Hukou and *Guanxi*: How Social Discrimination and Networks Impact Intrahousehold Allocations in China

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Abstract

Hukou, China's household registration system, affects access to public services and signals the strength of a person's local social network, *guanxi*. We use a collective model and data on household consumption and spouses' *hukou* status to show that *hukou* plays a crucial role in determining within-family bargaining power. Wives who bring the family more lucrative *hukou* enjoy significantly higher bargaining power than other wives. Still, these wives have less bargaining power than their husbands. Large differences in preferences between husbands and wives, especially regarding alcohol, tobacco, and clothing, allow us to identify these disparities.

Key words

Intrahousehold allocations, Bargaining power, *Hukou*, Discrimination

JEL Classification codes

J12, D13, J18, J16

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Introduction

We leverage differences in status between husbands and wives within China's *hukou* system, which we describe briefly below and in more detail in section 1, to show that differential access to resources affects bargaining power within a couple. Holding income constant, the household spends more on goods that the wife values when she has a more advantageous *hukou* status than her husband. Using a structural model, we estimate that the wife's bargaining weight increases by .07 if she provides the household's local-urban *hukou*. Thus, we show that this migration policy, although not intended to affect the division of power within a household, nevertheless has notable effects.

The *hukou* system was designed to restrict migration within China. Thus, an individual can have *agricultural* or *non-agricultural hukou*, commonly called *rural* and *urban*. Furthermore, *hukou* is tied to a locality. Thus, residents of a city may have local urban, local rural, non-local urban, or non-local rural *hukou*. Residents with local *hukou* have access to benefits such as health care, education, government jobs, and unemployment insurance that are largely unavailable to those without local *hukou*. In addition, residents with local-urban *hukou* enjoy better resources than people with local rural *hukou* because the most favorable resources are located in cities (Song, 2014). Thus, individuals with local-urban *hukou* face a more favorable labor market, can enter better schools, and may be more attractive in the marriage market (Afridi et al., 2015). In addition, local-urban *hukou* signals that the individual has strong social ties in the local community. Such connections, known as *guanxi*, play a crucial part in job finding and conducting business (Zhang, 2010).

Children born before 1998 received their mother's *hukou*. Since then, they may receive their father's *hukou* instead if the parents so choose. Individuals can change their *hukou* status under some conditions, most notably through marriage, and changing status has become easier in the last several years. We use data from 2002-06, which predates the liberalization of *hukou* regulations. In addition, most, but not all, of the couples in our sample married before a child could receive its father's status.

Hukou status might affect bargaining power either through the initial marriage 'contract' or

its ongoing association with access to benefits. If only one spouse, say the wife, has local-urban *hukou* before the marriage, she brings a valuable asset to the couple. This initial contribution to the marriage might influence future bargaining even if the husband acquires local-urban *hukou* through the marriage. If he cannot obtain local-urban *hukou*, she will continue to have greater access to resources. Moreover, in either case, she is likely to have more valuable social connections or *guanxi*. Thus, we anticipate that *hukou* will be both a determinant of and an indicator of factors affecting bargaining power within the family.

We begin by providing reduced-form evidence. First, we show that if she has better *hukou*, the household spends more on clothing, education and entertainment (unfortunately not separated in the data), and, perhaps, home improvement, and less on alcohol and tobacco, consistent with her having more influence over the allocation of consumption. We then show that the wife's social insurance expenditure, a measure of the resources she brings to the household, is higher when she has the better *hukou*.

We then develop a version of the collective model of the household (e.g., Chiappori (1992); Lise & Seitz (2011)) in which bargaining power depends on the husband's and wife's *hukou* statuses and who brought the more desirable *hukou* type to the family. The model posits that households pool their incomes, but their members have different preferences over consumption. Households maximize a weighted sum of the spouses' utilities where the weights define their relative bargaining power (Quisumbing et al., 2000). Because husbands and wives have different preferences over consumption, we can derive their relative bargaining power by observing what (categories of) goods the household consumes. We add to the literature by identifying bargaining power in a model with only household-level data on consumption and individual labor supply. We draw on the structures in Mazzocco (2007), Cherchye et al. (2012), Yamaguchi et al. (2014), and Lise & Yamada (2019). Following Blundell et al. (2005) and Lise & Yamada (2019), we also introduce home production, which we assumed uses the wife's nonworking time.

Consistent with, but somewhat lower than findings in advanced economies, the wife's bargaining weight averages $.34 - .35$, depending on the specification. Providing the more desirable

hukou increases this weight by .07. This pattern is confirmed when we use a more detailed classification of *hukou* statuses. We also confirm the importance of *guanxi*; an extra year spent in the household's location adds .2 percentage points to her bargaining weight.

As required for identification of bargaining weights, we find that husbands and wives have notably different preferences over consumption. The women strongly prefer spending on clothing, entertainment and education, and food, while men put more weight on alcohol and tobacco, home improvement, and transportation and utilities.

Prior research shows that before 1998 the *hukou* system increased the demand for wives with local-urban *hukou* (Han et al., 2015). We complement this literature by showing that it also increased such wives' bargaining power within marriage because it allowed them to set advantageous ground rules before marriage or directly affected bargaining after marriage. We are not the first to recognize that external forces such as sex ratios (Bobonis, 2009; Chiappori et al., 2002) and divorce laws (Chiappori, 1992; Chiappori et al., 2002; Browning et al., 1994), or social programs like PROGRESA (Bobonis, 2009; Attanasio & Lechene, 2002, 2014) can affect power within marriage. However, the pervasiveness of the *hukou* system in China makes it particularly interesting.

1 The *hukou* system, *guanxi* and their impacts

Hukou is a household registration system that plays a significant role in China's social, political, and economic life. It categorizes Chinese citizens as having either "agricultural" or "non-agricultural" (rural or urban) *hukou*.[1] Therefore, each locality has local residents with urban *hukou*, local residents with rural *hukou*, non-local residents with urban *hukou*, and non-local residents with rural *hukou*.

The local government determines the social welfare benefits and opportunities available to individuals with each type of *hukou*. Typically, non-local residents have limited, if any, access

[1]Four provinces partially canceled the modifier "agricultural" and "nonagricultural" in 2001. As of 2014, 12 provinces had partially canceled the title. In 2014, the central government asked provinces to remove the "agricultural" and "nonagricultural" titles by the end of 2020. However, residents must still register with their original birthplace, and the welfare system is fundamentally unchanged.

to local government resources. Only local-urban residents benefit from high-quality resources because the most desirable resources (e.g., low-price public housing, top public schools, and favored university admissions) are located in urban areas (Song, 2014). Similarly, local governments and state-owned enterprises favor residents with local *hukou* when hiring. These jobs are usually stable and provide comprehensive social insurance. In principle, although other employers must participate in the social insurance system and cover employed migrants, enforcement remains very weak (Song, 2014). *Hukou*-related benefits vary from province to province and city to city. Table A1 in the appendix lists the general benefits restricted by *hukou* types as a reference for readers unfamiliar with the system.

Hukou is assigned at birth. Before 1998, a child received its mother's *hukou.* Subsequently, parents may choose either parent's *hukou* (State Council of the People's Republic of China [1998] Order No.24). Since the 1990s, changing *hukou* has been possible. Still, until recently, local governments generally limited such switches to highly skilled and highly educated workers. Low-skilled migrant workers, unable to switch their *hukou*, face discrimination in formal jobs offering social protection (Gagnon et al., 2011).

Chinese households have a formal head, as registered with the local government. Traditionally, the husband is the head. However, if only the wife has local-urban *hukou,* registering the wife as the head is advantageous. Even if both have local-urban *hukou*, hers may be located in a better school district. Wives who owned the house before marriage may also be designated as the head.[2] In contrast, if they have the same *hukou*, the choice of head is unimportant, and typically they choose the husband.

After marriage, one spouse may acquire the others *hukou* as a dependent (Regulations on Household Registration of the People's Republic of China, Chapter 19). Generally, they will choose the more lucrative one, local-urban *hukou*, if possible. The waiting period varies across localities and can be ten years in large cities like Beijing and Shanghai. In addition, there may be an age restriction, such as requiring the spouse changing their status to be at least 45 years

[2] A *hukou* unit is associated with an address. Thus, a marriage always involves a transfer of *hukou*, which can be intra-city, inter-city, intra-province, etc. Wu & Zhang (2018) provides evidence that a household tends to register the wife as the head if she has the homeownership, especially when they also have school-age children.

old. Some localities allow migrant spouses to enjoy rights similar to their spouse's during the waiting period.

Furthermore, Chinese society relies heavily on personalized social networks called *guanxi*. Local-urban *hukou* is a natural indicator of strong *guanxi* in the locality. A son or daughter-in-law with strong *guanxi* can help expand the family's *guanxi* network. Parents frequently involve themselves in marriage and post-wedding decisions, expect the new family member to provide benefits, and exert strong mental pressure on the newcomer to do so (Huang et al., 2012). Hence, people prefer a spouse with local-urban *hukou*. Even if both partners have local-urban *hukou*, the one who had local-urban *hukou* earlier should have more *guanxi* connections.

2 Data and Descriptive Statistics

The data come from the Urban Household Survey in China (UHS, National Bureau of Statistics of China, 2002-2006), which includes data from 31 provinces collected annually from 2002 to 2009 by the National Bureau of Statistics of China. The UHS gathered basic information such as gender, education, occupation, income, and social insurance and tax expenditures for each household member. It also includes household-level information on income, expenditures on food, clothing, home improvement, medicines, transportation, education, utilities, rent or mortgage, and other miscellanea. Unfortunately, the labor force questions were dropped after 2006. One-third of the sample was replaced each year. Therefore, households are in our sample for up to three years but an average of two.

The survey was designed to uncover the dynamics of demographic, employment, income, education, consumption, cash holding, and residence of urban households in China. The household was measured based on the *hukou* structure, with a household head and dependents. Over 95% of households consist of only the head, their spouse, and any children.

We restrict the sample to married-couple households and drop those in which at least one spouse has reached retirement age (men > 60 or women > 55) and those with less than ¥500 annual income. Our final sample consists of 29,023 households. Measures reported in yuan are adjusted based on the CPI in the province/year where the household is located. The year 2000

serves as the time baseline.

2.1 *Hukou* measures

We have the following *hukou*/household head combinations:

1. Wife **reported as** household head

    (a) both spouses have local-urban *hukou* (8,263 households)

    (b) wife, but not husband, has local-urban *hukou* (84 households)

    (c) husband, but not wife, has local-urban *hukou* (32 households)

    (d) neither spouse has local-urban *hukou* (69 households)

2. Husband **reported as** household head

    (a) both spouses have local-urban *hukou* (19,699 households)

    (b) wife, but not husband, has local-urban *hukou* (87 households)

    (c) husband, but not wife, has local-urban *hukou* (349 households)

    (d) neither spouse has local-urban *hukou* (440 households)

Unfortunately, we do not know *hukou* status at marriage. By the time we observe them, both spouses hold local-urban *hukou* in 98% of households where the wife is the household head. We infer that in such cases, either only the wife had local-urban *hukou*, or she had a form of local-urban *hukou* that was superior in social welfare and benefits to her husbands'. When only the wife has local-urban *hukou*, she is listed as household head roughly half the time. In contrast, when only the husband has this good *hukou*, he is the head over 90% of the time. Undoubtedly, we miss some cases where the wife contributed the better *hukou,* but the husband was still recorded as the head.[3]

Alternatively, we use a tighter set of criteria for determining initial *hukou* strength:

[3]We cannot observe and may, therefore, miss some cases where the head is switched later in marriage. However, anecdotal experience from *hukou* offices suggests that, while permitted, such changes are very rare.

- Group A (*wife brought inhukou*): wife is the designated head and has local-urban *hukou* and either a) settled in the locality before her husband or was born locally *or* b) the husband does not have local-urban *hukou*. While we think of this variable as primarily identifying who brought the family good *hukou*, it also indicates that the wife is likely to have more *guanxi*. (6,701 households)

- Group B: wife is not designated as head, but only she has local-urban *hukou*. (102 households)

- Group C: wife is not designated as head , and both have local-urban *hukou*. (21,130 households)

- Group D: only husband has local-urban *hukou*. (381 households)

- Group E: neither has local-urban *hukou*. (509 households)

For some purposes, we collapse these five categories into three, treating all cases where the wife does not have local-urban *hukou* together, regardless of the husband's status. We still treat Group A as a single case: Case 1 (6,701 households). We combine Group B and Group C into Case 2 (21,232 households), and Group D and Group E into Case 3 (827 households).

2.2 Summary statistics

Table 1 presents means and standard deviations of individual and household characteristics. Mean household income is ¥$32,145$. Husbands earn 51% more, on average, than wives. Salary accounts for 80% of wives' incomes and 90% of husbands'. About one-fourth of non-salary income is not assigned to either spouse. 70% of families have two earners, consistent with the high labor force participation rate among women in China.

Measuring incomes from the expenditure side shows that consumption plus savings and investment is ¥$31,031$, of which consumption accounts for 74%. The table shows consumption divided into (1) alcohol and tobacco, (2) clothing, (3) household supplies, (4) medical,

(5) transportation and utilities, (6) entertainment and education, (7) rent or housing loans, (8) miscellaneous and (9) food consumed in the home.[4]

[Insert Table 1 here]

29% of families register the wife as household head, presumably most frequently because the wife had better *hukou* than her husband. Although almost the entire sample had local-urban *hukou* when interviewed, it is possible many obtained it through marriage or work. Only 63% of wives and 60% of husbands were born locally, and not all of these would have received local-urban *hukou* at birth.[5] 24% of wives and 35% of husbands have a college degree or above, which would also facilitate acquiring a more desirable form of *hukou*.[6]

On average, wives are less than two years younger than their husbands and have reached an age at which fertility is likely to be complete. Of course, some are sufficiently young to have more children and others sufficiently old that the children have left home. The average household size is 2.94 persons.

3 *Hukou* affects power: reduced-form evidence

We expect that wives will have more power in families when they bring in local-urban *hukou* or have better *hukou*. Thus, we expect wives to have their greatest bargaining power when they are in type-A or B households. She should have more power in type-C households than E and the least power in type-D households. We expect the wife's power to be highest when either she brought local-urban *hukou* to the household or she has local-urban *hukou* and her husband does

[4]Food does not include dining out expenditures, which are included in the category of miscellanea.

[5]See conclusions in Johnson (2003) and Han et al. (2015).

[6]"College degree" is defined broadly to include full-time college and vocational institute education. The proportions of students who attend colleges and vocational institutes after graduating from high school are roughly equal. A degree from a college or vocational institute is usually required to take a comparatively advanced civil servant job, generally regarded as the most stable occupation in China. Local governments reserve most of the positions for local residents.

not and to be lowest when he, but not she, has the good *hukou*. It is not obvious how to rank the cases where we have no evidence that she brought in local-urban *hukou* but both have it and when neither has it.

We begin by testing whether our measures of *hukou* are associated with another indicator/determinant of power within the marital relationship. In Table 2, the dependent variable is the proportion of the household's expenditure on social insurance contributed by the wife. This is related to her relative income, often treated as a determinant of bargaining power (e.g., Mazzocco (2007) and Cherchye et al. (2012)). However, it also reflects the household's social benefits from her job. Positions in government or state-owned enterprises and similar jobs that favor workers with local *hukou* provide more comprehensive social insurance than other jobs. In addition, future family benefits depend on contributions to social insurance.[7]

[Insert Table 2 here]

The table shows the results of regressing her share of social insurance payments on measures of *hukou* status, number of children, age group dummies in ten-year intervals, time dummies, and province dummies. The first column measures *hukou* only by the dummy for group A, "Wife brought in *hukou*." It is associated with an increase in her share of sixteen percentage points and is significant at all conventional levels. The third column controls for whether the individuals hold a government job or position in a state-owned enterprise (nearly half the sample), which typically only hire people with local *hukou*. In a sense, this constitutes over-controlling since the spouses' ability to get these jobs is one of the ways that *hukou* status affects power. However, it is helpful to know whether this is the only mechanism. If so, we would probably prefer to use employment status rather than *hukou* status as a determinant of power. As expected, adding these controls somewhat lowers the coefficient. Importantly, it remains highly

[7]The social insurance program in China includes five different kinds of insurance and one housing provident fund program. The housing provident fund allows individuals to voluntarily deposit part of their salaries towards the purchase of their first home and doubles their total deposits as a part of the payment (akin to a 401K with a government match in the United States but not just for retirement).

significant.

Columns (2) and (4) repeat the specifications in columns (1) and (3) but include more detailed measures of *hukou* status. As expected, "Wife brought in local-urban *hukou* " continues to be associated with a large increase in her share of payments relative to the case where both spouses have it, but she cannot be shown to have brought it in. There is also a large positive association between only her having the status and her contribution, although it loses significance when we control for the spouses' occupations. Also, as expected, she accounts for a substantially lower proportion of their social security contributions when only he has local-urban *hukou* compared with the case where neither has it. The last two columns address *guanxi* by looking at the effect of years lived in the locality, although, as we have noted, this is associated both with *hukou* quality and with who is likely to have brought it in. The coefficients on wife's and husband's years in the locality are roughly equal and opposite sign, indicating that each year difference in time since settling in the locality is associated with a three percentage point difference in her share.

In Table 3, we examine the relation between our *hukou* measures and shares of spending on alcohol and tobacco, clothing, home improvement, and entertainment and education.[8] As expected, if the wife brings the household local-urban *hukou*, the share of household spending on alcohol and tobacco falls by a statistically significant $0.5pp$ on a base of 2.3%. We find less clear evidence when we use narrow *hukou* categories. Spending on alcohol and tobacco is lowest when the wife brings in *hukou* or she has local-urban *hukou*, and he does not. However, the household does not spend more on these products when only he has local-urban *hukou* than when neither has it.

[Insert Table 3 here]

[8] Articles with empirical applications that feature a preference gap between different genders, such as Anderson & Baland (2002), Attanasio & Lechene (2002), Bobonis (2009), Doepke & Tertilt (2011), and Attanasio & Lechene (2014) show empowering wives' increases spending on items such as clothing (women's clothing), education and savings, which women traditionally prefer, and decreases spending on items such as alcohol and tobacco, which are treated as men's private goods.

Similarly, as expected, the share of household expenditure on clothing is highest when she brought local-urban *hukou* to the household. Still, the gap between the cases where only she has good*hukou* and both do is small, and there is no significant difference between the cases when only he and neither has local-urban *hukou*.

We do not find strong evidence of a *hukou* effect on home improvement, possibly because spouses' preferences differ little. However, we do find an effect on education and entertainment. Although we find an effect when using only a binary *hukou* measure, this effect is driven by the difference between households in which at least one spouse has local-urban *hukou* and those in which neither spouse does and may, therefore, merely reflect access to education.

Attanasio & Lechene (2002) and Doepke & Tertilt (2011) use spending on different categories of clothing to test whether the PROGRESA program increased wives' bargaining power. Similarly, Browning et al. (1994) identifies a structural unitary model by assuming that husbands and wives each consume only their own clothes and not their spouse's. While we do not believe that spouses do not derive utility from each other's clothes, it seems intuitive that each spouse cares more about their own clothes. Therefore, in Table A2, we drill down further. The pattern in the table fits our expectations. *Hukou* combinations that should give her greater power result in more spending on the wife's clothing and less on her husband's. The evidence on children's clothing is less clear but largely, although not entirely, consistent with our expectations.

4 The collective model with *hukou*

We draw heavily on the collective household model of Chiappori (1988, 1992) and Lise & Seitz (2011). Following Mazzocco (2007), Yamaguchi et al. (2014) and Lise & Yamada (2019), we allow for intertemporal decisions about resource allocation and altruistic behavior. However, neither is essential to our approach, and we quickly reduce the model to a static framework.

A family (F) consists of a husband (H), wife (W), and, possibly, children (K). The couple determines consumption and labor supply. All family members consume, but children cannot work or bring in income. The wife and husband have egoistic utility functions $u^W(\cdot)$ and $u^H(\cdot)$

that depend on their final goods consumption, c^W or c^H, their leisure time, ℓ^W or ℓ^H, and their consumption of home goods, q^W or q^H, produced from purchased intermediate products, g. In addition, both spouses derive utility from the children's consumption of goods, c^K and q^K. We use superscript F to denote household totals so that $c^F \equiv c^W + c^H + c^K$.

The household utility maximizes a weighted average of wife's and husband's utilities. Thus, in a single period, household utility V^F is

$$V^F(c_t^W, c_t^H, c_t^K, \ell_t^W, \ell_t^H, q_t^W, q_t^H, q_t^K) = \mu u^W(c_t^W, \ell_t^W, q_t^W, c_t^K, q_t^K) + (1-\mu) u^H(c_t^H, \ell_t^H, q_t^H, c_t^K, q_t^K) \tag{1}$$

where μ is the wife's weight in the utility function or her bargaining power. Equivalently, $1-\mu$ equals the husband's weight. Note that children's consumption, not their utility, directly enters the husband and wife's utility. Also note that the collective model allows us to avoid specifying the spouses' outside options.

We assume that q_t is produced from intermediate goods and wife's 'leisure time' according to a constant-returns-to-scale production function.

$$q_t = q(g_t, \ell_t^W). \tag{2}$$

Consistent with the low participation of Chinese men in household chores, the husband does not engage in home production.

We assume that the household maximizes the discounted present value of lifetime utility $\Sigma_{t=t_0}^{\infty} \beta^{t-t_0} V_t^F$ where β is the spouses' common discount factor. This maximization is subject to a per-period time constraint for each spouse

$$h_t^j + \ell_t^j = 1, \quad j \in \{W, H\} \tag{3}$$

and a household lifetime budget constraint.

However, we reduce the dynamic problem to a static one by assuming that the household maximizes within-period utility given an optimally chosen savings path. Thus, the household maximizes (1) subject to a one-period budget constraint where consumption equals income

minus net savings

$$c_t^F + g_t^F + s_{t+1}^{*F} = w_t^W h_t^W + w_t^H h_t^H + (1 + r_t) s_t^{*F} \tag{4}$$

where s_{t+1}^{*F} is the optimal savings carried over to the next period in the intertemporal model, and s_t^{*F} is the savings level carried over from the prior period in that model.

We have data only on aggregate household consumption. Therefore, treating the household's problem as a two-stage resource allocation process is convenient. The first stage allocates consumption across (sets of) goods. The second stage allocates the goods among family members.

Our approach is without loss of generality. The household will choose $c^{F*} = c^{W*} + c^{H*} + c^{K*}$ and $q^{F*} = q^{W*} + q^{H*} + q^{K*}$ for the first-stage allocations and then allocate consumption exactly as in the one-shot solution.

Thus, we maximize

$$U_t^F(c_t^F, \ell_t^W, \ell_t^H, q_t^F) = \mu U_t^W(c_t^F, \ell_t^W, q_t^F) + (1 - \mu) U_t^H(\, c_t^F, \ell_t^H, q_t^F) \tag{5}$$

subject to (2), (3), and (4), and the non-negativity constraints

$$c_t,\ \ell_t,\ h_t,\ q_t,\ g_t \geq 0. \tag{6}$$

Note that U and u are different functions with different arguments. While not our primary motivation, this framework also allows us to avoid claiming that certain goods are public and others private.

4.1 Parameterization

We assume each spouse has a constant-elasticity of substitution utility function

$$U_t^j(\boldsymbol{c}_t^F, q_t^F, \ell_t^j) = \frac{1}{1 - \sigma^j} \left(\boldsymbol{\tau}_{1,t}^j (\boldsymbol{c}_t^F)^{\psi^j} + \tau_{2,t}{}^j (q_t^F)^{\psi^j} + \tau_{3,t}^j (\ell_t^j)^{\psi^j} \right)^{\frac{1-\sigma^j}{\psi^j}} \tag{7}$$

where $j \in \{W, H\}$, $\boldsymbol{c}^F = (c_1^F, c_2^F, \cdots, c_n^F)'$ is the vector of goods the family consumes and $\boldsymbol{\tau}_{1,t}^j = (\tau_{1,1,t}{}^j, \tau_{1,2,t}{}^j, \cdots, \tau_{1,n,t}{}^j)$ is the vector of the corresponding coefficients in the utility function at time t. The spouses may weight goods differently; we allow the weights to vary

with age. Similarly, ${\tau_{2,t}}^j$ shows the husband's and wife's preferences for the home-produced good. We abuse notation by using $(\boldsymbol{c}_t^F)^{\psi^j}$ to refer to each element of the vector raised to the power ψ^j.

We impose that $\boldsymbol{\tau}_{1,t}^j \cdot \mathbf{1} + \tau_{2,t}^j + \tau_{3,t}^j = 1$ by modeling the preference parameters as

$$\tau_{i,t}^j = \frac{exp(\boldsymbol{\nu}_i^j \cdot \boldsymbol{x}_{j,t}^j)}{1 + \Sigma_{k=1}^n \exp(\boldsymbol{\nu}_{1,k}^j \cdot \boldsymbol{x}_{j,t}^j) + exp(\boldsymbol{\nu}_2^j \cdot \boldsymbol{x}_{j,t}^j)} \text{ for } j = \text{ H,W} \tag{8}$$

where $\boldsymbol{x}_{j,t}^j$ consists of individual characteristics at time t, and $\boldsymbol{\nu}_i^j$ is a corresponding vector of parameters showing how these characteristics shift preferences. Due to computational limitations, x consists of a constant and the wife's or husband's age. We mainly focus on age because consumption preferences mainly transition with individuals' age (Becker & Mulligan, 1997). This approach follows the strategy used in Cherchye et al. (2012) to avoid an over-specified model. In addition, based on the reduced-form evidence, we further incorporate the number of children as a factor influencing the preference for clothing and education and entertainment expenditures for the wife's utility. With a slight violation of notation, (8) holds for each of the n categories of final good consumption and the intermediate good.

To ensure that bargaining power (or the Pareto weights) is between 0 and 1, we impose

$$\mu_t = \frac{exp(\boldsymbol{\mu_0} \cdot \boldsymbol{Z}_0 + \boldsymbol{\mu_1} \cdot \boldsymbol{Z}_t)}{1 + exp(\boldsymbol{\mu_0} \cdot \boldsymbol{Z}_0 + \boldsymbol{\mu_1} \cdot \boldsymbol{Z}_t)} \tag{9}$$

where $\boldsymbol{Z}_0$ and $\boldsymbol{Z}_t$ incorporate the *hukou*-related factors on which we focus. We use the same classifications of *hukou* as in the reduced-form (Table 2 and Table 3). The subscripts 0 and t are utilized to differentiate between the Hukou status at the time of marriage and the present status.

Finally, we impose that home production is Cobb-Douglas in wife's leisure and intermediate goods, which we measure as food consumed in the home

$$q_t^F = q(g_t, \ell_t^W) = (\ell_t^W)^\rho (g_t^F)^{1-\rho}. \tag{10}$$

Similar to the identification of preferences, the home production parameter is also parameterized with the number of children (x_t^c):

$$\rho = \frac{exp(\iota_0 + \iota_1 \cdot x_t^c)}{1 + exp(\iota_0 + \iota_1 \cdot x_t^c)}. \tag{11}$$

It is common to assume that wives are indifferent between time spent on home and market production. However, we do not impose this condition and, therefore, cannot test whether home production is efficient.

4.2 Estimation

We derive the first-order conditions with respect to consumption $\{\boldsymbol{c}_t^F, g_t^F\}$ and leisure $\{\ell_t^W, \ell_t^H\}$ in the first part of Appendix A.2. From these, we derive marginal rate of substitution equations that allow us to construct moment constraints. The substitution between two consumption items i and k is

$$\frac{\mu_t\big(A_t^W\big)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\,\tau_{1,i,t}^W(c_{i,t}^F)^{\psi^W-1}+(1-\mu_t)\big(A_t^H\big)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_{1,i,t}^H(c_{i,t}^F)^{\psi^H-1}}{\mu_t\big(A_t^W\big)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\tau_{1,k,t}^W(c_{k,t}^F)^{\psi^W-1}+(1-\mu_t)\big(A_t^H\big)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_{1,k,t}^H(c_{k,t}^F)^{\psi^H-1}}=1 \tag{12}$$

where $A_t^j=\boldsymbol{\tau}_{1,t}^j(\boldsymbol{c}_t^F)^{\psi^j}+{\tau_2}^j(q_t^F)^{\psi^j}+\tau_3^j(\ell_t^j)^{\psi^j}$.

The marginal rate of substitution between a final good i and the intermediate good g_t^F is:

$$\begin{aligned}&\mu_t\big(A_t^W\big)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\,\tau_{1,i,t}^W(c_{i,t}^F)^{\psi^W-1}+(1-\mu_t)\big(A_t^H\big)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_{1,i,t}^H(c_{i,t}^F)^{\psi^H-1}\\ =&(\ell_t^W)^{\rho}(1-\rho)(g_t^F)^{-\rho}\big[\mu_t\big(A_t^W\big)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\tau_2^W(q_t^F)^{(\psi^W-1)}+(1-\mu_t)\big(A_t^H\big)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_2^H(q_t^F)^{(\psi^H-1)}\big]\end{aligned} \tag{13}$$

The first-order conditions for the optimal leisure time for the wife ℓ_t^W and husband ℓ_t^H imply the marginal rates of substitution between leisure time and final good i or intermediate goods g_t^F is:

$$\begin{aligned}&\frac{\mu_t}{w_t^W}\big(A_t^W\big)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\big[\tau_2^W(q_t^F)^{\psi^W-1}\rho(\ell_t^W)^{\rho-1}(g_t^F)^{1-\rho}+\tau_3^W(\ell_t^W)^{\psi^W-1}\big]\\ =&\mu_t\big(A_t^W\big)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\,\tau_{1,i,t}^W(c_{i,t}^F)^{\psi^W-1}+(1-\mu_t)\big(A_t^H\big)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_{1,i,t}^H(c_{i,t}^F)^{\psi^H-1}\end{aligned} \tag{14}$$

and

$$\frac{\mu_t}{w_t^W}\left(A_t^W\right)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\left[\tau_2^W(q_t^F)^{\psi^W-1}\rho(\ell_t^W)^{\rho-1}(g_t^F)^{1-\rho}+\tau_3^W(\ell_t^W)^{\psi^W-1}\right]$$
$$=(\ell_t^W)^{\rho}(1-\rho)(g_t^F)^{-\rho}\left[\mu_t\left(A_t^W\right)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\tau_2^W(q_t^F)^{(\psi^W-1)}+(1-\mu_t)\left(A_t^H\right)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_2^H(q_t^F)^{(\psi^H-1)}\right] \tag{15}$$

for wives, and

$$\begin{aligned}&\frac{1-\mu_t}{w_t^H}\left(A_t^H\right)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_3^H(\ell_t^H)^{\psi^H-1}\\ =&\mu_t\left(A_t^W\right)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\tau_{1,i,t}^W(c_{i,t}^F)^{\psi^W-1}+(1-\mu_t)\left(A_t^H\right)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_{1,i,t}^H(c_{i,t}^F)^{\psi^H-1}\end{aligned} \tag{16}$$

$$\begin{aligned}&\frac{1-\mu_t}{w_t^H}\left(A_t^H\right)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_3^H(\ell_t^H)^{\psi^H-1}\\ =&(\ell_t^W)^{\rho}(1-\rho)(g_t^F)^{-\rho}\left[\mu_t\left(A_t^W\right)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\tau_2^W(q_t^F)^{(\psi^W-1)}+(1-\mu_t)\left(A_t^H\right)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_2^H(q_t^F)^{(\psi^H-1)}\right]\end{aligned} \tag{17}$$

for husbands. Additionally, the marginal rate of substitution between wife's and husband's leisure time is

$$\frac{\mu_t}{1-\mu_t}\frac{w_t^H}{w_t^W}\left(A_t^W\right)^{\frac{1-\sigma^W-\psi^W}{\psi^W}-\frac{1-\sigma^H-\psi^H}{\psi^H}}=\frac{\tau_3^H(\ell_t^H)^{\psi^H-1}}{\tau_2^W(q_t^F)^{\psi^W-1}\rho(\ell_t^W)^{\rho-1}(g_t^F)^{1-\rho}+\tau_3^W(\ell_t^W)^{\psi^W-1}}. \tag{18}$$

We estimate the model using nonlinear generalized method of moments (GMM). Equation (12), which governs substitution between pairs of goods, allows us to construct 28 moment constraints. We get 8 moment constraints from the relation between the intermediate good and eight final goods in (13). Equations (14) to (18) provide 19 moment constraints (substitution between final goods and wife's leisure (8); between final goods and husband's leisure (8); between the intermediate good and wife's or husband's leisure (2); between wife's and husband's leisure (1)) for a total of 55 moment constraints.

There are 36 taste parameters $\{\nu_i^j\}$: a constant and a coefficient on age for home production and each of eight categories of final goods, for each spouse separately $(2*9*2=36)$. The

constraint that the weights on the goods sum to 1 determines the preference for leisure. Additional parameters determine the home production function. Two parameters, ψ^W and ψ^H, are related to the elasticities of substitution, and two parameters, σ^W and σ^H, are related to the degrees of homogeneity of the spouses' utility functions. Lastly, the Pareto weights (bargaining power) are determined by the coefficient vector $\{\boldsymbol{\mu_0}, \boldsymbol{\mu_1}\}$.

The model is identified primarily by the assumption that the wife does not value her husband's leisure and that the husband values his wife's leisure only through its effect on home production. If each spouse received utility from the other's leisure, we could not, for example, distinguish a world in which the wife has a lot of power and values her leisure highly from one in which she has little power, but her husband values her leisure highly. The closest equivalent is Browning et al. (1994) who assume that husbands and wives do not derive utility from their spouse's clothes.

In a broader sense, differences in husbands' and wives' consumption preferences identify the model. If men tend to value alcohol and tobacco more highly, the household will consume more alcohol and tobacco when the husband has more bargaining power. If the wife has more bargaining power, she may work less. Given these taste differences, we would infer that in households where her leisure is high, she has high power, whereas he has more power when spending on alcohol and tobacco is high. Thus, we implicitly assume that the couple's *hukou* status can only affect the expenditure distribution through its effect on bargaining power. If wives and husbands want to spend more on clothing when she brought local *hukou* into the family, this assumption will be violated.

In the body of the paper, we summarize preferences for final goods: $\boldsymbol{\tau}^j_{1,t}$, the intermediate good: $\tau^j_{2,t}$, and leisure at the sample means. Our focus is on bargaining power, for which we provide estimates both at sample means and of the effect of *hukou.* We use the delta method to calculate the standard errors at these means.

5 Results

We show that husbands and wives have different preferences over classes of goods and use these differences to estimate the effect of *hukou* and *guanxi* on bargaining power. We present the results in the opposite order, focusing first on the determinants of bargaining power, our main contribution, before showing the taste preferences that identify bargaining power.

5.1 Better *Hukou* Raises Bargaining Power

The first column in Table 4 uses the binary distinction, whether the wife is the recorded household head. The first row shows the wife's mean bargaining weight is about .35,[9] which is somewhat low relative to estimates in developed countries (e.g., 0.5 to 0.52 in the US (Del Boca & Flinn, 2012) and 0.43 to 0.44 in Japan (Lise & Yamada, 2019)). As expected, an advantageous *hukou* gives wives more power. If the wife is the household head, her bargaining weight is higher by about .07 at the mean.

[Insert Table 4 around here]

Column (2) adds the spouses' current *hukou* status. Once we control for who is household head, neither her nor his current *hukou* status enters statistically significantly. However, both are imprecisely measured, and the coefficient on her status is large and positive. Importantly, adding these variables has no notable effect on the relation between her power and whether she is the household head.

The last column replaces the focus on *hukou* with *guanxi*, although, as previously noted, her *guanxi* may play a role in her selection as household head if, for example, she owned the family's house before marriage. As expected, time lived in the community, our indicator of *guanxi*, has a positive effect on a spouse's bargaining power, although the effect falls well short of significance for husbands. A one-year increase in the wife's years in her current town raises

[9] The weight is calculated at average age, average number of children, and proportion wife household head.

her bargaining weight by .2 percentage points at the mean, but this estimate is somewhat imprecise, while the point estimate for husbands is only about one-fourth of that for wives. These findings suggest that *guanxi*, a critical social tie that connects people's economic, political, and social life, influences intrahousehold allocations and bargaining power.

Column (2) suggests that current *hukou* status may be unimportant, while columns (1) and (3) suggest that *hukou* status at time of marriage and *guanxi* may both be important. Table 5 addresses the combined role of these two factors directly and explores the role of current *hukou* status more fully.

Column I of Table 5 uses the variable "wife brought in *hukou,*" which equals 1 if either the wife is the head or she has lived in the town longer than her husband has to capture the likelihood that she has the greater *guanxi*. The coefficient remains significant, but its magnitude falls by roughly 7 percent, and its standard error increases by about a fifth.

Column II adds whether she has local *hukou* but did not provide the family with local-urban *hukou.* This specification provides a clearer picture. Recall that these two groups comprise 97% of our sample. Therefore, it is not surprising that the difference in wives' bargaining power in households where she brought in *hukou* relative to where she has local-urban *hukou* is similar to the difference between the first group and all other households combined. More striking is the large difference in bargaining power between wives with and without local-urban *hukou* in families where she did not bring this *hukou* status to the family. Wives with local-urban *hukou* but who were not responsible for their family's *hukou* status still have 24% more bargaining power than those without local-urban *hukou*. Families who rely on the wife for better *hukou* see the wives enjoy a Pareto weight of 0.3939 on average, which is 19% and 48% higher than the weight of the wives who are in the groups that do not rely on the wives for *hukou*, and who have and do not have local-urban *hukou*.

[Insert Table 5 here]

Column (3) further divides the group where she has local-urban *hukou* but did not bring this

status to the household where the husband has and does not have local-urban *hukou*. The latter case is unusual. It means that the wife is not the listed head of household, and the husband has lived in the town at least as long as the wife has, but he does not yet have local-urban *hukou*. We also divide the households where the wife does not have local-urban *hukou* into those in which the husband does and does not. We expect the wife to have more bargaining power when she, and not her husband, has local urban *hukou*. The point estimates do not support this expectation, but the estimates are sufficiently imprecise that we can conclude very little from this comparison. As expected, when the wife does not have local-urban *hukou*, she has more power when her husband also does not have it (the excluded category) than when he does. However, the estimates are again too imprecise to permit any strong conclusions.

We have not focused on the role of children in affecting bargaining power. However, we consistently find that an additional child reduces the wife's bargaining power, consistent with the reduced-form evidence. We are cautious about interpreting this effect as causal. Lower-income and less-educated families tend to have more children in China, and, in developed countries, at least, these characteristics are associated with lower bargaining power of the wife. Moreover, the labor-supply reducing effect of children may reduce the wife's market income and, thus, her power in decision-making. Similar outcomes have been confirmed elsewhere, such as in Mazzocco (2007) and Lise & Yamada (2019).

5.2 Husbands and Wives Have Different Preferences over Consumption

The lower panels of Table 4 and Table 5 show our estimate of the weights wives and husbands place on different categories of home production at the average age. See the second part of Appendix A.2 for estimates of how individual characteristics affect preferences.

On average, the wife places less weight on each category than her husband does. Since the weights on goods and nonmarket time must sum to 1, she must place more weight on her nonmarket time than he does on his. Similarly, Anderson & Baland (2002) find that wives value savings more than spending on consumption. There are also large differences in the relative weights placed on different categories. His weight on alcohol and tobacco is almost twenty

times hers. In contrast, his weight on clothing is only about three times hers. This implies that she values clothing relative to alcohol and tobacco much more than he does. Doepke & Tertilt (2011) reach a similar conclusion. Among consumption goods, wives also put more weight on entertainment and education than on other spending.

Recall that we do not impose that home production is 'efficient' in the sense that the wife's value of marginal product in home production equals her market wage. This is because she may enjoy time spent on home production more or less than time spent working in the market. Nevertheless, we can test whether this constraint holds in our data. We write the constraint as $\rho = \frac{w^W \ell^W}{g^F + w^W \ell^W}$ for each period. The right-hand side $\frac{w^W \ell^W}{g^F + w^W \ell^W}$ has a sample mean of 0.8274 and the 95% confidence interval is $[0.8261, 0.8288]$, far higher than our estimates of ρ in Table 4 and Table 5. This suggests that "wives spend too much time on home production," presumably because they find home-production time more enjoyable than time spent working in the market.

Conclusions

Even though we lack data on individual consumption within the household, we can uncover the bargaining weights within the household because wives and husbands have different preferences over goods, particularly in the relative weight they put on alcohol and tobacco compared with clothing. This allows us to explore how the *hukou* that the individuals in the couple bring to the household affects their bargaining power.

We find that wives in China generally have less bargaining power than their husbands and are, therefore, disadvantaged in the distribution of household resources. The average wife's Pareto weight is between 0.34 and 0.35, somewhat smaller than found in developed countries. However, if the wife brought local urban *hukou*, which allows family members to enjoy better public services, her bargaining power is about 19.4% (about $7pp$) higher than the bargaining power of a wife whose family does not rely on her for *hukou*. *Guanxi* or social networks are also important in deciding individuals' bargaining power. Wives with stronger local *guanxi*, as measured by the years they have been living in their current town, have higher bargaining power by roughly 0.2 percentage points per year lived in the town.

The barriers to obtaining *hukou* have gradually lessened thanks to a series of reforms since China started to move towards a market economy. This has significance far beyond the topic of this paper. Nonetheless, it is important to recognize that these reforms will alter bargaining power within the household.

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Tables

Table 1: Summary statistics

	Mean (std. dev.)	
Panel A	Household	
Total income	32144.61 (22609.62)	
Salary income	26832.78 (20511.53)	
Dual-earner (full-time) ratio	0.7 (0.46)	
Number of children	0.94 (0.47)	
Total expenditure	31031.01 (36423.65)	
Consumption	22830.71 (18247.9)	
Alcohol and tobacco	730.58|2.27% (1028.75)	
Clothing	2454.56|7.64% (2241.68)	
Home improvement	1308.08|4.07% (2696.55)	
Medical	1351.07|4.20% (2846.6)	
Transportation and utility	2900.75|9.02% (8533.58)	
Entertainment and education	3720.85|11.58% (5044.86)	
Rent	2109.3|6.56% (4868.32)	
Misc.	796.5|2.39% (1332.56)	
Food	8189.61|25.48% (4456.36)	
Panel B	Wife	Husband
Age	42.95 (7.31)	44.6 (7.36)
College Degree	0.24 (0.42)	0.35 (0.48)
Working hours/m	132.97 (78.13)	171.07 (42.88)
Urban *hukou*	0.976	0.983
Local urban *hukou*	0.969	0.977
Years in town	18.88 (12.94)	20.56 (12.23)
Household head	0.291	0.709

Notes: The summary statistics presents the mean values of variables with standard deviations in the parentheses. The income catagories include zero-income individuals. In the consumption subgroup part, the percentages behind | stand for the amount to the total income. The sample comprises 29,023 households in total from year 2002 to 2006. The currency values are adjusted according to the CPI in each province. The sum of the nine catagory expenditure is not exactly same as the total because of the missing reports of some households in subcatagories. The residual catagory (the difference between the total income and the total consumption) is the net savings. Dual-earner family is the family with two full-time earners. A full-time earner is defined as a worker who spend more than 100 hours per month in the labor market. College degree proportion is the proportion of those have attended vocational institutes or colleges or higher.

Table 2: Reduced-form evidence I: *hukou* and wife's contribution on social insurance

Variable:	Dependent variable: Wife's social insurance expenditure / Total social insurance expenditure					
Wife brought in *hukou*	0.161		0.125			
	(0.0060)		(0.0060)			
Group A		0.202		0.130		
(wife brought in *hukou*)		(0.0410)		(0.0370)		
Group B		0.197		0.09		
(wife didn't bring in *hukou* & she has		(0.0760)		(0.0710)		
local urban *hukou* and he doesn't)						
Group C		0.043		0.006		
(wife didn't bring in *hukou* & she and		(0.0410)		(0.0360)		
he both have local urban *hukou*)						
Group D		-0.126		-0.098		
(wife didn't bring in *hukou* & he has		(0.0450)		(0.0400)		
local urban *hukou* and she doesn't)						
Wife years since settling					0.030	0.020
					(0.0070)	(0.0060)
Husband years since settling					-0.027	-0.022
					(0.0080)	(0.0060)
Number of children	-0.029	-0.029	-0.020	-0.020	-0.033	-0.023
	(0.0050)	(0.0050)	(0.0050)	(0.0050)	(0.0060)	(0.0050)
Wife occupation			×	×		×
Husband occupation			×	×		×
Wife and husband age groups	×	×	×	×	×	×
Time fixed effects	×	×	×	×	×	×
Province fixed effects	×	×	×	×	×	×
Observations	23,615	23,615	23,615	23,615	23,615	23,615
R2	0.145	0.149	0.314	0.316	0.098	0.287

Note: Standard errors in brackets and errors are clustered at the household level. The spending is monthly based on the currency of *yuan*, and the values are log linearized. Group A, B, C, and D are arranged according to the assumed bargaining power ranks of wives within families. The baseline group is Group E.

Table 3: Reduced-form evidence II: *hukou* and consumption on different items

	Consumption to the total income							
Variable:	Alcohol and tobacco		Clothes		Home improvement		Education and entertainment	
Wife brought in *hukou*	-0.005		0.007		0.001		0.006	
	(0.0010)		(0.0010)		(0.0010)		(0.0020)	
Group A		-0.009		0.017		0.012		0.039
(wife brought in *hukou*)		(0.0020)		(0.0030)		(0.0020)		(0.0060)
Group B		-0.011		0.014		0.013		0.027
(wife didn't bring in *hukou* & she has		(0.0040)		(0.0070)		(0.0070)		(0.0180)
local urban *hukou* and he doesn't)								
Group C		-0.005		0.010		0.012		0.034
(wife didn't bring in *hukou* & she and		(0.0020)		(0.0030)		(0.0020)		(0.0060)
he both have local urban *hukou*)								
Group D		-0.003		0.002		0.010		0.031
(wife didn't bring in *hukou* & he has		(0.0030)		(0.0040)		(0.0040)		(0.0100)
local urban *hukou* and she doesn't)								
Number of children	0.001	0.001	0.005	0.005	-0.001	-0.001	0.028	0.029
	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0010)	(0.0020)	(0.0020)
Wife and husband age groups	×	×	×	×	×	×	×	×
Time fixed effects	×	×	×	×	×	×	×	×
Province fixed effects	×	×	×	×	×	×	×	×
Observations	29,023	29,023	29,023	29,023	29,023	29,023	29,023	29,023
R^2	0.074	0.075	0.084	0.084	0.01	0.01	0.012	0.013

Note: Standard errors in brackets and errors are clustered at the household level. The spending is monthly based on the currency of *yuan*, and the values are log linearized. Group A, B, C, and D are arranged according to the assumed bargaining power ranks of wives within families. The baseline group is Group E.

Table 4: Structural estimation I: *hukou* types, preferences and bargaining power

	Hukou types and *guanxi* (years since settling)					
	(1)		(2)		(3)	
Pareto weight (bargaining power)						
μ (sample average)	0.3540		0.3484		0.3528	
	(0.1285)		(0.1836)		(0.1166)	
Pareto weight parameters						
Wife household head	0.329		0.303			
	(0.022)		(0.083)			
Wife local urban *hukou*			0.346			
			(0.533)			
Husband local urban *hukou*			-0.050			
			(0.504)			
Wife years since settling					0.211	
					(0.088)	
Husband years since settling					-0.055	
					(0.130)	
F-test Chi-square			0.9214			
F-test P-value			0.6308			
Home production						
ρ	0.0872		0.1434		0.1164	
	(0.0402)		(0.0606)		(0.0697)	
Preference						
	Wife	Husband	Wife	Husband	Wife	Husband
Alcohol and tobacco	0.0029	0.0569	0.0001	0.0582	0.0001	0.0576
	(0.0009)	(0.0007)	(0.0011)	(0.0008)	(0.0014)	(0.0014)
Clothing expenditures	0.0134	0.0475	0.0127	0.0475	0.0071	0.0512
	(0.0013)	(0.0007)	(0.0021)	(0.0010)	(0.0013)	(0.0005)
Home improvement	0.0067	0.0519	0.0068	0.0513	0.0040	0.0533
	(0.0010)	(0.0006)	(0.0015)	(0.0008)	(0.0011)	(0.0005)
Medical expenditures	0.0071	0.0517	0.0063	0.0517	0.0096	0.0498
	(0.0010)	(0.0006)	(0.0014)	(0.0008)	(0.0015)	(0.0007)
Transportation and utility	0.0074	0.0505	0.0062	0.0508	0.0007	0.0541
	(0.0011)	(0.0006)	(0.0014)	(0.0006)	(0.0009)	(0.0006)
Entertainment and education	0.0085	0.0499	0.0067	0.0505	0.0123	0.0482

	(0.0011)	(0.0006)	(0.0014)	(0.0008)	(0.0019)	(0.0008)
Rent	0.0123	0.0483	0.0119	0.0481	0.0125	0.0488
	(0.0015)	(0.0008)	(0.0025)	(0.0013)	(0.0019)	(0.0010)
Misc.	0.0081	0.0513	0.0079	0.0508	0.0045	0.0531
	(0.0009)	(0.0005)	(0.0015)	(0.0008)	(0.0011)	(0.0006)
Intermediate goods (food)	0.0504	0.0397	0.0524	0.0440	0.0560	0.0399
	(0.0054)	(0.0024)	(0.0084)	(0.0064)	(0.0078)	(0.0042)
ψ	0.227	1.192	0.231	1.176	0.321	1.119
	(0.035)	(0.010)	(0.090)	(0.014)	(0.051)	(0.013)
Observations	29,023		29,023		29,023	

Notes: Standard errors in parentheses. The Pareto weight(bargaining), home production elasticity, and preference coefficients of 8 final goods and 1 intermediate good are computed through the Delta method with the sample means. The coefficient of leisure is one minus the sum of the coefficients of home production and consumptions. F-test is the joint significance test based on the joint zero coefficient assumption of husband's and wife's *hukou* types.

Table 5: Structural estimation II: *hukou* obtention, preferences and bargaining power

	Hukou obtention and household *hukou* types					
	(1)		(2)		(3)	
Pareto weight (bargaining power)						
μ (sample average)	0.3498		0.3424		0.3480	
	(0.1576)		(0.1719)		(0.1555)	
Pareto weight parameters						
Wife brought in *hukou*	0.305					
	(0.027)					
Group 1			0.580			
(wife brought in *hukou*)			(0.264)			
Group 2			0.302			
(wife didn't bring in *hukou* & she has local urban *hukou*)			(0.352)			
Group A					0.583	
(wife brought in *hukou*)					(0.290)	
Group B					0.273	
(wife didn't bring in *hukou* & she has local urban *hukou* and he doesn't)					(0.340)	
Group C					0.223	
(wife didn't bring in *hukou* & she and he both have local urban *hukou*)					(0.270)	
Group D					-0.099	
(wife didn't bring in *hukou* & he has local urban *hukou* and she doesn't)					(0.653)	
F-test Chi-square					250.57	
F-test P-value					2.2e-16	
Home production						
ρ	0.1513		0.0746		0.1218	
	(0.0585)		(0.0410)		(0.0594)	
Preference						
	Wife	Husband	Wife	Husband	Wife	Husband
Alcohol and tobacco	0.0001	0.0577	0.0001	0.0574	0.0032	0.0556
	(0.0016)	(0.0009)	(0.0013)	(0.0012)	(0.0011)	(0.0008)
Clothing expenditures	0.0127	0.0475	0.0105	0.0485	0.0119	0.0478

	(0.0016)	(0.0009)	(0.0011)	(0.0008))	(0.0016)	(0.0008)
Home improvement	0.0066	0.0516	0.0047	0.0524	0.0054	0.0521
	(0.0016)	(0.0008)	(0.0009)	(0.0007)	(0.0011)	(0.0006)
Medical expenditures	0.0066	0.0516	0.0053	0.0521	0.0062	0.0516
	(0.0015)	(0.0008)	(0.0009)	(0.0008)	(0.0012)	(0.0006)
Transportation and utility	0.0054	0.0513	0.0035	0.0521	0.0049	0.0513
	(0.0016)	(0.0007)	(0.0007)	(0.0006)	(0.0016)	(0.0007)
Entertainment and education	0.0072	0.0504	0.0062	0.0507	0.0067	0.0504
	(0.0018)	(0.0009)	(0.0011)	(0.0008)	(0.0014)	(0.0007)
Rent	0.0132	0.0476	0.0118	0.0482	0.0106	0.0488
	(0.0017)	(0.0021)	(0.0044)	(0.0012)	(0.0023)	(0.0011)
Misc.	0.0086	0.0505	0.0061	0.0517	0.0068	0.0514
	(0.0015)	(0.0007)	(0.0009)	(0.0007)	(0.0013)	(0.0007)
Intermediate goods (food)	0.0484	0.0459	0.0392	0.0435	0.0518	0.0425
	(0.0061)	(0.0039)	(0.0064)	(0.0024)	(0.0071)	(0.0047)
ψ	0.335	1.151	0.229	1.146	0.188	1.179
	(0.048)	(0.018)	(0.055)	(0.011)	(0.073)	(0.009)
Observations	29,023		29,023		29,023	

Notes: Standard errors in parentheses. The Pareto weight(bargaining), home production elasticity, and preference coefficients of 8 final goods and 1 intermediate good are computed through the Delta method with the sample means. Group A, B, C, and D arranged according to the assumed bargaining power ranks of wives within families. The baseline group is Group E. F-test is the joint significance test based on the joint zero coefficient assumption of Group A to D. The coefficient of leisure is one minus the sum of the coefficients of home production and consumptions.

Table A1: *Hukou*-related benefits

Hukou benefits	Details and examples of benefits
Work	While it is illegal for employers in China to discriminate against job applicants based on their race, ethnicity, sex, and religion, the national law does not provide protection for employees based on their*hukou* status (as stated in Chapter 2, Article 12 of the Labour Law of the People's Republic of China, 1994). However, government entities and state-owned companies often impose*hukou* requirements during their hiring processes, with the specific requirements varying depending on the level of government. In many cases, a large percentage of job positions are exclusively reserved for individuals who possess a local*hukou* and who have met certain residency requirements. In some cases, exceptions to these requirements can be made under talent programs, which may require applicants to hold certain degrees or qualifications.
Housing	In many major cities, the ability to purchase a house is restricted to individuals who hold a local*hukou*. Two housing projects designed to assist low-income residents—the Economically Affordable Housing Project (for purchase) and the Low-Rent Housing Project (for rent)—also require applicants to have held a local*hukou* for a specified period of time.
Education	Enrollment in most public preschools, primary schools, and high schools is typically restricted to students who hold a*hukou* located within the school's district. As a result, even if a child has a*hukou* within the same city, they may not be permitted to attend a school located in a different district. The college admission process in China is based on a provincial level, with each college reserving a higher quota for local students. Consequently,*hukou* status in cities and provinces with more prestigious colleges, which are typically located in more developed regions such as Beijing and Shanghai, is more highly valued.
Social welfare	The five different types of employment-based insurance, which include Endowment Insurance, Maternity Insurance, Medical Insurance, Employment Injury Insurance, and Unemployment Insurance, are not directly linked to an individual's*hukou* status. However, individuals do have the option to make insurance payments to the city where they work or to their original hometown. It is important to note that the Endowment Insurance program has a special requirement for individuals without local*hukou*. Specifically, these individuals must have made consecutive payments for at least ten years in order to be eligible to receive pension benefits.
Vehicle	Major large cities (i.e. Beijing, Shanghai, Shenzhen, Guangzhou , etc.) utilize lottery systems for vehicle registration plates, with participation restricted to residents who hold local*hukou* or other qualified individuals with a sufficient history of residency and social insurance payments.

On-line Appendix (not for publication)

A.1. The estimating equations

This part gives the full details of the estimation of the structural model.

Final goods and intermediate good:

The first-order conditions with respect to the optimal choices of household consumption of final goods and intermediate good purchase $\{\boldsymbol{c}_t^F, g_t^F\}$ for Equation (11) are:

$$\mu_t \frac{\partial U_t^W}{\partial \boldsymbol{c}_t^F} + (1-\mu_t)\frac{\partial U_t^H}{\partial \boldsymbol{c}_t^F} + \mathbf{1}'\lambda_t = \mathbf{0} \tag{A1}$$

$$\mu_t\left(\frac{\partial U_t^W}{\partial q_t^F}\frac{\partial\, q_t^F}{\partial g_t^F}\right) + (1-\mu_t)\left(\frac{\partial U_t^H}{\partial q_t^F}\frac{\partial q_t^F}{\partial g_t^F}\right) + \lambda_t = 0 \tag{A2}$$

In the next step, the explicit forms of utility functions of individuals from Equation (9) and the home production function from Equation (10) are taken to substitute into the expressions[10]:

After the operation, we can obtain the explicit forms for the consumption vector of final goods $\boldsymbol{c}_t^F$:

$$\mu_t\big(A_t^W\big)^{\frac{1-\sigma^W-\psi^W}{\psi^W}} \cdot \boldsymbol{\tau}_{1,t}^W \cdot (diag(\boldsymbol{c}_t^F))^{\psi^W-1} + (1-\mu_t)\big(A_t^H\big)^{\frac{1-\sigma^H-\psi^H}{\psi^H}} \cdot \boldsymbol{\tau}_{1,t}^H \cdot (diag(\boldsymbol{c}_t^F))^{\psi^H-1} + \mathbf{1}'\lambda_t = \mathbf{0} \tag{A3}$$

where $A_t^j = \boldsymbol{\tau}_{1,t}^j(\boldsymbol{c}_t^F)^{\psi^j} + \tau_2^j(q_t^F)^{\psi^j} + \tau_3^j(\ell_t^j)^{\psi^j}$.

and the consumption vector of the intermediate good g_t^F:

$$(\ell_t^W)^{\rho}(1-\rho)(g_t^F)^{-\rho}\big[\mu_t\big(A_t^W\big)^{\frac{1-\sigma^W-\psi^W}{\psi^W}}\tau_2^W(q_t^F)^{(\psi^W-1)} + (1-\mu_t)\big(A_t^H\big)^{\frac{1-\sigma^H-\psi^H}{\psi^H}}\tau_2^H(q_t^F)^{(\psi^H-1)}\big] + \lambda_t = 0 \tag{A4}$$

5.2.1 Leisure:

Similarly, the first-order conditions with respect to the optimal choices of the leisure time of wife and husband $\{\ell_t^W, \ell_t^H\}$ for Equation (11) are:

$$\mu_t\left(\frac{\partial U_t^W}{\partial \ell_t^W} + \frac{\partial U_t^W}{\partial q_t^F}\frac{\partial q_t^F}{\partial \ell_t^W}\right) + \lambda_t w_t^W = 0 \tag{A5}$$

$$(1-\mu_t)\frac{\partial U_t^H}{\partial \ell_t^H} + \lambda_t w_t^H = 0 \tag{A6}$$

[10] diag() is the operation to convert a vector into a square matrix with the vector as the value of the diagonal. The detailed operation is $diag(x) = \sum_1^m e_i' x e_i e_i'$, where e_i is the i-th basis vector of $\mathbb{R}^m$.

Taking the explicit forms of the utility function and home production function to the equations above, we can determine that the leisure time of wife ℓ_t^W is:

$$\mu_t \left(A_t^W\right)^{\frac{1-\sigma^W-\psi^W}{\psi^W}} \left[\tau_2^W (q_t^F)^{\psi^W-1} \rho (\ell_t^W)^{\rho-1} (g_t^F)^{1-\rho} + \tau_3^W (\ell_t^W)^{\psi^W-1}\right] + \lambda_t w_t^W = 0 \tag{A7}$$

and the leisure time of husband ℓ_t^H is:

$$(1-\mu_t)\left(A_t^H\right)^{\frac{1-\sigma^H-\psi^H}{\psi^H}} \tau_3^H (\ell_t^H)^{\psi^H-1} + \lambda_t w_t^H = 0 \tag{A8}$$

Equations (A3), (A4), (A7), and (A8) are all in the form where the right-hand side equals 0, which allows us to easily construct orthogonality conditions by replacing the right-hand sides with error terms. Thus, we have 8 errors $e_1 - e_8$ for Equation (A3), one error for every Equation (A4), (A7), and (A8): $e_9 - e_{11}$.

A.2. Empirical appendix

Reduced-form evidence on clothing expenditure

We supplement the reduced-form evidence with evidence on clothing spending, with subcategories such as men's, women's, and children's clothing.[11] Table A2 shows the proportions of clothing expenditure allocated to men's, women's, and children's clothing (if the family has children).

Attanasio & Lechene (2002) and Doepke & Tertilt (2011) who find that an aid program giving women more power increases spending on men's, women's and children's clothing, we find that shifts between men and women's clothing. A wife bringing in better *hukou* significantly increases spending on women's clothing, reduces spending on men's clothing, and has statistically significant but trivial negative effects on spending on children's clothing. Using the more detailed *hukou* categories, reinforces the results using the binary category.

Additional detail from structural estimation

Table A3 shows the constant terms (υ_0) and coefficients on age (υ_1) from the GMM estimation results reported in Table 4 while Table A4 does the same for Table 5.

[11] Other subcategories include textiles and accessories, which we do not consider here.

Table A2: Reduced-form evidence II: *hukou* and spending on clothing

	Member's to the total spending on clothing					
Variable:	Wives' clothing		Husbands' clothing		Children' clothing	
Wife brought in*hukou*	0.027		-0.016		-0.004	
	(0.003)		(0.003)		(0.001)	
Group A		0.057		-0.040		-0.009
(wife brought in*hukou*)		(0.011)		(0.010)		(0.006)
Group B		0.046		-0.032		0.01
(wife didn't bring in*hukou* & she has local urban*hukou* and he doesn't)		(0.026)		(0.024)		(0.016)
Group C		0.031		-0.025		-0.005
(wife didn't bring in*hukou* & she and he both have local urban*hukou*)		(0.011)		(0.010)		(0.006)
Group D		0.002		-0.008		-0.002
(wife didn't bring in*hukou* & he has local urban*hukou* and she doesn't)		(0.016)		(0.015)		(0.008)
Number of children	-0.019	-0.019	-0.007	-0.007	0.022	0.022
	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)
Wife and husband age groups	×	×	×	×	×	×
Time fixed effects	×	×	×	×	×	×
Province fixed effects	×	×	×	×	×	×
Observations	28,799	28,799	28,799	28,799	24,834	24,834
R2	0.016	0.017	0.031	0.031	0.224	0.225

Note: Standard errors in brackets and errors are clustered at the household level. The spending is monthly based on the currency of yuan, and the values are log linearized. Group A, B, C, and D are arranged according to the assumed bargaining power ranks of wives within families. The baseline group is Group E.

Table A3: Details of parameter estimates to the structural estimation I

		Hukou types and *guanxi* (years since settling)					
		I		II		III	
Home production							
Number of children		-0.587		-0.400		-0.441	
		(0.229)		(0.142)		(0.226)	
Preference							
		Wife	Husband	Wife	Husband	Wife	Husband
Alcohol and tobacco	ν_0	-0.098	2.069	-0.089	2.357	0.439	2.024
		(3.949)	(1.074)	(66.945)	(1.583)	(80.890)	(1.717)
	ν_1	-1.497	-1.149	-2.374	-1.215	-2.509	-1.128
		(1.034)	(0.288)	(18.666)	(0.425)	(23.870)	(0.459)
Clothing expenditures	ν_0	-1.351	1.630	-1.276	1.861	-1.053	1.760
		(2.524)	(1.203)	(3.938)	(1.512)	(2.959)	(1.702)
	ν_1	-1.106	-1.079	-1.126	-1.138	-1.239	-1.090
		(0.659)	(0.322)	(1.037)	(0.408)	(0.785)	(0.452)
	ν_2	2.080	-	1.980	-	1.372	-
		(0.175)	-	(0.300)	-	(0.252)	-
Home improvement	ν_0	0.432	1.901	-0.282	2.142	-0.590	1.931
		(2.400)	(1.060)	(3.136)	(1.526)	(3.433)	(1.682)
	ν_1	-1.419	-1.128	-1.225	-1.192	-1.286	-1.124
		(0.616)	(0.285)	(0.820)	(0.410)	(0.902)	(0.447)
Medical expenditures	ν_0	-1.103	1.995	-0.712	2.150	-0.725	1.889
		(2.432)	(1.087)	(3.441)	(1.570)	(2.531)	(1.777)
	ν_1	-0.992	-1.154	-1.131	-1.192	-1.017	-1.131
		(0.624)	(0.292)	(0.901)	(0.422)	(0.665)	(0.472)
Transportation and utility	ν_0	-1.086	2.003	-2.295	2.262	-1.788	1.978
		(3.876)	(1.026)	(7.761)	(1.421)	(23.305)	(1.681)
	ν_1	-0.988	-1.162	-0.713	-1.226	-1.423	-1.133
		(1.026)	(0.276)	(2.058)	(0.382)	(6.152)	(0.447)

Entertainment and education	ν_0	-1.654	1.843	-1.769	2.035	-2.115	1.881
		(3.197)	(1.101)	(4.895)	(1.600)	(2.262)	(1.714)
	ν_1	-0.930	-1.123	-0.943	-1.168	-0.721	-1.138
		(0.819)	(0.295)	(1.275)	(0.430)	(0.613)	(0.455)
	ν_2	0.774	-	0.662	-	0.845	-
		(0.088)	-	(0.156)	-	(0.121)	-
Rent	ν_0	1.774	1.620	1.782	1.811	1.815	1.463
		(0.995)	(1.157)	(2.309)	(1.540)	(1.619)	(1.775)
	ν_1	-1.616	-1.072	-1.629	-1.121	-1.625	-1.024
		(0.277)	(0.311)	(0.598)	(0.416)	(0.454)	(0.473)
Misc.	ν_0	1.129	1.783	2.292	1.834	2.360	1.758
		(1.340)	(1.165)	(2.353)	(1.519)	(4.719)	(1.565)
	ν_1	-1.556	-1.100	-1.872	-1.113	-2.041	-1.080
		(0.358)	(0.312)	(0.603)	(0.409)	(1.300)	(0.417)
Intermediate goods (food)	ν_0	0.743	1.075	0.798	1.475	0.166	1.633
		(0.713)	(1.619)	(1.012)	(2.189)	(1.545)	(1.972)
	ν_1	-0.963	-0.980	-0.969	-1.056	-0.784	-1.122
		(0.206)	(0.435)	(0.293)	(0.601)	(0.416)	(0.508)
Observations		29,023		29,023		29,023	

Note: This table provides the detailed parameters used to estimate the average weights of home production and different consumption categories in the utility functions. ν_1 is the parameter for age. ν_2 in the categories of clothing expenditures and entertainment and education is the parameter for the number of children.

Table A4: Details of parameter estimates to the structural estimation II

		Hukou obtention and household *hukou* types					
		I		II		III	
Home production							
Number of children		-0.298		-0.504		-0.518	
		(0.097)		(0.243)		(0.212)	
Preference							
		Wife	Husband	Wife	Husband	Wife	Husband
Alcohol and tobacco	ν_0	-0.085	2.550	0.283	2.550	0.488	2.512
		(116.683)	(1.344)	(79.146)	(1.746)	(3.902)	(1.421)
	ν_1	-2.468	-1.268	-2.532	-1.268	-1.633	-1.269
		(33.865)	(0.360)	(22.565)	(0.467)	(1.062)	(0.381)
Clothing expenditures	ν_0	-1.044	1.947	-1.276	2.065	-2.437	2.369
		(2.535)	(1.430)	(3.180)	(1.806)	(5.243)	(1.535)
	ν_1	-1.246	-1.160	-1.279	-1.185	-0.889	-1.271
		(0.644)	(0.383)	(0.826)	(0.483)	(1.403)	(0.410)
	ν_2	2.321	-	2.550	-	2.303	-
		(0.251)	-	(0.190)	-	(0.283)	-
Home improvement	ν_0	-0.188	2.302	0.395	2.353	-0.012	2.487
		(3.668)	(1.285)	(4.714)	(1.646)	(2.941)	(1.393)
	ν_1	-1.260	-1.232	-1.512	-1.240	-1.359	-1.280
		(0.980)	(0.344)	(1.249)	(0.441)	(0.788)	(0.374)
Medical expenditures	ν_0	-0.603	2.307	-0.542	2.373	-1.237	2.548
		(3.927)	(1.287)	(4.830)	(1.639)	(2.670)	(1.413)
	ν_1	-1.151	-1.233	-1.232	-1.247	-0.996	-1.298
		(1.037)	(0.345)	(1.270)	(0.440)	(0.707)	(0.379)
Transportation and utility	ν_0	-1.619	2.392	-1.681	2.447	-1.446	2.550
		(7.747)	(1.260)	(14.713)	(1.625)	(11.849)	(1.453)
	ν_1	-0.932	-1.257	-1.039	-1.267	-1.003	-1.300
		(2.076)	(0.337)	(3.929)	(0.435)	(3.225)	(0.390)

Entertainment and education	ν_0	-1.481	2.160	-2.480	2.287	-0.582	2.276
		(6.159)	(1.419)	(10.097)	(1.786)	(4.810)	(1.443)
	ν_1	-1.111	-1.201	-0.921	-1.231	-1.291	-1.232
		(1.582)	(0.378)	(2.690)	(0.477)	(1.216)	(0.386)
	ν_2	1.303	-	1.498	-	0.825	-
		(0.294)	-	(0.248)	-	(0.143)	-
Rent	ν_0	2.225	1.840	1.762	2.024	2.131	2.170
		(1.338)	(1.425)	(1.201)	(1.793)	(1.704)	(1.413)
	ν_1	-1.720	-1.131	-1.631	-1.175	-1.753	-1.213
		(0.362)	(0.381)	(0.329)	(0.481)	(0.462)	(0.380)
Misc.	ν_0	1.701	2.051	1.872	2.198	1.041	2.356
		(1.966)	(1.416)	(1.914)	(1.747)	(1.937)	(1.413)
	ν_1	-1.692	-1.171	-1.836	-1.203	-1.579	-1.249
		(0.541)	(0.379)	(0.508)	(0.468)	(0.483)	(0.379)
Intermediate goods (food)	ν_0	0.645	1.877	0.067	2.062	0.401	2.046
		(1.156)	(1.662)	(1.203)	(1.994)	(1.029)	(1.880)
	ν_1	-0.950	-1.150	-0.858	-1.212	-0.867	-1.217
		(0.322)	(0.441)	(0.342)	(0.535)	(0.289)	(0.504)
Observations		29,023		29,023		29,023	

Note: This table provides the detailed parameters used to estimate the average weights of home production and different consumption categories in the utility functions. ν_1 is the parameter for age. ν_2 in the categories of clothing expenditures and entertainment and education is the parameter for the number of children.