I Will Divorce if You Don't Give Me More Children, Especially Sons: Evidence from a Vietnam

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Abstract

Although divorces place millions of women from poor countries into hardship, we know little about this issue and its causes. This paper shows that the lack of children is a leading cause for divorce. We use *twins* and *gender of firstborns* as instruments to estimate the effect of the *number of children* and the *existence of a son* on mother' marital statuses. The 2009 Vietnam Population Census shows the divorce rate is 1.76 percent. We find two effects of the lack of children on the parents' divorce. First, an additional child reduces the divorce rate by 0.66 percentage point (equivalent to 37% of the population divorce rate). Second, the existence of at least a son reduces the divorce rate by 0.54 percentage point (equivalent to 30% of the population divorce rate). This massive magnitudes suggest areas for intervention to improve women's welfare and control the population growth.

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1. Introduction

Divorces are unwanted events for families as well as society. Divorces can result in serious effects on people involved in divorces, especially children. In family economics, children are sometimes regarded as ‘public or collective goods’, and the "free-rider" problem arises in the context of divorce (Becker et al. 1977, Weiss and Willis 1985, Folbre, 1994). Without cooperation within marriage, parents tend to spend less time and money for the children. In addition, parents who do not stay with children tend also to receive less utility from their children’s consumption and invest less in children. As a result, parental divorces can have negative effects on education, physical and mental health of children. There are a large number of studies finding negative association between parental divorces and children’s welfare (e.g., Hetherington, 1979; Amato and Keith, 1991; Haveman and Wolfe, 1995; Garasky, 1995; Biblarz and Raftery, 1999; Amato, 2000; Gruber, 2004; Hyun, 2011).

There are a large number of reason why couples marry or divorce. According to Becker (1974) and Becker et al. (1977), a couple will divorce if their combined married-wealth is lower than their combined divorced-wealth. All other things being equal, any factor that affects the cost and benefit of marriage and divorce will affect the probability of divorce. Important factors that affect divorces are characteristics and earnings of couples, discrepancies in their traits, marital-specific assets.

An important and interesting question for researchers is whether children can influence the marital dissolution of their parents. In the family economics, children are a marital-specific capital that have lower value if their parents disrupt marriage (Becker, 1974; Becker et al., 1977; Becker, 1981). Put it differently, benefits from children for both parents are higher in marriage than divorce. As a result, the number of children can reduce the risk of parental divorce.

Several sociological theories also advocate the negative relation between children and parental divorce. Parents can postpone divorce and maintain marriage since they are aware of adverse impacts of divorce on their children’s development (Levinger, 1965; Thornton, 1977). Children also increases happiness of parents and the marital satisfaction (Thornton, 1977).

Through raising children, parents share common finance, emotions and other activities, and as a result ties between parents are strengthened (Morgan et al., 1988; Waite and Lillard ,1991).

However, there are several theories that predict the positive effect of children on the probability of parental divorce. Having children can cause time and income of couples and threaten the marital stability (Waite and Lillard,1991). Children can interfere the marital activities of parents and reduce the happiness and satisfaction of parents (Glenn and McLanahan, 1982). Children can cause a major source of stress for parents (Aneshensel, 1992; Crnic and Acevedo 1995) and increase the marital instability (Thornton, 1977).

A reason for disagreement in theories on children and marital dissolution is that there are many complicated channels through which children can affect marital dissolution of parents. Children can have an influence on many aspects of family including income, consumption, leisure and other economic and social activities, and these aspects can affect the probability of marital disruption. For example, we can argue that children can put pressure on income of households and parents are more likely to migrate or work far from home for higher income. Less contact between spouses can increase the risk of marital instability.

Not only the number but also the gender composition of children can affect the marital dissolution of parents. In many developing countries and even developed ones in Asia, parents tend to prefer boys to girls. If children are a marital-specific capital (Becker, 1974; Becker et al., 1977; Becker, 1981), then boys are viewed as a higher value marital-specific capital than girls. The cost of divorce will be increased in the presence of sons rather than in the presence of daughters. In addition, men are more active in fostering children when having sons and this tends to stabilize the marriage (Lundberg and Rose, 2003). In some cases, a man can divorce if he has no boys with the current wife. He will remarry with expectation of having a son with future women. As a result, having a son tends to reduce the probability of divorce.

Empirical studies are not consistent in the findings on the effect of children on marital disruption of parents. A negative relation between the presence of children and parental divorce are found in many studies such as Renne (1970), Becker et al., (1977), Waite et al. (1986), Lillard and Waite (1993), Errington and Diamond (1999). Other studies find the opposite direction. For example, Thornton (1997) and Clarke and Berrington (1999) finds a U-shape relationship between the number of children and the risk of parental divorce. Couples with a large number of children are more likely to end marriage than couples with a low number of children. No effects of the number of children on marital stability of parents are documented in Jensen and Smith (1990).

There are less empirical studies on the children's gender on parental divorces. Dahl and Moretti E. (2008) find couples with first-born daughters are more like to be divorced than those with first-born sons. Lundberg and Rose (2003) find the presence of sons increase women's probability of marriage. A positive effect of having a son on the marriage stability are also found in sociological studies such as Morgan et al. (1988) Mott (1994) and Katzev et al. (1994) Wu and Penning (1997). However, using the sample data of Canada, the USA and European countries, Diekmann and Schmidheiny (2004) do not find a significant effect of children's gender composition on the risk of divorce.

A difficulty in estimating the causal effect of children on marital dissolution of parents is the endogenity of children in the equation of marital dissolution. There are two possible sources of the endogenity of children. The first is the reverse causality between children and marital stability of parents. Couples who expect low gains from marriage or high probability of divorce are more likely to avoid having children (Becker et al., 1977). The second is unobserved variables that affect both children and the divorce risk. For example, parents who prefer children tend to have more children and at the same time try to maintain marriage to avoid the harmful effects of divorce on their children.

In this study, we test the hypothesis of children and divorce in Vietnam. More specifically we estimate the effect of the number of children as well as having at least son on the divorce risk of women. Further, we also investigate whether children can affect decision of marriage for unmarried and widowed women with children. To tackle the endogeneity problem of the number of children and the presence of at least a son, we use the instrumental variables regressions with the presence of twins and the gender of the firstborn child as instruments.

For some reasons, Vietnam is an interesting case to look at. Vietnam is a transition country with success in economic growth and social development. Together with economic growth, there are changes in social and demographical features that can threaten the human development. The divorce rate has been increasing in Vietnam (Lam and Mai, 2008). There is also an increasing proportion of women who have children without marriage. The abortion rate has been increasing in Vietnam, and Vietnam is now one of the countries with the leading rate of abortion (Hong, 2006; Dan-Tri, 2010). Vietnam has a large population with a high population growth rate. The population increased by from 76 million to 86 million people during the period of 1999-2009 (Cam, 2009). Like other Asian countries, parents in Vietnam has a strong preference of boys over girls and this gender bias can explain a part of high population growth in Vietnam. It is not clear whether the number as well as gender of children can have influence the marital status of women in Vietnam.

The paper is structured into seven sections. The second section describes data from the 2009 Population and Housing Census which is used in this study. The third section presents the descriptive statistics of fertility and marital status of women in Vietnam. The fourth section presents the estimation method. Next the fifth and sixth section presents empirical findings on the impact of the number and gender of children on the marital status of women. Finally, conclusions are presented in the seventh sections.

2. Data set

The main data used in this study are from the 15-percent sample of the Population and Housing Census (PHC) of Vietnam in 2009. The census was conducted by the General Statistics Office of Vietnam (GSO) in April 2009. Technical supports on designs of sample, census instruments such as questionnaires, and also data collection monitoring are provided by United Nations Population Fund (UNFPA). The 15-percent sample of the 2009 PHC contains data on basic demographic, education, employment, durable ownership and housing characteristics. The sample size is 3,692,042 households with 14,177,590 individuals.

This study limits the analysis on the sample of women who have at least a child. In the 2009 VPHC, women from 15 to 49 were asked about their total number of biological children biological. They were also asked about the number of children currently living as well as not living with them. Since we will use twin children and gender of the firstborn child as instrumental variables, we have to know the gender and age of children. Thu we use only the sample of women who are living with all their biological children. Women who have children not living in the same family or died are dropped from the sample. The number of women used this study is 1,621,289.

3. Children and marital status of women in Vietnam

Vietnam is a country with a high population growth. The average annual growth rate is around 1.2 percent during the period 1999-2009 (GSO, 2010). The population increased from 76 million in 1999 to nearly 86 million in 2009. Limited knowledge on family planning and preference for boys are two possible explanations for high growth of population in Vietnam. In our sample of women aged from 15 to 49, around 27 percent of the women have one child, 51 percent of the women have two children, 16 percent of the women have three children, and the remaining 6 percent of the women have more than three children. The average number of children per women is 2.04. Rural and ethnic minority women tend to have more children than urban and Kinh women (Table A.3 in Appendix). Education of women is negatively correlated with their number of children.

The divorce rate in Vietnam is relatively low compared with other countries (United Nations, 2006). However, the divorce rate have been increasing in Vietnam (Lam and Mai, 2008). Table 1 presents the distribution of women from 15 to 49 years old by marital statuses and the number of children and gender of children. Among the women having at least a child, 0.4 percent are not married, 94.9 percent are married and living with husband, 2.9 percent are widowed, 1.3 percent and 0.5 percent are divorced and separated, respectively.

Women with more children are less likely to be unmarried, divorced or separated. Table 1 shows that women who have at least a son tend to be more married. The proportion of women who are unmarried, widowed, divorced as well as separated is lowed for women with at least a son than women without a son.

Table 2 examines the association between marital status and other characteristics of women. Overall, women who are old, urban and Kinh and have high education are a bit more likely to be divorced and separated than those who are young, rural and ethnic minorities and have low education. Yet, rural and low education women are more likely to have children without marriage than urban and high education women. This can be because rural and low education women lack knowledge on family planning and tend to have unexpected children before marriage.

Divorces as well as living without husband might can cause difficulties, not only economic but also social and psychological, for women and their children (e.g., Amato and Keith, 1991; Garasky, 1995; Biblarz and Raftery, 1999; Amato, 2000; Gruber, 2004; Hyun, 2011). Table 3 shows that women without husbands tend to have lower durables and worsen living conditions than those living with husbands. The strongly negative relation between marriage and living conditions is more clear when observed variables are control in regressions reported by Table 4 (This table presents only coefficients of marital variables. The full regressions are reported in Table A.2 in Appendix).

4. Estimation method

To measure the effect of the number of children and the gender of children on mothers' marital statuses, we use the following simple model:

$$Y_i = \alpha + X_i\beta + C_i\gamma + B_i\theta + \varepsilon_i \, , \qquad (1)$$

where Y_i is a binary variable of a choice of marital status of woman *i* (divorce, unmarried and widowed), X_i is a vector of control variables, C_i is the number of children of woman *i*, B_i is a dummy variable that equals to one if the woman have at least a son, and zero otherwise.

The control variables include age, ethnicity and education of women, urban and regional dummies. Control variables should be exogenous and not affected by the number as well as gender of children (Heckman et al., 1999; Angrist and Pischke, 2008). The summary statistics of variables are presented in Table A.1 in Appendix.

There are two problems in estimating model (1). The first, more importantly, is the endogeneity of the number of children and having at least a son. Women who pay more attention to quality of children might be less likely to have many children and be divorced. There can be a reverse causality of women's marital status and the number of children. Women no longer living with spouses are less likely to have more children. Similarly, having at least a son can be also endogenous. Parents who are gender bias can try to have children until a son. For example, preference for boy or local culture on gender which are unobserved can be both affect marital status and the gender of children.

Randomization of a treatment is the most valid method to measure the effect of the treatment. However, it's impossible to conduct a randomization of fertility and gender of children. Instead, we use instrumental variable regression to measure the effect of the number of children and the existence of at least a son. Finding valid instruments that cause the treatment but not outcomes is always challenging. In empirical studies on the effect of children or fertility, twins are often used as the exogenous instrument for the number of children (e.g., Rosenzweig and Wolpin 1980; Schultz, 2005; Cáceres-Delpiano 2005; Black et al. 2005; Angrist et al. 2010). In our study, we use the presence of twins as the instrument of the number of children of women. Since there are two endogenous variables, there must be at least two instrumental variables. The instrument for the variable of the presence of at least a boy is a dummy variable that the firstborn is a boy. Gender of the firstborn is random and correlated with the chance of having at least a boy. It is expected that twins and gender of firstborn children affect the marital status of women through only the channel of the number of children and having at least a son of women.

The second problem is the difficulty in estimating a model of a multiple response dependent variable with endogenous regressors (Wooldridge, 2007). Since women's choice of marital statuses is a category variable, a multinomial response model such as a multinomial logit model should be used. However, there is no available estimators for a multinomial response model with discontinuous endogenous regressors.[1] Even nonlinear estimators for a binary response model with discontinuous endogenous regressors are not available.[2] Instead, 2SLS is widely used for models of a binary dependent variable with discontinuous endogenous regressors (e.g., see Angrist 2001; Angrist and Krueger 2001; Cáceres-Delpiano 2005; Angrist et al. 2010). Thus in this study we estimate the effect of the number of children and the existence of at least a son on women's marital statuses by a series of 2SLS linear probability models. More specifically, the first stage is linear regressions in which the

[1] If the endogenous variable in a multinomial response model is continuous, one can use the control function approach of Rivers and Vuong (1988). However, in our case, the endogenous variables are the number of children and the presence of at least a boy which are not continuous.

[2] There are maximum likelihood and control function estimators are available for a binary response model with continuous endogenous regressors.

dependent variables are the number of children and the presence of at least a boy on, and the explanatory variables are the instrumental variables and control variables X. In the second stage, we estimate linear probability models as the equation (1) in which the dummy dependent variables are 'being divorced', 'being unmarried', 'being widowed'.

5. The impact of children on women's divorce

This section presents estimation of the effect of children on women's probability of divorce. It should be noted that divorced and separated women are combined into the 'divorced' group since they both reflect the marital dissolution.[3]

The first-stage regressions of the number of children and the existence of at least a son are reported in Table A.3 in Appendix. The instrumental variables are strongly significantly. Having twins increases the number of children as well as the chance of having a boy. Having a son as the firstborn child implies the chance of having at least a son but decreases the number of children. Families in Vietnam tend to prefer a boy, and several families try to have more children until getting a boy. Thus having the firstborn son will discourage them to have more children. The Cragg-Donald weak identification test of the instruments produces a very high statistic, indicating that the instruments are very strong.[4]

Table 5 presents the linear probability regressions of women's divorce on their number of children and existence of at least a son. We try two samples of women. Firstly, the full sample keeps all women of different marital statuses including unmarried, married, widowed, divorced and separated. It should be noted that all the women have at least a child (as discussed in section 2 'Data set'). The second sample excludes unmarried and widowed women. The estimates from the two sample are very similar.

Table 5 shows that the number of children has a negative and significant effect on the probability of divorce of mothers. The 2SLS regressions tend to produce a small effect than the OLS regressions. According the 2SLS regression using the full sample, having an additional child reduces the probability of divorce by around 0.0066. It should be noted that

[3] Actually, we tried to estimate the effect of children on the probability of divorce and the probability of separation, and the effect on divorce is very similar to the effect on separation.
[4] As a rule of thumb, if a F- statistic is under 10, the instruments might be weak (Staiger and Stock 1997).

the proportion of divorced women is 1.76 percent (including both divorced and separated women). Thus the relative effect of having an additional child is quite large: it reduces the probability of 'divorced' by around 37 percent.

The presence of a boy helps stabilize the marriage and reduce the risk of divorce. Having at least son reduces the probability of be being 'divorced' by around 0.0054. This effect is approximately equal to 30 percent of the proportion of divorced women.

Table 6 also reveals the association between divorce and other explanatory variables. Old women tend to be divorced than young women.[5] This finding seems to contradict the prediction by theory that the risk of divorce decreases as the duration of marriage increases (Becker et al., 1977). One possible explanation is that younger women are more likely to remarry quickly after divorce than older women. In our data set, we are not able to know how many times a woman has been divorced or married.

In both theories and empirical findings, the effect of women's education on divorce is ambiguous (e.g., Becker et al., 1977; Clarke and Berrington, 1999). In this study, education is negatively associated with the probability of divorce (education can be endogenous). Women with higher education are more likely to marry with men of high education. Couples with more education can have better labor division within family and reduce the divorce risk (Becker, 1997).

Women in rural and ethnic minorities are less likely to be divorced. This can be because people in this areas have more traditional attitude against divorce. Divorce is considered as the bad, and the cost of divorce for rural and ethnic minority people is higher than that for urban and Kinh (Vietnamese) people.

Table 6 examines whether the effect of children on women's divorce varies across several characteristics by including interactions between the number of children and the existence of a son with age and education of women, urbanity and the proportion of households having solid wall of house in districts. The proportion of households having solid wall of house in a district is an indicators of well-being of the locality. The 2009 PHC contains data on several durables and housing conditions of households. We do not use these household-level variables since they are endogenous. Instead, we create the district-level

[5] We tried the age and age squared in the regressions, but the age squared is not statistically significant.

variables by averaging the household-level variables across households, then interact these district-level variables with the number of children and the existence of a son. The signs of the interactions of these district-level variables in regressions of marital statuses are quite similar, thus we report only regressions with the interactions of the proportion of households having solid wall of house in a district.

The effect of the number of children and the existence of a son on women's probability of divorce tends to be larger as women's age increase. In other words, when getting older, women with many children and a son are much less likely to be 'divorced'. There is no difference in the effect of children on women's divorce between urban and rural areas and between women of different education grade.

The variable 'district mean of solid wall' is positive in the regressions, implying divorce is more likely in better-off areas. However, the negative effect of the number of children is stronger in the better-off areas than the worse-off areas.

Age of children also matters to the risk of divorce (e.g., Becker et al., 1977; Clarke and Berrington, 1999). Empirical studies support the hypothesis that younger children tend to lower the probability of divorce (Clarke and Berrington, 1999). According to Becker et al. (1977), younger children are more marital-specific capital than older children, and other things being equal cost of divorce will be higher if parents have younger children. This hypothesis is supported in the case of Vietnam. Having older children increase the probability of divorce. However the effect of the number of children and the existence of a son on the divorce risk tends to be larger for women having older children. A possible explanation???

6. The impact of children on other marital statuses

In addition to the risk of divorce, we also examine the effect of children on the probability of 'unmarried' and 'widowed' statuses of women. In theories, this effect of children is ambiguous. Becker (1974) and Becker et al. (1977) argues that children from the previous marriage will increase the cost of the new marriage and it can decrease the probability of remarriage. Put differently, women who are unmarried or widowed but have children are less likely to remarry. Children can increase the probability of 'unmarried' and 'widowed' statuses.

However, Becker et al. (1977) postulate that women who are pregnant accidentally before marriage will be more motivated to get married since they want to "legitimate" their children. Koo and Suchindran (1980) also argue that women with children have a stronger motivation to marry to reduce the burden of raising children. They will gain from remarriage more than those without children. As a result, having children can increase the probability of remarriage and reduce the probability of be 'unmarried' as well as 'widowed'.

It shows that the number of children reduces the probability of being 'unmarried' as well as the probability of 'widowed' in Vietnam (Table 7). In other words, having children encourages women, either unmarried or widowed, remarry. Similar to the case of divorce, the existence of a son can increase the probability of the first marriage of women, thereby reducing the probability of being 'unmarried'. It is possible that the biological fathers are much more motivated to marry when having a son. However, having a son is not an advantage for widowed women to increase their probability of remarriage.

Table 7 also shows several interesting findings on other characteristics associated with the probability of being unmarried and widowed. Older women are more likely to be unmarried and widowed, since older women can find it more difficult to remarry than younger women. Education helps women increase the probability of marry or remarry, thereby reducing the risk of being unmarried or widowed. Kinh women tend to be more unmarried, but less widowed than ethnic minority women. Urban women have lower probability of being unmarried as well as widowed for rural women. It implies that urban women with children are more likely to get married than rural women.

Finally, Tables 8 and 9 present the 2SLS regressions of the probability of being unmarried and the probability of being widowed with interactions between children and other explanatory variables, respectively. Interestingly, the effect of children on the probability of being unmarried is lower in the urban areas. Although urban women with children find it easier to get married than rural women (in Table 7), having more children encourages rural women to marry more strongly than the urban women. The effect of children on the probability of being unmarried of women is higher as women's age increases. Older women are more likely to marry than younger women when having more children. The effect of the number of children on the probability of being unmarried is also larger in the better-off districts than the worse-off districts.

The effect of children on the probability of being widowed does not differ largely across different characteristics. Having more children increases the probability of remarriage more for rural women than for urban women. The effect of having a son on the probability of tends to be large for women in worse-off districts and for women with older children.

7. Conclusions

In this paper, we present new evidence for a strong causal effect of the quantity and gender of children in a family on the probability of their parents' divorce. To address the endogeneity issue, we use *twins* and *gender of firstborns* as instrument variables for the *number of children* and the *existence of a son* on divorce. Our estimation shows that: (i) an additional child reduces the divorce rate by 37%; and (ii) the existence of at least a son reduces the divorce rate by 30%. Both of these effects are stronger when the mother is older, indicating that older women might be more vulnerable to divorce. Interestingly, both of these effects are weaker in poorer areas, suggesting perhaps women in richer areas are more susceptible to divorce.

When divorce brings adversity and having more children particularly sons reduces divorce risk, many women will naturally prefer to have more children. Apparently, having more children may bring another kind of hardship for families, especially for women. The evidence presented in this paper points to a new way to control population growth: interventions to reduce the hardship of divorced women. If governments or communities have programs to mitigate the hardship of divorce, women will probably reduce their optimal number of children.

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List of Tables

Table 1: Women by marital status, the number and gender of children

Groups	Unmarried	Married	Widowed	Divorced	Separated	Total
The number of children						
1	1.16	91.12	3.95	2.85	0.92	100
	(0.03)	(0.06)	(0.04)	(0.04)	(0.02)	
2	0.11	96.37	2.37	0.82	0.33	100
	(0.00)	(0.03)	(0.02)	(0.01)	(0.01)	
3	0.04	96.33	2.81	0.57	0.25	100
	(0.00)	(0.05)	(0.04)	(0.02)	(0.01)	
4	0.02	96.08	3.22	0.41	0.27	100
	(0.00)	(0.08)	(0.07)	(0.03)	(0.02)	
5	0.01	96.00	3.51	0.24	0.24	100
	(0.01)	(0.14)	(0.13)	(0.03)	(0.03)	
Gender of children						
Have no boy	0.64	93.58	3.11	2.01	0.65	100
	(0.02)	(0.05)	(0.04)	(0.03)	(0.02)	
Have at least boy	0.29	95.36	2.86	1.07	0.42	100
	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	
Total	0.37	94.94	2.92	1.29	0.47	100
	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	

Standard errors of means in parentheses.
Source: Authors' estimation from the 2009 PHC.

Table 2: Women by marital status and other characteristics

Groups	Unmarried	Married	Widowed	Divorced	Separated	Total
Age						
15-25	0.13	98.85	0.44	0.35	0.23	100
	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)	
26-35	0.19	97.25	1.37	0.85	0.33	100
	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	
36-45	0.49	93.06	4.11	1.76	0.58	100
	(0.01)	(0.05)	(0.04)	(0.02)	(0.01)	
46-49	1.13	85.71	9.26	2.85	1.04	100
	(0.04)	(0.13)	(0.11)	(0.06)	(0.04)	
Completed education grade						
0-5	0.37	94.59	3.18	1.36	0.50	100
	(0.01)	(0.04)	(0.03)	(0.02)	(0.01)	
6-9	0.42	95.07	2.88	1.16	0.47	100
	(0.01)	(0.03)	(0.03)	(0.02)	(0.01)	
10 +	0.22	95.53	2.30	1.54	0.42	100
	(0.01)	(0.06)	(0.04)	(0.04)	(0.02)	
Ethnicity						
Ethnic minorities	0.36	95.29	3.08	0.87	0.41	100
	(0.02)	(0.05)	(0.04)	(0.02)	(0.02)	
Kinh (Vietnamese)	0.38	94.89	2.90	1.36	0.48	100
	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)	
Urbanity						
Rural	0.45	95.08	3.00	1.02	0.46	100
	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	
Urban	0.20	94.61	2.74	1.97	0.49	100
	(0.01)	(0.06)	(0.04)	(0.03)	(0.02)	
Regions						
Northern Mountain	0.62	94.80	2.87	1.28	0.44	100
	(0.02)	(0.06)	(0.04)	(0.03)	(0.02)	
Red River Delta	0.52	95.21	2.77	1.11	0.40	100
	(0.02)	(0.05)	(0.04)	(0.02)	(0.01)	
Central Coast	0.67	94.20	3.76	0.97	0.40	100
	(0.02)	(0.06)	(0.05)	(0.03)	(0.01)	
Central Highlands	0.15	95.36	2.97	1.06	0.46	100
	(0.01)	(0.08)	(0.06)	(0.04)	(0.02)	
South East	0.07	94.45	2.70	2.11	0.67	100
	(0.01)	(0.09)	(0.06)	(0.05)	(0.03)	
Mekong River Delta	0.02	95.79	2.40	1.30	0.50	100
	(0.00)	(0.05)	(0.04)	(0.03)	(0.02)	
Total	0.37	94.94	2.92	1.29	0.47	100
	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	

Standard errors of means in parentheses.
Source: Authors' estimation from the 2009 PHC.

Table 3: Proportion of woman living in a household with the following assets (%)

Woman by marital status	Household having motorbike	Household having television	Household having solid wall	Household having solid roof	Household having tap water	Household having flush toilet
Unmarried	22.38	60.92	81.91	9.93	11.89	13.23
	(0.64)	(0.77)	(0.62)	(0.51)	(0.64)	(0.61)
Married	80.68	89.38	73.57	18.33	23.84	33.02
	(0.13)	(0.09)	(0.22)	(0.20)	(0.29)	(0.29)
Widowed	51.91	81.13	75.67	12.55	22.05	27.07
	(0.33)	(0.24)	(0.31)	(0.25)	(0.40)	(0.40)
Divorces	59.60	80.68	77.90	14.21	35.88	44.44
	(0.50)	(0.36)	(0.42)	(0.41)	(0.64)	(0.62)
Separated	46.22	72.39	72.19	8.88	23.67	30.07
	(0.79)	(0.64)	(0.70)	(0.46)	(0.75)	(0.85)
Total	79.19	88.84	73.71	18.03	23.89	32.90
	(0.13)	(0.09)	(0.22)	(0.20)	(0.29)	(0.29)

Standard errors of means in parentheses.
Source: Authors' estimation from the 2009 PHC.

Table 4: Probit regressions of assets (%)

	Dependent variables					
Explanatory variables	Household having motorbike	Household having television	Household having solid wall	Household having solid roof	Household having tap water	Household having flush toilet
Unmarried	-1.5683***	-1.3272***	-0.3308***	-0.8670***	-0.5204***	-0.7857***
	(0.0220)	(0.0228)	(0.0298)	(0.0343)	(0.0389)	(0.0316)
Widowed	-0.8661***	-0.6627***	-0.1895***	-0.4736***	-0.2336***	-0.4299***
	(0.0086)	(0.0102)	(0.0107)	(0.0130)	(0.0125)	(0.0113)
Divorces	-0.7804***	-0.7143***	-0.1514***	-0.3711***	-0.0491***	-0.1963***
	(0.0129)	(0.0145)	(0.0159)	(0.0209)	(0.0164)	(0.0153)
Separated	-1.0339***	-0.9014***	-0.2493***	-0.6345***	-0.2184***	-0.4485***
	(0.0203)	(0.0221)	(0.0247)	(0.0359)	(0.0272)	(0.0246)
Married			Base -Omitted			
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,621,289	1,621,289	1,621,289	1,621,289	1,621,289	1,621,289
Pseudo R-squared	0.137	0.192	0.412	0.302	0.305	0.304

Note: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from the 2009 PHC.

Table 5. Regressions of 'divorced'

Explanatory variables	Full sample of women		Sample of women 'divorced and married'	
	OLS	2SLS	OLS	2SLS
The number of children	-0.01526***	-0.00657***	-0.01688***	-0.00710***
	(0.00020)	(0.00106)	(0.00022)	(0.00110)
Having at least a boy	-0.00883***	-0.00544***	-0.00963***	-0.00575***
	(0.00036)	(0.00060)	(0.00038)	(0.00063)
Age	0.00205***	0.00161***	0.00232***	0.00179***
	(0.00003)	(0.00006)	(0.00003)	(0.00006)
Completed education grade	-0.00058***	-0.00037***	-0.00068***	-0.00042***
	(0.00005)	(0.00005)	(0.00005)	(0.00005)
Kinh majority	-0.00162***	0.00136**	-0.00190***	0.00141**
	(0.00044)	(0.00057)	(0.00046)	(0.00059)
Urban	0.00047	0.00327***	-0.00046	0.00285***
	(0.00042)	(0.00054)	(0.00043)	(0.00057)
Northern Mountain	Omitted			
Red River Delta	-0.00471***	-0.00532***	-0.00493***	-0.00560***
	(0.00052)	(0.00053)	(0.00055)	(0.00055)
Central Coast	-0.00276***	-0.00511***	-0.00232***	-0.00504***
	(0.00050)	(0.00057)	(0.00052)	(0.00060)
Central Highlands	0.00321***	-0.00022	0.00367***	-0.00015
	(0.00061)	(0.00073)	(0.00063)	(0.00076)
South East	0.00431***	0.00424***	0.00393***	0.00398***
	(0.00074)	(0.00075)	(0.00076)	(0.00077)
Mekong River Delta	-0.00488***	-0.00421***	-0.00591***	-0.00498***
	(0.00054)	(0.00055)	(0.00056)	(0.00057)
Constant	-0.00868***	-0.01771***	-0.01153***	-0.02105***
	(0.00074)	(0.00133)	(0.00077)	(0.00133)
Observations	1,621,289	1,621,289	1,566,108	1,566,108
R-squared	0.017	0.014	0.020	0.016
Endogeneity test Chi-sq(2) (P-value)		96.53 (0.000)		51.57 (0.000)
Cragg-Donald weak IV test		12473		12125

Note: In 2SLS regressions, the endogenous variables are 'the number of children' and 'having at least a boy'. The instrumental variables for these endogenous variables are the presence of twins and the firstborn child.
Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from the 2009 PHC.

Table 6. 2SLS regressions of 'divorced' with interactions
(sample of divorced and married women)

Explanatory variables	Divorce	divorce	divorce	divorce	divorce
The number of children	-0.00640***	0.00500	-0.00443**	-0.00138	-0.00282
	(0.00101)	(0.00465)	(0.00221)	(0.00238)	(0.00202)
Having at least a boy	-0.00635***	0.01210***	-0.00574***	-0.00449***	0.00225***
	(0.00069)	(0.00258)	(0.00122)	(0.00125)	(0.00075)
Age	0.00179***	0.00282***	0.00179***	0.00178***	0.00097***
	(0.00006)	(0.00032)	(0.00006)	(0.00006)	(0.00007)
Completed education grade	-0.00041***	-0.00040***	0.00048	-0.00037***	-0.00047***
	(0.00005)	(0.00005)	(0.00065)	(0.00006)	(0.00005)
Kinh majority	0.00151***	0.00133**	0.00231***	0.00172***	0.00203***
	(0.00056)	(0.00059)	(0.00087)	(0.00062)	(0.00058)
Urban	0.00632	0.00266***	0.00286***	0.00249***	0.00364***
	(0.00594)	(0.00058)	(0.00057)	(0.00059)	(0.00058)
Northern Mountain	Omitted				
Red River Delta	-0.00563***	-0.00561***	-0.00558***	-0.00634***	-0.00531***
	(0.00055)	(0.00055)	(0.00055)	(0.00065)	(0.00055)
Central Coast	-0.00506***	-0.00479***	-0.00499***	-0.00516***	-0.00414***
	(0.00060)	(0.00063)	(0.00060)	(0.00069)	(0.00064)
Central Highlands	-0.00017	0.00007	-0.00035	-0.00026	0.00072
	(0.00076)	(0.00078)	(0.00078)	(0.00076)	(0.00078)
South East	0.00395***	0.00421***	0.00381***	0.00348***	0.00501***
	(0.00077)	(0.00078)	(0.00077)	(0.00080)	(0.00079)
Mekong River Delta	-0.00490***	-0.00486***	-0.00508***	-0.00414***	-0.00497***
	(0.00058)	(0.00057)	(0.00058)	(0.00062)	(0.00057)
Urban * number of children	-0.00256				
	(0.00295)				
Urban * Having a boy	0.00196				
	(0.00131)				
Age * number of children		-0.00033**			
		(0.00014)			
Age * Having a boy		-0.00054***			
		(0.00009)			
Educ. grade * number of children			-0.00044		
			(0.00030)		
Educ. grade * Having a boy			-0.00003		
			(0.00017)		
District mean of solid wall * number of children				-0.00763**	
				(0.00324)	
District mean of solid wall * Having a boy				-0.00185	
				(0.00177)	
District mean of solid wall				0.01908**	
				(0.00750)	
Average age of children * number of children					-0.00042*
					(0.00023)
Average age of children * Having a boy					-0.00112***
					(0.00013)
Average age of children					0.00284***
					(0.00048)
Constant	-0.02211***	-0.05616***	-0.02748***	-0.03548***	-0.01802***
	(0.00184)	(0.00948)	(0.00486)	(0.00576)	(0.00391)
Observations	1,566,108	1,566,108	1,566,108	1,566,108	1,566,108
R-squared	0.016	0.017	0.016	0.016	0.019

Note: This table reports 2SLS estimations of the effect of 'the number of children' and 'having at least a son' on women's marital statuses. The instrumental variables for 'the number of children' and 'having at least a son' are 'the presence of twins' and 'the existence of the firstborn son'. Instrumental variables for interactions between 'the number of children' as well as 'having at least a son' and an explanatory variable such as age and education of women are interactions between the presence of twins' and 'the presence of the firstborn son' with the explanatory variable.
Robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from the 2009 PHC.

Table 7. Regressions of 'unmarried' and 'widowed'

Explanatory variables	Dependent variable is 'Woman is unmarried'		Dependent variable is 'Woman is widowed'	
	OLS	2SLS	OLS	2SLS
The number of children	-0.00634***	-0.00284***	-0.01627***	-0.00697***
	(0.00014)	(0.00030)	(0.00027)	(0.00150)
Having at least a boy	-0.00275***	-0.00085***	-0.00680***	-0.00105
	(0.00017)	(0.00024)	(0.00039)	(0.00076)
Age	0.00073***	0.00055***	0.00422***	0.00372***
	(0.00002)	(0.00002)	(0.00004)	(0.00008)
Completed education grade	-0.00035***	-0.00026***	-0.00137***	-0.00113***
	(0.00002)	(0.00002)	(0.00006)	(0.00007)
Kinh majority	0.00021	0.00143***	-0.00726***	-0.00400***
	(0.00024)	(0.00027)	(0.00060)	(0.00078)
Urban	-0.00489***	-0.00373***	-0.01321***	-0.01007***
	(0.00018)	(0.00019)	(0.00051)	(0.00068)
Northern Mountain	Omitted			
Red River Delta	-0.00151***	-0.00177***	-0.00048	-0.00116*
	(0.00033)	(0.00033)	(0.00067)	(0.00068)
Central Coast	0.00118***	0.00022	0.01109***	0.00853***
	(0.00034)	(0.00035)	(0.00072)	(0.00082)
Central Highlands	-0.00215***	-0.00355***	0.00995***	0.00623***
	(0.00027)	(0.00029)	(0.00079)	(0.00096)
South East	-0.00609***	-0.00610***	-0.00391***	-0.00391***
	(0.00029)	(0.00029)	(0.00080)	(0.00079)
Mekong River Delta	-0.00826***	-0.00797***	-0.01163***	-0.01082***
	(0.00028)	(0.00028)	(0.00065)	(0.00066)
Constant	-0.00040	-0.00430***	-0.05958***	-0.07028***
	(0.00034)	(0.00049)	(0.00096)	(0.00180)
Observations	1,621,289	1,621,289	1,621,289	1,621,289
R-squared	0.013	0.010	0.028	0.026
Endogeneity test Chi-sq(2) (P-value)		96.53 (0.000)		98.34 (0.000)
Cragg-Donald weak IV test		12473		12473

Note: In 2SLS regressions, the endogenous variables are 'the number of children' and 'having at least a boy'. The instrumental variables for these endogenous variables are the presence of twins and the firstborn child.
Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from the 2009 PHC.

Table 8. 2SLS regression of 'unmarried' with interactions

Explanatory variables	Unmarried	Unmarried	Unmarried	Unmarried	Unmarried
The number of children	-0.00316***	0.00265*	-0.00234***	-0.00067*	-0.00292***
	(0.00038)	(0.00160)	(0.00052)	(0.00035)	(0.00055)
Having at least a boy	-0.00120***	0.00231**	-0.00107**	-0.00105***	0.00030
	(0.00033)	(0.00112)	(0.00048)	(0.00038)	(0.00030)
Age	0.00055***	0.00090***	0.00055***	0.00054***	0.00125***
	(0.00002)	(0.00011)	(0.00002)	(0.00002)	(0.00004)
Completed education grade	-0.00027***	-0.00025***	-0.00012	-0.00026***	-0.00022***
	(0.00002)	(0.00002)	(0.00015)	(0.00002)	(0.00002)
Kinh majority	0.00138***	0.00141***	0.00159***	0.00085***	0.00086***
	(0.00027)	(0.00027)	(0.00030)	(0.00025)	(0.00026)
Urban	-0.00681***	-0.00376***	-0.00373***	-0.00404***	-0.00465***
	(0.00117)	(0.00019)	(0.00019)	(0.00020)	(0.00020)
Northern Mountain	Omitted				
Red River Delta	-0.00175***	-0.00177***	-0.00177***	-0.00293***	-0.00201***
	(0.00033)	(0.00033)	(0.00033)	(0.00038)	(0.00033)
Central Coast	0.00022	0.00031	0.00023	-0.00051	-0.00029
	(0.00035)	(0.00035)	(0.00035)	(0.00037)	(0.00035)
Central Highlands	-0.00356***	-0.00346***	-0.00359***	-0.00366***	-0.00418***
	(0.00029)	(0.00030)	(0.00029)	(0.00029)	(0.00029)
South East	-0.00610***	-0.00598***	-0.00613***	-0.00689***	-0.00681***
	(0.00029)	(0.00029)	(0.00029)	(0.00032)	(0.00030)
Mekong River Delta	-0.00803***	-0.00789***	-0.00799***	-0.00702***	-0.00805***
	(0.00028)	(0.00028)	(0.00028)	(0.00026)	(0.00028)
Urban * number of children	0.00123**				
	(0.00051)				
Urban * Having a boy	0.00097**				
	(0.00044)				
Age * number of children		-0.00015***			
		(0.00005)			
Age * Having a boy		-0.00009**			
		(0.00004)			
Educ. grade * number of children			-0.00008		
			(0.00007)		
Educ. grade * Having a boy			0.00003		
			(0.00006)		
District mean of solid wall * number of children				-0.00290***	
				(0.00075)	
District mean of solid wall * Having a boy				0.00020	
				(0.00065)	
District mean of solid wall				0.00940***	
				(0.00179)	
Average age of children * number of children					-0.00002
					(0.00005)
Average age of children * Having a boy					-0.00006
					(0.00004)
Average age of children					-0.00090***
					(0.00011)
Constant	-0.00333***	-0.01652***	-0.00533***	-0.01014***	-0.01884***
	(0.00068)	(0.00330)	(0.00117)	(0.00123)	(0.00114)
Observations	1,621,289	1,621,289	1,621,289	1,621,289	1,621,289
R-squared	0.011	0.011	0.010	0.011	0.013

Note: In 2SLS regressions, the endogenous variables are 'the number of children' and 'having at least a boy'. The instrumental variables for these endogenous variables are the presence of twins and the firstborn child.
Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from the 2009 PHC.

Table 9. 2SLS regressions of 'widowed' with interactions

Explanatory variables	Widowed	Widowed	Widowed	Widowed	Widowed
The number of children	-0.00910***	-0.00297	-0.00558**	-0.00639**	-0.00267
	(0.00158)	(0.00731)	(0.00280)	(0.00291)	(0.00246)
Having at least a boy	-0.00173*	-0.00314	-0.00042	-0.00537***	0.00038
	(0.00096)	(0.00318)	(0.00142)	(0.00148)	(0.00085)
Age	0.00374***	0.00388***	0.00373***	0.00372***	0.00204***
	(0.00008)	(0.00050)	(0.00008)	(0.00008)	(0.00008)
Completed education grade	-0.00119***	-0.00113***	-0.00059	-0.00115***	-0.00123***
	(0.00007)	(0.00006)	(0.00085)	(0.00007)	(0.00007)
Kinh majority	-0.00432***	-0.00400***	-0.00350***	-0.00456***	-0.00262***
	(0.00078)	(0.00079)	(0.00112)	(0.00078)	(0.00077)
Urban	-0.02644***	-0.01007***	-0.01006***	-0.01021***	-0.00801***
	(0.00721)	(0.00069)	(0.00068)	(0.00071)	(0.00069)
Northern Mountain					
Red River Delta	-0.00106	-0.00117*	-0.00114*	-0.00192**	-0.00061
	(0.00068)	(0.00068)	(0.00068)	(0.00079)	(0.00067)
Central Coast	0.00856***	0.00859***	0.00857***	0.00796***	0.00998***
	(0.00082)	(0.00087)	(0.00082)	(0.00092)	(0.00088)
Central Highlands	0.00623***	0.00628***	0.00613***	0.00615***	0.00784***
	(0.00096)	(0.00102)	(0.00098)	(0.00096)	(0.00100)
South East	-0.00389***	-0.00382***	-0.00400***	-0.00441***	-0.00201**
	(0.00079)	(0.00081)	(0.00080)	(0.00084)	(0.00082)
Mekong River Delta	-0.01117***	-0.01075***	-0.01087***	-0.01032***	-0.01060***
	(0.00067)	(0.00066)	(0.00066)	(0.00071)	(0.00065)
Urban * number of children	0.00791**				
	(0.00355)				
Urban * Having a boy	0.00153				
	(0.00140)				
Age * number of children		-0.00011			
		(0.00023)			
Age * Having a boy		0.00007			
		(0.00011)			
Educ. grade * number of children			-0.00023		
			(0.00039)		
Educ. grade * Having a boy			-0.00011		
			(0.00019)		
District mean of solid wall * number of children				-0.00077	
				(0.00414)	
District mean of solid wall * Having a boy				0.00567***	
				(0.00210)	
District mean of solid wall				-0.00040	
				(0.00948)	
Average age of children * number of children					-0.00037
					(0.00032)
Average age of children * Having a boy					-0.00036**
					(0.00016)
Average age of children					0.00337***
					(0.00065)
Constant	-0.06514***	-0.07594***	-0.07412***	-0.06890***	-0.04546***
	(0.00267)	(0.01475)	(0.00624)	(0.00715)	(0.00491)
Observations	1,621,289	1,621,289	1,621,289	1,621,289	1,621,289
R-squared	0.026	0.026	0.026	0.026	0.028

Note: In 2SLS regressions, the endogenous variables are 'the number of children' and 'having at least a boy'. The instrumental variables for these endogenous variables are the presence of twins and the firstborn child.
Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from the 2009 PHC.

Appendix

Table A.1. Variable description

Variables	Type	Mean	Std. Dev.	Min	Max
Unmarried	Binary	0.0037	0.0610	0	1
Married	Binary	0.9494	0.2192	0	1
Widowed	Binary	0.0292	0.1684	0	1
divorce	Binary	0.0129	0.1130	0	1
Separated	Binary	0.0047	0.0685	0	1
The number of children	Discrete	2.0425	0.9081	1	13
Have at least a son	Binary	0.7639	0.4247	0	1
Age	Discrete	34.650	7.167	16	49
Completed education grade	Discrete	6.5173	3.3614	0	12
Proportion of children below 15	Continuous	0.3595	0.1807	0	0.889
Proportion of elderly above 60	Continuous	0.0142	0.0552	0	0.6
Proportion of female members	Continuous	0.5072	0.1828	0.037	1
Household size	Discrete	4.1518	1.1768	2	37
Kinh (Kinh majority=1; ethnic minorities=0)	Binary	0.8684	0.3381	0	1
Urban (urban = 1; rural = 0)	Binary	0.2898	0.4537	0	1
Northern Mountain	Binary	0.1388	0.3458	0	1
Red River Delta	Binary	0.2395	0.4268	0	1
Central Coast	Binary	0.2099	0.4072	0	1
Central Highlands	Binary	0.0646	0.2458	0	1
South East	Binary	0.1583	0.3650	0	1
Mekong River Delta	Binary	0.1889	0.3914	0	1
Number of observations		1,621,289			

Source: Authors' estimation from the 2009 PHC.

Table A.2. Probit regressions of assets (%)

Explanatory variables	Dependent variables					
	Household having motorbike	Household having television	Household having solid wall	Household having solid roof	Household having tap water	Household having flush toilet
Unmarried	-1.5683***	-1.3272***	-0.3308***	-0.8670***	-0.5204***	-0.7857***
	(0.0220)	(0.0228)	(0.0298)	(0.0343)	(0.0389)	(0.0316)
Widowed	-0.8661***	-0.6627***	-0.1895***	-0.4736***	-0.2336***	-0.4299***
	(0.0086)	(0.0102)	(0.0107)	(0.0130)	(0.0125)	(0.0113)
Divorces	-0.7804***	-0.7143***	-0.1514***	-0.3711***	-0.0491***	-0.1963***
	(0.0129)	(0.0145)	(0.0159)	(0.0209)	(0.0164)	(0.0153)
Separated	-1.0339***	-0.9014***	-0.2493***	-0.6345***	-0.2184***	-0.4485***
	(0.0203)	(0.0221)	(0.0247)	(0.0359)	(0.0272)	(0.0246)
Married	Omitted					
Age	-0.0012***	0.0430***	0.0256***	0.0222***	0.0187***	0.0208***
	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.0006)	(0.0004)
Education grades	0.0397***	0.0618***	0.0678***	0.0093***	-0.0106***	0.0088***
	(0.0008)	(0.0009)	(0.0010)	(0.0011)	(0.0013)	(0.0011)
Kinh majority	0.5355***	0.7639***	1.0440***	0.7986***	0.3084***	0.8435***
	(0.0097)	(0.0103)	(0.0155)	(0.0208)	(0.0297)	(0.0178)
Urban	0.5219***	0.4665***	0.6534***	0.5279***	1.6685***	1.3427***
	(0.0095)	(0.0097)	(0.0151)	(0.0140)	(0.0213)	(0.0138)
Proportion of children below 15	-0.5464***	-0.2231***	-0.0469***	0.0198	0.0922***	0.0789***
	(0.0110)	(0.0133)	(0.0121)	(0.0145)	(0.0145)	(0.0124)
Proportion of elderly above 60	0.0905***	1.2275***	0.7455***	0.4819***	0.0838**	0.4195***
	(0.0299)	(0.0395)	(0.0346)	(0.0391)	(0.0421)	(0.0348)
Proportion of female members	-0.0772***	-0.0223**	0.1396***	0.0856***	0.1416***	0.1825***
	(0.0081)	(0.0096)	(0.0086)	(0.0104)	(0.0101)	(0.0091)
Household size	0.0569***	0.0391***	-0.0541***	-0.0204***	-0.0788***	-0.0929***
	(0.0022)	(0.0026)	(0.0024)	(0.0029)	(0.0034)	(0.0027)
Northern Mountain	Omitted					
Red River Delta	-0.0875***	0.2597***	1.8004***	0.7695***	0.4152***	0.4510***
	(0.0111)	(0.0138)	(0.0284)	(0.0166)	(0.0339)	(0.0208)
Central Coast	-0.0764***	-0.0298**	0.7617***	-0.5231***	0.2372***	0.4819***
	(0.0111)	(0.0128)	(0.0189)	(0.0208)	(0.0340)	(0.0203)
Central Highlands	0.5160***	0.1914***	0.0604***	-1.5387***	-0.3872***	0.3928***
	(0.0138)	(0.0207)	(0.0224)	(0.0337)	(0.0528)	(0.0267)
South East	0.6072***	0.1516***	0.5486***	-0.8813***	0.1849***	1.3528***
	(0.0156)	(0.0163)	(0.0213)	(0.0316)	(0.0416)	(0.0247)
Mekong River Delta	-0.5191***	-0.2241***	-0.9096***	-1.5482***	0.4342***	0.3487***
	(0.0120)	(0.0125)	(0.0183)	(0.0243)	(0.0334)	(0.0203)
Constant	0.1654***	-1.3273***	-1.7062***	-2.4677***	-2.2728***	-2.7238***
	(0.0156)	(0.0182)	(0.0215)	(0.0262)	(0.0362)	(0.0252)
Observations	1,621,289	1,621,289	1,621,289	1,621,289	1,621,289	1,621,289
R-squared	0.137	0.192	0.412	0.302	0.305	0.304

Note: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from the 2009 PHC.

Table A.3. First-stage regressions of 'the number of children' and 'having at least a boy'

	Full sample of women				Sample of women 'divorced and married'	
	Number of children	Having at least a boy	Number of children	Having at least a boy	Number of children	Having at least a boy
Having twin children	1.12222***	0.04081***	1.04000***	0.02789***	1.02897***	0.02586***
	(0.01028)	(0.00339)	(0.00908)	(0.00333)	(0.00919)	(0.00336)
Gender of the firstborn child	-0.10762***	0.50577***	-0.14103***	0.49975***	-0.14331***	0.49536***
	(0.00184)	(0.00105)	(0.00171)	(0.00105)	(0.00173)	(0.00107)
Age			0.04727***	0.00833***	0.05026***	0.00895***
			(0.00019)	(0.00005)	(0.00020)	(0.00005)
Completed education grade			-0.02415***	-0.00110***	-0.02510***	-0.00128***
			(0.00048)	(0.00012)	(0.00049)	(0.00012)
Kinh majority			-0.32898***	-0.03611***	-0.32426***	-0.03451***
			(0.00647)	(0.00122)	(0.00653)	(0.00124)
Urban			-0.29853***	-0.05763***	-0.31435***	-0.06101***
			(0.00436)	(0.00102)	(0.00445)	(0.00104)
Northern Mountain	Omitted					
Red River Delta			0.06496***	0.01149***	0.06303***	0.01097***
			(0.00589)	(0.00148)	(0.00600)	(0.00151)
Central Coast			0.25949***	0.02230***	0.26555***	0.02318***
			(0.00646)	(0.00136)	(0.00654)	(0.00139)
Central Highlands			0.38119***	0.02551***	0.37762***	0.02482***
			(0.00963)	(0.00169)	(0.00973)	(0.00170)
South East			0.01824**	-0.02847***	0.00570	-0.03115***
			(0.00749)	(0.00176)	(0.00757)	(0.00179)
Mekong River Delta			-0.06410***	-0.03702***	-0.08179***	-0.04071***
			(0.00594)	(0.00143)	(0.00600)	(0.00145)
Constant	2.08865***	0.49385***	0.91347***	0.26634***	0.84215***	0.25281***
	(0.00258)	(0.00105)	(0.00829)	(0.00210)	(0.00839)	(0.00213)
Observations	1,621,289	1,621,289	1,621,289	1,621,289	1,558,746	1,558,746
R-squared	0.019	0.353	0.213	0.378	0.231	0.377
Cragg-Donald weak IV test		12321		12473		12125

Note: Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from the 2009 PHC.