Property Rights and Intra-Household Bargaining*

Shing-Yi Wang

University of Pennsylvania

August 30, 2012

Abstract

This paper examines whether an individual-level transfer of property rights increases the individual's bargaining power within the household. The question is analyzed in the context of a housing reform that occurred in China that gave existing tenants the opportunity to purchase the homes that they had been renting from their state employers. The rights to each housing unit were granted to a particular employee, so property rights were defined at the individual level rather than the household level. The results indicate that transferring ownership rights to men increased household consumption of some male-favored goods and women's time spent on chores. Transferring ownership rights to women decreased household consumption of some male-favored goods.

*Email: shingyi.wang@nyu.edu. This paper has benefited from comments from Santosh Anagol, A.V. Chari, Nancy Qian, Nicola Persico and various seminar participants. Lizi Chen provided excellent research assistance. All errors are my own.

1 Introduction

Land and housing assets represent a large share of the total value of assets held by households across the world. In the United States, data from the Federal Reserve Flow of Funds Account in 1990 indicate that real estate represented about one-third of household assets. In developing countries, the corresponding numbers are often much higher at 45% of urban wealth in China, 80% of rural wealth in China, 78% of urban wealth in India and 87% of rural wealth in India.[1] The importance of real estate for the economic lives of households has motivated property rights reforms in many developing countries. Such reforms include land titling and privatization programs that aim to allow households maximize their use of land and housing assets.

Research has demonstrated that property rights affect household decision-making, including the investments (Besley 1995, Field 2005, Galiani and Schargrodsky 2010, Goldstein and Udry 2008), labor market choices (Field 2007, Wang 2012) and residential decisions (Wang 2011). However, the economics literature on property rights has generally focused on the household as a single agent. In reality, property rights can accrue to individuals within a household rather than to a unitary household unit or in equal proportion to all members of a household. For example, registration of property titles often include only the name of the head of household (Deere and Leon 2001). In developing countries, the household head is often male; thus, programs that transfer land titles or other forms of property rights to households without careful consideration of intra-household issues may have important implications for gender inequality within households.

This paper examines how individual-level transfers of property rights affects the distribution of bargaining power within the household. Thus, the results contribute to a growing policy debate on structuring property rights reforms to be cognizant of the implications for women's rights in developing countries. There is growing interest in mandating the inclusion of

[1]The sources of data for these estimates are the 1995 Urban and Rural Household Income Surveys of China and the National Sample Survey Organization of India in 1991.

the names of both husbands and wives on property registration and other forms of protection of individual rights within households (Field 2003, Deere and Leon 2001, Lastarria-Cornhiel 2009, Meizen et al 1997).

Descriptive evidence demonstrates a positive correlation between female ownership of land or housing and her outcomes within the household as measured by domestic violence (Panda and Agarwal 2005). To my knowledge, my analysis is the first to offer a rigorous empirical method for identifying the causal impact of individual-level property rights transfers on the bargaining outcomes of men and women within households. This question is answered in the context of a housing reform that occurred in China that gave existing tenants the opportunity to purchase the homes that had been tied with their employment within the state sector. Rights to each housing unit were granted to a particular employee, so property rights were defined at the individual level rather than the household level. Prior to the reform, people had use rights to the housing units, but the reform gave them full ownership rights including the right to lease, sell and collateralize the property. Using a panel data set, the empirical strategy compares the outcomes of same households before and after the reform, as well as relative to a comparison group of households. This analysis is done separately by the gender of the recipient of additional property rights.

In addition to the literature on the microeconomic effects of property rights, this paper contributes to an understanding of the intra-household bargaining outcomes between men and women.[2] Previous empirical work that consider determinants of bargaining weights within a couple focus on gender differences in income (Anderson and Eswaran 2009, Browning et al 1994, Duflo 2003, Hoddinott and Haddad 1995, Luke and Munshi 2011, Ponczek 2011, Thomas 1990). In contrast, the focus on the transition of use rights into ownership rights over housing offers insight into whether control over assets allows an individual to behave in a way that deviates from the preferences of other household members. Unlike income, assets such as housing may

[2]See Basu (2006), Manser and Brown (1980) and McElroy and Horney (1981) for the use of bargaining models of intra-household allocation.

never be monetized if households do not rent out, mortgage or sell. Thus, the findings in this paper emphasize the potential importance of the gender of the recipient of improved property rights and suggest that household outcomes may be influenced by more subtle and indirect determinants of bargaining power.

2 Institutional Background

2.1 Socialism and Early Housing Reforms

After taking control in 1949, the Communist Party of China nationalized urban land and established a labor market system that guaranteed jobs for workers. Households that already held private ownership rights to their homes retained full property rights over their residences, but the government established public ownership of all new housing stock. Public housing stock was allocated to urban residents through state work units in exchange for nominal rents.

Reform began following the death of Chairman Mao Zedong in 1976. The new leadership initiated a gradual reform of the socialist system towards a mixed economy. Housing reforms were considered because the government recognized serious problems in the state provision of housing, including shortages, poor management and corruption in distribution (Wang and Murie 1999). The government permitted private construction of housing to occur and the supply of private housing expanded. The first experiments of reforming the public housing system in 1979 entailed the sale of newly built apartments at construction cost in Xian and and Nanning. During the 1980s, several other small-scale housing experiments were piloted in different cities. However, the small-scale attempts at privatizing housing failed because people found the prices too high.

After the political protests in Tiananmen Square in 1989, the central government shifted the discussion about housing reform towards rent increases rather than privatization. The government realized its past attempts at privatization were financially infeasible as well as po-

litically destabilizing (Davis 1993). Davis' interviews with urban residents confirm that the central and municipal governments hid their plans for full commodification of urban housing from the population through the early-1990s. While the experiments of the 1980's demonstrated the government's interest in housing reform, qualitative research suggests that the urban population did not foresee the timing and specific nature of the reform. The quantitative analyses in Wang (2011) and Wang (2012) confirm that anticipation of the housing reform did not affect pre-reform labor market choices.

2.2 Privatization of State-Owned Housing

In July 1994, the State Council announced the procedures for state employers to sell state-owned housing units to existing tenants in all cities in China. Those living in state-owned housing were given the opportunity to buy ownership rights to their current homes. Learning from the negative public response to the small-scale housing experiments of the 1980s, the government allowed work units to set prices for their housing stock below market value with additional discounts based on seniority. Most buyers paid less than 15% of the market value for their homes (China News Analysis, 1998). Analysis using data from the Chinese Household Income Project covering urban areas in eleven provinces in 1995 indicate that the average difference between the market value and the price charged by the government was 24,462 RMB, which is over two times the average annual wages of a household.

2.3 Property Rights in Marriage and Divorce

According to the Marriage Law in China, property and other assets acquired during marriage were considered to be jointly owned. The laws leave unclear whether use rights to housing acquired prior to marriage but converted to full ownership rights during marriage are legally considered to be acquired during marriage and hence joint property or acquired prior to marriage and hence the individual property. Thus, one possible channel through which individual

property rights can influence bargaining outcomes is that it affects the well-being of individuals in the case of divorce. In a rational model of Nash bargaining within a household, an individual endowment of assets associated with a reform can only change bargaining outcomes between husbands and wives if it alters their outcomes under the threat point (Manser and Brown 1980, McElroy and Horney 1981). However, even in the complete absence of individual rights over the property in the case of divorce, the reform may alter outcomes between husbands and wives under a behavioral story of a kind of mental accounting (Thaler 1992, Duflo and Udry 2004). Unfortunately, the limitations of the data, which will be discussed in greater detail in the following section, make it impossible to disentangle the relative contributions of these possible channels.

There is an upward trend in the rate of divorce in China over the sample period, but overall the rates remained low and never exceeded 3% in the sample. The low rates of divorce does not imply that models of intrahousehold bargaining do not apply during this period in China. What matters in these standard bargaining models is the threat of divorce; in equilibrium, divorce rates may remain low but the threat of divorce may affect the decisions of husbands and wives. Furthermore, alternative models propose that threat points may be non-cooperative marriage rather than divorce (Lundberg and Pollack 1993).

3 Data and Methodology

3.1 China Health and Nutrition Survey

I use a panel data set called the China Health and Nutrition Survey (CHNS). Nine provinces (Guangxi, Guizhou, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Liaoning, and Shandong) are covered by the CHNS and these provinces vary considerably in their economic development and geography. Following a multistage, random cluster design, counties were stratified into three levels of income, and a weighted sampling technique randomly selected four counties in each

province. In addition, the data include the capital province and one low-income city. The full data set covers approximately 4,400 households in the non-consecutive years 1989, 1991, 1993, 1997, 2000, 2004 and 2006. Thus, the data used in this analysis include three waves before and four waves after the beginning of the housing reform in 1994.

There are a few important drawbacks to the data. The sample size appropriate for the analysis is relatively small, particularly for the sample of households in which only wives are working in the state sector. Furthermore, the sample sizes vary across outcomes because the survey questions covered varied wave to wave.

The data set offers several measures of household bargaining outcomes between husbands and wives.[3] First, a measure of individual contributions to household public goods is reflected by the amount of time that individuals spend on household chores. The number of minutes that an individual spends on chores includes the time spent on child care, buying food, food preparation and washing clothing. These questions were asked in all seven waves of the survey. Table 1 presents summary statistics with data that pools together all available waves of data for heads and spouses in the treatment and controls households. It shows that there are substantial gender differences in time spent on chores. Men spend a little more than one hour per day on chores, and women over three hours per day.

The second measure of intrahousehold bargaining outcomes is who makes the decisions on household durable goods consumption. In the asset module, the CHNS asks households whether they purchased a household durable good in the past 12 months. If the household did make such a purchase, it is also asked who made the decision (husband, wife, both) and the value of the good. These questions were only asked in the four waves between 1989 and 1997, and the durable goods included in the questionnaire varied wave-to-wave.[4] On average, each household purchased 2.1 of these goods in a survey year.

[3]While the data also include anthropometric measurements of children, the sample sizes are quite small and the data and results are discussed in Appendix A.

[4]The assets are stereo, VCR, black and white television, color television, washing machine, refrigerator, air conditioner, sewing machine, electric fan, wall clock, camera, microwave, electric cooker, and pressure cooker.

Finally, the data include individual consumption of items that men prefer more strongly than women. These items are cigarettes, tea and alcohol.[5] The questions on cigarette consumption is asked in 1991 on while the questions on tea and alcohol are asked from 1993 on. Table 1 demonstrates that Chinese men smoke over 9 cigarettes per day as compared with less than 1 by Chinese women. Women in China drink about half as much tea as men. Finally, men drink about 14 times more alcohol than women.[6] All of these differences are significant at the 5% level or higher.

3.2 Econometric Methodology

To evaluate the causal impact of the housing reform on household bargaining outcomes, I use a differences-in-differences framework. The idea underlying the identification strategy is to compare the outcome not only before and after the reform, but also between a treatment group and a control group. After the central announcement of the policy change occurred in July 1994, the start of the implementation of the housing reform varied at the regional level. I am unable to exploit this variation because the data set used in this analysis is not collected in the years between 1993 and 1997, and all areas in the data set had implemented the reform by 1997.[7]

The two treatment groups in the analysis are households in which a man received housing ownership rights and households in which a woman received the rights. While the rights to each housing unit were assigned to a particular person, the data set does not explicitly ask which household member held these rights. I separate the male treatment group ($Property^m = 1$) from the female treatment group ($Property^f = 1$) by identifying households living in state-owned housing with only the head or the spouse of the head employed in the state sector in

[5]Other commonly-used gender-specific consumption measures, such as men's and women's clothing, are not included in this data set.

[6]Alcohol is in units of alcohol proof per week and is a combination of wine, liquor and beer.

[7]See Wang (2012) for details.

1989 (or the next pre-reform wave for which data is available).[8] In the majority of state-owned housing units, both the head and the spouse are employed in the state sector. Because it is not possible to identify which individual held the rights to the property in the CHNS, households in which both the husband and wife are working in the state sector are excluded from the analysis. Households in which both the husband and the wife are working in the private sector are also excluded. Thus, the identification strategy employed in this paper does not make use of about 70% of households in the total sample.

The 1995 wave of the China Household Income Project (CHIP) asks the identity of the specific individual in the household that holds the property rights to the state-owned housing.[9] I use the CHIP data to evaluate whether the methodology that I propose for the CHNS accurately identifies the holder of the property rights. I construct the analogous male and female treatment groups using questions on employment and housing status for households in which only one member of the married couple is working in state sector in the CHIP. Comparing these constructed measures with the identities of the individuals holding property rights based on the direct CHIP survey question, the constructions are accurate for 90% of CHIP households. The small amount of measurement error in the construction of the treatment groups in the CHNS should lead to a downward bias in the results.

There are two comparison groups in the analysis, comprised of households that are not living in state-owned housing where either the male or female head or the spouse of the head is employed in the state sector in 1989 (or the next pre-reform wave for which data is available). For comparability with the treatment groups, these comparison groups exclude households in which both the husband and wife or neither the husband and wife are employed in the state sector. The individuals in the comparison groups should not experience a direct effect of the reform of state-owned housing but should absorb other changes occurring in the state sector

[8] In other words, the cases where the data are missing for 1989, treatment status is defined with the next earliest pre-reform wave (1991 or 1993) for which data are available.

[9] I am unable to use the CHIP for the analysis in this paper because it only offers cross-sectional information.

around the time of the housing reform. Thus, these control groups remove the effect of changes in the wage structure, increases in lay-offs in the public sector, or decreases in provision of other in-kind benefits.

I combine the each treatment group and comparison group by gender. One set of analyses includes the female treatment group ($Property^f = 1$) and the female control group of households not living in state-owned housing where only the wives are working in state sector ($Property^f = 0$). In other words, within a sample of households where the wives are the only ones working in the state sector, the impact of the housing reform is measured by comparing households living in state-owned housing and households living in private housing prior to the transfer of property rights. The second separate set of analyses includes the male treatment group ($Property^m = 1$) and households not living in state-owned housing where only the husbands are working in the state sector ($Property^m = 0$). This pairing of the treatment and comparison groups addresses the concern that households where only wives work in the state sector are different along observable and unobservable dimensions from households in which only husbands work in the state sector or households or households in which both husbands and wives work in the same sector. The key comparisons are between households where the same household member is working in the state sector.

Table 2 presents pre-reform characteristics of the households in the four groups. The first two columns refer to the households in which only the husband is employed in the state sector, and the last two to households in which only the wife is employed in the state sector. Among households with women employed in the state sector, the characteristics of those living in state-owned housing are generally not statistically different from those living in private housing. Female treatment households have on average a slightly smaller household size and an older head of household. Similar differences in household size and age of the head of household for the male sample. Furthermore, in the male sample, the differences in the intra-household bargaining outcomes are statistically significant for several measures. Regardless of the gender

of the individual employed in the state sector, households living in private housing tend to consume more cigarettes, tea and alcohol.

A potential concern is that differences in observable characteristics may suggest the presence of differences in unobservable characteristics. The panel structure of the data allows me to remove the effects of any unobservable factors that are time invariant through the inclusion of household fixed effects. However, the fixed effects approach cannot address time-varying effects of unobservable factors. The comparison of the results for the male sample and the female sample can be helpful in this regard. Given that observable differences between the treatment group and the comparison group are similar for men as for women, it may be reasonable to infer that unobservable differences between the treatment and comparison groups are also similar across gender. If unobservable differences in the treatment and comparison groups are driving the results, then we would expect the impact of the reform to have effects on the measures of bargaining outcomes that have the same sign. In contrast, if the improvement in property rights is driving the estimated post-reform differences between the treatment and control groups, then we would expect opposite sign effects for men and women.

Furthermore, it is important to note that the identification strategy does not require the characteristics of the treatment and the comparison groups to be identical. Rather, the identification strategy requires that the trends in the outcomes of the treatment group moves in parallel with the comparison group prior to the reform. Figure 1 presents the trends over time in the means of three of the bargaining outcomes available in the data.[10] The data offer three pre-reform waves of data for the share of time spent on chores that is born by wives (row 1) as well as for the share of household purchasing decisions that wives participate in (row 2). There are two pre-reforms waves of data for household cigarette consumption (row 3). The first column presents the trends for the treatment and comparison group in the sample of households where only the husband is employed in the state sector. The second columns presents the same

[10]The figure omits two bargaining outcomes. It is not possible to examine pre-reform time trends in alcohol consumption and tea consumption because the questions are added to the survey in 1993.

information for the sample of households in which only the wife is state employed. The evidence supports the idea that the trends in the outcomes for the treatment and comparison groups were generally moving in parallel prior to the housing reform.

4 Property Rights and Bargaining Outcomes

To implement the estimation strategy described in the previous section, I estimate the following fixed effects equation:

$$y_{it} = \alpha_1 Property_i^g * Post_t + \delta_t + \alpha_{\mathbf{4}}\mathbf{x_{it}} + \gamma_i + \epsilon_{it} \tag{1}$$

where i denotes household and t year. $Property^g$ identifies the treatment group where $g = f$ refers to the female sample and $g = m$ the male sample. $Post_t$ is a dummy variable that equals 1 in the periods following the reform, and γ_i are household fixed effects. The vector of covariates, $\mathbf{x_{it}}$, is a quadratic in the age of the household head, the logarithm of household size and an indicator variable for the gender of the head. The dependent variables are the share of household chores done by women, the share of purchasing decisions made by women, the logarithm of the one plus number of cigarette consumed per day by the household, the logarithm of one plus the number of cups consumed per day by the household, and the logarithm of one plus the amount of alcohol consumed by the household in a week.

The main results are presented in Tables 3 and 4. Table 3 displays the impact of transferring property rights to men. Increasing property rights to men increases women's share of total time spent on household chores by five percentage points. This effect is statistically significant at the 10% level. It also decreased women's participation in household decisions regarding purchases of durable goods, but this is not statistically significant at standard levels. In terms of consumption of male-favored goods, the results indicate that increasing property rights held by men leads to an increase in household consumption of tea and cigarettes, but

only the results for tea are significantly different from zero at the 5% level. The majority of the results provide evidence suggesting that a transfer of property rights to men increased their subsequent bargaining power in the household. The exception is the results on alcohol, where consumption by households where men received the ownership rights to state-owned housing falls by ten percent relative to households in which men did not receive improvements to their property rights. However, this result is not statistically significant.

The corresponding results for women are in Table 4. Given that the sample size is much smaller, it is not surprising that the results are statistically much weaker than the results for men. The only impact that is statistically significant at the 5% level is household cigarette consumption. The results indicate that transferring ownership rights to women leads to a large 59% drop in the household consumption of cigarettes. The results in Appendix A show that transferring ownership rights to women corresponds with a 0.9 standard deviation increase in the weight-for-age of girls in the household. The direction of the estimates also indicates that strengthening property rights held by women leads to slight decreases in women's share of household chores, increases in their decision-making power over durable goods purchases and declines in the consumption of tea and alcohol. However, the results are not very conclusive given the lack of power in the estimates.

The differences in the direction of the effects of ownership rights for households in which women receive the rights (Table 4) and households in which men receive the rights (Table 3) are interesting for several reasons. First, they support the conclusion that the estimated changes in the female share of chores and in consumption of male-favored is not driven by a general household-level wealth effect or by general household changes in specialization associated with the transition from renting to owning. If the results were driven by *household*-level changes rather than by shifts in *intra*-household bargaining, then we would expect the results to be the same sign regardless of the gender of the recipient of property rights. Second, the differences in the results for women and for men suggest that the results are not driven by time-varying

effects of unobservable differences between the treatment and comparison groups.

The results indicate an interesting possible asymmetry in the uses of increased intra-household bargaining power of women and men. Strengthening women's property rights does seem to increase women's bargaining power, and on average women use this power to decrease their husbands' consumption of cigarettes. Men's bargaining power within the household is also improved when property rights are transferred to them, and they choose to leverage their additional power to drink more tea and do less chores.

5 Robustness Checks

Table 2 indicated some significant differences in the characteristics of households in the treatment and the control groups. In this section, I examine the possibility that the results may be explained by time-varying effects of the observable characteristics along which the treatment and control households are different. For example, in the samples in which only wives are employed in the state sector, the age of the head of household is about seven years older in the treatment group than in the control group. The same age gap in the sample in which only husbands are employed in the state sector is only two years. There may be age differences in preferences for consumption of tea and cigarettes. Furthermore, gaps in the level of health of men and women as they age may explain shifts in the gender division of chores.

I deal with this concern by including the interaction of the post-reform indicator and age, household size and gender of the household head in the regressions. The results are shown in Table 5. Panel A corresponds to Table 3 with the additional regressors, and Panel B corresponds to Table 4 with the additional regressors. The magnitude and the significance of the estimates are quite similar after allowing for time-varying effects of the observable characteristics. The exception is the impact of transferring property rights women on households' consumption of alcohol where the results actually become stronger. This estimate becomes significant at the 10% level, and indicates that transferring property rights over housing to women decreases the

household's consumption of alcohol by over 40%. This is consistent with the interpretation that transferring property rights to women increases her relative bargaining power and leads to decreases in the consumption of male-favored goods.

6 Alternative Mechanisms

While the gender differences in the results suggest that the mechanism must be occurring at the individual-level, this section considers whether the results are consistent with alternative, individual-level changes associated with housing reform. Wang (2012) shows that the housing reform affects individuals' probability of moving from the state sector to the private sector. Prior to the reform, subsidized state-owned housing was tied to an individual's state employer. The reform may have allowed individuals with housing rights to move into jobs with higher wages relative to their spouses. Thus, the main effect of the housing reform may operate through changes in the household composition of wages.

I consider this possibility of a wage-based mechanism by examining the impact of the gender of the transfer of housing rights on the female share of household earnings. The results are presented in columns 1 and 3 of Table 6. In the sample of households in which only husbands are employed in the state sector, the impact of receiving ownership rights leads to a 2.6 percentage point decline in the wife's share of household income but this is not statistically different from zero. In the sample of households in which only wives are employed in the state sector, the impact of receiving ownership rights translates into a 7.6 percentage point decline in the wife's share of household income. While this is not statistically significant at the standard levels, the sign of the impact is the opposite of what we would expect if the gender composition of earnings explained the results on bargaining outcomes.

I also examine the hypothesis that household bargaining outcomes changed as a result of changes in the composition of the household. This could be driven by mobility of individuals out of the household following the housing reform. Previous research has shown that the reform did

lead to an increase in household-level residential mobility (Wang 2012). I examine the impact of the reform on household size in the male sample and in the female sample in columns 2 and 4, respectively. The sign of the impact of receiving ownership rights is the same for the male sample and the female sample, and neither are statistically different from zero. Overall, the results do not support the alternative mechanisms for explaining the results on household consumption of male-favored goods and on the division of household chores.

7 Conclusion

The results of the paper provide some evidence to support the idea that strengthening property rights for individuals also has effects for their bargaining power within the household. In the context of China, strengthening property rights over housing by granting rights to sell, lease and mortgage for women led to very large decreases in household consumption of cigarettes and alcohol, which are male-favored goods, and to improvements in girls' weight-for-age. Strengthening the same rights for men led to increases in household consumption of a male-favored good, tea, and decreases in the men's contributions to household chores. The large magnitude of the results in this paper may not be that surprising given that the value of the asset transfer was extremely large at over twice an average household's annual income.

The findings in this paper are consistent with previous findings that reject the model of a unitary household. While the existing literature has focused mainly on control over income, the contribution of this paper is to highlight the importance of individual control over assets. The findings of the paper are the most relevant for other countries, particularly in Asia and sub-Saharan Africa, where state-owned housing assets represent a substantial share of the housing stock. However, they are also potentially relevant for titling programs that convert use rights into formal ownership rights. The results highlight the potential importance of the individual that receives the ownership rights for bargaining outcomes within the household.

A Anthropometric Measurements of Children

Improvements in the earnings of women relative to men have been shown to lead to improvements in the children's outcomes. Duflo (2003) finds that pensions received by South African women increased the anthropometric outcomes of girls only while those received by men had no effect on either girls or boys. Thomas (1990) shows that increases in unearned income by mothers have larger effects on child health than the same income attributable to fathers.

I look at anthropometric measurements of children to examine gender differences in investments in children in the household. I construct weight-for-age and height-for-age z-scores for boys and and girls aged 18 and under in the households. The nutrition literature considers children's height to be a long-run measure of nutrition and health inputs while weight is a short-run indicator. The z-score calculation uses U.S. Center for Disease Control Growth Reference charts from 2000. While these data are available for every wave of the survey, the sample sizes are quite small as the weight-for-age z-scores for girls (boys) are only available for households with at least one girl (boy). Furthermore, the limitations of the data do not allow me to only examine outcomes for children under the age of 60 months, as there would be no variation in the interaction of treatment status and post-reform in the sample of households in which only women are employed in the state sector.

The results are presented in Appendix Table 7. Panel A shows that transferring ownership rights to men does in translate into significant changes in the height or weight of children in the household. In contrast, transferring property rights to women leads to almost a standard deviation increase in the weight-for-age of girls but no corresponding impact for boys. The gender differences in the results for weight-for-age are very similar to those found by Duflo (2003). Unlike the findings of previous studies on income transfers, the transferal of property rights does not lead to significant changes height-for-age. This may be because rights over asset ownership do not have long-run effects whereas control over income does, or it may be because of the low power offered by the sample including anthropometric measures of children.

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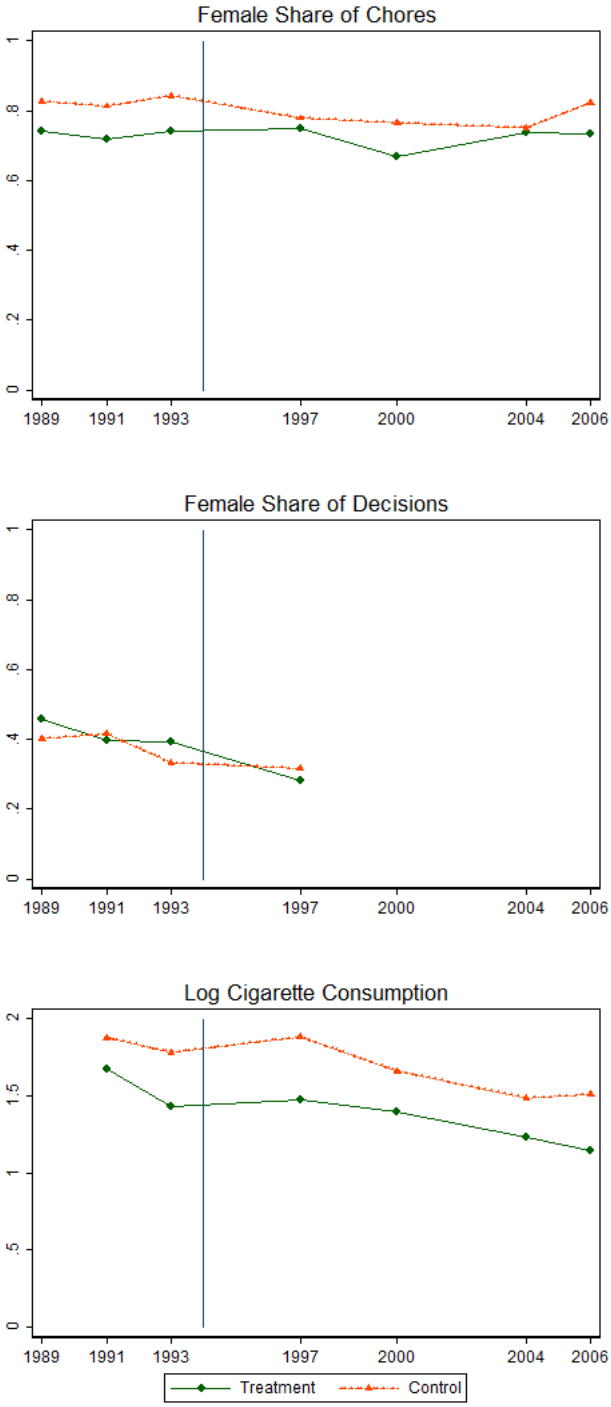
Table 1: Individual Time Use and Consumption by Gender

	Men	Women
Time on Household Chores (minutes/day)	66.53	201.46
	(218.14)*	(324.05)
	N=2801	N=3034
Sole Decision Maker on Purchases	0.25	0.12
	(0.43)*	(0.32)
	N=1411	N=1473
Number of Cigarettes per Day	9.58	0.61
	(10.83)*	(2.87)
	N=1902	N=2265
Cups of Tea per Day	2.35	1.15
	(2.72)*	(1.94)
	N=1374	N=1667
Alcohol Consumption per Week	2.39	0.17
	(4.49)*	(0.96)
	N=1428	N=1703

Notes: Standard deviations in parentheses. N displays the number of observations. * denotes that the control group is significantly different from the treatment group at the 5% level.

Figure 1: Trends in Bargaining Outcomes

(a) Male Sample



(d) Female Sample

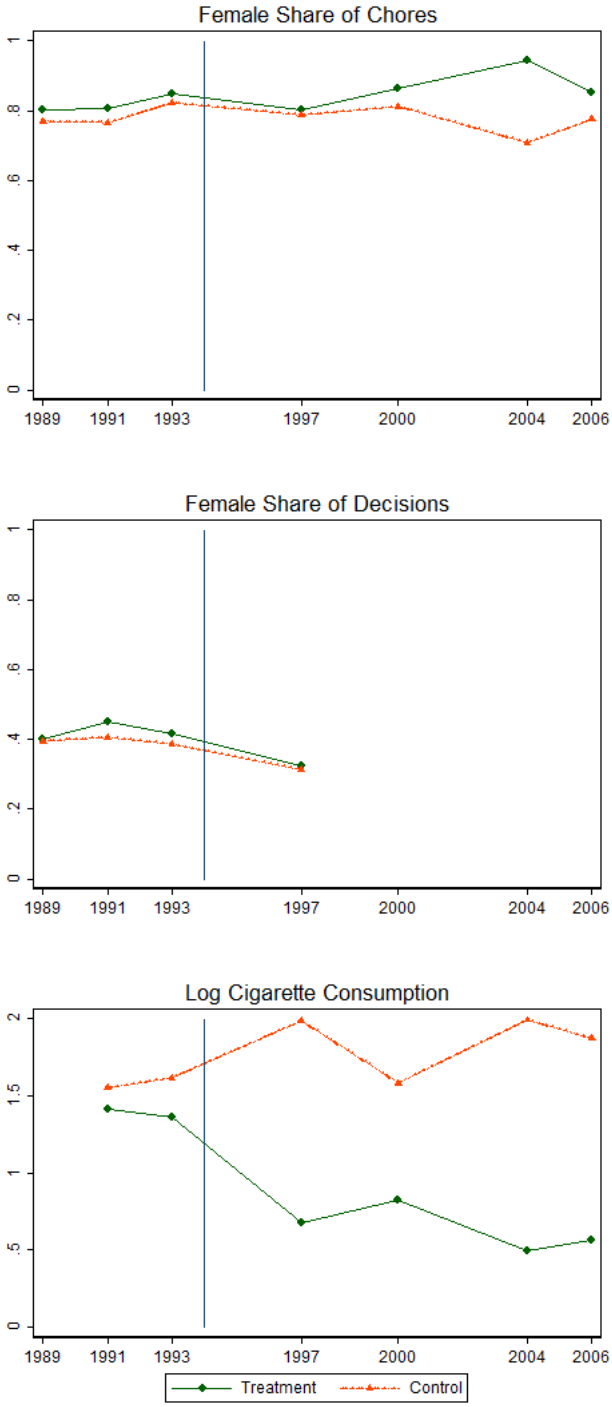


Table 2: Pre-Reform Household Characteristics by Gender and Residence of the State Employee

	Male State Employed		Female State Employed	
	Treatment	Control	Treatment	Control
Monthly Household Earnings	235.87	232.16	245.69	275.48
	(173.69)	(169.68)	(149.95)	(201.04)
	N=463	N=749	N=137	N=111
Household Size	3.52	4.09	3.51	4.02
	(1.39)*	(1.47)	(1.39)*	(1.52)
	N=586	N=961	N=164	N=131
Age of Head	51.09	49.31	55.92	48.46
	(14.14)*	(13.02)	(14.96)*	(14.43)
	N=582	N=955	N=164	N=128
Education of Head	7.02	6.34	5.40	5.57
	(4.86)*	(4.20)	(4.65)	(4.03)
	N=545	N=928	N=155	N=128
Female Share of Chores	0.73	0.83	0.82	0.78
	(0.34)*	(0.28)	(0.29)	(0.29)
	N=564	N=918	N=159	N=128
Female Share of Decisions	0.34	0.31	0.38	0.33
	(0.28)	(0.29)	(0.30)	(0.28)
	N=586	N=961	N=164	N=131
Cigarette Consumption	9.98	12.73	7.70	9.50
	(12.18)*	(13.79)	(9.92)	(10.71)
	N=354	N=611	N=101	N=84
Tea Consumption	3.64	4.95	3.80	3.97
	(4.18)*	(5.98)	(4.70)	(4.63)
	N=165	N=291	N=44	N=38
Alcohol Consumption	1.96	2.73	0.91	2.03
	(3.18)	(5.30)	(1.72)	(3.21)
	N=165	N=293	N=43	N=39

Notes: Standard deviations in parentheses. N displays the number of observations. * denotes that the control group is significantly different from the treatment group at the 5% level. The consumption measures are at the household level.

Table 3: Effects of Transferring Property Rights to Men on the Division of Chores and Consumption

	Female Share of Chores	Female Share of Decisions	Log Cigarette Consumption	Log Tea Consumption	Log Alcohol Consumption
	(1)	(2)	(3)	(4)	(5)
Property^m*Post	0.049+	-0.101	0.050	0.203*	-0.123
	[0.029]	[0.083]	[0.135]	[0.100]	[0.095]
Year1989	-0.001	0.038			
	[0.033]	[0.051]			
Year1991	-0.007	0.051	0.378**		
	[0.032]	[0.049]	[0.139]		
Year1993	0.017	-0.002	0.237+	0.397**	0.212*
	[0.031]	[0.051]	[0.130]	[0.086]	[0.085]
Year1997	-0.020		0.308**	0.202**	0.242**
	[0.029]		[0.106]	[0.078]	[0.076]
Year2000	-0.059*		0.129	0.225**	0.310**
	[0.026]		[0.100]	[0.069]	[0.071]
Year2004	-0.049*		0.032	0.016	0.123*
	[0.025]		[0.086]	[0.068]	[0.062]
Observations	2495	1343	2135	1597	1626
Adjusted R^2	0.031	0.020	0.065	0.077	0.044

Notes: Robust standard errors clustered by household in brackets. **, *, + denotes significance at the 1%, 5% and 10% level, respectively. Regressions also include a quadratic in the age of the head of household, the logarithm of household size, an indicator for the gender of the household head, a constant term and household fixed effects. The sample is limited to households with only the husband working in the state sector.

Table 4: Effects of Transferring Property Rights to Women on the Division of Chores and Consumption

	Female Share of Chores	Female Share of Decisions	Log Cigarette Consumed	Log Tea Consumed	Log Alcohol Consumed
	(1)	(2)	(3)	(4)	(5)
Property^f*Post	-0.000	0.061	-0.589*	-0.033	-0.315
	[0.060]	[0.151]	[0.228]	[0.229]	[0.261]
Year1989	-0.009	-0.001			
	[0.078]	[0.078]			
Year1991	-0.001	0.022	-0.057		
	[0.075]	[0.071]	[0.282]		
Year1993	0.030	-0.020	-0.072	0.277	0.150
	[0.070]	[0.076]	[0.274]	[0.241]	[0.278]
Year1997	-0.017		0.238	0.147	0.434**
	[0.065]		[0.230]	[0.201]	[0.157]
Year2000	0.017		-0.059	-0.073	0.210
	[0.056]		[0.231]	[0.176]	[0.134]
Year2004	-0.006		0.055	-0.016	0.214
	[0.062]		[0.195]	[0.156]	[0.163]
Observations	438	266	362	255	259
Adjusted R^2	0.042	0.136	0.143	0.055	0.059

Notes: Robust standard errors clustered by household in brackets. **, *, + denotes significance at the 1%, 5% and 10% level, respectively. Regressions also include a quadratic in the age of the head of household, the logarithm of household size, an indicator for the gender of the household head, a constant term and household fixed effects. The sample is limited to households with only the wife working in the state sector.

Table 5: Impact of Property Rights Allowing for Time-Varying Effects of Observables

	Female Share of Chores	Female Share of Decisions	Log Cigarette Consumed	Log Tea Consumed	Log Alcohol Consumed
	(1)	(2)	(3)	(4)	(5)
Panel A: Male State Employed Sample					
Property^m*Post	0.051+	-0.076	0.091	0.179+	-0.108
	[0.030]	[0.097]	[0.141]	[0.101]	[0.099]
Year1989	-0.095	0.054			
	[0.097]	[0.229]			
Year1991	-0.100	0.067	-0.613		
	[0.097]	[0.231]	[0.417]		
Year1993	-0.075	0.013	-0.756+	-0.749*	-0.382
	[0.097]	[0.230]	[0.416]	[0.307]	[0.280]
Year1997	-0.023		0.276*	0.199*	0.241**
	[0.030]		[0.109]	[0.081]	[0.077]
Year2000	-0.061*		0.102	0.222**	0.308**
	[0.027]		[0.103]	[0.072]	[0.072]
Year2004	-0.050*		0.023	0.016	0.124*
	[0.025]		[0.088]	[0.069]	[0.063]
Observations	2495	1343	2135	1597	1626
Adjusted R^2	0.031	0.024	0.065	0.076	0.043
Panel A: Female State Employed Sample					
Property^f*Post	-0.008	-0.064	-0.691**	-0.205	-0.433+
	[0.064]	[0.222]	[0.247]	[0.229]	[0.256]
Year1989	0.109	0.008			
	[0.177]	[0.055]			
Year1991	0.119	0.037	-0.504		
	[0.176]	[0.044]	[0.828]		
Year1993	0.155		-0.502	-0.122	-0.189
	[0.176]		[0.835]	[0.680]	[0.779]
Year1997	-0.004	0.395	0.220	0.125	0.425**
	[0.066]	[0.424]	[0.236]	[0.206]	[0.152]
Year2000	0.026		-0.061	-0.081	0.207
	[0.057]		[0.233]	[0.184]	[0.133]
Year2004	-0.005		0.047	-0.009	0.201
	[0.061]		[0.194]	[0.160]	[0.161]
Observations	438	266	362	255	259
Adjusted R^2	0.046	0.122	0.145	0.033	0.072

Notes: Robust standard errors clustered by household in brackets. **, *, + denotes significance at the 1%, 5% and 10% level, respectively. Regressions also include a quadratic in the age of the head of household, post times a quadratic in age, the logarithm of household size, post times the logarithm of household size, an indicator for the gender of the household head, post times the indicator for gender, a constant term and household fixed effects.

Table 6: Fixed Effects Estimates of Property Rights, Household Size and Division of Income

	Male State Employed (g=m)		Female State Employed (g=f)	
	Female Share of Earnings	Log Household Size	Female Share of Earnings	Log Household Size
	(1)	(2)	(3)	(4)
Property^g*Post	-0.025	-0.018	-0.088	-0.081
	[0.040]	[0.037]	[0.111]	[0.104]
Year1989	-0.052	0.345**	0.176	0.419**
	[0.049]	[0.040]	[0.157]	[0.102]
Year1991	-0.043	0.272**	0.125	0.392**
	[0.046]	[0.039]	[0.150]	[0.097]
Year1993	-0.035	0.223**	0.139	0.307**
	[0.046]	[0.038]	[0.142]	[0.093]
Year1997	-0.020	0.093**	0.049	0.163*
	[0.040]	[0.035]	[0.114]	[0.077]
Year2000	-0.021	0.072*	0.060	0.085
	[0.038]	[0.031]	[0.102]	[0.068]
Year2004	-0.039	0.012	-0.149	0.008
	[0.043]	[0.027]	[0.102]	[0.074]
Observations	1513	2720	252	474
Adjusted R^2	0.010	0.183	0.136	0.247

Notes: Robust standard errors clustered by household in brackets. **, *, + denotes significance at the 1%, 5% and 10% level, respectively. Regressions also include a quadratic in the age of the head of household, an indicator for the gender of the household head, a constant term and household fixed effects.

Appendix Table 7: Fixed Effects Estimates of Property Rights and Anthropometric Measures

	Weight-for-Age		Height-for-Age	
	Girls	Boys	Girls	Boys
	(1)	(2)	(3)	(4)
Panel A: Male State Employed Sample				
Property^m*Post	0.178	-0.027	0.194	-0.113
	[0.258]	[0.175]	[0.253]	[0.193]
Year1989	0.534	0.179	0.060	0.034
	[0.357]	[0.203]	[0.380]	[0.267]
Year1991	0.107	-0.080	-0.227	-0.111
	[0.329]	[0.176]	[0.371]	[0.248]
Year1993	0.247	0.033	-0.218	-0.034
	[0.321]	[0.172]	[0.355]	[0.236]
Year1997	0.156	0.128	-0.549	0.101
	[0.314]	[0.172]	[0.341]	[0.200]
Year2000	-0.030	0.003	-0.407	0.124
	[0.308]	[0.166]	[0.335]	[0.199]
Year2004	0.187	0.009	-0.496	-0.377*
	[0.248]	[0.144]	[0.327]	[0.180]
Observations	527	612	503	580
Adjusted R^2	0.022	0.037	0.042	0.040
Panel B: Female State Employed Sample				
Property^f*Post	0.979**	-0.090	0.356	-0.380
	[0.303]	[0.361]	[0.472]	[0.237]
Year1989	0.139	-0.866	2.119**	-0.673+
	[0.901]	[0.778]	[0.414]	[0.395]
Year1991	0.228	-0.836	1.887**	-0.856+
	[0.866]	[0.670]	[0.315]	[0.424]
Year1993	0.345	-0.410	1.619**	-0.461
	[0.881]	[0.616]	[0.295]	[0.412]
Year1997	-0.203	-1.063+	1.016**	-0.582
	[0.759]	[0.605]	[0.322]	[0.392]
Year2000	0.017	-0.483	0.588+	-0.316
	[0.587]	[0.539]	[0.294]	[0.383]
Year2004	-0.362	-0.713	1.113**	-0.224
	[1.412]	[0.696]	[0.253]	[0.360]
Observations	97	120	95	112
Adjusted R^2	0.118	0.090	0.152	0.134

Notes: Robust standard errors clustered by household in brackets. **, *, + denotes significance at the 1%, 5% and 10% level, respectively. Regressions also include a quadratic in the age of the head of household, an indicator for the gender of the household head, a constant term and household fixed effects.