4076***	−0.4101***	−0.4183***	−0.5086***	−0.4088**
	(0.055)	(0.096)	(0.064)	(0.057)	(0.063)	(0.095)	(0.062)	(0.108)	(0.086)	(0.056)	(0.091)	(0.165)
South Central Coast	−0.3583***	−0.3034***	−0.3106***	−0.3265***	−0.3971***	−0.4139***	−0.3171***	−0.2140***	−0.3033***	−0.3421***	−0.3395***	−0.4031***
	(0.039)	(0.074)	(0.050)	(0.045)	(0.053)	(0.066)	(0.047)	(0.072)	(0.061)	(0.062)	(0.065)	(0.078)
Central Highlands	−0.3901***	−0.4844	−0.1594	−0.2929***	−0.3934***	−0.4279***	−0.0893	0.1639	0.0129	−0.1314*	−0.2265**	−0.3538***
	(0.101)	(0.312)	(0.158)	(0.089)	(0.095)	(0.114)	(0.071)	(0.151)	(0.098)	(0.078)	(0.106)	(0.127)

Table A6 (*Continued*)

	Male sample						Female sample					
	Mean	Q10	Q25	Q50	Q75	Q90	Mean	Q10	Q25	Q50	Q75	Q90
Mekong River Delta	−0.2716***	−0.2372***	−0.2480***	−0.2496***	−0.2618***	−0.2853***	−0.2336***	−0.1108*	−0.2131***	−0.2541***	−0.3209***	−0.2856***
	(0.038)	(0.063)	(0.049)	(0.044)	(0.052)	(0.072)	(0.044)	(0.068)	(0.061)	(0.046)	(0.057)	(0.081)
Interviewed in 1st quarter	0.0532	0.1640**	0.0783*	0.0365	0.0618	−0.0057	−0.0037	0.0064	0.0163	−0.0010	−0.0615	−0.0229
	(0.037)	(0.076)	(0.048)	(0.044)	(0.047)	(0.065)	(0.040)	(0.062)	(0.057)	(0.043)	(0.051)	(0.079)
Interviewed in 2nd quarter	0.0157	0.1284	0.0745	0.0544	0.0295	−0.0717	0.0195	−0.0842	−0.0350	0.0831	0.0344	0.1220
	(0.038)	(0.086)	(0.051)	(0.044)	(0.045)	(0.068)	(0.043)	(0.072)	(0.061)	(0.058)	(0.057)	(0.079)
Interviewed in 3rd quarter	0.0223	0.1112	0.0878*	0.0279	−0.0068	−0.0591	−0.0098	−0.0386	−0.0057	0.0067	0.0033	0.0440
	(0.044)	(0.094)	(0.052)	(0.047)	(0.055)	(0.079)	(0.057)	(0.093)	(0.067)	(0.071)	(0.074)	(0.099)
Constant	0.2139	−0.8223*	−0.3305*	0.3446*	0.9122***	0.9086***	0.5369***	−0.0816	0.1315	0.5906***	1.1966***	1.2660***
	(0.183)	(0.428)	(0.201)	(0.212)	(0.219)	(0.294)	(0.191)	(0.371)	(0.245)	(0.222)	(0.283)	(0.280)
R^2 or Pseudo R^2	0.1780	0.1023	0.0857	0.0956	0.1399	0.1669	0.2175	0.1097	0.1003	0.1258	0.1469	0.1932
Number of Observations	1848	1848	1848	1848	1848	1848	1210	1210	1210	1210	1210	1210

Note: See Table A5.

Table A7
Male and female regression models, 2002

	Male sample						Female sample					
	Mean	Q10	Q25	Q50	Q75	Q90	Mean	Q10	Q25	Q50	Q75	Q90
Married	−0.0555***	−0.0826***	−0.0804***	−0.0551***	−0.0443***	−0.0560*	−0.0812***	−0.0625*	−0.0688***	−0.0747***	−0.0752***	−0.0936***
	(0.016)	(0.028)	(0.018)	(0.016)	(0.015)	(0.031)	(0.018)	(0.038)	(0.023)	(0.019)	(0.022)	(0.030)
Age	0.0423***	0.0606***	0.0467***	0.0332***	0.0314***	0.0238***	0.0266***	0.0502***	0.0305***	0.0200***	0.0188***	0.0186**
	(0.004)	(0.008)	(0.005)	(0.004)	(0.005)	(0.008)	(0.005)	(0.010)	(0.008)	(0.006)	(0.007)	(0.008)
Age squared	−0.0005***	−0.0008***	−0.0006***	−0.0003***	−0.0003***	−0.0002**	−0.0003***	−0.0007***	−0.0003***	−0.0002*	−0.0001	−0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	0.0648***	0.1146***	0.0938***	0.0595***	0.0485**	0.0532	0.0892***	0.1425***	0.0980***	0.0913***	0.0926***	0.0491
	(0.019)	(0.034)	(0.022)	(0.018)	(0.021)	(0.038)	(0.025)	(0.050)	(0.023)	(0.032)	(0.027)	(0.033)
Lower secondary	0.0734***	0.1258***	0.1109***	0.0835***	0.0653***	0.0237	0.1566***	0.1912***	0.1580***	0.1463***	0.1573***	0.1248***
	(0.020)	(0.034)	(0.024)	(0.020)	(0.020)	(0.038)	(0.027)	(0.050)	(0.030)	(0.030)	(0.030)	(0.040)
Upper secondary	0.2319***	0.1997***	0.2031***	0.2022***	0.2556***	0.3218***	0.3742***	0.3494***	0.3244***	0.3472***	0.3938***	0.3712***
	(0.024)	(0.039)	(0.024)	(0.022)	(0.028)	(0.045)	(0.031)	(0.060)	(0.037)	(0.035)	(0.040)	(0.041)
Higher education	0.4787***	0.4469***	0.4707***	0.4757***	0.5140***	0.5156***	0.6012***	0.5363***	0.5783***	0.6066***	0.6280***	0.6132***
	(0.022)	(0.035)	(0.025)	(0.022)	(0.025)	(0.040)	(0.029)	(0.054)	(0.030)	(0.034)	(0.035)	(0.040)
Health	−0.0575**	−0.0176	−0.0418	−0.0656*	−0.0555**	−0.0991*	−0.0597*	−0.0501	−0.0559	−0.0711**	−0.0687*	−0.0785
	(0.030)	(0.053)	(0.038)	(0.039)	(0.029)	(0.059)	(0.035)	(0.052)	(0.047)	(0.033)	(0.036)	(0.056)
Kinh	0.1297***	0.1239**	0.0698***	0.0950***	0.1347***	0.1784***	0.0550*	0.0503	0.0060	0.0305	0.0039	0.0148
	(0.026)	(0.054)	(0.026)	(0.028)	(0.024)	(0.039)	(0.032)	(0.087)	(0.031)	(0.030)	(0.034)	(0.048)
Private	0.1052***	0.1955***	0.1722***	0.0731***	0.0276	0.0348	−0.0161	−0.0172	−0.0216	−0.0089	−0.0255	−0.0550*
	(0.015)	(0.024)	(0.023)	(0.020)	(0.020)	(0.024)	(0.018)	(0.040)	(0.025)	(0.019)	(0.022)	(0.030)
Urban	0.1697***	0.1561***	0.1735***	0.1496***	0.1543***	0.2188***	0.0356**	0.0076	0.0004	0.0057	0.0435**	0.1054***
	(0.015)	(0.026)	(0.024)	(0.019)	(0.020)	(0.022)	(0.017)	(0.043)	(0.022)	(0.019)	(0.020)	(0.026)
Northern Uplands	−0.1783***	−0.1875***	−0.2213***	−0.2336***	−0.1824***	−0.1770***	−0.1385***	−0.0704	−0.1067***	−0.1422***	−0.2289***	−0.2333***
	(0.022)	(0.034)	(0.030)	(0.021)	(0.028)	(0.046)	(0.030)	(0.059)	(0.041)	(0.032)	(0.030)	(0.052)
Red River Delta	−0.1840***	−0.1975***	−0.1965***	−0.2266***	−0.1950***	−0.1680***	−0.2023	−0.2508***	−0.2294***	−0.2266***	−0.2385***	−0.1686***
	(0.018)	(0.032)	(0.025)	(0.020)	(0.022)	(0.037)	(0.025)	(0.058)	(0.032)	(0.027)	(0.027)	(0.036)
North Central Coast	−0.2176***	−0.2427***	−0.2522***	−0.2655***	−0.2003***	−0.1418***	−0.2708***	−0.3127***	−0.2926***	−0.2881***	−0.2847***	−0.2191***
	(0.023)	(0.039)	(0.034)	(0.022)	(0.030)	(0.051)	(0.033)	(0.078)	(0.040)	(0.042)	(0.040)	(0.058)
South Central Coast	−0.0756***	−0.0589*	−0.0713**	−0.1089***	−0.0882***	−0.0866**	−0.0927***	−0.0297	−0.0613**	−0.1218***	−0.1641***	−0.1297***
	(0.019)	(0.034)	(0.030)	(0.021)	(0.027)	(0.039)	(0.025)	(0.050)	(0.031)	(0.023)	(0.030)	(0.041)
Central Highlands	0.1504***	0.0329	0.0964***	0.1495***	0.2278***	0.2726***	0.2059***	0.0569	0.1294***	0.2272***	0.2661***	0.3104***
	(0.027)	(0.043)	(0.036)	(0.027)	(0.033)	(0.058)	(0.033)	(0.078)	(0.049)	(0.040)	(0.042)	(0.041)

Table A7 (*Continued*)

	Male sample						Female sample					
	Mean	Q10	Q25	Q50	Q75	Q90	Mean	Q10	Q25	Q50	Q75	Q90
Mekong River Delta	−0.0626***	−0.1460***	−0.0838***	−0.0841***	−0.0219	0.0192	−0.0558**	−0.0587	−0.0539**	−0.1019***	−0.0867***	0.0244
	(0.019)	(0.035)	(0.028)	(0.021)	(0.024)	(0.033)	(0.024)	(0.046)	(0.026)	(0.028)	(0.024)	(0.036)
Interviewed in 1st quarter	−0.0356**	−0.0563	−0.0309	−0.0504***	−0.0234	0.0406	−0.0322	−0.0330	−0.0346	−0.0548***	−0.0372	−0.0144
	(0.015)	(0.047)	(0.020)	(0.019)	(0.019)	(0.027)	(0.020)	(0.039)	(0.024)	(0.020)	(0.025)	(0.036)
Interviewed in 2nd quarter	0.0175	0.0200	0.0073	0.0064	0.0146	0.0288	−0.0014	0.0149	−0.0132	−0.0307	−0.0227	0.0265
	(0.014)	(0.022)	(0.017)	(0.019)	(0.016)	(0.021)	(0.020)	(0.039)	(0.025)	(0.021)	(0.024)	(0.038)
Interviewed in 3rd quarter	0.0165	0.0318	0.0252	0.0198	0.0026	0.0104	0.0516	0.0126	0.0440	0.0353	0.0178	0.0477
	(0.014)	(0.024)	(0.018)	(0.019)	(0.015)	(0.025)	(0.040)	(0.040)	(0.037)	(0.028)	(0.021)	(0.035)
Constant	0.0661	−0.8324***	−0.2588***	0.3044***	0.5855***	0.8873***	0.2487***	−0.6975***	−0.0207	0.4317***	0.7600***	1.0037***
	(0.073)	(0.135)	(0.089)	(0.070)	(0.084)	(0.140)	(0.091)	(0.177)	(0.134)	(0.105)	(0.102)	(0.147)
R^2 or Pseudo R^2	0.2278	0.0887	0.1024	0.1400	0.1680	0.1662	0.2476	0.0919	0.1212	0.1632	0.1818	0.1820
Number of Observations	10531	10531	10531	10531	10531	10531	6532	6532	6532	6532	6532	6532

Note: See Table A5.

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