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## **Two-name Land Use Certificates and Gender Inequality: An Empirical Investigation for Vietnam**

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# **Two-name Land Use Certificates and Gender Inequality: An Empirical Investigation for Vietnam**

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## **Abstract**

The new 2003 Land Law marks an extraordinary change in the land titling policy in Vietnam. It strongly requires that the names of both the husband and the wife must be stated on the land use right certificate of the land plot that they both own. This regulation not only officially recognizes the property rights of women as land is a crucial asset for every household but it also improves the position of the wife relatively compared to the husband.

We examine how the intra-couple issues change in association with having two-name land use certificates which are considered as a legally recognized proof of property rights for women. We expect some correlation between the outcome of the two-name land titling policy and the allocation of human resources between the husband and the wife; the income gap between the husband and the wife, the investment in their sons and daughters' education; and 'bad' consumption on smoking and alcohol drinking of the husband which consumes resources without generating utility (in terms of good health).

We use the data from two waves of Vietnam Household Living Standard Surveys (VHLSS), before and after the two-name land use certificates came into effect to identify the correlation. The investigation is conducted for a wide range of outcomes, namely, the difference of the working time that the husband and the wife allocated to the first and the second time consuming jobs; the difference of the wife and the husband's time doing house work; the difference in individual income of the wife and the husband; the difference in expenses on their sons and their daughters' education; the change in expenses on smoking and alcohol drinking. Though divorce is one of the most interesting outcomes that should be investigated, the household survey data observed only a few cases of new divorce in the two year period and does not ensure enough variations to conduct the analysis. Therefore, we leave the relationship between having two-name land use certificates and divorce unknown. We find that, in association with having two-name land use certificates, the non-Kinh (or non-

Hoa) wife works for individual income less while the Kinh or Hoa wife seems to work more relatively compared to her husband. The correlation is opposite for the number of hours spent on house work. The difference in house work time of the Kinh wife and her spouse is significant reduced while it turns to increase in the case of non-Kinh couples. This gap also decreases for non-poor couples. Two-name land use certificates seem to be uncorrelated with the income gap between the wife's and the husband's personal income. Interestingly, the two-name land use certificates encourage rural couples to invest in their daughters while observing the opposite for urban couples. Finally, we find no correlation between the ownership of two-name land use certificates and the husband's bad habits (smoking and drinking).

## **Two-name Land Use Certificates and Gender Inequality: An Empirical Investigation for Vietnam**

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### **1 Introduction**

Land rights are important not just because land is a crucial asset for most people and is a key input for agriculture which accounts for a large share of farmers' income but also because land rights are believed to empower women in the negotiations with other household members. When possessing land, women will have direct economic benefits from land through generating income from agricultural production, renting or selling land or from using land as collateral for access to credit for consumption or investment purposes. Moreover, as land contains intrinsic values, land ownership can also ensure long-term security of women and therefore reduces vulnerability of women in particular in the events of risks such as divorce, being widowed and getting unable to work. Fafchamps and Quisumbing (2002), when investigating how the control and devolution of productive assets are allocated between husband and wife, find that women's land rights within marriage are associated with larger claims over land upon divorce.

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Among the East Asian countries, Vietnam has been experiencing some gender biases in the society. Men always have more privilege than women. Culturally, parents always demand for at least one son to carry on the lineage. It is believed that a couple score a 10 mark if they have a daughter then a son, a 8 mark if they have a son then a daughter, a 7 mark if they have two sons and a zero mark if they have two daughters. The reason why daughter-son sibling gets the highest mark is because an older sister can help her parents take care of home and her brother much better than a son does. Negative biases against women are widely happening in the society. For instance, it is much easier for social perception to accept men to betray their wife because people always keep saying “men can have 5 wives, 7 sex partners while women should be virtuous to her only husband”. Gender biases are even enforced by legal documents though it may be unintendedly legalized. Before 2004, land use certificates were issued to the owner of households. However, more than 75% of households in Vietnam is legally ‘owned’ by men. This regulation strongly negatively affects reversion and assets rights of women. Therefore, it also affects significantly the power when bargaining and making decisions of the women. The new 2003 Land Law recognizes the rights of owning land of the woman when it strongly requests the issuer to put two names of the owners rather than just the household head’s name as previously on the land use certificate.

The literature of gender economics has achieved dramatic development over last few years. The economics of gender points out that the negotiating power of women may be determined by the values of properties they own. As land is a valuable asset, land ownership may help empower women to more actively participate in their communities, to play more important role in making decisions. Under this perspective, two-name land use certificates as a proof of having land ownership for women are expected to change resource allocation in such a way of more favor for women such as the husband will share more house work burden with the wife and more investment will be put on daughters.

In this study, we have the data from two rounds of Vietnam Household Living Standard Survey (VHLSS) which were conducted in 2004 and 2006, respectively. Before 2004, when the two-name land use certificate policy came into effect (after the 2003 Land Law), land use certificates were only titled to the household head who was very much likely a man. We therefore claim that all the two-name land use certificates recognized in the sample were titled or retitled after the 2003 Land Law came into effect in mid 2004. Thus, the VHLSS 2004 can be considered as the data before the policy while the VHLSS 2006 would be the data after the policy. We compare the change in outcomes for couples between the two-year period in association with having land use certificates for which the husband and the wife were both titled. We find that, in association with having two-name land use certificates, the non-Kinh (or non-Hoa) wife gets her husband more involved in sharing the house work with her while the Kinh or Hoa wife seems to work more compared to her husband. The correlation is opposite for the number of hours spent on house work. The difference in house work time of the Kinh wife and her spouse is significant reduced

while it turns to increase in the case of non-Kinh couples. This gap also decreases for non-poor couples. Two-name land use certificates seem to be uncorrelated with the income gap between the wife's and the husband's personal income. Interestingly, the two-name land use certificates discourage rural couples to invest in their daughters while observing the opposite for urban couples. Finally, we find no correlation between the ownership of two-name land use certificates and the husband's bad habits (smoking and drinking).

The paper is structured as follows: section 2 describes the process of land policies and reforms in Vietnam, section 3 discusses the theoretical effects of land use rights in a gender perspective, section 4 describes the data and our empirical strategy. Section 5 presents our empirical results, focusing on key indicators namely working time, individual income, investment in children's education. Section 6 concludes and suggests issues for further research.

## **2 Land rights in Vietnam**

### **2.1 Land issues and policies before 2003 Land Law**

Since the declaration of Vietnam Democratic Republic in 1945 land in Vietnam has been experiencing a history with lots of substantial changes. During the period 1945-1954 Vietnam was governed by French colonial rule and most land was owned by French colonists or large Vietnamese landlords. From 1954 – 1975, after the independence from the French there was a huge reform in land in the North. Land was returned to farmers with ownership and use rights. In the South, however, the political conflicts between northern and southern governments and the “Vietnam War” were driving the land policies in such a way very much different to the North. The southern government adopted a pro-landowner land policy. In 1975, the country enjoyed a union. Land collectivization was conducted country-widely though it was more successful in the North than in the South. The collectivization policy finally turned out to be an irrelevant policy since it caused a huge reduction in agricultural productivity. Then a major land reform was taken when the government introduced Resolution 10 in 1988. The main purpose of Resolution 10 was to liberalize agriculture sector by transferring control and cash-flow rights from cooperatives to households. However, despite the allocation of land and the recognition of land use rights, land transactions were not officially accepted until the 1993 Land Law. The 1993 Land Law granted five rights to households over their land: the right to transfer, exchange, inherit, rent and mortgage. Accordingly, land use certificates were issued to households to ensure the rights.

We, however, have no intension to depict in further details the whole context of land issues in Vietnam prior to the 2003 Land Law because we believe that no one can describe the

history of land in Vietnam as well as Do and Iyer (2008) without replicating lots of their work. We therefore encourage readers to look at their paper for more detailed land story.

### **2.3 The 2003 Land Law: Enforcing asset rights for women**

The 2003 Land Law is a replacement for the 1993 Land Law, and any other regulations on land issue before 2003. The Law was passed by the Assembly of Vietnam on the 26<sup>th</sup>, November 2003.

The 2003 Land Law was introduced with a lot of changes compared to the 1993 Land Law. For instance, land can be given to enterprises with more rights. The procedure for granting the land use certificate is much more simple. The new Law continues to keep the five rights of land as it had in the 1993 Land Law. Under a gender perspective, the major new feature of the 2003 Land Law that draws our attention is the strength of the appearance of the wife's name on the land use certificates if the land plot belongs to both the husband and the wife. Article 48 of the 2003 Land Law insists that "where the land use right is a mutual asset of a wife and a husband, the certificate of the land use right must state the full names of both husband and wife". This Article recognizes the property rights for the women and ensures their benefits over the land they mutually own.

## **3 Theories**

In both developed and developing countries, land has been always a greatly-valued asset for households. Land is not only a key input for agricultural production but it can also be a direct means for generating income, for instance, through sales or renting land. Land can also be used as collateral when households want to get accessed to credit. However, women may not fully participate in benefits generated by land if they do not share formal property rights over the land (Katz, 2003). This relationship has been confirmed by empirical evidence. Katz and Chamorro (2002), relying on the data from Nicaragua and Honduras, finds that greater control over agricultural income, higher shares of business and labor market earnings and more frequent receipt of credit is associated with a more strengthened women's property rights.

According to intra-household economic theory, household preferences and resource allocation decisions are heavily affected by the spouses' cooperating ability in economic activities. Given the importance of land, possession of land may empower women in their negotiations with other household members, especially with their spouse. Land rights can enforce the role of women who may have been treated unequally in the households. Therefore, land use rights may facilitate women's activeness in their community.

## **4 Data and Empirical Strategy**

## 4.1 Data

The data we use for the analyses come from the two rounds of the Vietnam Household Living Standard Surveys (VHLSS), conducted in 2004 and 2006 by the General Statistical Office (GSO) of the Government of Vietnam and funded by the United Nations Development Program (UNDP) and the World Bank. The surveys have been considered high-quality data sets. Generally, they provide detailed information on household demography, education attainment, health status and health care, employment, income activities including agriculture, husbandry, aquaculture, silviculture, and non-farm activities, and household expenditure. In particular, in the VHLSS 2004, the survey asked very detailed questions about land and land use certificates (LUC). A panel structure can be constructed from the two surveys. Specifically, at household level, there are 4200 households both asked in the two rounds.

Within this study's framework, however, the entire focus is put on couples in the households since the main purpose of the study is to look at the effects of two-name LUCs on gender issues within families in Vietnam. We therefore restrict ourselves to identify couples in the sample. Note that in the VHLSS, the only indicator we can use to identify couples is the relationship between individuals and the head of the household. However, this indicator is quite general in the sense that it does not distinguish between natural children and children-in-law of the head. Therefore, couples who are children of the head can not be precisely identified. We then decide to put the whole focus on couples who are the head and the spouse of the head of the household.

## 4.2 Empirical strategy

Our main focus will be on the effects of two-name land use certificates on intra-family issues in a gender perspective. Specifically, we investigate how the difference of the working time that the husband and the wife allocated to the first and the second time consuming jobs; the difference of the wife and the husband's time doing house work; the difference in individual income of the wife and the husband; the difference in expenses on their sons and their daughters' education; the change in expenses on smoking and alcohol drinking change in association with having two-name land use certificates.

The investigation will be conducted using a difference-in-differences strategy. Basically, this method compares the difference between 2004 and 2006 for couples having two-name land use certificates in 2004 as compared to couples who did not have two-name land use certificates in 2004. The regressions can be specified as follows:

$$y_{it} = \beta_0 + \beta_1 T_t + \beta_2 (T_t * L_{i,04}) + \gamma X_{it} + \varepsilon_{it} \quad (1)$$

where  $y_{it}$  represents the outcome of couple  $i$  at time  $t$  (2004 or 2006),  $T_t$  represents the dummy (equal to 0 for 2004, and 1 for 2006),  $L_{i,04}$  is the dummy for having two-name land

use certificate(s) in 2004 (equal to 1 if having at least one two-name land use certificate, and 0 otherwise), and  $X_{it}$  are other couple and household characteristics. The coefficient  $\beta_1$  represents the change between 2004 and 2006 for couples who did have two-name land use certificate(s) in 2004. The most important coefficient is  $\beta_2$  which shows how much two-name land use certificates changed the outcome variables. We will also control for couple and household characteristics such as difference in age of the couple, age of the wife, education and training level of the husband and the wife, number of children and household per capita income.

### **4.3 Endogeneity**

Our empirical strategy is likely to bear with biases in the results if the ownership of two-name land use certificates are correlated with other unobserved variables which also affect the outcome variable. The origin of the endogeneity is that two-name land use certificates are not completely required. In principle, land use certificates for land plots owned by both the husband and the wife which were issued after the 2003 Land Law should specify two names of the couples. However, as we realized from pilots interviews at the initial phase of this study, two-name land use certificates were not necessarily applied for the lands for which two-name land use certificates were supposed to have been applied. As revealed by land officials in the pilot communes, LUCs issuers may keep using the old land use certificates which could specify only one name because they did not want to waste the templates that they bought. Moreover, it is not required that couples who have one-name land use certificates must change to two-name land use certificates. Thus, we may have selection problems for those who decided to change from one-name land use certificates to two-name land use certificates. Perhaps, it is more likely for highly educated couples, or for unanimous couples to change. Fees for changing LUC could also potentially cause the selection biases. Basically, it costs about 100 thousand VND to change a land use certificate and this amount is fairly large for rural households, especially poor households.

One can solve the endogeneity problem by using instrumental variables. We have been thinking about using the implementation status of land consolidation policy which widely conducted in northern provinces in 2005 to instrument for the endogeneity. However, by the time being the data collection has not been finished yet. We therefore have to take the ownership of two-name land use certificates as exogenous with awareness of possibility of having biases in the results.

## **5 The ownership of Two-name LUCs under a gender perspective**

There are reasons to believe that differences in the background as well as in the behavior between rural and urban households; between Kinh or Hoa and minority households; and



between poor and non-poor households. Thus, we need to take into account those differences. However, instead of running the regressions of each sub-sample, we run the those regressions in pooled datasets using interaction terms. For example, when we want to capture the differences across Kinh or Hoa and other ethnicities, we introduce, among corresponding double interaction effects, the triple interaction term based on the time T, the measure of two-name land use certificates, and the indicator of ethnicity.

In the regressions, we also eliminate couples who are ineligible in the sense that neither the wife nor the husband was involved in the outcome indicator in both two years. In other words, those couples are not participating in the outcome activities regardless whether or not they had two-name land use certificates in 2004. The number of observations, therefore, varies across the dependent variables.

## **5.1 Working time**

### **The most and second time consuming works**

The VHLSS asked individuals how much time they spent on the most and the second time consuming jobs over the last twelve months. As discussed in the theoretical section, the impacts of two-name land use certificates can be two fold. First, as after having the two-name land use certificates the female feels that her life is more secure. She would probably want to work harder. If this direction works, it is likely that the wife will be working more so that she or the couple can earn more. Second, as the role of the wife is now strengthened and she now has more power to bargain with the husband, one might expect the wife to work less (relatively compared to the male), especially for those wives who worked hard in the previous period. One way of verifying this relationship is by regressing the difference between the number of working hours on the most and the second time consuming works of the wife and that of the husband against the measure of two-name land use certificates.

Table 2 shows that, the two-name land use certificates are associated with the intra-couple time allocation on the first and second time consuming jobs differently for Kinh and non-Kinh couples. The non-Kinh wife decreases her working time on the most and second time consuming works by about 120 hours compared to her husband in association with having two-name land use certificates. This association is statistically significant at 10% and is robust with and without more controls being put into the regression specifications. However, the relationship is reverse for Kinh or Hoa couples. The Kinh (or Hoa) wives seem to work harder when their names mutually appear on the land use certificates. The regression results show that they can increase the working time by from 40 to 60 hours. For poor or non poor households, the ownership of two-name LUCs does not make any differences. In addition, for urban or rural couples, two-name land use certificates appear not to matter in changing the allocation of working time between the husband and the wife.

## **House work**

In addition to the most and second time consuming works, the VHLSS also asks respondents the number of hours they spent on house work. In Vietnamese society, people believe that women's time spent on house work is much more than men's. This observation is confirmed by the VHLSS 2004 data. Table 1 shows that in Vietnam, on average, women have to work on taking care of the house more than twice compared to men although they seem to work equivalently hard for making money (wage activities). One can argue that this imbalance simply means an optimal way of allocating resources since women are more skillful than men and they would not probably want men to do the job because the outcome can not be so good as their outcome. We are more in favor of the argument that the imbalance of resource allocation on house work is likely to reflect the fact that women are more dependent on men in terms of assets therefore men have some privilege against women. The two-name land use certificates, as a proof of property rights, may help reduce the inequality of men and women's responsibility at home in terms of doing house work. We investigate this hypothesis by looking at the difference between the number of working hours that the men and the woman spent on house work. Table 3 summarizes the regression results for the difference between the number of hours the wife spent on house works and that of the husband. The results show an interesting observation. While having two-name LUC(s) widens the difference in house work burden for non-Kinh or non-Hoa couples (though not very robust and statistically significant) it narrows down the gap of house work burden for Kinh or Hoa couples (highly significant if we control for region effects). The possession of two-name LUC(s) helps reduce the gap about 65 hours per year for Kinh or Hoa couples and increase the gap about 70 hours per year for non-Kinh couples.

Two-name LUCs also help equalize the gap of time consuming on house works between the husband and the wife for rural couples and non-poor couples. However, the correlation is not very robust and not highly statistically significant.

## **5.2 Individual income**

Corresponding to the information on the first and second time consuming works, the VHLSS also asked the respondents about their income generated when doing the works. Note that, this is not full personal income in the sense that we are not able to separate income for individuals from household-level income elements such as income from household's agricultural production, and livestock activities. Two-name land use certificates may affect the individual income of the male and the female by affecting their incentives to work, or productivity or the nature of jobs that they choose. For instance, as her assets have been more secured with two-name land use certificates, the female may be more productive in her earning activities.

The in-depth investigation of individual income in terms of not only the amount of income but also the patterns of jobs, the types of employers needs to be conducted. However, in this version of draft, for the first cut, we simple verify the relationship between the possession of two-name land use certificates with the gender of the worker. Thus, we will be regressing the difference in individual income of the wife to the husband's on the ownership of two-name land use certificates, controlling for individual and household characteristics. The regressions results are summarized in Table 4 in the appendix. The results show no regression coefficients are statistically significant. This suggests that two-name land use certificates does not appear to drive the gap in income between the male and the female. As discussed a bit earlier, in the further research we would be focusing much more on explaining the mechanism of why and how the two-name land use certificates affect poor households but not the others.

### **5.3 Investment in the future**

Given all kinds of unfavorable situations for women in Vietnam's society, it is not surprising that educational expenditure for women is lower than for men. For example, the VHLSS 2004 reveals that on average there is an amount of 942 thousands Dong spent on education for men while there is only 891 thousands Dong allocated for women's education. This may reflect the perception of favor of investment in men rather than in women which could be caused by gender biases. Thus, the two-name land use certificates are expected to raise investment in education for women. We investigate this relationship by looking at the difference in expenditure on education for the couple's daughters and sons in association with the ownership of two-name land use certificates. Although the regression coefficient of interest does not appear to be significant in the regressions for Kinh/non-Kinh couples and poor/non-poor couples, Table 5 shows a very interesting observation. Rural couples and urban couples react differently to the investment decision when having two-name land use certificates. While rural couples decided to increase investment in education for their daughters compared to their sons, urban couples turn to invest more in their sons.

### **5.4 Bad habits**

In Vietnam, men often do relax much more than women in the sense that it is very common that after a working day or before meals men have quite a lot of beer and alcohol. In addition, smoking is harmful for health but happens widely for men. Drinking and smoking are not only very bad for health, affecting strongly household human capital but also consume resources which do not benefit the household. Though unwanted, the female seem to be unable to interfere to stop these bad habits of her husband. This may be because she does not have enough power to negotiate with her husband due to low position in the

family. The rights of assets are therefore expected to improve the power to stop or at least to reduce bad habits of her husband. One way of verifying this is by looking at changes in consumption on smoking and drinking of men before and after having two-name land use certificates. We conduct the investigation for both smoking and drinking separately as well as for the combination of the two 'bad' habits. The results are summarized in Table 6, 7 and 8.

In general, we do not find statistically significant correlation between the ownership of two-name land use certificates and the change in bad habits. The coefficients of interest in almost all the regression specifications are not significant, even at 10% level of significance.

## **5.5 Divorce**

One of the most interesting effects of two-name land use certificates in gender perspective is to see if two-name land use certificates help reduce the level of divorce or intra-household violence or not. Since it is very much expected that, as the role and position of the female has been strengthened after possessing land use certificates, intra-couple violence will be reduced significantly, divorce can be affected by exactly the same mechanism since the male will be less motivated to divorce because he will have to split the land if the woman's name appears on the land use certificates. However, the relationship can not be investigated by the existing data from Vietnam Household Living Standard Survey. Between the two year 2004 and 2004, we hardly observed new divorces. More concretely, there are only 8 new divorces recognized within the two-year period. We therefore have to limit ourselves not to dig into the investigation of this relationship.

## **6. Concluding remarks and suggestions for further research**

The new 2003 Land Law marks an extraordinary change in the land titling policy in Vietnam. It strongly requires that the names of both the husband and the wife must be stated on the land use right certificate of the land plot that they both own. This regulation officially recognizes the property rights over land of women over the land they mutually own as land is a crucial asset for every household. In the point of view of intra-household economic theory, we expect the two-name land titling policy to affect the intra-family decisions of resource allocation, the investment in their son and daughters' future and social conflicts.

We employ the data from two rounds of Vietnam Household Living Standard Survey, namely, VHLSS 2004 and VHLSS 2006 to implement a difference-in-differences to evaluate the impacts of two-name land use certificates under the gender perspective. The VHLSS 2004 is considered as the data before the policy while the 2006 VHLSS would

be the data after the policy. We compare the change in outcomes for couples between the two-time periods in association with owning land use certificates for which the husband and the wife were both titled. We find sharing house work burden between the Kinh (or Hoa) husband and his wife is improved in association with the ownership of two-name land use certificates while it becomes worse for non-Kinh couples. The two-name land use certificates are not associated with the income gap between the wife's and her spouse's personal income. Interestingly, the two-name land use certificates encourage rural couples to invest in their daughters while observing the opposite for urban couples. Finally, we find that two-name land use certificates do not help reduce the consumption of alcohol drinking which may harm the health and cause social conflicts in some circumstances.

We are aware that our results may be biased due to the endogeneity problem. However, we are unable to correct these potential biases given the availability of the information at the time this study is conducted. We hope to improve the precision of the analysis's results when we have information about the implementation status of land consolidation at the commune level. With this information, we can conduct an instrumental analysis to eliminate the biases.

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## Appendix

**Table 1: Descriptive analysis of working time of the female and the male (VHLSS 2004)**

	# of working hours on the most and second time consuming works		# of working hours on house works		# of total working hours	
	Male	Female	Male	Female	Male	Female
<b>Ethnicity</b>						
non-Kinh or non-Hoa	1685.11 [31.09]	1693.94 [32.99]	469.66 [14.90]	755.34 [14.91]	2154.77 [34.59]	2449.28 [35.30]
Others	1710.91 [18.01]	1628.59 [19.19]	399.27 [7.08]	873.06 [8.76]	2110.18 [18.76]	2501.65 [19.25]
<b>Poverty status in 2004</b>						
Non-poor	1734.59 [18.24]	1655.59 [19.54]	402.15 [7.19]	870.39 [8.91]	2136.74 [18.89]	2525.98 [19.57]
Poor	1577.41 [31.29]	1545.32 [32.39]	436.54 [14.16]	800.38 [15.12]	2013.95 [35.46]	2345.7 [33.88]
<b>Rural/Urban</b>						
Rural areas	1654.03 [16.63]	1605.33 [17.68]	412.83 [7.14]	838.24 [8.40]	2066.86 [17.76]	2443.57 [18.43]
Urban areas	1889.26 [41.53]	1742.94 [44.99]	391.82 [14.53]	926.65 [18.94]	2281.08 [42.03]	2669.59 [41.93]
<b>Whole Vietnam</b>	1707.7 [16.00]	1636.73 [17.05]	408.03 [6.43]	858.41 [7.80]	2115.73 [16.76]	2495.14 [17.19]

**Note:**

- Standard errors of mean in brackets
- Mean and standard errors corrected by sampling weights
- Sample include eligible only

**Table 2 Difference in working time on wage activities between the male and the female and two-name LUCs**

<b>Dependent variable: Difference between the female's working time on wage activities and that of the male</b>									
	<b>Ethnicity</b>			<b>Poverty status</b>			<b>Urban/Rural</b>		
	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>
Triple intersection term based on Year, two-name LUCs and Subpop†	191.86** (91.46)	170.80* (95.81)	160.26* (93.91)	-163.49 (102.10)	-116.78 (102.66)	-143.23 (101.20)	218.34 (146.26)	226.77 (141.61)	217.56 (141.12)
Two-name LUCs 2004*Year==2006	-125.41* (67.10)	-121.21* (72.88)	-121.86* (71.17)	65.83 (63.75)	44.29 (61.89)	41.00 (61.78)	-26.50 (53.67)	-36.38 (53.09)	-49.25 (52.94)
Year == 2006	-30.23 (41.55)	-35.93 (45.66)	-46.46 (45.72)	7.88 (23.67)	31.83 (25.81)	14.29 (25.81)	1.31 (22.39)	20.17 (23.89)	-3.51 (23.93)
Female worked hard in 2004 (1: yes; 0: no)		256.67*** (51.36)	236.67*** (49.46)		604.98*** (35.12)	595.63*** (35.43)		490.93*** (32.01)	466.39*** (32.45)
Age difference between the male and the female		-17.70** (8.41)	-22.33*** (8.29)		-21.66*** (5.34)	-22.12*** (5.25)		-18.86*** (4.10)	-19.06*** (4.12)
Age of the female in years		7.06 (15.37)	9.34 (14.14)		35.28*** (10.09)	34.88*** (9.88)		28.40*** (8.03)	31.32*** (7.87)
Squared age of the female in years		-0.01 (0.17)	-0.03 (0.15)		-0.21** (0.11)	-0.22** (0.10)		-0.17** (0.08)	-0.21*** (0.08)
Number of children		-27.03 (18.31)	-12.23 (18.65)		-39.51*** (13.73)	-25.41* (13.93)		-36.60*** (10.68)	-29.28*** (10.88)
Education level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Education level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Per capita expenditure in log	N	Y	Y	N	Y	Y	N	Y	Y
Region fixed effects	N	N	Y	N	N	Y	N	N	Y
Number of observations	6,188	6,188	6,188	6,188	6,188	6,188	6,188	6,188	6,188
R2	0.002	0.103	0.117	0.000	0.097	0.114	0.001	0.104	0.124

Standard errors in parentheses, corrected for commune-level clustering. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%; † is either Ethnicity, Poverty status for Urban/Rural. Ethnicity: Kinh == 1; Poverty status: poor == 1; Urban/Rural: urban == 1



**Table 3: Difference in working time on house works between the male and the female and two-name LUCs****Dependent variable: Difference between the female's working time on house works and that of the male**

	Ethnicity			Poverty status			Urban/Rural		
	1	2	3	1	2	3	1	2	3
Triple intersection term based on Year, two-name LUCs and Subpop†	-108.78* (57.61)	-115.12** (57.47)	-135.89*** (50.56)	21.04 (53.02)	16.90 (52.96)	13.73 (51.79)	-29.22 (65.88)	-49.23 (64.78)	-35.86 (64.49)
Two-name LUCs 2004*Year==2006	46.93 (49.14)	49.34 (49.43)	69.49* (41.53)	-46.66 (30.61)	-55.47* (30.26)	-56.67* (30.33)	-44.09 (29.01)	-44.87 (28.57)	-50.83* (28.66)
Year == 2006	23.88 (21.66)	3.67 (23.36)	16.47 (23.24)	-32.04** (13.78)	-66.10*** (14.80)	-57.11*** (14.81)	-29.44** (12.50)	-63.48*** (13.97)	-44.97*** (13.80)
Female worked hard in 2004 (1: yes; 0: no)		41.95 (27.00)	58.51** (25.53)		25.44 (19.04)	30.13 (19.25)		56.47*** (18.33)	71.45*** (18.50)
Age difference between the male and the female		-2.29 (3.71)	-0.34 (3.54)		-1.88 (2.76)	-1.45 (2.72)		-1.99 (2.16)	-1.23 (2.11)
Age of the female in years		16.61** (8.16)	13.98* (7.76)		-8.22 (5.09)	-8.51* (5.04)		-2.97 (4.54)	-5.18 (4.50)
Squared age of the female in years		-0.18** (0.09)	-0.16* (0.08)		0.06 (0.05)	0.06 (0.05)		0.00 (0.05)	0.03 (0.05)
Number of children		-5.22 (8.94)	-13.01 (9.70)		25.87*** (8.04)	19.99** (7.89)		14.12** (6.75)	10.15 (6.76)
Education level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Education level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Per capita expenditure in log	N	Y	Y	N	Y	Y	N	Y	Y
Region fixed effects	N	N	Y	N	N	Y	N	N	Y
Number of observations	6,304	6,304	6,304	6,304	6,304	6,304	6,304	6,304	6,304
R2	0.015	0.041	0.057	0.006	0.032	0.054	0.008	0.039	0.065

Standard errors in parentheses, corrected for commune-level clustering. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%; † is either Ethnicity, Poverty status for Urban/Rural. Ethnicity: Kinh == 1; Poverty status: poor == 1; Urban/Rural: urban == 1

**Table 4: Difference in individual income between the male and the female and two-name LUCs****Dependent variable: Difference between the female's individual income and that of the male**

	Ethnicity			Poverty status			Urban/Rural		
	1	2	3	1	2	3	1	2	3
Triple intersection term based on Year, two-name LUCs and Subpop†	798.14 (1,216.18)	954.95 (1,242.56)	1,090.86 (1,290.22)	245.87 (923.93)	-149.62 (906.07)	-107.50 (886.02)	825.61 (1,519.78)	1,454.81 (1,516.83)	1,782.49 (1,487.30)
Two-name LUCs 2004*Year==2006	-78.63 (1,017.19)	-19.27 (1,036.14)	53.56 (1,084.77)	480.63 (698.39)	711.70 (706.19)	887.86 (698.30)	404.64 (550.34)	506.95 (576.40)	600.31 (586.73)
Year == 2006	-275.29 (264.08)	19.57 (335.33)	27.54 (332.93)	149.77 (243.92)	733.49** (288.34)	782.19*** (303.02)	33.06 (258.16)	541.19 (367.68)	557.21 (408.73)
Female worked hard in 2004 (1: yes; 0: no)		149.37 (523.29)	140.86 (511.53)		874.33 (551.68)	952.06* (551.61)		539.28 (388.38)	513.99 (407.02)
Age difference between the male and the female		-56.73 (77.19)	-58.13 (75.27)		-103.73 (87.90)	-122.00 (88.38)		-38.97 (58.56)	-54.78 (57.13)
Age of the female in years		-188.89 (136.97)	-110.92 (140.72)		93.22 (141.28)	100.56 (144.08)		32.74 (91.59)	32.54 (94.56)
Squared age of the female in years		2.32 (1.57)	1.39 (1.61)		0.44 (1.58)	0.50 (1.63)		0.49 (1.04)	0.65 (1.09)
Number of children		96.35 (162.66)	-1.62 (171.33)		-1,008.71*** (202.39)	-1,059.66*** (204.96)		-345.01*** (118.91)	-433.00*** (126.89)
Education level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Education level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Per capita expenditure in log	N	Y	Y	N	Y	Y	N	Y	Y
Region fixed effects	N	N	Y	N	N	Y	N	N	Y
Number of observations	3,418	3,418	3,418	3,418	3,418	3,418	3,418	3,418	3,418
R2	0.011	0.104	0.113	0.005	0.105	0.111	0.009	0.119	0.131

Standard errors in parentheses, corrected for commune-level clustering. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%; † is either Ethnicity, Poverty status for Urban/Rural. Ethnicity: Kinh == 1; Poverty status: poor == 1; Urban/Rural: urban == 1

**Table 5: Difference in consumption on education for daughters and sons and two-name LUCs****Dependent variable: Difference in consumption on education for daughters and sons**

	Ethnicity			Poverty status			Urban/Rural		
	1	2	3	1	2	3	1	2	3
Triple intersection term based on Year, two-name LUCs and Subpop†	110.85 (83.98)	111.89 (90.79)	76.69 (91.13)	-20.89 (55.87)	-26.75 (57.94)	-21.52 (58.59)	-170.47* (97.25)	-172.80* (104.63)	-248.62** (103.35)
Two-name LUCs 2004*Year==2006	-68.97 (68.66)	-57.57 (75.23)	-29.87 (76.64)	32.90 (50.41)	46.03 (52.71)	39.74 (51.73)	75.21 (50.39)	79.13 (51.43)	85.80* (51.51)
Year == 2006	106.51* (55.94)	136.86 (92.40)	145.91 (93.31)	140.46*** (47.87)	204.07*** (65.50)	202.54*** (66.05)	112.27*** (34.76)	158.21*** (49.48)	160.58*** (50.87)
Female worked hard in 2004 (1: yes; 0: no)		27.28 (65.52)	31.61 (68.08)		41.20 (58.70)	30.14 (59.23)		-10.99 (42.96)	-14.74 (43.71)
Age difference between the male and the female		3.06 (6.54)	3.02 (6.74)		2.84 (9.97)	3.92 (10.25)		2.43 (6.73)	1.54 (7.00)
Age of the female in years		-49.22* (25.86)	-48.41* (26.41)		-22.53 (22.32)	-20.26 (22.22)		-7.77 (17.65)	-6.49 (17.40)
Squared age of the female in years		0.55* (0.31)	0.53* (0.32)		0.14 (0.27)	0.11 (0.27)		-0.02 (0.22)	-0.04 (0.21)
Number of children		19.74 (20.32)	16.77 (20.62)		70.39** (27.80)	66.37** (27.64)		37.05** (18.71)	34.03* (17.84)
Education level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Education level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Per capita expenditure in log	N	Y	Y	N	Y	Y	N	Y	Y
Region fixed effects	N	N	Y	N	N	Y	N	N	Y
Number of observations	4,680	4,680	4,680	4,680	4,680	4,680	4,680	4,680	4,680
R2	0.002	0.012	0.014	0.003	0.011	0.013	0.002	0.015	0.022

Standard errors in parentheses, corrected for commune-level clustering. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%; † is either Ethnicity, Poverty status for Urban/Rural. Ethnicity: Kinh == 1; Poverty status: poor == 1; Urban/Rural: urban == 1

**Table 6: Difference in percentage of consumption on smoking over total consumption and two-name LUCs****Dependent variable: Difference between the female's individual income and that of the male**

	Ethnicity			Poverty status			Urban/Rural		
	1	2	3	1	2	3	1	2	3
Triple intersection term based on Year, two-name LUCs and Subpop†	-0.13 (0.33)	0.06 (0.33)	0.15 (0.29)	-0.13 (0.31)	-0.29 (0.31)	-0.30 (0.30)	0.09 (0.28)	0.11 (0.27)	0.11 (0.27)
Two-name LUCs 2004*Year==2006	0.02 (0.30)	0.00 (0.30)	-0.03 (0.26)	-0.05 (0.13)	0.10 (0.13)	0.15 (0.12)	-0.10 (0.13)	0.01 (0.12)	0.05 (0.11)
Year == 2006	0.02 (0.12)	0.03 (0.13)	0.14 (0.12)	0.06 (0.05)	0.11* (0.05)	0.17*** (0.05)	0.03 (0.06)	0.04 (0.06)	0.20*** (0.06)
Female worked hard in 2004 (1: yes; 0: no)		-0.11 (0.19)	-0.01 (0.16)		-0.10 (0.07)	-0.02 (0.07)		-0.17** (0.08)	-0.04 (0.07)
Age difference between the male and the female		-0.02 (0.02)	0.01 (0.02)		0.01 (0.01)	0.01 (0.01)		0.00 (0.01)	0.00 (0.01)
Age of the female in years		-0.14** (0.06)	-0.14*** (0.04)		0.02 (0.02)	0.02 (0.02)		0.02 (0.02)	0.01 (0.02)
Squared age of the female in years		0.00** (0.00)	0.00*** (0.00)		-0.00* (0.00)	-0.00* (0.00)		-0.00* (0.00)	-0.00 (0.00)
Number of children		0.06 (0.07)	-0.04 (0.06)		-0.05* (0.03)	-0.13*** (0.03)		-0.05 (0.03)	-0.11*** (0.03)
Education level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Education level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Per capita expenditure in log	N	Y	Y	N	Y	Y	N	Y	Y
Region fixed effects	N	N	Y	N	N	Y	N	N	Y
Number of observations	5,976	5,976	5,976	5,976	5,976	5,976	5,976	5,976	5,976
R2	0.000	0.065	0.177	0.003	0.056	0.173	0.002	0.058	0.182

Standard errors in parentheses, corrected for commune-level clustering. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%; † is either Ethnicity, Poverty status for Urban/Rural. Ethnicity: Kinh == 1; Poverty status: poor == 1; Urban/Rural: urban == 1

**Table 7: Difference in percentage of consumption on drinking over total consumption and two-name LUCs****Dependent variable: Difference between the female's individual income and that of the male**

	Ethnicity			Poverty status			Urban/Rural		
	1	2	3	1	2	3	1	2	3
Triple intersection term based on Year, two-name LUCs and Subpop†	-0.09 (0.33)	-0.04 (0.33)	-0.04 (0.33)	-0.16 (0.28)	-0.12 (0.28)	-0.11 (0.27)	-0.14 (0.15)	-0.17 (0.15)	-0.21 (0.15)
Two-name LUCs 2004*Year==2006	0.16 (0.33)	0.10 (0.32)	0.03 (0.32)	0.06 (0.07)	0.07 (0.07)	0.01 (0.08)	0.07 (0.10)	0.11 (0.10)	0.07 (0.10)
Year == 2006	0.05 (0.10)	0.10 (0.10)	0.03 (0.10)	0.04 (0.03)	0.04 (0.04)	0.02 (0.04)	0.02 (0.04)	0.08* (0.04)	-0.00 (0.04)
Female worked hard in 2004 (1: yes; 0: no)		0.09 (0.15)	0.03 (0.15)		0.02 (0.05)	-0.02 (0.05)		0.11* (0.06)	0.03 (0.06)
Age difference between the male and the female		0.04** (0.02)	0.04** (0.02)		0.01 (0.01)	0.01 (0.01)		0.02*** (0.01)	0.02*** (0.01)
Age of the female in years		-0.08* (0.04)	-0.06 (0.04)		0.01 (0.01)	0.02 (0.01)		-0.01 (0.01)	0.01 (0.01)
Squared age of the female in years		0.00* (0.00)	0.00 (0.00)		-0.00 (0.00)	-0.00* (0.00)		0.00 (0.00)	-0.00 (0.00)
Number of children		0.11* (0.06)	0.08 (0.06)		-0.06*** (0.02)	-0.06*** (0.02)		0.02 (0.03)	-0.01 (0.02)
Education level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Education level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Per capita expenditure in log	N	Y	Y	N	Y	Y	N	Y	Y
Region fixed effects	N	N	Y	N	N	Y	N	N	Y
Number of observations	6,244	6,244	6,244	6,244	6,244	6,244	6,244	6,244	6,244
R2	0.051	0.071	0.096	0.013	0.034	0.074	0.005	0.021	0.073

Standard errors in parentheses, corrected for commune-level clustering. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%; † is either Ethnicity, Poverty status for Urban/Rural. Ethnicity: Kinh == 1; Poverty status: poor == 1; Urban/Rural: urban == 1

**Table 8: Difference in percentage of consumption on smoking and drinking over total consumption and two-name LUCs****Dependent variable: Difference in percentage of consumption on smoking and drinking over total consumption**

	Ethnicity			Poverty status			Urban/Rural		
	1	2	3	1	2	3	1	2	3
Triple intersection term based on Year, two-name LUCs and Subpop†	-0.20 (0.42)	0.01 (0.41)	0.14 (0.43)	-0.32 (0.40)	-0.44 (0.38)	-0.48 (0.39)	-0.02 (0.33)	-0.04 (0.32)	-0.10 (0.33)
Two-name LUCs 2004*Year==2006	0.21 (0.39)	0.14 (0.38)	-0.01 (0.40)	0.05 (0.16)	0.21 (0.15)	0.19 (0.15)	0.01 (0.17)	0.15 (0.15)	0.13 (0.15)
Year == 2006	0.06 (0.14)	0.12 (0.16)	0.17 (0.15)	0.09 (0.06)	0.15** (0.07)	0.19*** (0.07)	0.04 (0.07)	0.12 (0.07)	0.19** (0.07)
Female worked hard in 2004 (1: yes; 0: no)		-0.06 (0.25)	-0.01 (0.23)		-0.08 (0.09)	-0.05 (0.08)		-0.08 (0.10)	-0.02 (0.10)
Age difference between the male and the female		0.02 (0.03)	0.05* (0.03)		0.02 (0.01)	0.02 (0.01)		0.03* (0.01)	0.03** (0.01)
Age of the female in years		-0.20** (0.08)	-0.20*** (0.07)		0.04* (0.02)	0.05** (0.02)		0.03 (0.03)	0.04 (0.02)
Squared age of the female in years		0.00** (0.00)	0.00*** (0.00)		-0.00*** (0.00)	-0.00*** (0.00)		-0.00** (0.00)	-0.00** (0.00)
Number of children		0.17* (0.09)	0.04 (0.09)		-0.10*** (0.04)	-0.17*** (0.04)		-0.03 (0.04)	-0.11*** (0.04)
Education level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the female	N	Y	Y	N	Y	Y	N	Y	Y
Education level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Training level of the male	N	Y	Y	N	Y	Y	N	Y	Y
Per capita expenditure in log	N	Y	Y	N	Y	Y	N	Y	Y
Region fixed effects	N	N	Y	N	N	Y	N	N	Y
Number of observations	6,298	6,298	6,298	6,298	6,298	6,298	6,298	6,298	6,298
R2	0.015	0.060	0.115	0.010	0.057	0.104	0.006	0.056	0.108

Standard errors in parentheses, corrected for commune-level clustering. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%; † is either Ethnicity, Poverty status for Urban/Rural. Ethnicity: Kinh == 1; Poverty status: poor == 1; Urban/Rural: urban == 1