

## **The Impact of Family Size on Family Wealth: A Longitudinal Study of a Rural Area in Thailand**

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### **ABSTRACT**

Objective of this study is to investigate the influence of family size on family wealth. Unit of analysis is nuclear family, which the wives' age between 15-29 years old in 1984. Data sets for this study are Nang Rong data 1984 and 1994. There are 700 families included in this analysis. Independent variables composes of family size, amount of land own, amount of land use, husband education, husband occupation, duration of married, a canal or stream in the village, major dialect, distance from village to Nang Rong and new children age 0-11. Results from the analysis found that family size did not have any association with family wealth. However, an additional new child in 1994 decline family wealth for about 7 thousand Baht.

One suggestion from this study; it is found that family size did not have any association with family wealth. Therefore, there may be some other factors more important than family size. Thus, to promote family wealth, we should pay more attention on the other factors such as factors about production resources. This study found high associations between family wealth and amount of land own, amount of land use, family head's occupation, and family head's education.

### **1. Rationale and Research Question**

On studying fertility decline, demographers remarked that there are many factors affect fertility. Among the factors, the United Nations (1973) states the important role of contraception on fertility decline that "contraception was the principal intermediate variable responsible for the shift from high to low fertility during the late nineteenth and early twentieth century."

At present, man learns a lot on reproduction science. They know many means to prevent unwanted pregnancy and have a lot of modern appliance contraception. Among common people, in these days, people's knowledge of contraception is very well. Recent studies suggested that almost reproductive ages know and some of them currently use modern contraception. Such as a study in The Philippines (Olenick, 2000) by Phillipines National Demographic and Health Survey in 1998 revealed that 98 per cent of females in reproductive age know at least one modern contraceptive method. In addition, 47 per cent of married women currently practice contraception. No doubt with younger ages, a study in Romania (Breslin, 1998) found that knowledge of modern contraceptive methods almost universal among adolescence 15-24 years. Moreover, some studies in many countries such as the Netherlands, Pakistan, India and Egypt etc. (Doppenberg, 1994; Center for Reproductive Law and Policy, 1995; Davies & Agha, 1997; Cobb, 1993)

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pointed that people's abilities to afford contraception were almost perfect. Although some of appliance contraception has rather high prices, the other methods have moderate prices or to be subsidized for having low price for even poor couples could afford them.

Concerning the accessibility of contraception, nowadays, though not all types of contraception are allowed in every country, some of the types are selected and access to people even in rural areas. For the popularization of modern contraception, the accessibility to people even in rural areas included with the low price of contraception that almost the people could afford. Therefore, it can conclude that "people of reproductive ages nowadays would like to have children or not?" or "how many children they would like to have?" are the matters that a couple can determine.

As discussed that a couple can control the number of children if they want. However, a mysterious is; what motivations make families have few children while the others have more? This question, some scholars try to explain. Nevertheless, the explanations are rather dispersion. If trying to classify, it can be divided the explanations roughly into three categories; 1) the benefit perspective, 2) the demand – supply perspective and 3) the innovation-diffusion perspective.

**The benefit perspective's explanations** are partly related to benefit of the children, such as critiques of Coale, Caldwell, etc. Coale, (in United Nations, 1973) states that there are three preconditions for substantial fertility decline: 1) the acceptance of calculated choice as a valid element in marital fertility, 2) the perception of advantages from fertility regulation, and 3) knowledge and mastery of effective technique of control. For Caldwell (1982), he proposed "Wealth Flow Theory." The theory mentions the effect of wealth that flow between children and parents. If parents get benefit from children more than cost, it means the net of wealth flows from children to parents. In this case, the families will have many children. On the contrary, if the wealth flows in different direction, families will have fewer children.

**The "demand – supply perspective"** used microeconomics principles to explain demand and supply of children. Becker (1960) introduced the idea that children might be thought of as "commodities." He proposed that families have to produce three types of goods; 1) child number, 2) child quality, and 3) general commodities. Under one budget line, families have to trade of among child number, child quality and general commodities. However, if set general commodities constant, families those increase child quality, have to reduce child number.

As Weeks (1996) mentioned, the third group is "**innovation-diffusion perspective**". The view of this group is social pressure plays major roles on fertility, regardless of the underlying economic circumstances. A study by Hayfa, (1983) in Bangladesh supports the view that, in Bangladesh, acceptance of social and cultural norms may act as a strong motivation for having many children. Religion, marriage customs, son preference, social prestige, and status of women show a pronatal pattern. In addition, Leibenstein, (1973) mentions that neither education, food, clothing, mother's time, nor child earning can account for reducing family size; only different taste, and changing desire for children can explain smaller families among those with rising income. The other example is the influence of governments on families in developing countries. It is between 1960s and 1970s, the USA, some other developed countries, and the Rockey Feller Foundation donated a great amount of budgets as well as some academic supports for developing countries to reduce population growth rate. The

donators convinced developing countries that high growth rate was the cause of poverty and non-economic development (King, 1974 cited in Attakorn. & Sukharon, 1990). The persuasion was effecting. Consequently, many developing countries such as Pakistan, Zimbabwe, Tunisia, Algeria, Thailand etc. had population policy which mainly to reduced population growth rate. Fertility of the mentioned countries declined due to the initiation of population policies and family planning programs (Lee, et.al., 1995; Knodel, Chamratitthirong and Debvalya, 1987).

It can not determine which of the explanations, among the benefit perspective, the demand–supply perspective and the innovation-diffusion perspective, is correct. All of them seem believable but depends upon the societies, situations or individuals. That is, different societies might have different perspectives. And even in the same society, a family may make a decision on number of children upon their own rationality and not necessary do as same as neighbors do. That is, some families may think of benefit of additional children while the others may think of social norm or quality of children.

In the case of fertility decline in Thailand, it sharply declined from high to low fertility after the government proclaimed population policy in 1970. The policy supports voluntary family planning and aims to reduce annual population growth rate down from 3.00 per cent in the end of the Third Plan period (1976), and decline to 1.2 per cent in the end of Seventh Plan period (1996) (Wongboonsin, 1995). A study of Knodel, Havanon and Pramualratana (1983) addresses the two most important components that interacted to result in rapid fertility decline. The first component is fundamental social and economic changes, which induced latent demands for fertility control among the older generation as well as current desire for smaller family among the younger. The second component is the effect of family planning program.

Concerning the concealed needed of fertility reduction among Thai people. It does not have clearly evidence to support that the needs are occurred because they follow Becker’s view on demand-supply perspective, think of cost-benefit of additional children, looking on flow of wealth between parents and children or they want to improve quality of children. The same things that the government officers give their civilians while they have population policy are;

- 1) let all families have knowledge and understanding on modern contraception,
- 2) make modern contraception service access to all families even in remote rural areas,
- 3) give free of charge of contraception service or a little amount payment on the service.
- 4) give some information concerning benefit of fertility reduction on mass media (see Leonanonchai, 1987; Knodel, 1987).

Especially, some phrases that broadcast on TV and radio (see Ministry of Public Health, 1978; Population Development Association, 1984), such as, “if you have more children you will become poor,” “one child for seven years poverty” etc. They were easy to memorize and scared normal people on having high fertility.

The population policy of the Thai government succeeded with sharp fertility decline. Total fertility rate (TFR) shows that each family has fewer children when compare to the former cohort. It reduced from six children per family in 1960 to two

children in 2000. Some scholars such as Knodel, Chamrathrithirong and Debavallaya (1987) mentioned that Thailand is now approaching to the two children fertility norm.

Family is a special unit. It employs both production and consumption unit. The important duty is to produce as much as its members' consumption. Factors that might affect family economy is not only the number of its member, but include some other factors such as quality and quantity of capital, occupation, qualifications of family member such as education, experiences, strengthen etc. In addition, some endogenous factors as well as exogenous factors also affect family economy. Endogenous factors those might affect family economy are sedulousness, frugality, consumption's habit etc. On the other hand, exogenous factors those might affect family economy are socioeconomic system, politics, exposure to information and service, monopoly in economic system, inheritance of treasure from predecessors, lottery winning etc. Moreover, in farm families, some other important exogenous factors are drought, flood and farm production's prices. The three factors affect both farm production and family income.

Majorities of Thai population are in agricultural sectors. Normally farm production processes largely depended upon manpower. However, since the Thai government proclaimed population policy in 1970, almost all peasant families accepted the policy and limited number of children that they should reproduce. The contradiction might occur from the change of perception that more number of children no more returns benefit but returns more deficiency on family wealth as Phodhisita (1985) mentioned.

Although many peasants believe that families who have many children will become poor, however, there is no clear evidence to support. Views on the impact of child number on family economy are now still controversy. Therefore, we have a research question that, looking on young couples who are in the early stage of family formation, **does family size impact family wealth?** Answers of the question will let we know that among many important factors those influence family wealth, family size do any impacting on family wealth or not. The knowledge will confirm that limitation of family size is not only a new norm in the society, but also make the families get more benefit on family wealth's promotion. On the other hand, if family size does not have any impacting on family wealth, it will be an evidence that in a point of times while families of rural areas performing fertility regulation, number of children those they reproduced, does not impact family wealth at all. In this case, if someone want to promote family wealth of population in rural area, they need to concentrate on the other factors, do not need to pay so much attention on family size. For this reason, **an objective of this research is "to investigate the influence of family size on family wealth"**.

## **2. Determinants of Family Wealth**

Families are both the production and consumption unit. Production is an obligation of adolescents or adults, and sometimes also includes children whom strong enough to work, while consumption is an activity of all family's members.

As mentioned, the result of production's activity is income. On the other hand, residual of consumption is family wealth that families accumulate every year. The duration of times that families accumulate their wealth depends upon the times that the

couple forms their families. That is, longer time of marrying, the couples may have longer times to accumulate family wealth.

According to Keynes (1952 in United Nations, 1973), he mentioned that consumption will increase with income, though not in the same proportion, and therefore, savings as a residual after consumption will depend upon income. From his argument, income, consumption and saving have close relation. Income as well as consumption has an impact to savings, which this thesis classifies it as a part of family wealth. Thus “Factors Affecting Family Wealth” will concentrate on factors that concern production and consumption.

## 2.1 Production Factors

Production is the mean to get income. It is widely known that factors those affect the production are factors of production. As Boonnag & Kaewsonthi (1991) mentioned, the factors of production compose of lands and natural resources, labours, capital goods, and entrepreneurs.

Normally peasant families work in the fields. They do not produce in factories. Therefore, factors of production in peasant families are rather different from industries, especially the fourth factors of production, entrepreneur. The heads of the peasant families are not entrepreneurs, though they play the families’ leadership on producing for families. In addition, in some families, all the members are wage employ. No one of them is an entrepreneur but some members bring income to families. However, for peasant families who do agriculture or husbandry, the families need factors of production as the industry. They are land and natural resource, labor, capital goods and qualification of family members.

**Land and natural resources** are very important for peasant families. Amount of land, quality of soil, sufficiency of water etc., affect quantity and quality of crop production. There are some studies found the impact of natural resources on family economy, such as a study of Deesuankhok, Teerasawat, & Kaenmanee, (1986). The study found that family economy of villagers on Chi River’s basin, northeastern of Thailand, are rather deficient if they live in a village that frequently damage from natural harm such as flood, drought, unfertilized soil, lack of irrigation system etc.

The second factor of production is **labor**. According to Chayanov (Natsupa, et.al., 1997), an agricultural economist of Russia, he observed Russian data of peasant families between 18<sup>th</sup> and 19<sup>th</sup> century. He concluded that family size was the important factor on the amount of land that families cultivate as well as the size of agricultural activity. It is harmony with a study of Krishnaji (1995) in rural area of India that there was a strong positive correlation between land holding and family size. Moreover, a study in rural Botswana on family income found that total income increased positively with family size. On the other hand, income per capita decreased negatively with family size (Chernichovsky, Lucas & Mueller, 1985). Based on the studies, it refers that families that have more labors will have more cultivated land as well as more productions’ activities. The outcome is the families those have more labors also have more production, however, productions per capita decrease.

In a view of human capital approach, they do not view labors as only the number of manpower, but they also concentrate on quality of them. Qualities of labors are

education, in service training etc. High quality labors can produce more production than lower quality labors (Hanchangsit, 1997).

The third factor is **capital goods**. In industrial sector, capital goods are factories, machines, buildings etc. while capital goods in peasant families are plows, water buffaloes, digging tools, sickles etc. Capital goods are used in production process to produce the other goods (Boonnag, & Kaewsonthi, 1991). Comparing by size and prices, peasant capital goods are smaller than those of industrial. Naturally, capital goods increase the efficiency of production. Therefore, families that possess more capital goods may produce more production.

**Family member's qualifications** is another one important factors. In a small factory, entrepreneur is the owner of a business who looks after all the production lines (Boonnag, & Kaewsonthi, 1991). In peasant family, family's head looks after the farms and leads the other family members as well as hires labors to work in the fields. Quality and quantity of the farm production may depend on family's head and the other member qualifications such as experience, education, sedulousness etc. A study on characters of family head by DeGraff & Bilsborrow (1993) in Ecuador found some relations of family head and production. From the study, married female heads were in the groups of the poorest. Poorer than those headed by divorced and widowed women even after remittances have been taken into account. It is harmony with a study of Handa (Handa, in Lloyd, 1995) in Jamaica, where many families are declared female-headed even when the head's spouse is in residence. Female-head families with a partner were worse off than those without. Moreover, a panel data study of 1985 in U.S.A. by Boggess (1998) found that children of female family headed were less likely to graduate high school when compared to male family headed. From the studies that mentioned, it refers that if females have to act as family head, they have to run all business in families. It might be too heavy burden for them to look after the families.

Besides, the factors of production will not work in families that all members employ for wage. In such the families, factors affecting their wages might be personal qualification such as education, experiences, working area, migration, diligence etc. Especially migration, studies in Thailand (Pongsapich, 1988) reported that migration bring about income. It allows opportunity of working positions and higher rate of wages. Migrants could get higher income if compare to the places where they came from. Therefore, they can remit to their homes in rural area. Concerning education, two studies in the USA (Dooly & Gottschalk, 1985; Gottschalk, 1997), revealed that the earnings of college-educated person increased while those of high school graduates and dropouts have declined steadily.

## 2.2 Consumption Factors

Quantity of consumption may be the affected from number of consumers, pattern, and prices of goods. Pattern of consumption may be affected from family structure because families that have different age structure might need different goods and different quantity.

Leibenstein (1975) proposed the concepts of relation between number of consumers and savings. The higher burden of dependency ratio is associated with a lower saving rate. However, the population growth, which derived from age-structure effect, is

a cause of decrease in the saving rates. In addition, another one study in Thailand found that fewer children's families, were more likely to have better economy than families that have more children, comparing from family durable goods, quality of dwelling units and child education (Havanon, Knodel and Sittitrai, 1990).

Factors affecting family wealth are not only concerning production and consumption, but also some exogenous factors, such as market system, exposure to information, etc. However, this research does not want to compare between cross-societies. Thus, the exogenous factors as mentioned may not play the important role due to all of them are in the same societies.

The other exogenous factors that important for family wealth i.e. exposure to information and service, inheritance of treasure from predecessors, lottery winning etc. also affect family wealth. Some of them can not control in this study. Therefore, one should let them to be residuals.

### 3. Conceptual Framework

Dependent variable in this framework is family wealth. It is a composite variable, created from family assets in 1994. For independent variables, they compose of ten variables as shown in Figure I. It could classified the independent variables into two sets: the characteristics of 1984, and the changes between 1984 and 1994. However, one should bear in mind that there are several factors those impact family wealth but do not include in this analysis.

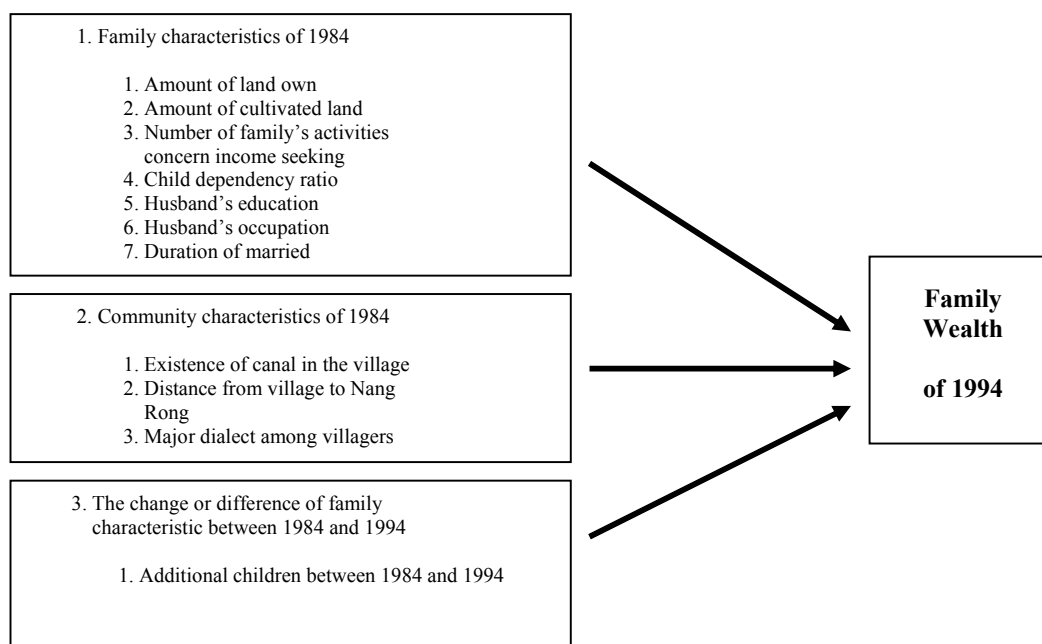


Figure I Variables in the analysis of "The impact of family size on family wealth."

## 2. Hypothesis

Though children are consumers and producers in the same moment. The amounts that the children produce may not exceed the children's consumption. In the cases that there are some left over contributing to their parents, the amount of remittances that the older children contribute to their parents may only keep the younger brothers or sisters have enough for consumption. It may not enough for savings. Even when all the children become adolescents, the first and the second child may get marry and stop contributing to parents. Therefore, the families those have large number of children should have small amount of family wealth than the families those have fewer number of children. Therefore, **the hypotheses of this study is "family size has inverse association with family wealth."**

### 3. Methodology and Results

#### 3.1 Data

This study focuses on population in rural area because they are majority of Thai population. In addition, population in rural area have low income when compare to the population in urban areas. Among populations in rural area, rural families from the northeastern region are the poorest.

Longitudinal data is employed for this study. Longitudinal data provide families backgrounds those benefit for answering the research questions. Accordingly, the Institute for Population and Social Research (IPSR), Mahidol University, has longitudinal data of Nang Rong, a district of Buriram in the northeastern region. There are two data sets in this study 1984 round and 1994 round. They are census of all individuals, households and communities in 51 selective villages of Nang Rong district.

Nang Rong is a district of Buriram province. It locates in the northeastern region of the Korat plateau, Thailand. Majority of population works in agriculture sector. Nang Rong is 330 kilometers from Bangkok and about 55 kilometers from town hall of Nang Rong to Buriram provincial center. In 1992, Nang Rong was split into another three districts, Chamni, Nonsuwan, and Chalermprakiet (Department of Local Administration Ministry of Interior, 2001). In this study, Nang Rong refers the area of Nang Rong in 1984, which include the area before it was split out.

**Unit of analysis** for this framework **is family**. They were nuclear families of young couples who the wives' ages were between 15 and 29 years in 1984. There are two reasons to select only nuclear families. 1) Husband and wife of nuclear family can independently run their family's business. They can make their own decision on production, consumption, as well as control the number of children without domination of parents. 2) Nuclear family is the most simple form if compare to the other family's types. In the cases that some new members are added to families by born or move in, or some members lost from the family by death or move out, it is easier than the other family types to see the impact of the movements. This study select only nuclear families those both husbands and wives live together in 1984 to prevent the problem on detecting that the families are real nuclear families or not. The limitation on the wives' age of each family to be 15 and 29 is to allow the wives still in reproductive age after ten years passed. During the 10 years, the wives may have a period of times for bearing new

children. In addition, the families may have some changes such as admit some additional children from relatives or adopt a child into families. Moreover, in the age groups, they are young adults. Many changes and activities highly occur in these periods of times such as fertility, migration, unemployment etc. (see Rindfuss, 1991). Therefore, it is interesting to study these ages' groups.

Number of all families in Nang Rong data set, 1984 was 5,863. There were 1,911 families had at least one young married female of 15 to 29 years of ages resided inside. Among the families, 891 cases (46.6 per cent) were nuclear families, and 1,020 cases (53.4 per cent) were non-nuclear families. Ten years passed, in 1994, 12 families became combine families (two or more families moved to a house to live together). In addition, 270 families lost to the follow up. The lost to the follow up composed of 184 nuclear families (20.6 per cent of nuclear families) and 86 non-nuclear families (8.41 per cent of non-nuclear families). All the families those became combine families (12 cases) were dropped from the analysis. In addition, families those had outlier of too many children (more than 6 children, 1 cases) and families those had incomplete information (4 cases) were also dropped. **The remaining for selection bias analysis was 1,894 families. And the remaining for the data analysis of “the impact of family size on family wealth,” were 700 families.**

### 3.2 Variables' Construction

There are 11 independent variables. They are family and community's characteristics. Dependent variable is divided into two types: 1) family wealth included cattle & water buffalo, and 2) family wealth excluded cattle & water buffalo. It defines two types because cattle and water buffalo are not only livestock, but also living agriculture tools and assets. Cattle and water buffalo are the assets that almost all the peasant families in the former time up to present possess. Therefore, this analysis has two types of family wealth for comparison. The two types of family wealth composes of the prices of the following articles;

1. **Family wealth included cattle and water buffalo** = Summation of family assets' prices in 1994, in Baht currency of black & white television + color television + vcrs + refrigerator + Itan (agricultural truck) + car/truck/ pick-up + motorcycle + sewing machine + tractor + walking tractor (rototiller) + water pump + cattle + water buffalo.
2. **Family wealth excluded cattle and water buffalo** = Summation of family assets' prices in 1994, in Baht currency of black & white television + color television + vcrs + refrigerator + Itan (agricultural truck) + car/truck/ pick-up + motorcycle + sewing machine + tractor + walking tractor (rototiller) + water pump.

Table 1 of the Appendix shows prices of durable goods from the Ministry of Finance, Thailand. for wealth calculation. The prices of cattle and water buffalo are estimated from local information.

### 3.3 Sample Selection Bias Analysis

The sample size for this diagnosis is 700 nuclear families those found in 1994. Comparing between nuclear families found in 1994 and the other family types (in Table 2 of the Appendix), the sample is a little bias on nuclear families, which has higher child dependency ratio. Similarly, when comparing between nuclear family lost and nuclear family found in 1994, the sample is a little bias on nuclear family that has more amount of land.

### **3.4 Results from the analysis of the impact of family size on family wealth**

This section is mainly to report the output of data analysis. The presentation composes of two topics: the sample's characteristics, and results from the analysis of "the impact of family size on family wealth." The sample's characteristics and the impact of family size on family wealth are shown in Table 1 and Table 2 respectively.

**Table 1** Descriptive statistics of nuclear families those have 15-29 years old married females in the families in 1984, Nang Rong, Thailand

Variables	N	Min	Max	Mean	Std.
1. Family wealth, included cattle and water buffalo (Baht, 42 Baht= 1 U.S. Dollar)	700	0	667,500.0	68,654.4	88,123.2
2. Family wealth, excluded cattle and water buffalo (Baht)	700	0	651,500.0	44,140.1	80,281.7
3. Natural log of family wealth, included cattle and water buffalo	700	0	13.41	9.741	3.222
4. Natural log of family wealth, excluded cattle and water buffalo	700	0	13.39	7.780	4.364
5. Family size (number of children ever born of 1994)	700	0	6	2.124	1.054
6. New children age 0-11 (number)	700	0	4	0.793	0.828
7. Amount of land own (in rai, 1 rai = 1,600 meter <sup>2</sup> )	698	0	90	10.587	13.749
8. Amount of land use (in rai)	686	0	90	16.827	15.272
9. Family has some activities to earn extra income (=1, no activities=0)	700	0	1	0.024	0.154
10. Child dependency Ratio (ratio)	700	0	3	1.054	0.523
11. Husband education 5 years or higher (=1, husband education lower than 5 years=0)	700	0	1	0.090	0.286
12. Husband occupation is in agriculture (=1, Husband occupation is not in agriculture =0)	700	0	1	0.934	0.248
13. Duration of married (in year)	697	0	23	6.448	3.523
14. A canal or stream is in the village (=1, no anal or stream in the village=0)	700	0	1	0.270	0.444
15. Major dialect is Thai Korat (=1, other =0)	700	0	1	0.736	0.441
16. Major dialect is Khmer & Suai (=1, other =0)	700	0	1	0.070	0.255
17. Major dialect is Lao (=1, other =0)	700	0	1	0.194	0.396
18. Distance from village to Nang Rong (kilometer)	700	2	37	16.263	6.629
Valid N (listwise)	683				

Before analyzing multiple regression, all the independent variables are checked collinearity by Pearson correlation as shown in **Table 3** of the Appendix. From the table it is found that there are some collinearity between number of living children and child dependency ratio (0.98). Therefore, child dependency ratio is dropped from the analysis.

**Table 2** shows unstandardized coefficients and robust standard error of the impact of family size on family wealth in various measurements. There are 6 Models of ordinary, semilog, and the poor and middle wealth's families' models.

**Model 1** and **Model 2** are mainly to investigate the impact of family size on family wealth. Model 1 is included cattle and water buffalo. By contrast, Model 2 is excluded cattle and water buffalo.

According to Gujarati, (1995), there are two types of linearity for the linear regression model. The first one is linearity in the variables. This type of linearity, the conditional expectation of Y is a linear function of X. The second type of linearity is linearity in the parameters. It means the conditional expectation of Y is a linear function of the parameters. It may or may not be linear in the variable X. In the case that the variable is nonlinear, it can make suitable transformations of the variables to be linearity in the parameters. He suggests 3 measurements to transform the variables to be linearity in the parameter. They are 1) the log-linear model, 2) semilog models, and 3) reciprocal models.

Due to the ranges of both family wealth included cattle and water buffalo and family wealth excluded cattle and water buffalo were rather large. In addition standard deviation of the variables were larger than mean. The mean of family wealth included cattle and water buffalo, and the mean of family wealth excluded cattle and water buffalo were 68.6 and 44.1 thousand Baht respectively, while the standard deviation were 88.1 and 80.3 thousand Baht respectively. Therefore, I wonder that the conditional expectation of Y (dependent variable) is a linear function of X (independent variables) or not. Thus to confirm the results those presented in Model 1 and Model 2, the semilog models is employed. In this case, natural log of the family wealth included cattle and water buffalo, as well as family wealth excluded cattle and water buffalo were taken on the Multiple regression analysis. The results are in **Model 3** and **Model 4** respectively.

**Model 5** and **Model 6** are the models that focus on majorities of families in rural areas who were in the average of family wealth. These two models are mainly to find some explanation of the association between family size and family wealth. In Model 5 and Model 6, 5 per cent of the richest families were cut off. The remaining cases were the poor families up to middle and a little high wealth's families. The remaining cases in Model 5 were families those had family wealth include cattle and water buffalo between 0 and 250,000 Baht. In addition, the remaining cases of Model 6 were families those had family wealth excluded cattle and water buffalo between 0 and 150,000 Baht.

**Table 2** Unstandardized coefficients and robust standard error of multiple regression from the impact of family size on family wealth

Variables <sup>1/2</sup>	Ordinary Models		Semilog Models		Poor & middle class Models	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Family wealth (included cattle&buffalo)	Family wealth (excluded cattle&buffalo)	Log family wealth (included cattle&buffalo)	Log family wealth (excluded cattle&buffalo)	Family wealth (included cattle&buffalo) <=250,000 ₪	Family wealth (excluded cattle&buffalo) <=150,000 ₪
	Coeff. (Robust S.E.)	Coeff. (Robust S.E.)	Coeff. (Robust S.E.)	Coeff. (Robust S.E.)	Coeff. (Robust S.E.)	Coeff. (Robust S.E.)
1. Family size	-1,028.7 (3,609.1)	-4,259.8 (3,554.5)	-.017 (.158)	.069 (.187)	5,129.4* (2,121.9)	1,438 (1,288.9)
2. New children age 0-11	-7,407.1** (2,789.4)	-5,932.5* (2,934.9)	-.535** (.188)	-.501* (.226)	-5,194.4* (2,313.2)	-4,207* (1,772)
3. Amount of land own	1,797.2*** (318.0)	1,615.1*** (333.1)	.030*** (.007)	.047*** (.009)	883.3*** (172.7)	707.4*** (107.8)
4. Amount of land use	364.7 <sup>†</sup> (202.7)	158.2 (188.9)	.023** (.009)	.036*** (.010)	447.0*** (130.0)	358.0*** (86.4)
5. Husband education 5 years or higher	34,898.6* (16,074.0)	30,839.9* (14,510.8)	.547 (.386)	.716 (.573)	5,429.5 (6,602.6)	4,121.0 (5,146.1)
6. Husband occupation is in agriculture sector	-79,698.9*** (19,174.9)	-87,748.7*** (19,589.4)	-.961 <sup>†</sup> (.559)	-2.409*** (.658)	-5,530.1 <sup>†</sup> (7,679.7)	-14,097.9*** (5,230.1)
7. Duration of married	986.4 (1,191.0)	524.0 (1,165.2)	.038 (.041)	.016 (.061)	323.1 (524.5)	25.3 (363.9)
8. A canal or stream is in the village	-16,561.2** (6,151.2)	-14,605.8* (6,063.6)	-.118 (.273)	-.237 (.424)	-3,873.3 (2,643.0)	-1,145.1 (2,731.2)
9. Major dialect is Khmer & Suai	8,288.5 (6,570.5)	11,512.9 (11,299.9)	.030 (.316)	-.266 (1.087)	-4,570.3 (2961.0)	-1,409.1 (4,805.0)
10. Major dialect is Lao	-2,765.7 (9,403.0)	-3,940.5 (9,100.4)	.570* (.287)	-.590 <sup>†</sup> (.315)	-6,642.8 <sup>†</sup> (4,036.5)	-14,533.6*** (2,492.0)
11. Distance from village to Nang Rong	162.7 (507.7)	-80.0 (496.3)	-.018 (.023)	.016 (.021)	-207.1 (276.9)	-43.1 (158.8)
Constant	118,396.3*** (21,218.3)	119,269.8*** (21,716.2)	10.304*** (.845)	8.971*** (.830)	37,268.0*** (10,535.2)	31,919.6*** (7,410.6)
R <sup>2</sup>	.1801	.1883	.0725	.0894	.1557	.1812
F	15.05***	10.57***	16.08***	18.98***	17.87***	16.31***
N	683	683	683	683	647 <sup>2/</sup>	646 <sup>2/</sup>

Note: <sup>†</sup> = p < .10, \* = p < .05, \*\* = p < .01, \*\*\* = p < .001

1/ Reference groups are husband's education is 4 years or lower, husband's occupation is not in agriculture sector, no canal or stream in the village, major dialect is Thai Korat.

2/ Cut riches families 36 cases off (5.3 %)

3/ Cut riches families 37 cases off (5.4 %)

The purpose of **Model 1** is to investigate the effect of family size on family wealth that included cattle and water buffalo, after controlling for family and community contexts. Focus on the significant variables in Model 1, new children age 0-11 had inverse association with family wealth ( $p < .01$ ). It refers that, within the current situation, one additional new child declines family wealth for 7.5 thousand Baht.

Amount of land that a family own in 1984 was not out of the expectation. It had positive association with family wealth ( $p < .01$ ). A rai of additional amount of land that family own associate with the increasing of 2 thousand Baht of family wealth.

For the sizes of family business, which measured from amount of land that a family used for cultivation, the coefficient's size was rather small. However, it was statistically significant with family wealth ( $p < .10$ ). An additional of one rai of land that a family used for cultivation associated with the increasing of about 400 Baht of family wealth.

The other variables, husband's education (family head's education), it had positive association with family wealth ( $p < .05$ ). The families those had family's heads completed grade 5 or higher had more family wealth than the families those had family's

heads completed grade 4 or lower for 35 thousand Baht. In addition, the families those had family's heads worked out of the agriculture sector, had more amount of family wealth than the families that had family head worked in agriculture sector for about 80 thousand Baht.

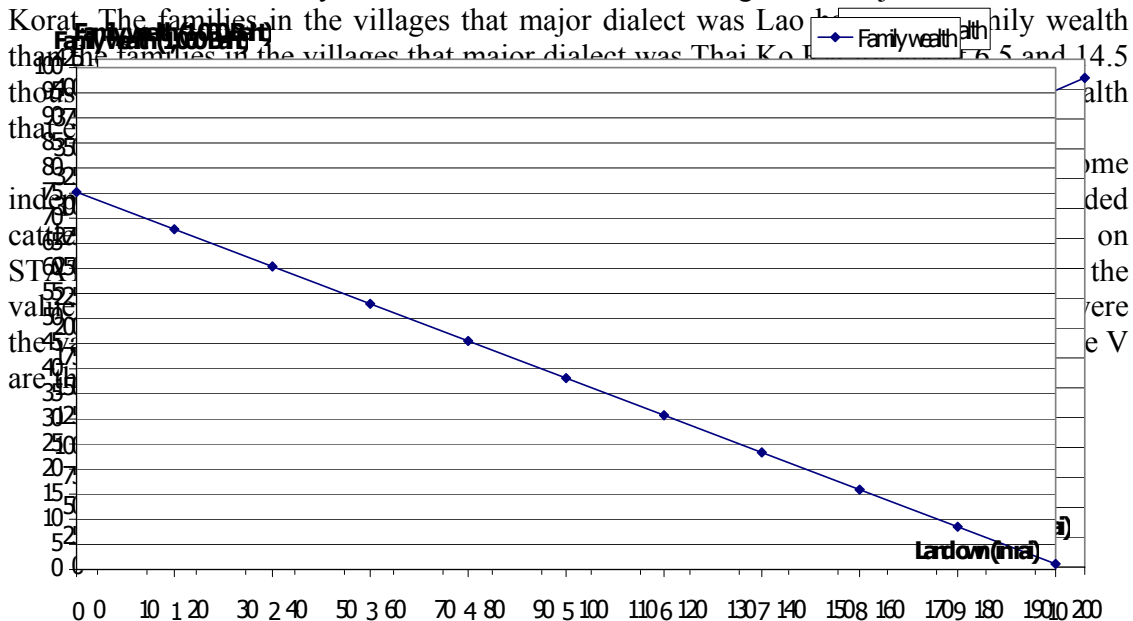
The last variable that statistically significant in the model was “a canal or stream is in the village” ( $p < .01$ ). A family that lived in a village where it had at least one canal or stream had 17 thousand Baht of family wealth less than the family that lived in a village where it did not have a canal or stream. The variable was out of the expectation. It was expected positive associated with family wealth. However, it had inverse association. It can explain that the canals and streams in Nang Rong, most of them were not in irrigation project. Villagers could not control amount and sustainable of the water. Sometimes, water from the canal and stream flooded their paddy field. Consequently, it reduced number of yield of the production.

In **Model 2**, the dependent variable is family wealth that excluded cattle and water buffalo. The results from the analysis were very similar to the result of Model 1. Every variable those significant in Model 1 also significant in Model 2, except “amount of land use.” It was not statistically significant at 90 per cent. The differences between the results of Model 1 and Model 2 were the sizes of coefficients. Majority of the coefficient's sizes of the significant variables in Model 2 was smaller than the sizes of Model 1.

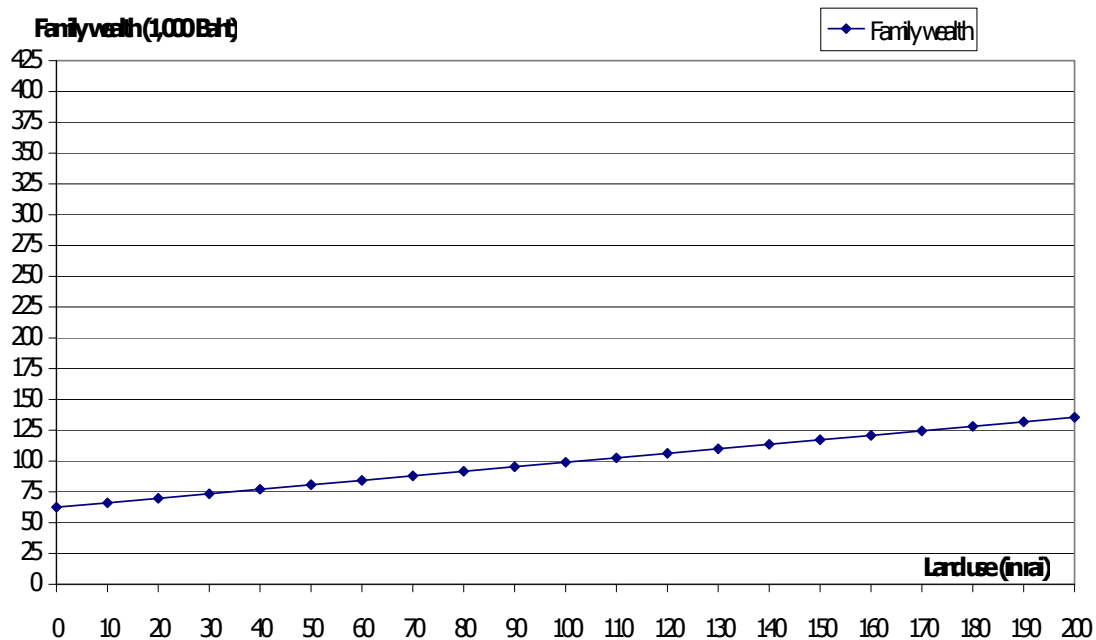
Results of **Model 3** and **Model 4** confirm that family size had no association with family wealth. In addition, it confirms the important of new children age 0-11, amount of land own, amount of land used and husband occupation, on family wealth.

In **Model 5** and **Model 6**, the models of the poor, middle and a little high wealth's families, the results were almost as same as Model 1 and Model 2. A distinction difference is, in Model 5, family size was statistically significant with family wealth that include cattle and water buffalo. It had inverse association. The findings is interesting that, for the poor, middle and a little high wealth's families, children played no harm for family wealth. On the other hand it associated with the increment of family wealth that include cattle and water buffalo for about 5 thousand Baht per additional child.

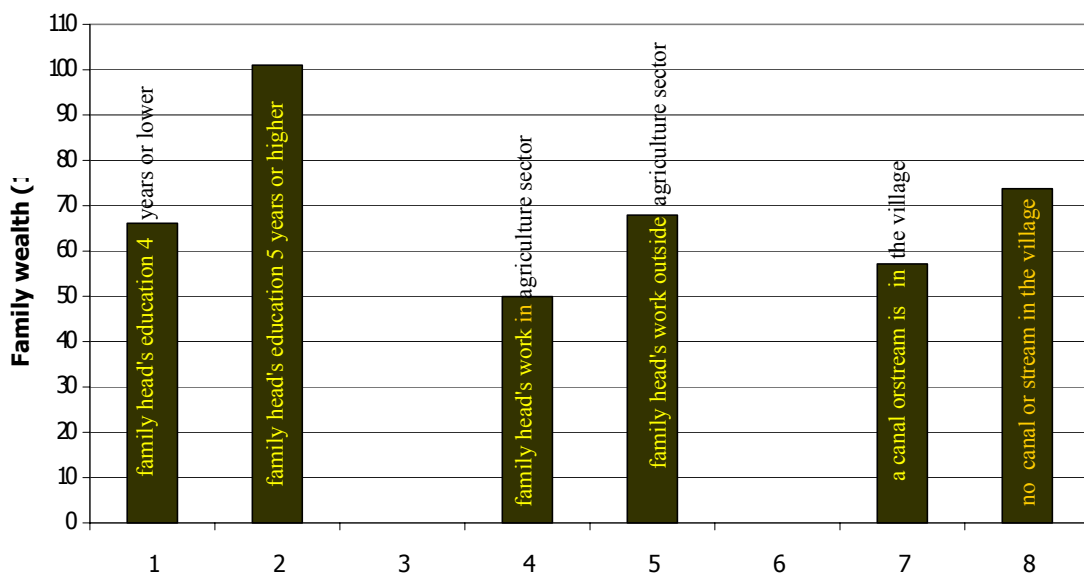
Another one interesting findings is, families in the villages that major dialect was Lao had lower family wealth than families in the villages that major dialect was Thai Korat. The families in the villages that major dialect was Lao had family wealth that were 6.5 and 14.5



**Figure IV Family wealth by amount of land that a family use, the simulation output**



**Figure V Family wealth by family heads education, family heads occupation and canal or streams in the village or not**



Results from the analysis as shown in **Table 2**, can be concluded that **for peasant families in rural area of Thailand, family size of the last 10 years did not impact present family wealth at all**. However, a new child declines family wealth in short term. From the table one may say that one additional child in 1994 declines family wealth for about 7 thousand Baht. But for the poor, middle, and a little high wealth's families, "family size" had positive association with family wealth. In this group, an additional child increases family wealth for about 5 thousand Baht.

### 3.5 Discussion

We would like to discuss about 2 topics of the non-association between family size and family wealth in rural area, and the association of ethnicity and family wealth.

#### 3.5.1 The non-association between family size and family wealth

From the analysis of Table 2, it needs an explanation about the non-association between family size and family wealth in rural area of the northeastern region, Thailand. The non-association between family size and family wealth in rural area may derive from 1) the low investment on human capital, and 2) times of contribution from children to family are short.

##### 1. The low investment on human capital

According to the results from the analysis of family size on child education attainment, it found that constant of the regression coefficient was about 7 years. It means that the children in Nang Rong had rather low education. The average education was 7 years, or one year higher than compulsory education. It refers that few of the children continued studying higher than compulsory education. In elementary education, the families paid not much expense per child. Thus children did not harm family wealth.

##### 2. The times of contribution from children to family are fairly fast.

Consequence from the low investment on human capital let the children have an opportunity to work and contribute to families. The children who did not further their study after finishing grade 6 can enroll on labor force in the early teenage. It returns that the children can contribute to families fairly fast. Thus in the poor and normal economy's families, the additional child associated with the increase of family wealth for 5 thousand Baht as shown in Model 5 of Table 2.

As mentioned, the children in rural area seem to contribute to the family fairly fast. Therefore, the more number of the older children the greater the positive impact on family wealth. We test by dividing the children into two groups: 1) lower age children, and 2) the higher age children. From the results of Table 4 on the Appendix, one additional higher age children associated with the increasing of 8.5 thousand Baht of family wealth.

#### 3.5.2 The association of ethnicity and family wealth

There was a doubt about the association of ethnicity and family wealth. Families in the village that major dialect was Lao had more family wealth (included cattle and water buffalo) than the families in the village that major dialect was Thai Korat (Model

3). On the other hand, families in the village that major dialect was Lao had fewer family wealth (exclude cattle & water buffalo) than the families in the village that major dialect was Thai Korat (Model 4). The directions were opposite. The inconsistency association of ethnicity and family wealth may due to the number of cattle and water buffaloes those villagers raised. From checking the frequencies, families from villages those major dialect was Lao raised more cattle and water buffalo than the villagers those major dialect was Thai Korat. When included cattle and water buffalo into family wealth, the families from the villages that major dialect was Lao became richer than families from the villages those major dialect were Thai Korat. On the other hand, when excluded cattle and water buffalo out of family wealth, the families those in a village that major dialect was Lao became poorer than families those in a village that major dialect was Thai Korat.

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## Appendix

**Table 1** Durable article's price in 1994

Durable article	Description	Price (Baht)
1. black & white television <sup>1</sup>	<ul style="list-style-type: none"> <li>There is no new black and white television 17 inches up on sale in 1994. The price is for used television.</li> </ul>	3,500. _
2. color television	<ul style="list-style-type: none"> <li>20 inches</li> </ul>	11,000. _
3. vcrs	<ul style="list-style-type: none"> <li>Play and record, included remote control</li> </ul>	11,000. _
4. refrigerator	<ul style="list-style-type: none"> <li>5 cubic feet</li> </ul>	5,800. _
5. Itan (agricultural truck) <sup>1</sup>	<ul style="list-style-type: none"> <li>Include engine, truck and equipment for agricultural work</li> </ul>	90,000. _
6. car/ truck/ pick-up	<ul style="list-style-type: none"> <li>Diesel engine, 2,400 c.c. or higher</li> </ul>	300,000. _
7. motorcycle	<ul style="list-style-type: none"> <li>110 c.c. or higher</li> </ul>	42,000. _
8. sewing machine	<ul style="list-style-type: none"> <li>Able to do zigzag work, include motor</li> </ul>	5,500. _
9. tractor	<ul style="list-style-type: none"> <li>75 horse power, included equipment for agricultural work</li> </ul>	550,000. _
10. walking tractor (rototiller)	<ul style="list-style-type: none"> <li>10 horse power, included equipment for agricultural work</li> </ul>	45,000. _
11. water pump	<ul style="list-style-type: none"> <li>Gasoline engine, 3.00 inches or wider of pipe diameter, 1,130 liter per minute or more of</li> </ul>	11,000. _

12. cattle <sup>1</sup>	• pumping capability • Medium size, 80 kg. of beef	8,000. _
13. water buffalo <sup>1</sup>	• Medium size, 100 kg. of beef	10,000. _

Note: Source of durable goods' prices: Department of General Education. (1994).  
1/ Prices were estimated from local information

**Table 2** Unstandardized coefficient and robust standard error from multinomial logistic regression of families those have at least one married female 15 to 29 years of ages live in the families, on results of the attempt to follow up the families in 1994

Variables <sup>1</sup>	nuclear families in 84 lost in 94 vs nuclear family in 84 found in 94	non nuclear families in 84 lost in 94 vs nuclear family in 84 found in 94	non nuclear families in 84 found in 94 vs nuclear family in 84 found in 94
	Coefficient (Robust Std. Err.)	Coefficient (Robust Std. Err.)	Coefficient (Robust Std. Err.)
1. Amount of land own in 1984	-.056*** (.012)	.019 <sup>†</sup> (.010)	.059*** (.007)
2. Family has some activities to earn income out of main occupation	.431 (.537)	.843 (.559)	.776** (.306)
3. Child dependency Ratio	-.538** (.164)	-1.401*** (.234)	-1.919*** (.132)
4. A canal or stream is in the village	-.177 (.222)	-.008 (.294)	.204 (.241)
5. Major dialect is Khmer & Suai	.070 (.194)	.021 (.533)	-.658 (.463)
6. Major dialect is Lao	.353 (.340)	.812 (.520)	.367 <sup>†</sup> (.225)
7. Distance from village to Nang Rong	.013 (.016)	-.032 (.028)	-.017 (.014)
Constant	-.681* (.287)	-.814*** (.539)	.928*** (.251)

N = 1,886

Model Chi-square (20) = 683.52\*\*\*

Pseudo R<sup>2</sup> = 0.1994

Note: † = p < .10, \* = p < .05, \*\* = p < .01 \*\*\* = p < .001

1/ Reference groups are family has some activities to earn income out of main occupation, no canal or stream in the village, major dialect is Thai Korat.

**Table 3** Pearson correlation and number of cases of nuclear family's characteristics those the wives' age in 1984 between 15 and 29

	SONDAU84	NEWMEM	LANDOW84	LANDUS84	CHILDDPEP	HEADED5Y	HEADOCC	DURAMAR
NEWMEM	-	1						
N	700	700						
LANDOW84	.146(**)	-0.001	1					
N	698	698	698					
LANDUS84	0.007	.076(*)	.524(**)	1				
N	686	686	686	686				
CHILDDPEP	.981(**)	-	.137(**)	0.005	1			
N	700	700	698	686	700			
HEADED5Y	-	0.03	0.051	-0.036	-	1		
N	700	700	698	686	700	700		
HEADOCC	0.015	0.017	0.039	.193(**)	0.028	-	1	
N	700	700	698	686	700	700	700	
DURAMAR	.526(**)	-	.133(**)	0.025	.493(**)	-	0.032	1
N	697	697	695	683	697	697	697	697
CANALSTR	0.014	-0.011	0.018	0.012	0.016	.090(*)	-0.008	0.025
N	700	700	698	686	700	700	700	697
D_KH_SUI	-0.006	.103(**)	0.064	0.007	-0.014	-0.047	0.005	-.089(*)
N	700	700	698	686	700	700	700	697
D_LAO	.113(**)	.145(**)	-0.018	-0.006	.111(**)	-0.041	0.043	.086(*)

N	700	700	698	686	700	700	700	697
VILL_NR	0.063	0.004	.076(*)	0.006	0.059	-	0.041	.080(*)
N	700	700	698	686	700	700	700	697

	CANALSTR	D_KH_SUI	D_LAO	VILL_NR
D_KH_SUI	0.01	1		
N	700	700		
D_LAO	-	-	1	
N	700	700	700	
VILL_NR	0.068	.127(**)	.383(**)	1
N	700	700	700	700

**Note:** Meaning of the abbreviations: SONDAU84 = Number of living children in 1984, NEWMEM = Number of new members 0 – 11 years of ages in 1994, LANDOW84 = Amount of land own in 1984 (in rai), LANDUS84 = Amount of land use in 1984 (in rai), CHLDDEP = Child dependency Ratio, HEADED5Y = Family head education is 5 years or higher (=1), HEADOCC = Family head occupation is not in agricultur sector (=1), DURAMAR = Duration of married (in years), CANALSTR = A canal or stream is in the village (=1), D\_KH\_SUI = Major dialect is Khmer & Suai (=1), D\_LAO = Major dialect is Lao (=1), VILL\_N = Distance from village to Nang Rong (in kilo meter)

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

**Table 4** Unstandardized coefficients and Robust standard error of multiple regression from the impact of family size on family wealth, divided family size (number of living children in 1984) into two variables (higher aged children and lower aged children)

Variables <sup>1</sup>	Natural log of family wealth (excluded cattle and water buffalo)			family wealth included cattle and water buffalo (5 % of the richest families were cut off from the analysis)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	- higher aged children is 5 years or higher	- higher aged children is 6 years or higher	- higher aged children is 7 years or higher	- higher aged children is 5 years or higher	- higher aged children is 6 years or higher	- higher aged children is 7 years or higher
	- lower aged children is lower than 5 years	- lower aged children is lower than 6 years	- lower aged children is lower than 7 years	- lower aged children is lower than 5 years	- lower aged children is lower than 6 years	- lower aged children is lower than 7 years
	<b>Coeff.</b>	<b>Coeff.</b>	<b>Coeff.</b>	<b>Coeff.</b>	<b>Coeff.</b>	<b>Coeff.</b>
	(Robust S.E.)	(Robust S.E.)	(Robust S.E.)	(Robust S.E.)	(Robust S.E.)	(Robust S.E.)
1. Number of higher aged children in 1984	.387 <sup>†</sup> (.231)	.434 <sup>†</sup> (.250)	.574 <sup>†</sup> (.294)	8,644.1*** (2,458.8)	8,385.6** (2,523.4)	8,287.5** (3,136.5)
2. Number of lower aged children in 1984	-.305 (.255)	-.242 (.226)	-.234 (.213)	1,003.0 (2,907.2)	2,300.8 (2,784.6)	3,176.6 (2,828.8)
3. New children age 0-11	-.483* (.226)	-.499* (.228)	-.526* (.228)	-4,935.4* (2,289.4)	-5,204.0* (2,285.4)	-5,362.6* (2,285.5)
4. Amount of land own	.046*** (.009)	.047*** (.010)	.046*** (.010)	880.1*** (169.4)	885.1*** (170.8)	880.3*** (171.8)
5. Amount of land use	.036*** (.010)	.036*** (.010)	.036*** (.010)	445.4*** (129.1)	435.9*** (128.1)	444.2*** (130.5)
6. Husband education 5 years or higher	.687 (.579)	.701 (.578)	.738 (.574)	4,837.9 (6,621.3)	5,136.1 (6,581.3)	5,518.8 (6,632.3)
7. Husband occupation is in agriculture sector	-2.507*** (.668)	-2.384*** (.676)	-2.338*** (.668)	-6,851.9 (7,543.3)	-5,559.3 (7,555.2)	-5,479.0 (7,560.1)

8. Duration of married	-.065 (.073)	-.505 (.070)	-.057 (.071)	-564.3 (593.1)	-299.2 (536.8)	-125.4 (525.6)
9. A canal or stream is in the village	-.256 (.431)	-.256 (.433)	-.263 (.429)	-4,061.7 (2,685.9)	-3,982.0 (2,664.9)	-3,988.9 (2,649.8)
10. Major dialect is Khmer & Suai	-.176 (1.123)	-.208 (1.125)	-.238 (1.108)	-3,921.3 (3,185.0)	-4,206.0 (3,145.0)	-4,462.8 (2,985.7)
11. Major dialect is Lao	-.531 <sup>†</sup> (.308)	-.552 <sup>†</sup> (.323)	-.592 <sup>†</sup> (.319)	-5,801.9 (4,040.9)	-6,112.8 (3,998.4)	-6,436.7 (4,023.8)
12. Distance from village to Nang Rong	-.014 (.021)	-.014 (.021)	-.014 (.021)	-234.6 (281.6)	-227.1 (280.4)	-221.7 (279.5)
Constant	9.758*** (.956)	9.635*** (.912)	9.686*** (.897)	46,198.9*** (11,265.8)	43,517.6*** (10,604.9)	42,232.1*** (10,843.4)
R <sup>2</sup>	.0991	.0981	.1007	.1661	.1619	.1596
F	17.47***	16.68***	16.16***	17.58***	17.10***	16.21***
N	683	683	683	647	647	647

**Note:** <sup>†</sup>= p < .10, \* = p < .05, \*\* = p < .01 \*\*\* = p < .001

**1/ Reference groups are husband's education is 4 years or lower, husband's occupation is not in agriculture sector, no canal or stream in the village, major dialect is Thai Korat.**