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# Forced Gifts

## The Burden of Being a Friend

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## ABSTRACT

In many developing countries, gift expenses account for a substantial share of total household expenditures. As incomes rise, gift expenses are escalating in several developing countries. We develop a theoretical model to demonstrate how (unequal) income growth may trigger "gift competition" and drive up the financial burden associated with gift exchange. We use unique census-type panel data from rural China to test our model predictions and demonstrate that (1) the value of gifts responds to the average gift in the community, (2) the escalation of gift giving may have adverse welfare implications (especially for the poor), and (3) escalating gift expenses crowd out expenditures on other consumption items.



**Keywords: gift competition, reciprocity, subjective well-being, inequality**

*JEL classification: O1, I3, D1*

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# 1. INTRODUCTION

Gift giving is ubiquitous in many developing countries, and gift expenses constitute a large share of living expenditures for many households. This is particularly true in rural areas, where limited opportunities to obtain formal insurance imply that individuals rely on tight-knit social networks to cope with adverse shocks. Gift giving plays an important role in signaling friendship, sustaining networks, and facilitating reciprocity (Levine 1998). According to Mauss (2011, 2–3), gift giving, altruism, and reciprocity are the "human rocks on which societies are built."

However, in several developing countries gift expenses are increasing rapidly, perhaps to the point where they become a burden on household budgets. In rural China, the gift-income ratio is now as high as 10 percent and continues to rise (Yan 1996; Chen, Kanbur, and Zhang 2011). According to our own data, presented in detail below, the average gift expenditure in the sampled villages grew by 40 percent per year between 2004 and 2011. During this period, annual nominal income grew by "only" 20 percent. Anecdotal evidence suggests that people increase their gift expenses in an effort to "keep up with the Joneses." Some households borrow to finance gift giving, or tighten their belts—reducing expenditures on other consumption items. Some even engage in risky behavior such as selling blood for the purpose of extending gifts (Chen and Zhang 2012). Escalating gift giving is also observed in other countries, including countries in West Africa and Southeast Asia. For instance, in Ghana, friends and in-laws demonstrate sorrow and respect for the deceased by giving (increasingly) generous gifts during funerals. Such gift giving can be semipublic, because gifts are usually announced to the public and written down (Witte 2003; Boni 2010; Wang 2016).

Why do people engage in such extensive gift giving? Sufficiently generous (costly) gifts can be interpreted as a sign of altruism or friendship, cementing (reciprocal) relationships between specific individuals (Levine 1998).[1] Generous gifts can also be a signal of public-spiritedness to all members of the local community, translating into high status (Hopkins and Kornienko 2004; Brown, Bulte, and Zhang 2011; Hopkins 2014), which may be useful in the pursuit of private objectives (Postlewaite 1998).

We are agnostic about the exact motives dominating the decision to engage in generous gift giving—personalized signaling or signaling to the community at large. Presumably, both motives matter for most individuals, but from the perspective of our theory the underlying motivation is unimportant. What matters is that most of the literature on "impure altruism" or "competitive altruism" assumes that income is observable. When income is observable, the appropriate (or reference) value of gifts given presumably varies with the givers' own income. Households only need to assure that their gifts meet the reference level appropriate for their income or capacity to give, rather than caring about others' gift expenses. Such models do not necessarily predict gift escalation.

In this paper we develop and test an alternative theory to explain escalating gift giving, and study its implications for welfare and inequality. We propose that in the absence of information about the exact income of gift givers, people may evaluate generosity by comparing the value of specific gifts to the *average value* of gifts given in the community. Usually in regions where gift giving escalates, the average gift value is readily observable and provides a natural reference point. To build reciprocal relationships, therefore, one has to give at least as much as others—preferably more. Such generous gifts bid up the average value of gifts in the reference population. To maintain the status of "friend," people have to "keep up" and also give more. We show that the welfare implications of this process vary with income levels. Specifically, the poor are made worse off. Model predictions are applied to data from rural China, where the unequal inflow of remittances and government transfers provides a particularly rich testing ground to explore the dynamics of social contests. We collected detailed census data on gift giving, incomes, and

[1] This is especially relevant in the context of rural China, where *guanxi* (the Chinese word for "connections") is a key component of social life. *Guanxi* is considered "absolutely essential to successfully complete any task in virtually all spheres of social life" (Gold, Guthrie, and Wank 2002, page 3-4), and gift exchange helps produce *guanxi* (Kipnis 1997). Failure to fulfill the obligation of reciprocity or to show enough consideration for others' feelings may be seen as immoral and a violation of ethics (Witte 2003) and may possibly sever a reciprocal relationship.

subjective welfare. Moreover, reference populations are identified in so-called natural villages (Knight, Song, and Gunatilaka 2009; Mangyo and Park 2011). We find considerable support for our theory of gift giving as a competitive and inequality-enhancing process.

This paper contributes to several strands of literature. It speaks to the literature on informal insurance and risk sharing. Although we are not the first to suggest that sharing in informal networks may have a "dark side," we provide an alternative mechanism to explain how informal solidarity networks supported by gift giving may adversely affect household welfare.[2] Our paper is also related to the literature on status. Focusing on rural China, Brown, Bulte, and Zhang (2011) demonstrate that people care about their rank in local society and engage in conspicuous consumption to acquire and protect status. Status races also involve negative externalities, likely resulting in Red Queen–type outcomes where "it takes all the running you can do, to keep in the same place" (see Hopkins and Kornienko [2004] for a theoretical treatment). Even more closely related to our paper is the small literature on gift behavior and impure altruism. Levine (1998) and Hopkins (2014) highlight the benefits of signaling altruism in a generalized setup. Inspired by the models, we develop a theoretical framework, and our empirical findings help cast light on rising levels of gift expenses and the distributional consequences of this trend.

The remainder of the paper is organized as follows. In section 2 we sketch the background and develop a simple theoretical model. We also derive several testable hypotheses. Section 3 introduces the data, and section 4 outlines our empirical strategy. We present our estimation results in section 5. Section 6 concludes.

[2] An emerging literature points to the potential adverse incentive effects of gift giving and informal exchange in kin networks (Di Falco and Bulte, 2013; Baland, Somanathan and Wahhaj, 2013; Malmendier, Velde and Weber, 2014; Ozier and Jakiela, 2015). A so-called moral economy of sharing, or forced solidarity, encourages free riding and attenuates incentives to accumulate or self-protect against (idiosyncratic) shocks.

## 2. CONCEPTUAL FRAMEWORK

### Institutional Background

Across the developing world, people rely heavily on nonmarket transactions such as reciprocal exchange due to ineffective contract enforcement and imperfect markets. Strong social connections are necessary for risk sharing and favor exchange. In rural China, for example, *guanxi* plays an essential role in every area of life—from harvesting, to house building, to personal financing (Yan 1996). To cultivate and strengthen these connections, people spend heavily on gift giving, which signals the social distance between gift givers and recipients (Yan 1996; Gold, Guthrie, and Wank 2002; Wang 2016). So, gift giving in China serves not only as a kind of "quasi-credit" or insurance (Fafchamps, 1999; Chiappori et al. 2014), but also as a signal of social distance or generosity.

The values of gifts are usually observable in China. Particularly at wedding ceremonies or funerals, gifts in kind are presented to all participants, while cash gifts are recorded in a "gift-list book" (see Yan 1996). Similar customs are found in other countries, for example, in Ghana, where gift values are not only recorded but also announced at funerals (Witte 2003).

### A Simple Model of Gift Competition

In this section we develop a simple model of competitive gift exchange, inspired by Hopkins (2014). In our model, the benefits of friendship are due to network linkages, which may have instrumental value (for example, mutual insurance or sharing, or assistance in times of need). We do not model any direct utility gains or intrinsic value associated with engaging with friends, or from knowing they do well (altruism). Obviously, such sentiments are important as well, and indeed help explain the signaling value of gifts.

In Levine (1998) and Hopkins (2014), gift givers do not need to compete with each other because incomes are assumed to be observable. By relating the value of the gift to a giver's income, the recipient can infer the giver's "type." However, income levels are not always perfectly observable—not even in rural areas in China, where more and more households have come to rely on off-farm income or remittances in recent years.[3] The absence of information about the giver's income forces the recipient to use an alternative reference level to assess whether a gift was sufficiently costly. A natural candidate is the average gift value in the local community. Specifically, agents are more likely to be perceived as true friends if their gifts are more valuable than the gifts given by others.[4]

Our model of gift competition and its welfare implications are based on this practical solution. To simplify the modeling, we refrain from explicitly modeling the benefits of strong network relations—which may be derived from a range of exchange services (for example, sharing, participation in labor teams, and so on). Instead, we develop a reduced-form shortcut, capturing the beneficial impact of generous gift giving on utility directly. Assume a community consists of $N$ agents and that each agent allocates his or her income to consumption goods ($x$) and gifts ($y$). Also assume the function $v(\cdot)$ maps gift expenses into a stream of benefits associated with reciprocal relationships (Levine 1998; Hopkins 2014). The net benefits of such network links for individual *i* in the community, $v(\cdot)$, are determined by two variables: own gift expenses, $y_i$, and a reference gift level, $\overline{y}$. As $y_i$ increases, an agent is more likely to be taken as a friend. In contrast, higher values of $\overline{y}$ raise the bar and reduce the benefits of gift giving. Hence,

[3] In rural areas, farm incomes are observable but off-farm incomes, in particular remittances, are much less observable.

[4] People will use the practical solution as long as it is (sufficiently) effective in identifying friends, although it is not perfect and may result in some errors.

$$\frac{dv(\cdot)}{dy_i} > 0$$
$$\frac{dv(\cdot)}{d\bar{y}} < 0 \quad . \tag{1}$$

One specification that captures these assumptions is the following function:

$$v(\cdot) = \left( y_i - \theta \cdot \frac{G - y_i}{N-1} \right)^{\beta} , \tag{2}$$

where $G = \sum_{i=1}^{N} y_i$, or the total value of gifts in the community. If people use the average gift as the reference level, $\bar{y}$ is given by $(G - y_i)/(N-1)$. Next, $\theta$ is a parameter capturing the sensitivity of reciprocity with respect to how one's own gifts compare with the gifts of others. It is assumed to be sufficiently small so that the net benefits of reciprocity are always positive.

We further assume that all agents have the following utility function, which can be decomposed into two elements:

$$U_i(x_i, y_i) = \left( x_i + \frac{G - y_i}{N-1} \right)^{\gamma} \cdot \left( y_i - \theta \cdot \frac{G - y_i}{N-1} \right)^{\beta} \qquad i \in \{1, \ldots, N\} , \tag{3}$$

where the first term on the right-hand side represents the utility from consuming goods (purchased $x_i$, or received as gifts). The second is the benefit of reciprocity, $v(\cdot)$. We assume gifts are equally distributed among members of the community, so that $(G - y_i)/(N-1)$ represents the gifts received by agent *i* from others. We further assume $0 < \gamma + \beta < 1$, ensuring diminishing marginal utility.[5] Following Hopkins and Kornienko (2004) and Hwang, Reed, and Hubbard (1992), the reciprocity term $v(\cdot)$ enters multiplicatively into the preference equation (3). Our utilitarian perspective on friendship assumes that the benefits from network relations vary with own consumption (which determines the degree to which interhousehold sharing is feasible).

Gift exchange can be costly for several reasons. There may be "deadweight losses" associated with gifts (Waldfogel 1993), caused by a mismatch between the preferences of the giver and recipient.[6] For example, in the context of rural China, welfare losses will occur because many in-kind gifts are overly "luxurious"—gift givers buy expensive food and commodities that are different from the items that they would purchase for their own consumption. The "expressive" function of gift giving implies that the cost of the gift is usually higher to the giver than the level of utility it generates to the recipient.[7] The wedge between the value of the good and the cost to the giver implies the following budget constraint:

[5] Note that we assume agents have zero utility if they do not engage in gift giving: $y_i = 0$ implies $v_i = 0$ and $U_i = 0$. In other words, it is always a dominant strategy to defend reciprocal relationships, so we do not formally discuss the case of corner solutions. Of course, alternative specifications are possible (Hopkins and Kornienko 2004). We acknowledge that the utility will be greater than zero even under "autarky." Hence, in reality people may "opt out" if gift expenses are too burdensome.

[6] In another social and cultural context, Waldfogel (1993) finds that the average recipient values gifts at 87 percent of the cost to the giver.

[7] Additional welfare losses may be due to the intertemporal dimension of gift exchange. Gifts are given at wedding ceremonies, which occur infrequently, so individual households may be "net givers" for a long period, which may result in liquidity problems. Escalating gift values also imply that early recipients may have to return more than they received, so there will be arbitrary winners and losers.

$$x_i + py_i \le z_i, \tag{4}$$

where $z_i$ is household income and *p* is the relative price of gifts, which is usually higher than 1. Many gifts are in-kind, but selling gifts for cash is limited due to social norms and related reasons (Vaillant et al. 2014).

### Individual Analysis

Suppose agents maximize utility by allocating their income to a bundle of consumption goods and gifts, taking others' gift expenses as given. Given utility function (3) and budget constraint (4), the optimal amount allocated to gifts by household $i$ is given by

$$y_i = \frac{\beta z_i + (\gamma p\theta + \beta)\cdot\left(\frac{G - y_i}{N-1}\right)}{(\gamma + \beta)\cdot p}. \tag{5}$$

According to (5), gift expenses are determined by own income level, $z_i$, and others' gift expenses, $(G - y_i)/(N-1)$. It is easy to demonstrate that the following holds:

$$\frac{dy_i}{d\left(\frac{G - y_i}{N-1}\right)} = \frac{\gamma p\theta + \beta}{(\gamma + \beta)\cdot p} > 0. \tag{6}$$

As the value of the average gift increases, household *i* will give more expensive gifts to retain the signaling value of its gifts: it becomes increasingly expensive to signal altruism. Gift expenses squeeze spending on other consumption goods.

Offsetting these costs, to some extent, is the enhanced inflow of gifts, that is, the increase in $(G - y_i)/(N-1)$, which will make the household better off. As long as $\theta$ or price wedge *p* is sufficiently large, however, gift competition results in a negative welfare effect.

$$\frac{dU_i}{d\left(\frac{G - y_i}{N-1}\right)} < 0. \tag{7}$$

In Appendix we show that for $\theta > 1/p$, the net welfare effect is negative, since the extra gifts received cannot compensate the welfare loss due to costs associated with gifts given. In our setup, the relative price of gifts, $p > 1$, is crucial for negative welfare impacts.

The negative welfare effect of gift competition is heterogeneous across income groups, with rich people suffering less than the poor. Specifically, in Appendix we prove that for $\gamma + \beta < 1$, the following holds:

$$\frac{d^2U_i}{d\left(\frac{G - y_i}{N-1}\right)dz_i} > 0. \tag{8}$$

The heterogeneous welfare effect is due to the concavity of the utility function. For $\gamma + \beta < 1$ and $p > 1$, extra gift spending squeezes consumption of other goods, which is particularly costly for the poor (who have a higher marginal utility of consumption).[8] In other words, the assumption of diminishing marginal utility amplifies the negative (net) impact of gift competition on the welfare of the poor.

### Equilibrium Analysis and Income Shocks

The Nash equilibrium reads as follows:

$$G = \sum_{i=1}^{N} y_i = \frac{1}{p(\gamma+\beta)} \cdot \beta \cdot \sum_{i=1}^{N} z_i + \frac{p\gamma\theta + \beta}{p(\gamma+\beta)} \cdot \sum_{i=1}^{N} \frac{G - y_i}{N-1} = \frac{\beta T}{p(\gamma+\beta) - p\gamma\theta - \beta}. \tag{9}$$

We now highlight the role of income growth in triggering gift competition and explore the dynamics and welfare implications in equilibrium. Suppose that agent *j* suddenly (and exogenously) has a higher income. According to (5), an increase in $z_j$ may affect $y_i$ via two channels—income and equilibrium effects. Specifically,

$$\frac{dy_i}{dz_j} = \frac{\partial y_i}{\partial z_j} + \frac{\partial y_i}{\partial G} \cdot \frac{\partial G}{\partial z_j}. \tag{10}$$

Consider the first case, where agent $i$ benefits from the income shock (so that $i = j$). In this case, the agent allocates more to both consumption and gifts. From (5) and (9), we know

$$\frac{dy_i}{dz_j} = \frac{(N-1)\cdot\beta}{(N-1)p(\gamma+\beta) + p\gamma\theta + \beta} \cdot \left[1 + \frac{p\gamma\theta + \beta}{p(\gamma+\beta) - p\gamma\theta - \beta}\right] > 0. \tag{11}$$

Extra giving by agent $i$ raises the average value of gifts in the local community, thereby inviting gift competition and driving up the gift expenses incurred by others. In turn, this causes agent $i$ to spend even more on gifts. So both income and equilibrium effects are positive as own income increases.

Next, consider the case in which the agent does not benefit from the income shock himself or herself ($i \neq j$). In the absence of an income effect, the gift giving of the agent will still be affected by the equilibrium effect:

$$\frac{dy_i}{dz_j} = \frac{(p\gamma\theta + \beta)\cdot\beta}{\left[(N-1)p(\gamma+\beta) + p\gamma\theta + \beta\right]\cdot\left[p(\gamma+\beta) - p\gamma\theta - \beta\right]} > 0. \tag{12}$$

Agents who do not benefit from the income gain also need to spend more on gifts to retain the credibility of their signal and retain the benefits of reciprocal exchange. Thus, we obtain the following proposition (the full proof is provided in Appendix).

**Proposition 1:** *As the income of agent j rises, all agents will increase their level of gift expenses.*

[8] Although it is not captured in our simple model, we observe that heterogeneous welfare effects across income groups may be even more pronounced in reality, since rich people rely less on reciprocity than the poor. Reciprocal relations are especially vital for relatively poor households, which have fewer mechanisms to smooth consumption in times of temporary hardship. The rich, in contrast, have access to alternative mechanisms (storage, savings, and insurance) to cope with contingencies, and therefore likely care less about how they are perceived by their fellow villagers.

In the Nash equilibrium, the welfare of households that were not subject to an income shock themselves deteriorates due to intensified gift competition. As shown in Appendix, we can demonstrate that for $\theta > 1/p$, the following holds:

$$\frac{dU_i}{dz_j} < 0 \quad . \tag{13}$$

Moreover, in equilibrium the negative welfare effect of gift competition varies across income groups. For $\gamma + \beta < 1$, we can prove that

$$\frac{d^2U_i}{dz_j dz_i} > 0 \quad . \tag{14}$$

The proof is again in Appendix. The welfare implications regarding gift competition are summarized as follows.

**Proposition 2:** *As agent $i$'s income rises, gift competition intensifies, resulting in a greater welfare loss for low-income households than for high-income households.*

This proposition explains why gift expenses may grow faster than income. Even if only a few households experience positive income shocks, all households must increase their level of gift expenditure. In the following empirical analyses, we will test Propositions 1 and 2.

## 3. DATA AND BACKGROUND

We seek to test key predictions of the theoretical model, drawing on census-type panel data collected in three administrative villages in Guizhou Province, China.[9] The dataset contains three waves of household data collected in three administrative villages, consisting of 26 so-called natural villages, in 2006, 2009, and 2011. The natural villages are both geographically isolated and ethnically diversified. Ethnic minorities (mainly Miao, Buyi, Gelao, and Yi) comprise about 20 percent of the population. Local residents know each other well, and the kinship and friendship networks of most residents are confined primarily to these natural villages.

The three survey waves cover more than 800 households and include detailed information on household demographics, income, consumption, and interhousehold transfers. A noteworthy feature of our dataset is the records on gift expenses. Compared to the information in other databases, the records on gift exchange are quite detailed, covering every household in the 26 villages. Variables include not only total gift expenses but also the times of gift giving, the value of the highest single-time gift, and amounts spent on social events.

Table 3.1 presents summary statistics of consumption and income for the three administrative villages in 2006, 2009, and 2011. The rise in income and living expenditures reflects the basic trend of economic growth in rural China. The share of gift expenses in total living expenditures rises quickly as well, exceeding 15 percent after 2009. Meanwhile, more households rely on off-farm incomes or remittances: from 2006 to 2011, the share of farm income decreases by around 20 percent; the percentage of households receiving remittances increases from 44 to 64 percent.

**Table 3.1 Summary statistics of consumption and income**

| Year | 2006 | 2009 | 2011 | 2006–2009 (%) | 2009–2011 (%) | 2006–2011 (%) |
|---|---|---|---|---|---|---|
| Consumption | | | | | | |
| Per capita living expense (yuan) | 1,594.32 | 2,566.33 | 3,641.19 | 20.32 | 20.96 | 25.68 |
| Food expense (%) | 44.96 | 41.92 | 39.35 | -2.26 | -3.06 | -2.5 |
| Fuel expense (%) | 7.74 | 7.42 | 10.25 | -1.39 | 19.07 | 6.48 |
| Phone expense (%) | 1.81 | 0.87 | 0.43 | -17.28 | -25.32 | -15.25 |
| Medical expense (%) | 10.82 | 12.45 | 10.85 | 5.02 | -6.45 | 0.04 |
| Education expense (%) | 7.32 | 4.88 | 6.79 | -11.10 | 19.54 | -1.45 |
| Gifting expense (%) | 11.23 | 15.03 | 15.53 | 11.27 | 1.68 | 7.66 |
| Clothing expense (%) | 3.78 | 4.09 | 4.73 | 2.76 | 7.84 | 5.05 |
| Income | | | | | | |
| Per capita income (yuan) | 1,617.47 | 2,992.22 | 4,387.87 | 28.33 | 23.38 | 34.26 |
| Farming income (%) | 49.00 | 46.14 | 31.76 | -1.94 | -15.58 | -7.03 |
| Remittance income (%) | 12.03 | 8.61 | 8.76 | -9.48 | 0.86 | -5.44 |
| Local nonfarm and self-employment income (%) | 22.13 | 17.63 | 18.06 | -6.78 | 1.23 | -3.68 |
| Income from land leasing and subsidy (%) | - | 1.73 | 11.44 | - | 280.93 | 280.93 |
| Other income (%) | 3.94 | 19.21 | 25.3 | 129.39 | 15.85 | 108.58 |
| Share of households receiving remittances (%) | 43.93 | 61.61 | 63.75 | 40.25 | 3.47 | 45.12 |

Source: Tabulations by authors based on IFPRI's Guizhou survey.

[9] The four-round surveys were conducted by the International Food Policy Research Institute, the Chinese Academy of Agricultural Science, and Guizhou University in 2004, 2006, 2009, and 2011. However, the data from 2004 are not used due to data attrition.

Table 3.2 reports summary statistics of some key variables, including measures of life satisfaction and average gift expenses. Average nominal per capita gift expenses increased by around 40 percent annually from 2006 to 2011. We further divide the households into three distinct groups: high-income (top 25 percent of households per natural village, ranked by income), middle-income (middle 50 percent) and low-income households (bottom 25 percent). The annual growth rate is higher for low-income and middle-income groups than for the high-income group, which sees a growth rate of less than 30 percent.

Table 3.2 also reports the measures of compensation given to households for land expropriation by the government. We will use these variables as instruments to tease out causal effects (see below). In the process of urbanization, some farmland was expropriated by the government. This represents an exogenous shock to the incomes of affected households (but not all households), which we will exploit in our empirical study.

Next, we outline how welfare and gift competition are measured. The database contains a survey-based measure of subjective welfare. Note that standard variables, like consumption or income, cannot be applied to gauge the total welfare effects, as some of the benefits associated with reciprocal relationships would not be reflected. For example, many favors exchanged in daily life are intangible. We assume such benefits are better captured by a measure of subjective well-being. Rather than using a standard index of life satisfaction ("level"), we use changes in life satisfaction over time, facilitating both interhousehold comparisons as well as controlling for household fixed effects. Our index has a three-category scale: an outcome of 1 indicates subjective welfare deteriorated over time, an outcome of 2 indicates welfare more or less stayed the same, and an outcome of 3 indicates that welfare increased across survey waves.[10] Specifically,

$$DHp_i = \begin{cases} 1, & \text{"welfare went down"} \\ 2, & \text{"constant welfare"} \\ 3, & \text{"welfare went up"} \end{cases}, \tag{15}$$

where $DHp_i$ is our index of change in life satisfaction. Casual inspection of the descriptive statistics suggests that despite fast income growth, subjective welfare (life satisfaction) has declined. We argue that rapidly growing gift expenses are one potential factor contributing to this puzzle.

To measure the intensity of gift competition, we assume that information about gift expenses is generally quite complete within a natural village (Yan 1996; Mangyo and Park 2011). A household therefore takes other villagers in the same natural village as a reference group for gift giving. So we use the average value of other villagers' gift expenses, $G_{-i}$, as a proxy for the intensity of gift competition for villager *i*. The measure is consistent with our model. Specifically, $G_{-i}$ is given as follows:

$$G_{-i} = \frac{G - Y_i}{N-1} = \frac{1}{N-1} \cdot \left[ \left( \sum_{i=1}^{N} Y_i \right) - Y_i \right] \qquad i \in \{1, \ldots, N\}, \tag{16}$$

where $G$ is the total gift expenses in a natural village and $Y_i$ is agent *i*'s own gift expenses. The gift variables are summarized in Table 3.2.

[10] We obtain qualitatively similar, but statistically weaker, results if we use satisfaction levels, rather than changes in levels, as the dependent variable.

**Table 3.2 Summary statistics of key variables**

| Year | 2006 | | 2009 | | 2011 | | Growth rate | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Mean | Standard deviation | Mean | Standard deviation | Mean | Standard deviation | 2006–2009 (%) | 2009–2011 (%) | 2006–2011 (%) |
| Mean of per capita gift expense of low-income group | 118.31 | 148.72 | 272.24 | 385.29 | 558.02 | 879.60 | 43.37 | 52.49 | 74.33 |
| Mean of per capita gift expense of middle-income group | 191.75 | 216.70 | 440.16 | 571.86 | 807.82 | 3,709.22 | 43.18 | 41.77 | 64.26 |
| Mean of per capita gift expense of high-income group | 372.78 | 399.07 | 641.63 | 858.56 | 998.51 | 1,964.19 | 24.04 | 27.81 | 33.57 |
| Mean of land expropriation subsidy to recipients in low-income group | - | - | - | - | 8,093 | 16,374 | - | - | - |
| Mean of land expropriation subsidy to recipients in middle-income group | - | - | - | - | 6,775 | 18,541 | - | - | - |
| Mean of land expropriation subsidy to recipients in high-income group | - | - | - | - | 7,286 | 14,324 | - | - | - |
| Change in life satisfaction | - | - | 2.61 | 0.67 | 2.5 | 0.63 | - | -2.16 | -2.16 |
| Gini index (total) | 0.48 | 0 | 0.48 | 0 | 0.58 | 0 | -0.27 | 10.42 | 3.97 |
| Gini index (administrative village) | 0.45 | 0.03 | 0.45 | 0.05 | 0.53 | 0.09 | 0.01 | 8.68 | 3.48 |
| Gini index (natural village) | 0.43 | 0.06 | 0.42 | 0.09 | 0.48 | 0.12 | -0.38 | 6.87 | 2.49 |

Source: Tabulations by authors based on IFPRI's Guizhou survey.

## 4. IDENTIFICATION STRATEGY

The hypotheses we seek to test follow from the theoretical model. We first explore the evidence of gift competition by testing the relationship between average gifts in the village and gift giving by individual households. Based on Proposition 1 we postulate the following:

**Hypothesis 1**: *People will increase their gift expenses as the average level of gift expenses by other villagers in the natural village rises (or when the intensity of gift competition goes up).*

To test this hypothesis, we first estimate the following fixed effects regression model explaining variation in gift giving (Model I):

$$\begin{aligned}\Delta Y_{int} = {} & \alpha_0 + \alpha_1 \Delta G_{-int} + \alpha_2 Mid_{int} \times \Delta G_{-int} \\ & + \alpha_3 High_{int} \times \Delta G_{-int} + \beta' \mathbf{X_{int}} + \delta_{in} + \varepsilon_{int} \quad , \end{aligned} \tag{17}$$

where $Y_{int}$ measures gift expenses of household *i* in village *n* at time *t*. $\mathbf{X}$ is a vector of control variables, and $\delta_{in}$ is a household dummy. $G_{-\text{int}}$ measures the intensity of gift competition faced by each household *i*. We cluster standard errors at the natural village level to reduce autocorrelation problems. We introduce interaction terms that are the product of $G_{-int}$ and income group dummies $Mid_{int}$ and $High_{int}$. While the former dummy takes a value of 1 if the household belongs to the middle-income group, the latter indicates that the household belongs to the high-income group. To keep consistency with the rest of the empirical studies, we employ a difference form of the dependent variable and control variables. Coefficient $\alpha_1$ measures the response of (poor) households to changes in the average gift level (which we expect to be positive), and coefficients $\alpha_2$ and $\alpha_3$ pick up heterogeneous treatment effects for middle- and high-income groups.

Our empirical strategy follows previous studies on peer effects, which usually rely on linear-in-means models. This implies that the so-called reflection problem must be addressed, which we seek to do by introducing a vector of peers' characteristics in the regression model. Another concern is reverse causation. To deal with concerns about endogeneity, we leverage location-specific variation in income gains due to the land expropriation policy as a source of exogenous variation in an instrumental variable (IV) setup. In the surveyed area, some households' land was expropriated by the government in 2010. As compensation, the government subsidized households that lost land by, on average, more than 15,000 RMB. This amounted to an exogenous income shock for about 30 percent of our respondents, which we will leverage to tease out causal effects. In a series of IV estimations we will focus on households in land acquisition villages that received no subsidies themselves, and explore how their gift giving changed as a result of a one-time income shock to their peers.

Specifically, if the increase in $G_{-int}$ is driven by land acquisition subsidies (transfers), we can identify the fraction of the variation that is exogenous—not affected by $Y_{int}$. We therefore use *Mean of land expropriation subsidy of other households in same natural village* and *Share of households subsidized by land expropriation subsidy in same natural village* as instrumental variables for $G_{-int}$ and estimate the model using two-stage least squares (2SLS).[11] This estimation provides empirical evidence to test Hypothesis 1. The instrument is exogenous because whether the subsidy is given depends only on the location of one's fields. We believe there is no reason to expect that gift giving by recipients is affected

[11] As land expropriation did not occur until 2010, land subsidy data are available only in the 2011 wave of the survey. For earlier years, since there were no land subsidies at all, we assign the amount of land subsidy as zero for all households.

by the subsidies, other than via the enhanced gift giving of the recipients. Hence, we assume (but will verify) that the exclusion restriction is satisfied.

We next probe the (heterogeneous) welfare effect of gift competition. Based on Proposition 2, we formulate the following testable hypothesis:

**Hypothesis 2**: *When gift competition intensifies, low-income households will be worse off than high-income households.*

To test this hypothesis, we follow Clark and Senik (2015) and explore the determinants of subjective well-being in China. In contrast to Clark and Senik, who use a linear regression, we employ an ordered probit model (also see Fafchamps and Shilpi [2008]) specified as follows (Model II):

$$\begin{aligned} DHp_{int} &= \alpha_0 + \alpha_1 \Delta G_{-int} + \alpha_2 Mid_{int} \times \Delta G_{-int} \\ &\quad + \alpha_3 High_{int} \times \Delta G_{-int} + \beta' \mathbf{X_{int}} + \delta_{in} + \varepsilon_{int} \end{aligned} \qquad where\ \varepsilon_{int} : N(0,1) \quad , \tag{18}$$

where $DHp^*_{\text{int}}$ is the (unobservable) change in utility of household $i$ in village $n$ in year $t$; the other variables are as defined above. We again cluster standard errors at the natural village level. We assume $DHp^*_{\text{int}}$ is related to the observable ordinal variable $DHp_{int}$ in the following way:

$$DHp_{int} = \begin{cases} 1, & if \quad -\infty < DHp^*_{\text{int}} < \theta_0 \\ 2, & if \quad \theta_0 \le DHp^*_{\text{int}} < \theta_1 \\ 3, & if \quad DHp^*_{\text{int}} \ge \theta_1 \end{cases} . \tag{19}$$

The main independent variable is $G_{-int}$, which measures the intensity of gift competition for household $i$. To control for time-invariant omitted variables, we introduce a fixed effect term into the estimation. By introducing interaction terms of $G_{-\text{int}}$ and the income group dummies, we estimate welfare effects for each income group separately. Our theory predicts that $\alpha_1$ is negative, as poor people (especially) will be worse off. The coefficients associated with the interaction terms are positive if adverse welfare effects for richer cohorts are attenuated. As a robustness check, we also split the sample, based on income groups, and estimate Model II without interaction terms.

Since endogeneity might also be a concern for Model II, we again use the land expropriation subsidy variables as instruments. Of course, it is not evident that the exclusion restriction is satisfied for this model, because the income shock may affect subjective welfare through channels other than gift expenses (Stevenson and Wolfers 2008). As a robustness check, we also estimate the welfare effects of gift competition for the subsample of households that did not benefit from the subsidy themselves.

We next consider the channel or mechanism via which gift competition affects welfare. According to our theory, escalating gift expenses reduce welfare of (especially) poor people by squeezing consumption of other goods. Therefore, we explore how gift giving affects expenditures on consumption items—the (potentially heterogeneous) squeeze effect.

**Hypothesis 3**: *When gift competition intensifies, gift expenses will squeeze consumption of other types of goods, especially for the low-income group.*

To explore the existence of this squeeze effect, we estimate the following specification for each income group separately:

$$\Delta SC_{int} = \alpha_0 + \alpha_1 \Delta G_{-int} + \alpha_2 \Delta SG_{int} + \beta' \mathbf{X_{int}} + \delta_{in} + \varepsilon_{int} . \quad (20)$$

In equation (20), $SC_{int}$ is the share of expenditures for certain consumption items in total expenditures of household $i$ in village $n$ at time $t$. We consider two categories of consumption goods: food spending and education expenditures. $SG_{int}$ represents the share of gift expenses in total expenditures, and $\mathbf{X}$ and $\delta_{in}$ are as defined above. We again cluster standard errors at the natural village level. Our theory predicts that the squeeze effect will be particularly serious for low-income households, so we expect $\alpha_1$ to be negative and significant for the low-income subsample. The effects for the middle- and high-income groups will be less significant. As a robustness check, and to attenuate concerns about endogeneity, we also estimate IV models using the land acquisition variables as instruments.

## 5. ESTIMATION RESULTS

Table 5.1 shows the estimation results of Model I. The dependent variable across all columns is per capita gift expenses. Column (1) shows the results of a parsimonious model with only household fixed effects. The coefficient of the main explanatory variable, $\Delta G_{-int}$, equals 0.635 and is significant at the 5 percent level: as average gift expenses by others in the natural village increase by 10 percent, household members increase their own gift expenses by more than 6 percent. This is consistent with model predictions. The coefficients of the interaction terms $Mid_{int} \times \Delta G_{-int}$ and $High_{int} \times \Delta G_{-int}$ are both negative and are significant for the high-income group at the 5 percent level. We control for changes in income rank, own income, and other household characteristics in Column (2). To reduce the concerns about the "reflection problem" we also introduce peers' characteristics. The coefficient for $\Delta G_{-int}$ reduces to 0.507 but remains significant at the 10 percent level.

Next, we estimate the effect of average gift giving on own gift giving for the three income groups separately[12]. This approach is slightly more general than the model with interaction terms, as it does not "force" the coefficients of the control variables to be identical across income groups. The results are reported in Columns (3)–(5). For all income groups we find that the coefficients of interest are positive and significant. The coefficient increases slightly, from 0.522 (significant at the 10 percent level) to 0.568 (significant at the 5 percent level), when we compare the estimation results for the low- and middle-income groups, but it shrinks to 0.433 (significant at the 10 percent level) for the high-income group.[13] It appears that all income groups respond to rising average gift values by increasing the value of their own gifts. Households have to spend more on gifts as long as the average gift value goes up—even if they do not receive more gifts themselves.

When we estimate a 2SLS model, all income groups strongly respond to the change in average gift levels. Second-stage regression results are reported in Columns (6)–(11). The results for the pooled sample of subsidy beneficiaries and non-beneficiaries are summarized in Columns (6)–(8). The coefficient for the low-income group now is 1.434, significant at the 5 percent level. Coefficients for the middle- and high-income groups are 1.263 and 1.509, respectively, and both are significant at least at the 5 percent level.[14]

Test statistics provide support for our instrumental variables. First-stage results of the IV model are summarized in Appendix, and all the estimates comfortably pass a standard overidentification test (Sargan test), with the usual caveat about the assumptions behind and power of such tests. We consider only nonbeneficiaries in Columns (9)–(11), suggesting that people follow the rising trend of gift spending even if they do not have extra income themselves. For the low-income group, the coefficient is 1.386 and significant at the 10 percent level, so a one standard deviation increase in gift expenses will increase the poor's spending on gifts by more than 50 percent—clearly a nontrivial outcome. Hence, after controlling for endogeneity we still find strong evidence of gift escalation.[15] Overall, these estimation results support Hypothesis 1.

[12] Households may change their income group over years. To keep a balanced panel data for each income group, we consider a household belongs to an income group as long as it is in that income group in any survey year.

[13] A *t*-test shows that the coefficients are not significantly different between the low- and middle-income groups, but the coefficient for the high-income group is significantly smaller than those for the other two groups.

[14] A *t*-test shows that the coefficients for all three income groups are significantly different from each other.

[15] It is interesting to observe that especially the coefficients for the high-income group have increased. We speculate that this may be because the share of beneficiaries of the subsidy scheme is disproportionally large among this group.

**Table 5.1 The heterogeneous responses to gift competition**

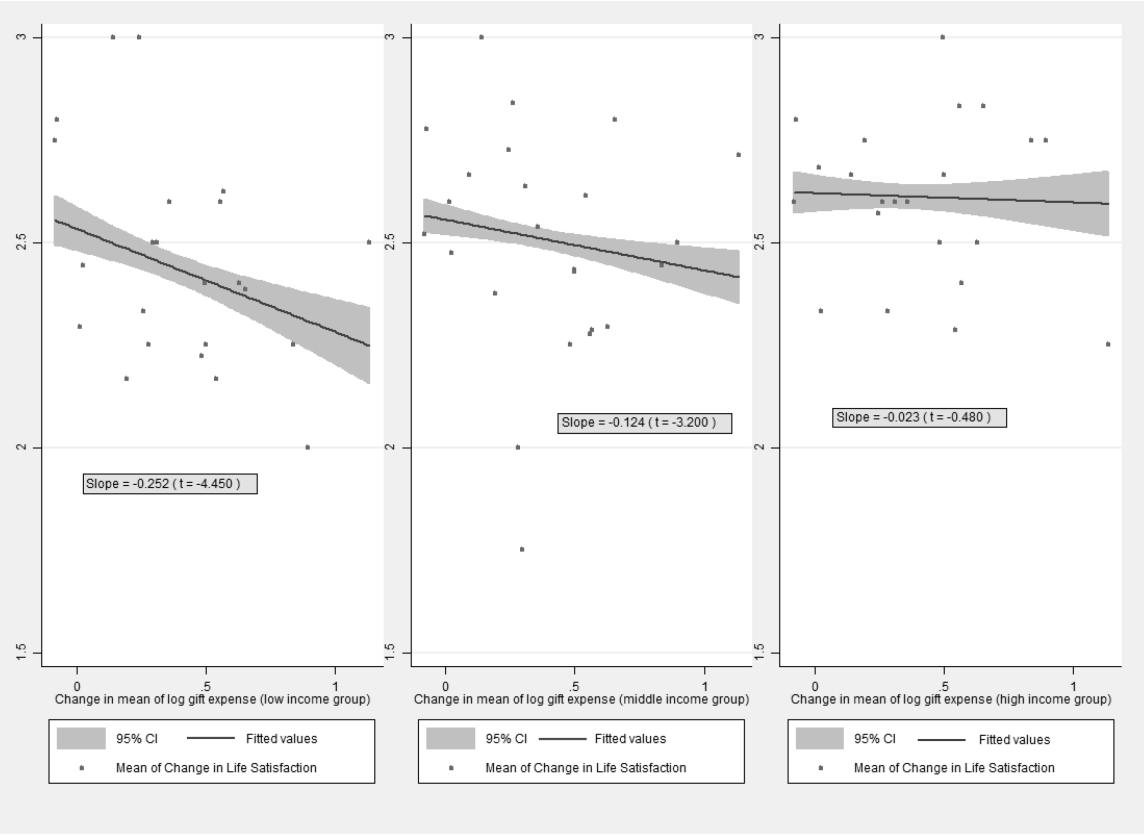
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Both land subsidy beneficiaries and nonbeneficiaries | | | | | | | | Only nonbeneficiaries of land subsidy | | |
| **Variable** | **Total sample** | **Total sample** | **Low income** | **Middle income** | **High income** | **Low income** | **Middle income** | **High income** | **Low income** | **Middle income** | **High income** |
| Change in mean of log per capita gift expense of household | 0.635** | 0.507* | 0.522* | 0.568** | 0.433* | 1.434** | 1.263*** | 1.509** | 1.386* | 1.668*** | 1.650 |
| | (0.254) | (0.291) | (0.265) | (0.250) | (0.238) | (0.655) | (0.437) | (0.706) | (0.743) | (0.632) | (1.160) |
| Change in mean of log per capita gift expense × belong to middle-income group | -0.338 | -0.166 | | | | | | | | | |
| | (0.255) | (0.294) | | | | | | | | | |
| Change in mean of log per capita gift expense × belong to high-income group | -0.581** | -0.337 | | | | | | | | | |
| | (0.232) | (0.321) | | | | | | | | | |
| Change in per capita income rank (natural village) | | 0.108 | 0.169 | 0.250 | 0.198 | 0.166 | 0.242 | 0.015 | 0.197 | 0.224 | -0.311 |
| | | (0.095) | (0.118) | (0.147) | (0.228) | (0.207) | (0.192) | (0.294) | (0.226) | (0.225) | (0.347) |
| Change in log per capita income of household | | -0.018 | -0.048 | -0.062 | -0.208 | -0.021 | 0.001 | 0.090 | -0.010 | 0.016 | 0.751* |
| | | (0.094) | (0.161) | (0.155) | (0.276) | (0.210) | (0.200) | (0.348) | (0.242) | (0.219) | (0.405) |
| Change in log per capita gift Received | | 0.025 | 0.067 | 0.009 | 0.046 | 0.060 | 0.030 | 0.011 | 0.077 | 0.066* | 0.049 |
| | | (0.027) | (0.060) | (0.033) | (0.043) | (0.048) | (0.031) | (0.040) | (0.048) | (0.038) | (0.054) |
| Controls | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Peers' characteristics | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| FE/RE (household) | FE | FE | FE | FE | FE | FE | FE | FE | FE | FE | FE |
| AIC | 2,686.13 | 2,301.10 | 870.15 | 1,668.11 | 874.52 | 570.07 | 1,101.06 | 590.97 | 431.66 | 822.16 | 352.95 |
| Adjusted *R*-squared | 0.017 | 0.082 | 0.206 | 0.109 | 0.077 | | | | | | |
| Sargan test (*p*-value) | | | | | | 0.381 | 0.425 | 0.135 | 0.012 | 0.848 | 0.762 |
| Observations | 1,091 | 957 | 338 | 649 | 357 | 180 | 366 | 186 | 136 | 270 | 128 |

Source: Authors.

Note: 1. Dependent variable is *Gift expense per capita of each household*. 2. Control variables include *Share of cadre in family*, *Marriage status*, *Share of party members in family*, *Share of females in family*, *Normalized per capita income rank (natural village)*, *Education level of household head*, *Share of children (age < 6) in family*, *Share of unmarried sons (age > 12)*, *Age of household head*, *Number of wedding ceremonies*, *Share of registered permanent residents in household*, *Number of funerals in family, Share of family members having local odd jobs, Share of family members working out of local county*. 3. We control peers' (mean) characteristics, such as age, ethnicity, gender, political status, and number of unmarried sons in the regression. 4. The bottom 25% of households are defined as the low-income group; the top 25% of households are defined as the high-income group. The rest (50%) are the middle-income group (see details in footnote 15). 5. In Columns (6)–(10), we employ *Mean of land expropriation subsidy of other households in same natural village* and *Share of households subsidized by land expropriation subsidy in same natural village* as instrumental variables of *Mean of log per capita gift expense of other households in same natural village*. 6. We use both subsidy beneficiaries and nonbeneficiaries in Columns (1)–(8), and focus on the villages that have land expropriation in Columns (6)–(8). We use only nonbeneficiaries as the sample in Columns (9)–(11). 7. Standard errors are clustered at the level of the natural village. 8. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. FE = fixed effect; RE = random effect; AIC = Akaike information criterion.

We next consider the relation between gift giving and subjective well-being. Figure 5.1 presents unconditional associations between average gift expenses and life satisfaction at the natural village level. The left panel shows the case of low-income households. Their subjective well-being is lower in villages with higher gift expenses. For middle-income households, displayed in the middle panel, the negative correlation is still significant but of smaller magnitude. The association between gift expenses and subjective welfare is very weak for the high-income group, as shown in the right panel. Patterns in these data are consistent with the predictions of our model.

**Figure 5.1 The heterogeneous effect of escalating gift expenses on subjective well-being (natural village)**




Source: Drawn by authors based on IFPRI's Guizhou survey.

In Table 5.2, we present the estimation results of Model II for the different income groups. Column (1) documents a negative correlation for the pooled sample. In Column (2), with interaction terms, the estimate of $\alpha_1$ is also negative and significant at the 1 percent level (-1.855). The negative coefficient for $\Delta G_{-\text{int}}$ indicates a negative effect on the probability that people are better off, or a positive marginal effect on the probability that people are worse off. Coefficients for the interaction terms $Mid_{int} \times \Delta G_{-int}$ and $High_{int} \times \Delta G_{-int}$ are positive but not precisely estimated and insignificant. These results suggest that we cannot reject the hypothesis that middle- and high-income groups also suffer from gift escalation. The income cohort–specific regression results provide a similar pattern. As shown in Columns (3)–(5), the estimated coefficients for the low-income and middle-income groups are negative and significant at the 1 percent level. By contrast, the coefficient for the high-income group is insignificant (but of similar magnitude). This suggests that there is more variation in the behavioral response among richer households, or that not everybody experiences a similar welfare loss.

**Table 5.2 The heterogeneous effects of gift competition on change in life satisfaction: Ordered probit estimations**

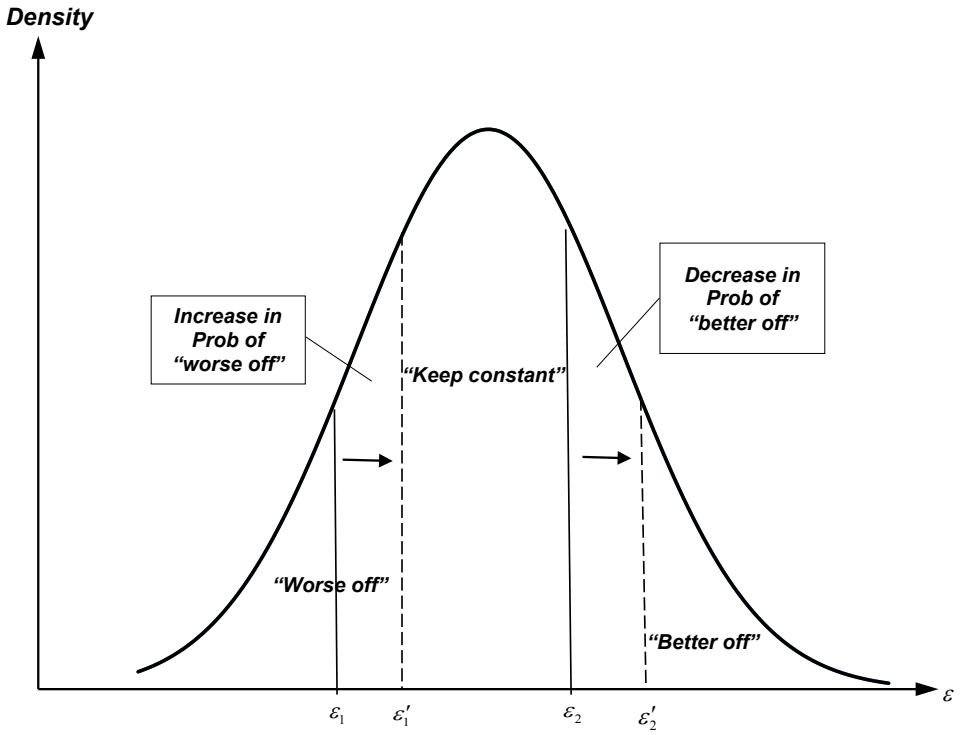
| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Variable** | **Total sample** | **Total sample** | **Low income** | **Middle income** | **High income** |
| Change in mean of log per capita gift expense of household | -0.878** | -1.855*** | -1.117*** | -1.339*** | -1.127 |
| | (0.430) | (0.551) | (0.404) | (0.485) | (1.084) |
| Change in mean of log per capita gift expense × belong to middle-income group | | 1.293* | | | |
| | | (0.774) | | | |
| Change in mean of log per capita gift expense × belong to high-income group | | 1.586 | | | |
| | | (1.159) | | | |
| Change in per capita income rank (natural village) | 0.230 | 0.444 | 0.034 | -0.023 | 1.760** |
| | (0.285) | (0.278) | (0.368) | (0.429) | (0.726) |
| Change in median of per capita income (natural village) | -0.586 | -0.409 | -0.698 | -1.481** | -0.608 |
| | (0.587) | (0.572) | (0.588) | (0.723) | (0.931) |
| Change in log per capita income of household | 0.168 | 0.114 | 0.319 | 0.597 | -1.182 |
| | (0.285) | (0.282) | (0.412) | (0.437) | (0.883) |
| Controls | Yes | Yes | Yes | Yes | Yes |
| FE/RE (household) | Yes | Yes | Yes | Yes | Yes |
| AIC | 569.679 | 548.719 | 265.140 | 153.536 | 147.536 |
| Log likelihood | -261.839 | -257.359 | -109.570 | -187.813 | -52.768 |
| Observations | 1,028 | 1,028 | 387 | 688 | 369 |

Source: Authors.

Notes: 1. Dependent variable is Change in life satisfaction, which is a subjective judgment about change in life satisfaction from 2009 to 2011, and from 2006 to 2009, being 1 if people feel worse, 2 if no change, and 3 if better. 2. An ordered probit panel-data (fixed effect) model is employed in estimation. 3. The bottom 25% of households are defined as the low-income group; the top 25% of households are defined as the high-income group. The rest (50%) are the middle-income group (see details in footnote 15). 4. Control variables include Male head of household (dummy), Marriage status, Education level of household head, Age of household head in 2006 (initial age), Self-reported health status of household head, Share of cadre in family, Share of family members having chronic disease, Share of children (age < 6) in family, Share of party members in family, Number of wedding ceremonies in natural village, Number of funerals in natural village, Number of wedding ceremonies, Number of funerals in family. 5. Standard errors are clustered at the level of the natural village. 6. *** p < 0.01, ** p < 0.05, * p < 0.1. FE = fixed effect; RE = random effect; AIC = Akaike information criterion.

As shown in Figure 5.2, the probability that people are worse off is defined by the area to the left of $\varepsilon_1$, equal to $\left[\theta_0 - \left(\alpha_0 + \alpha_1 \Delta G_{-i} + \beta' \mathbf{X} + \delta\right)\right]$. The probability that people are better off is captured by the region to the right of $\varepsilon_2$, which equals $\left[\theta_1 - \left(\alpha_0 + \alpha_1 \Delta G_{-i} + \beta' \mathbf{X} + \delta\right)\right]$. A negative $\alpha_1$ suggests that $\varepsilon_1$ and $\varepsilon_2$ move to $\varepsilon_1'$ and $\varepsilon_2'$, so the probability of becoming "worse off" increases, while the probability of becoming "better off" decreases. Based on the results presented in Column (3), with other things equal, the annual growth rate of gift expenses decreases the probability of becoming "better off" by 2 percent on average. Welfare improvements due to income growth are to some extent offset by gift escalation. The cumulative welfare impact of gift competition exceeds 10 percent during the survey period (2006–2011).

**Figure 5.2 Marginal effect of gift competition on life satisfaction**




Source: Drawn by authors.

To address concerns about the endogeneity of the gift variable, we present IV results in Table 5.3 for each income group separately. As shown in Columns (1)–(3), we obtain regression results that are qualitatively similar to the ordered probit results above: significantly negative effects for low-income and middle-income households, and no significant effect for the high-income group. The coefficient of the high-income group is not only imprecisely estimated but also some 40 percent smaller in magnitude than the coefficient of the low-income group.

We next focus separately on the welfare of the subsample of nonbeneficiaries of the subsidy. Columns (4)–(6) present the results for these households. Consistent with intuition, the estimated coefficients across all income groups are larger and more significant. For low-income households, the coefficient becomes -2.056.

**Table 5.3 The heterogeneous effects of gift competition on change in life satisfaction: Instrumental variable estimation**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Both land subsidy beneficiaries and nonbeneficiaries | | | Only nonbeneficiaries of land subsidy | | |
| Variable | Low income | Middle income | High income | Low income | Middle income | High income |
| Change in mean of log per | -1.653** | -0.851* | -0.992 | -2.056*** | -1.060** | -2.251** |
| capita gift expense of household | (0.669) | (0.514) | (1.361) | (0.549) | (0.510) | (1.010) |
| Change in per capita income | -0.247 | 0.098 | 1.086*** | -0.114 | 0.110 | 0.827*** |
| rank (natural village) | (0.304) | (0.181) | (0.227) | (0.277) | (0.195) | (0.227) |
| Change in median of per | -0.143 | -0.506 | -0.012 | 0.034 | -0.622* | 0.243 |
| capita income (natural village) | (0.551) | (0.318) | (0.380) | (0.525) | (0.322) | (0.399) |
| Change in log per capita | 0.249 | 0.115 | -0.820*** | 0.261 | 0.071 | -0.559*** |
| income of household | (0.212) | (0.145) | (0.159) | (0.175) | (0.137) | (0.135) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| AIC | 258.475 | 596.298 | 216.889 | 207.796 | 493.929 | 165.488 |
| Log likelihood | -106.340 | -274.103 | -86.444 | -80.898 | -222.964 | -60.744 |
| Observations | 147 | 315 | 150 | 110 | 242 | 112 |

Source: Authors.

Notes 1. Dependent variable is *Change in life satisfaction*, which is a subjective judgment about change in life satisfaction from 2009 to 2011, and from 2006 to 2009, being 1 if people feel worse, 2 if no change, and 3 if better. 2. We employ *Mean of land expropriation subsidy of other households in same natural village* and *Share of households subsidized by land expropriation subsidy in same natural village* as instrumental variables of *Mean of log per capita gift expense of other households in same natural village*. 3. The estimation results in Columns (1)–(3) are based on the total sample. The estimation results in Columns (4)–(6) are for the people who do not obtain any land subsidy. 4. An ordered probit instrumental variable model is employed in estimation. 5. The bottom 25% of households are defined as the low-income group; the top 25% of households are defined as the high-income group. The rest (50%) are the middle-income group (see details in footnote 15). 6. Control variables include *Male head of household (dummy)*, *Marriage status of household head*, *Education level of household head*, *Age of household head in 2006 (initial age)*, *Self-reported health status of household head*, *Share of cadre in family*, *Share of family members having chronic disease*, *Share of children (age < 6) in family*, *Share of party members in family*, *Number of wedding ceremonies in natural village*, *Number of funerals in natural village*, *Number of wedding ceremonies*, *Number of funerals in family*. 7. The fixed effect of the administrative village is controlled for as well. 8. Standard errors are clustered at the level of the natural village. 9. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. AIC = Akaike information criterion.

In Table 5.4 we probe the mechanism that explains the negative effect of escalating gifts on welfare. Escalating gifts should squeeze expenditures on other consumption items. We consider two different expenditure categories and examine how spending in these categories relates to gift giving for the three income groups separately. In Columns (1)–(3) we focus on food consumption, and in Columns (4)–(6) we consider education expenditures.

For both food and education expenditures, the estimated coefficients are negative. While the effects on education are significant for all income groups, only the low-income households tighten their belts by spending less on foodstuffs as well. The estimated coefficient for the low-income households is more than 2.5 times as large as the coefficient of the richer cohorts. As gift expenses increase by more than 40 percent per year, low-income people have to reduce the share of food expenditures by around 3 percent annually.[16] This clearly indicates a squeeze effect, especially for the poor, which is consistent with our theory.

[16] One standard deviation is 42 percent.

**Table 5.4 The heterogeneous squeeze effects of gift competition on consumption: Ordinary least squares estimation**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Change in share of food | | | Change in share of education | | |
| Variable | Low income | Middle income | High income | Low income | Middle income | High income |
| Change in mean of log per capita gift expense of household | -7.772* | -2.529 | -2.507 | -7.332** | -5.359** | -5.864** |
| | (4.039) | (4.010) | (6.918) | (3.299) | (2.597) | (2.774) |
| Change in share of gift expense of household | -0.065 | -0.154* | 0.055 | -0.080 | -0.146*** | -0.109 |
| | (0.149) | (0.082) | (0.171) | (0.058) | (0.041) | (0.087) |
| Change in log per capita income of household | -3.405*** | -2.571** | -3.605** | -0.275 | 0.646 | -0.486 |
| | (1.204) | (1.184) | (1.646) | (0.804) | (0.749) | (0.943) |
| Change in Gini index in natural village | -19.671 | 8.227 | -15.064 | 12.680 | 24.777*** | 3.080 |
| | (13.416) | (9.655) | (14.379) | (11.369) | (6.769) | (11.412) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| FE/RE (household) | Yes | Yes | Yes | Yes | Yes | Yes |
| AIC | 3,526.868 | 6,052.182 | 3,217.551 | 2,841.938 | 5,116.722 | 2,617.881 |
| Adjusted *R*-Squared | 0.080 | 0.049 | 0.092 | 0.120 | 0.085 | 0.157 |
| Observations | 409 | 721 | 381 | 392 | 693 | 366 |

Source: Authors.

Note: The bottom 25% of households are defined as the low-income group; the top 25% of households are defined as the high-income group. The rest (50%) are the middle-income group (see details in footnote 15). Control variables include *Marriage status of household head*, *share of females in family*, *Normalized per capita income rank (natural village), Education level of household head*, *Share of cadre in family*, *Share of family members having chronic disease*, *Share of children (age < 6) in family*, *Share of party members in family*, *share of registered permanent residents in household*, *Share of family members having local odd jobs, Share of family members working out of local county*. Standard errors are clustered at the level of the natural village. 5. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. FE = fixed effect; RE = random effect; AIC = Akaike information criterion.

In Table 5.5 we report the results of the 2SLS models in which we instrument for gift giving. The Sargan test suggests that we cannot reject the assumption of exclusion restriction being satisfied. The squeeze effect for food and education now emerges for the low-income group only, and the estimated coefficient is larger than before. However, the share of education spending is not significantly affected for the low-income group. The coefficient is large and negative but imprecisely estimated. We now find that the middle-income group is adversely affected by gift escalation.[17]

Overall, these regression results provide considerable support for our hypotheses. Asymmetric income shocks allow beneficiaries to raise their gift-giving level, which (due to the externality implied by the signaling process) triggers an escalating process of gift competition throughout the local community—squeezing the consumption of especially the poor, who have few options but to raise their level of gift giving to preserve their social relations.

[17] One interpretation is that most children in low-income households will not attend high school anyway. Since most education spending in primary school is covered by the government for low-income households (compulsory education), the share of income spent on education is very small. However, since children in middle-income households are more likely to go to high school, they are potentially more strongly affected by the squeeze effect.

**Table 5.5 The heterogeneous squeeze effects of gift competition on consumption: Instrumental variable estimations**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Change in share of food | | | Change in share of education | | |
| Variable | Low income | Middle income | High income | Low income | Middle income | High income |
| Change in mean of log per capita gift expense of household | -20.245** | 0.386 | 20.154 | -3.536 | -11.710* | -5.163 |
| | (10.061) | (9.211) | (35.976) | (6.972) | (6.827) | (14.228) |
| Change in share of gift expense of household | 0.008 | -0.156 | -0.196 | -0.057 | -0.160** | -0.138 |
| | (0.200) | (0.113) | (0.192) | (0.100) | (0.072) | (0.100) |
| Change in log per capita income of household | -3.696* | -3.508** | -1.464 | -0.829 | 1.161 | -1.025 |
| | (1.952) | (1.655) | (2.463) | (1.064) | (1.083) | (1.216) |
| Change in Gini index in natural village | -1.839 | 8.032 | -16.712 | 6.649 | 32.047*** | 5.241 |
| | (25.087) | (18.138) | (25.900) | (13.096) | (11.429) | (14.528) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| FE/RE (household) | Yes | Yes | Yes | Yes | Yes | Yes |
| AIC | 1,697.924 | 2,977.403 | 1,515.223 | 1,209.013 | 1,980.106 | 1,059.073 |
| Sargan test (*p*-value) | 0.673 | 0.934 | 0.043 | 0.241 | 0.889 | 0.363 |
| Observations | 186 | 338 | 168 | 158 | 260 | 138 |

Source: Authors.

Note: In the instrumental variable estimation, we focus on the nonbeneficiaries of the land subsidy. We employ *Mean of land expropriation subsidy of other households in same natural village* and *Share of households subsidized by land expropriation subsidy in same natural village* as instrumental variables of *Mean of log per capita gift expense of other households in same natural village*. The bottom 25% of households are defined as the low-income group; the top 25% of households are defined as the high-income group. The rest (50%) are the middle-income group (see details in footnote 15). Control variables include *Marriage status of household head*, *share of females in family*, *Normalized per capita income rank (natural village), Education level of household head*, *Share of family members having chronic disease*, *Share of children (age < 6) in family*, *share of registered permanent residents in household*, *Share of family members having local odd jobs, Share of family members working out of local county*. Standard errors are clustered at the level of the natural village. 6. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. FE = fixed effect; RE = random effect; AIC = Akaike information criterion.

Finally, to check the robustness of our estimation results, we specified and estimated several alternative models. Specifically, we (1) changed the grouping method (that is, we divide the full sample into four income groups), (2) replaced the log form of gift expenses and income with a level term, and (3) narrowed our focus to a smaller but balanced sample of only 379 households (for three years). The results of these regression models are consistent with the results reported and discussed above (details are available on request).

## 6. CONCLUSION

Gift giving allows people to invest in reciprocal relationships or signal altruism to the community more widely. In various parts of the world, gift giving appears to be escalating—and absorbing an increasing share of total income (or expenditures). We demonstrate a potential dark side of escalating gift exchange. In particular, if households base their appreciation of specific gifts on how these gifts compare to the value of the average gift in the community, then extending a generous gift implies a negative externality for others in the community. Generous gifts increase the value of the average gift in the community, raising the bar for future gift givers to signal generosity or altruism.

We develop a model based on the assumptions that households relate gifts received to the value of the average gift in their community, and that people have few alternative options (but signaling true friendship or altruism) to gain access to valued social services. Such services might eventuate via specific interhousehold relationships (*guanxi*). As gift levels escalate, especially the poor will have no option but to "keep up with the Joneses," such that expenditures on other items or services will be squeezed. People, particularly the poor, may be worse off as gift competition intensifies—their subjective welfare level deteriorates. This is the burden of friendship.

We test these theoretical predictions using census-type panel data from 26 natural villages in rural China and generally obtain support for our predictions. We find that (especially poor) households will respond to escalating gift giving by spending more on gifts themselves, reducing the share of income that can be spent on food and education. This process lowers their subjective well-being.

Our model of "forced altruism" deviates significantly from existing models of "impure altruism" (for example, Andreoni 1989; 1990). Our findings suggest that potential efficiency gains and distributional benefits might be achieved if the imperative of investing in reciprocal relationships via gifts were challenged by alternative institutions. For example, the expansion of financial services, including credit and insurance, could relax the need to invest in reciprocal relations. The outcome will be levels of gift giving that are dictated by altruism rather than the signaling value of transfers. We leave the exploration of the interactions between such formal institutional innovations and *guanxi* for future research.

## APPENDIX A: PROOFS

### Proof of Individual Analysis

#### *Welfare Loss of Gift Competition*

To prove the propositions, we first check the first-order derivative of $\frac{G-y_i}{N-1}$ on utility.

$$\begin{aligned} U_i &= \left(z_i - py_i + \left(\frac{G-y_i}{N-1}\right)\right)^{\gamma}\left(y - \theta\left(\frac{G-y_i}{N-1}\right)\right)^{\beta} \\ &= \left(z_i - p\cdot\frac{1}{p(\gamma+\beta)}\cdot\left[\beta z_i + (p\gamma\theta+\beta)\left(\frac{G-y_i}{N-1}\right)\right] + \left(\frac{G-y_i}{N-1}\right)\right)^{\gamma} \\ &\quad \cdot\left(\frac{1}{p(\gamma+\beta)}\cdot\left[\beta z_i + (p\gamma\theta+\beta)\left(\frac{G-y_i}{N-1}\right)\right] - \theta\left(\frac{G-y_i}{N-1}\right)\right)^{\beta} \end{aligned} \quad . \tag{A1}$$

From this, we get

$$\begin{aligned} \frac{dU_i}{d\left(\frac{G-y_i}{N-1}\right)} &= \gamma\left(z_i - py_i + \left(\frac{G-y_i}{N-1}\right)\right)^{\gamma-1}\left(y_i - \theta\left(\frac{G-y_i}{N-1}\right)\right)^{\beta}\left(-\frac{p\gamma\theta+\beta}{\gamma+\beta}+1\right) \\ &\quad +\beta\left(z_i - py_i + \left(\frac{G-y_i}{N-1}\right)\right)^{\gamma}\left(y_i - \theta\left(\frac{G-y_i}{N-1}\right)\right)^{\beta-1}\left(\frac{p\gamma\theta+\beta}{p(\gamma+\beta)} - \theta\right) \end{aligned} . \tag{A2}$$

As long as $\theta > \frac{1}{p}$, the following holds:

$$\frac{dU_i}{d\left(\frac{G-y_i}{N-1}\right)} < 0 \quad . \tag{A3}$$

Note that $\theta > \frac{1}{p}$ is a sufficient condition, rather than a necessary one.

### Heterogeneity of Welfare Loss

When we take the optimal $y_i$ back to the solution of $\frac{dU_i}{d\left(\frac{G-y_i}{N-1}\right)}$, we can prove that the negative welfare effect of gift competition is heterogeneous over income groups: compared with rich people, poor people will suffer more from gift competition. We can illustrate the idea by proving

$$\frac{d^2U_i}{d\left(\frac{G-y_i}{N-1}\right)dz_i} > 0 \quad , \tag{A4}$$

since

$$\frac{dU_i}{d\left(\frac{G-y_i}{N-1}\right)} = \gamma\left(z_i - py_i + \left(\frac{G-y_i}{N-1}\right)\right)^{\gamma-1}\left(y_i - \theta\left(\frac{G-y_i}{N-1}\right)\right)^{\beta}\left(-\frac{p\gamma\theta+\beta}{\gamma+\beta}+1\right)$$

$$+\beta\left(z_i - py_i + \left(\frac{G-y_i}{N-1}\right)\right)^{\gamma}\left(y_i - \theta\left(\frac{G-y_i}{N-1}\right)\right)^{\beta-1}\left(\frac{p\gamma\theta+\beta}{p(\gamma+\beta)}-\theta\right)$$

$$= \gamma\Delta^{\gamma-1}\nabla^{\beta}\left(-\frac{p\gamma\theta+\beta}{\gamma+\beta}+1\right)+\beta\Delta^{\gamma}\nabla^{\beta-1}\left(\frac{p\gamma\theta+\beta}{p(\gamma+\beta)}-\theta\right), \quad \text{(A5)}$$

where $\Delta = z_i - py_i + \left(\frac{G-y_i}{N-1}\right)$ and $\nabla = y_i - \theta\left(\frac{G-y_i}{N-1}\right)$.

We calculate the derivative with regard to agent $i$'s income,

$$\frac{d^2U_i}{d\left(\frac{G-y_i}{N-1}\right)dz_i} = \gamma\Delta^{\gamma-2}(\gamma-1)\left(1-\frac{p\gamma\theta+\beta}{\gamma+\beta}\right)\nabla^{\beta}\left(1-\frac{\beta}{\gamma+\beta}\right)$$

$$+\gamma\Delta^{\gamma-1}\left(1-\frac{p\gamma\theta+\beta}{\gamma+\beta}\right)\nabla^{\beta-1}\cdot\beta\cdot\frac{\beta}{(\gamma+\beta)p}$$

$$+\beta\gamma\Delta^{\gamma-1}\left(\frac{p\theta+\beta}{p(\gamma+\beta)}-\theta\right)\nabla^{\beta-1}\left(1-\frac{\beta}{\gamma+\beta}\right)$$

$$+\beta\Delta^{\gamma}\left(\frac{p\theta+\beta}{p(\gamma+\beta)}-\theta\right)\nabla^{\beta-2}\cdot(\beta-1)\cdot\frac{\beta}{(\gamma+\beta)p}. \quad \text{(A6)}$$

As long as $\gamma + \beta \leq 1$, we find that:

$$\frac{d^2U_i}{d\left(\frac{G-y_i}{N-1}\right)dz_i} > 0. \quad \text{(A7)}$$

Q.E.D.

### Proof of Proposition 1

The proposition shows that in equilibrium, people increase their gift expenses as the average gift expenses rise. Given the equilibrium condition,

$$G = \sum_{i=1}^{N} y_i = \frac{1}{p(\gamma+\beta)}\cdot\beta\cdot\sum_{i=1}^{N} z_i + \frac{p\gamma\theta+\beta}{p(\gamma+\beta)}\cdot\sum_{i=1}^{N}\frac{G-y_i}{N-1}. \quad \text{(A8)}$$

We obtain $G$ in equilibrium, which is a function of total income in the community.

$$G = \frac{\beta}{p(\gamma+\beta) - p\gamma\theta - \beta} \cdot \sum_{i=1}^{N} z_i = \frac{\beta T}{p(\gamma+\beta) - p\gamma\theta - \beta}, \tag{A9}$$

where $T = \sum_{i=1}^{N} z_i$. Since $p\theta > 1$, we can prove[18]

$$y_i = \frac{\beta z_i + (\gamma p\theta + \beta) \cdot \left( \frac{\eta T - y_i}{N-1} \right)}{(\gamma+\beta) \cdot p}, \tag{A10}$$

where $\eta = \frac{\beta}{p(\gamma+\beta) - p\gamma\beta - \beta}$;
therefore,

$$y_i = \frac{N-1}{(N-1)p(\gamma+\beta) + p\gamma\theta + \beta} \cdot \left( \beta z_i + \frac{(p\gamma\theta+\beta) \cdot \beta T}{(N-1)(p\gamma + p\beta - p\gamma\theta - \beta)} \right). \tag{A11}$$

Thus, if $i \neq j$,

$$\frac{dy_i}{dz_j} = \frac{1}{(N-1)p(\gamma+\beta) + p\gamma\theta + \beta} \cdot \frac{(p\gamma\theta+\beta) \cdot \beta}{(p\gamma + p\beta - p\gamma\theta - \beta)} > 0. \tag{A12}$$

When others' gift expenses rise as income increases, one must follow and spend more on gifts. This proves the existence of "forced" gifts.
Q.E.D

### Proof of Proposition 2

In equilibrium, the loss of utility is smaller for rich people than poor people, by the same mechanism as illustrated in the individual analysis. Bringing $G$ in equilibrium back to the utility function, we have

$$\begin{aligned} \frac{G - y_1}{N-1} &= \frac{1}{N-1} \cdot \left[ \frac{\beta T}{p(\gamma+\beta) - p\gamma\theta - \beta} - \frac{\beta z_i}{(N-1)p(\gamma+\beta) + p\gamma\theta + \beta} \right. \\ &\quad \left. - \frac{(p\gamma\theta+\beta) \cdot \beta T}{\left[(N-1)p(\gamma+\beta) + p\gamma\theta + \beta\right]\left[p(\gamma+\beta) - p\gamma\theta - \beta\right]} \right] \\ &= \frac{1}{N-1} \cdot \psi T - \varphi z_i \end{aligned}, \tag{A13}$$

[18] $p\theta > 1$ is a sufficient condition rather than a necessary condition.

where $\psi = \dfrac{\beta}{p(\gamma+\beta)-p\gamma\theta-\beta} - \dfrac{(p\gamma\theta+\beta)\cdot\beta}{\left[(N-1)p(\gamma+\beta)+p\gamma\theta+\beta\right]\left[p(\gamma+\beta)-p\gamma\theta-\beta\right]}$ and $\phi = \dfrac{\beta}{(N-1)p(\gamma+\beta)+p\gamma\theta+\beta}$.

As shown in the proof of Proposition 1,

$$U_i = \Delta^{\gamma}\nabla^{\beta}. \tag{A14}$$

Hence we have

$$\begin{aligned}\frac{dU_i}{dz_j} &= \gamma\Delta^{\gamma-1}\nabla^{\beta}\left(-\frac{p(p\gamma\theta+\beta)\beta - p(\gamma+\beta)\beta}{\left[(N-1)p(\gamma+\beta)+p\gamma\theta+\beta\right]\left[p(\gamma+\beta)-p\gamma\theta-\beta\right]}\right)\\ &\quad +\beta\Delta^{\gamma}\nabla^{\beta-1}\left(\frac{(p\gamma\theta+\beta)\beta-\theta p(\gamma+\beta)\beta}{\left[(N-1)p(\gamma+\beta)+p\gamma\theta+\beta\right]\left[p(\gamma+\beta)-p\gamma\theta-\beta\right]}\right)\\ &= -\frac{p\beta\gamma^2(p\theta-1)}{\left[(N-1)p(\gamma+\beta)+p\gamma\theta+\beta\right]\left[p(\gamma+\beta)-p\gamma\theta-\beta\right]}\cdot\Delta^{\gamma-1}\nabla^{\beta}\\ &\quad -\frac{\beta^3(p\theta-1)}{\left[(N-1)p(\gamma+\beta)+p\gamma\theta+\beta\right]\left[p(\gamma+\beta)-p\gamma\theta-\beta\right]}\cdot\Delta^{\gamma-1}\nabla^{\beta}\end{aligned} \tag{A15}$$

$$\frac{dU_i}{dz_j} < 0, \tag{A16}$$

so that

$$\begin{aligned}\frac{d^2U_i}{dz_j dz_i} &= -\frac{(p\theta-1)\beta}{\left[(N-1)p(\gamma+\beta)+p\gamma\theta+\beta\right]\left[p(\gamma+\beta)-p\gamma\theta-\beta\right]}\cdot\\ &\quad \left\{p\gamma^2(\gamma-1)\Delta^{\gamma-2}\nabla^{\beta}\Delta'_{z_i} + p\gamma^2\beta(\gamma-1)\Delta^{\gamma-1}\nabla^{\beta-1}\nabla'_{z_i} + \beta^2\gamma\Delta^{\gamma-1}\nabla^{\beta-1}\Delta'_{z_i}\right.\\ &\quad \left.\beta^2(\beta-1)\Delta^{\gamma}\nabla^{\beta-2}\nabla'_{z_i}\right\}\\ &= -\frac{(p\theta-1)\beta\Delta^{\gamma-2}\nabla^{\beta-2}}{\left[(N-1)p(\gamma+\beta)+p\gamma\theta+\beta\right]\left[p(\gamma+\beta)-p\gamma\theta-\beta\right]}\cdot\\ &\quad \left[\left(p\gamma^2(1-\gamma)\nabla^2-\beta^2\gamma\Delta\nabla\right)\cdot\Delta'_{z_i}+\left(\beta^2(1-\beta)\Delta^2-p\gamma^2\beta\Delta\nabla\right)\cdot\nabla'_{z_i}\right]\end{aligned} \tag{A17}$$

because

$$\Delta'_{z_i} = \frac{(N-1+\theta)\,p\gamma}{(N-1)\,p(\gamma+\beta)+p\gamma\theta+\beta} - \frac{p\gamma\beta(p\theta-1)}{\left[(N-1)\,p(\gamma+\beta)+p\gamma\theta+\beta\right]\left[p(\gamma+\beta)-p\gamma\theta-\beta\right]}, \tag{A18}$$

given the increase in $G$, which is driven by $m$,

$$\nabla'_{z_i} = \frac{(N-1+\theta)\,\beta}{(N-1)\,p(\gamma+\beta)+p\gamma\theta+\beta} - \frac{\beta^2(p\theta-1)}{\left[(N-1)\,p(\gamma+\beta)+p\gamma\theta+\beta\right]\left[p(\gamma+\beta)-p\gamma\theta-\beta\right]}. \tag{A19}$$

Therefore,

$$\frac{d^2U_i}{dz_j dz_i} = \left(p^2\gamma^3(1-\gamma)\nabla^2 - 2p\gamma^2\beta^2\Delta\nabla + \beta^3(1-\beta)\Delta^2\right)\cdot \left(\frac{(N-1+\theta)}{(N-1)\,p(\gamma+\beta)+p\gamma\theta+\beta} - \frac{\beta(p\theta-1)}{\left[(N-1)\,p(\gamma+\beta)+p\gamma\theta+\beta\right]\left[p(\gamma+\beta)-p\gamma\theta-\beta\right]}\right). \tag{A20}$$

If $\gamma+\beta=1$,

$$\frac{d^2U_i}{dz_j dz_i} \geq 0. \tag{A21}$$

Therefore, if $\gamma+\beta<1$,

$$\frac{d^2U_i}{dz_j dz_i} > 0. \tag{A22}$$

Q.E.D.

## APPENDIX B: SUPPORTING MATERIAL FOR THE 2SLS MODEL

**Table B.1 Land acquisition subsidy and average gift expenses**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **Variable** | **Total sample** | **Low income** | **Middle income** | **High income** |
| Log (Average land expropriation | 0.060*** | 0.098*** | 0.086*** | 0.034* |
| subsidy in natural village) | (0.013) | (0.022) | (0.016) | (0.020) |
| Share of households subsidized by | -1.109*** | -1.722*** | -1.469*** | -0.819*** |
| land subsidy in each natural village | (0.170) | (0.306) | (0.219) | (0.270) |
| First-stage *F*-statistic | 21.86 | 16.00 | 22.62 | 5.92 |
| Observations | 686 | 201 | 370 | 197 |

Source: Authors.

Note: 1. Dependent variable is *Mean of log per capita gift expense of other households in same natural village*. 2. The bottom 25% of households are defined as the low-income group; the top 25% of households are defined as the high-income group. The rest (50%) are the middle-income group. 3. Standard errors are in parentheses. 4. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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