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Connections and the allocation of public benefits

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Abstract: We explore the relationship between connections and public transfers in decentralized poverty-targeting programmes. Using panel data from Vietnam we find evidence that households with connections to local government are more likely to be classified as poor, the main determinant of whether households receive public benefits/supports. Social connections play a role by allowing politically connected households to receive supports without being reprimanded by their local community. We identify provision of information as a mechanism through which households use their connections to obtain the poverty classification, suggesting that information campaigns may be an effective means of eliminating local level corruption in poverty-targeting programmes.

Keywords: political connections, social connections, decentralization, poverty targeting, Vietnam
JEL classification: O12, I3, D1

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1 Introduction

Poverty alleviation remains a key focus of governments in developing countries and in many cases government transfers are an important source of income in the daily lives of the poorest and most vulnerable. Whether households most in need receive public benefits is an important question, especially in rural areas where resources are limited and who the most vulnerable households are is often not clear to central authorities. A decentralized decision-making process has the potential to lead to a more efficient allocation of benefits given that local information can be used in the distribution of government supports. Decentralized decision-making, however, also lends itself to corruption, particularly where self-interested bureaucrats are responsible for the distribution of benefits. In this paper, we investigate the extent to which political connections impact the allocation of public transfers where decisions in relation to who receives the benefits are fully decentralized. Using a detailed household panel dataset for the period 2008–12 for Vietnam we illustrate the role of political connections in determining the households that receive state benefits under the main decentralized government poverty-targeting programme. We also explore the role of social connections in this process on the basis that the stronger a household's social ties the less likely household members will be reprimanded within their local community if they are unfairly targeted for supports.

The role that decentralization can play in improving the efficiency of government programmes and the allocation of benefits is well documented. Bardhan and Mookherjee (2005, 2006) highlight that centralized systems of delivery of anti-poverty programmes are more prone to bureaucratic corruption than decentralized systems and that the latter are therefore more cost-effective. Galasso and Ravallion (2005) and Alderman (2002) show that programmes directly targeting the poor are more efficient and equitable when implemented at the local level than when implemented through a centralized process. In particular, Alderman (2002) finds that communes have local information that central authorities cannot possess, which assists in the targeting process. Similarly, Besley et al. (2005) investigate the relationship between participation in village meetings and the distribution of welfare programmes in South India. They find that poor and vulnerable groups are more likely to attend village meetings and that participation in meetings improves targeting of the poor for redistribution purposes. Their work highlights the potentially positive role that political participation can play in the allocation of public benefits.

There is also literature questioning the efficiency of decentralized targeting programmes, primarily owing to the potential for corruption (for a review, see Conning and Kevane 2002). Seminal theoretical work in this area shows that local officers have an incentive to exploit the regulations of anti-poverty programmes in controlling the allocation of public resources (Banerjee 1997). Pande (2007) highlights that it is more common for local officers to exploit political connections in poor countries because of the high economic returns. Besley and Coate (2003) also show that decentralized poverty targeting may create bureaucratic corruption and that the transparency and accountability of local governments is under a high level of capture by local elites because of voting pressure. Mansuri and Rao (2013) argue that elite capture tends to be greater in communities that are poor and not managed directly by the central government.

Empirical evidence exists highlighting the shortcomings of decentralized targeting programmes. For example, Baird et al. (2013) show that households with better information, that are active in village affairs, and that are related to village elites are more likely to become beneficiaries of community-driven development initiatives in Tanzania. Broussard et al. (2014) examine the allocation of food aid in Ethiopia and find that households with local influence are more likely to receive aid. Olken (2007) finds evidence from a field experiment in Indonesia to suggest that grassroots monitoring has the potential to reduce corruption but is also open to free-rider

problems and elite capture. Deshingkar et al. (2005) examine the Food-For-Work programme in India and find that the poorest are excluded from local democratic forums and have very little influence over the selection of beneficiaries.

It is also possible that social connections play a role in the allocation of benefits to the poor through decentralized targeting programmes, although this has been given much less attention in the literature. Caeyers and Dercon (2012) highlight that households with large social networks are likely to have more information on the benefits that are available, how to apply for them, and how to influence the process. They are also likely to be treated more favourably where there is community engagement in the targeting process. It is also likely that there are interactive effects with political connections. For example, Arcand and Fafchamps (2012) show that households that have family ties with village authorities are more likely to join community-based organizations.

Our study is set in the context of Vietnam which is an ideal testing ground for exploring the relationship between connections and poverty targeting and the underlying mechanisms at work. In Vietnam, the allocation of aid resources and other benefits depends on being ‘identified’ as poor by the Ministry of Labour, Invalids and Social Affairs (MoLISA). The classification process, however, takes place largely at village level. The main rationale for a decentralized process of identifying poor households is that, in the absence of resources to support all eligible poor households, village and commune leaders have more information on the vulnerability of households in their local area and so are better placed than centralized government authorities to identify the most deserving recipients. However, such a system presents opportunities for corruption, through both political and social connections.

A full description of the poverty classification process is provided in Section 2, but we summarize here the key features highlighting the potential for corruption in the process (see also Dinh and Zeller 2010; Mai and Lebailly 2013; Swinkels and Turk 2007). The first step in the classification process is village leaders drawing up a list of households eligible to be classified as poor. This list includes all households classified as poor in the previous period and other households that in their assessment may meet the eligibility criteria. Although income is an important factor other criteria are also considered including vulnerability to shocks and number of children. The list is reviewed by local authorities and is published in each village. A community meeting, attended by village leaders, representatives of various levels of local authorities, households included in the list, and representative households from the community, is then held to determine which households from the list will be identified as poor. This is decided by a vote, often in the form of a show of hands. The list of households identified as poor is then submitted to the district, province, and central governments to be confirmed. Once households are identified as poor they receive a range of public supports from poverty-targeting programmes; being identified as poor is the essential criteria for accessing public benefits. The ambiguity surrounding much of the procedure for identifying poor households provides significant scope for households to use connections to influence the process.

This paper begins by building a conceptual framework that considers the role of political and social connections in determining whether a household is defined as poor, thereby affecting the distribution of public transfers from anti-poverty programmes. Our model builds on standard models of corruption in decentralized decision-making by including a role for political and social connections in reducing the probability of being caught at government and community level. We then examine empirically the role of political and social connections in the identification of poor

households in Vietnam using household panel data for the period 2008–12.¹ We use propensity score matching to match politically connected households with unconnected households having similar characteristics. We use these households as a control group to test for the impact of political connections on the poverty identification process. We find that whether or not a household has political connections is an important determinant for whether they are classified as poor. Our results are strongest for households with relatives holding positions in commune level government. We also find evidence that social connections matter for poverty identity, but only for households that are politically connected. We identify access to information as the main channel through which households use their political connections to obtain the poverty identity.

The paper is organized as follows. Section 2 provides more detail on the process of poverty identification in Vietnam and presents a simple theoretical model that demonstrates the link between political and social connections and poverty identification. The data, descriptive statistics, and our empirical approach are presented in Section 3. In Section 4 we present our empirical results, while Section 5 concludes.

2 Background and conceptual framework

2.1 Poverty identification in Vietnam

Decentralized poverty targeting began in Vietnam in 2005. MoLISA is the official authority at central government level responsible for monitoring poverty and setting the criteria for identifying poor households. MoLISA sets the national poverty line for each five-year period.² The process of identifying poor households that will receive benefits begins each November when the Department of Labour, Invalids and Social Affairs (DoLISA)—the provincial level authority—sets the local guidelines, drafts the required documents, and prepares for the training of officials directly involved in the identification process (see MoLISA 2007). A Commune Survey Board consisting of village leaders and representatives of social unions and associations is established to assist in implementation at the local level. A list of households that are at risk of falling into poverty, or that are likely to escape from poverty, is prepared for review.³ In practice, this list is prepared by the village leaders (Mai and Lebailly 2013). A household survey to gather information on all listed households is then conducted. Detailed demographic information and information on employment, land, and income are collected.

The next step after data collection is the classification of households at the commune level. On the basis of data collected, the Commune Survey Board identifies listed households that are at risk of falling into poverty and that are likely to escape from poverty. The Board then organizes a meeting where a vote is taken on the households that will receive the poverty identity. Participants at this meeting include village leaders, representatives of the Communist Party Committee, Commune People’s Committee (CPC) officials, households included in the list, and representative households from the rest of the commune. It is required that the last category makes up over half

¹ Using these data, Markussen and Tarp (2014) explore the effect of political connections on the decision of farmers to invest in rural Vietnam. They find that political connections affect investment through strengthening property rights and improving access to credit and the labour market.

² It is possible for province offices to increase the poverty line applied in instances where more resources are available within the province.

³ In November 2012, after the time frame of our analysis, a new regulation was introduced requiring that the primary list of candidate households be posted at the Commune People’s Committee office, in the local village and on mass media for five days to ensure its accuracy and fairness. Prior to this no such checks were in place.

of all participants at the meeting. The vote is cast by a show of hands or a ballot and the selection must be approved by a majority of participants. The results of this process are submitted to the CPC for review. Once signed off by the leader of the CPC, the list of selected households is submitted by the Commune Survey Board to DoLISA who is responsible for evaluating the list and formally approving the list of households identified as poor. If at this stage of the process there is any suspicion about the suitability of the selected households, the list is sent back to the Commune Survey Board to be rechecked. In practice, however, as highlighted by Dinh and Zeller (2010) and Mai and Lebailly (2013), the final decision is rarely changed by district and provincial level authorities.

Once the list is signed by the leader of the District People’s Committee, DoLISA informs the Commune Survey Board and submits the list to the provincial level authorities for further approval. DoLISA checks the list against the results of the household survey and if there is no disagreement, the list is signed by the leader of the Provincial People’s Committee and submitted to MoLISA.

There is scope for corruption at a number of different stages of this process. First, given that local authorities define the local assessment criteria, this stage can be heavily influenced by connections between members of the community and local authorities. Second, connected households will have information on the local assessment criteria that unconnected households will not have. They can use this information in responding to the household questionnaire to ensure that their information meets the requirements and guidelines for selection. Third, given that the final selection is based on a vote at the village meeting, political connections give a household more sway in the voting process. Social connections may also be important, particularly where the vote is by a show of hands. Moreover, given that the results of the process are published locally, having a good social network may be important in avoiding complaints being made against ineligible households that are selected for poverty identification.

2.2 Conceptual framework

The context of poverty classification in Vietnam fits well with the theoretical framework set out by Banerjee (1997) and Banerjee et al. (2012) to explain political corruption in decentralized decision-making processes. There is a continuum of places on a poverty-targeting programme to be assigned by a local bureaucrat. The set of places is of measure 1 and the number of applicants for these places is $N > 1$, as is consistent with the setting in Vietnam where households identified as poor are selected from a list of eligible households. There are two types of applicants, real poor (P), the total number of which is denoted by N_P , and non-poor or ‘rich’ (R), the total number of which is denoted by N_R . In other words, $N = N_P + N_R > 1$. The private value placed on the slot (i.e. being identified as poor) is the same for each type of household and is denoted by η . Agents differ though in their ability to pay a bribe (y) for the slot, with $y_P < y_R$, and owing to credit constraints the ability to pay may be less than the private valuation $y_P < y_R \leq \eta$. We assume that all applicant households (i.e. all those on the list) are risk-neutral and have quasi-linear preferences over their receipt of public transfers and the cost of becoming classified as poor.

We assume that the government (G) and local bureaucrats (B) are risk-neutral and face no liquidity constraint. G ’s objective is to maximize social welfare and so it will want all of the poor to be allocated the slots. B , however, is only interested in private returns and so s/he will secretly accept bribes from households to be given a slot. B knows the type of household (i.e. whether they are poor or rich), but G does not. This is consistent with B having local information that G cannot observe. G has a mechanism, however, for detecting the type of a specific household. In the case of Vietnam, this is achieved through the checks that are in place at the various levels of government

working up from the most decentralized level (the commune) to the central government. The probability of detecting an unfair allocation (a rich person being given a slot) is given by μ . If detected the bureaucrat is charged a fine F . This could take the form of a fine, being discharged or demoted, or even legal action (such as a stay in prison). B faces no costs of charging the bribe or distributing the benefits. B 's only possible cost is the fine faced if caught. The bribes charged to poor and rich households are given by ϕ_P and ϕ_R , respectively.

Within the local community there is also the possibility of community members detecting an unfair allocation. In the case of Vietnam, detection is possible given that the lists of eligible households and those identified as poor are published in the local community and in mass media. If a rich household is detected on the list, the local community can impose a social cost, C , on the rich household. The probability of being detected in the local community is denoted by λ .⁴

Given this set-up B must choose ϕ_P , ϕ_R , π_P , and π_R , where π_P and π_R , respectively, are the probabilities that the poor type and rich type get selected to maximize the following condition:

$$N_P \pi_P \phi_P + N_R \pi_R \phi_R - N_R \pi_R \mu F \quad (1)$$

This choice may be constrained by the incentives of the households to pay the bribe, which for the poor and rich households can be expressed as Equations (2) and (3), respectively.

$$\pi_P \eta - \phi_P \geq 0 \quad (2)$$

$$\pi_R \eta - \phi_R - \pi_R \lambda C \geq 0 \quad (3)$$

B 's choice may also be constrained by the affordability of the bribe, which can be given by Equation (4) for poor households and Equation (5) for rich households.

$$\phi_P \leq y_P \quad (4)$$

$$\phi_R + \lambda C \pi_R \leq y_R \quad (5)$$

If the probability of detection is zero at both government and community level (i.e. $\mu = \lambda = 0$) then B sets the price of the bribe at the household's ability to pay. In other words, $\phi_R = y_R$ and $\phi_P = y_P$. Since the rich are able to pay more, $y_R = y_P$, they will always be selected ($\pi_R = 1$ and $\pi_P = 0$). However, with a positive probability of detection at community and government level (i.e. $\mu > 0$, $\lambda > 0$) the choices facing B are constrained. In particular, the maximum price B can charge to the rich is $y_R - \lambda C$ and the payoff to B from taking the bribe from a rich household will be $y_R - \lambda C - \mu F$. B can continue to charge the poor according to their ability to pay ($\phi_P = y_P$) given that there is no risk of sanctions on either B or the household. B 's payoff to taking the bribe from a poor household will be y_P . As such, B will take the bribe from the poor if $y_P > y_R - \lambda C - \mu F$ and B will be indifferent between allocating the slot between the poor and the rich where:

$$\lambda C + \mu F = y_R - y_P \quad (6)$$

⁴ For simplicity, we assume that the community cannot report bureaucrats and so the probability of detection at community level and at government level is not related.

The key determinants of whether B will take the bribe from the poor household or the rich household are the relative difference between the ability of the rich and the poor to pay, the size of the fine, the size of the social cost, and the probability of getting caught at community and government level.

Our innovation in this paper is that we introduce political and social connections to this framework. We assume that the probability of being caught, μ , depends on whether the household has political connections. Connected households can better disguise corruption. For example, the bureaucrat could provide the connected household with information on the process for selection, which can help the household to be selected without raising suspicion. This is particularly the case with close political connections where there is trust between the household and the bureaucrat (such as connections with friends and relatives). In other words, $\mu(\delta)$ where δ is a measure of the extent of political connections of the household and $\mu'(\delta) < 0$.

Moreover, corruption is most likely to occur at the level of government where decisions are made, that is, where the bureaucrats are the most powerful. In the case of Vietnam, this is where the initial list of qualified households is drawn up (village level) and where the final decision on the households to be identified as poor is made (commune level). As such, we expect connections at the village and commune level to be more effective for households in becoming classified as poor than connections at higher levels of governance.

Similarly, the probability of being sanctioned at community level depends on whether the household has a good social network. Where households are well connected they are less likely to be reported. In the case of Vietnam, given that the list of qualified households is published in the village, households that are inappropriately classified as poor may invest in maintaining good social networks to ensure that they are not reported by others in the village. Households that use political connections have an incentive to also invest in their social network. In other words, we have $\lambda(s)$ where s is a measure of the extent of social connections of the household and $\lambda'(s) < 0$.

Applying this to Equation (6) leads us to two testable hypotheses. For given levels of C , F , y_R , and y_P the probability of being selected to the programme will increase with: (i) the extent of political connections; and (ii) the extent of social connections.

3 Data and empirical approach

The data used in this paper come from the Vietnam Access to Resources Household Survey (VARHS) for 2008, 2010, and 2012.⁵ The dataset contains information on 2112 households in each year from 461 communes, 138 districts in 12 provinces. Our aim is to test whether political and social connections impact the probability of households being classified as poor.

We use household fixed effects to exploit within-household variation in poor status and political and social connections to identify the effects; all time-invariant confounders are controlled for. Time-varying controls include income, vulnerability to natural risks, the value of durable goods, living conditions, the share of dependent members, ethnicity, and other factors that according to

⁵The survey was developed collaboratively by the Development Economics Research Group (DERG), Department of Economics, University of Copenhagen and the Central Institute of Economic Management (CIEM), the Institute for Labour Studies and Social Affairs (ILSSA), and the Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD), Hanoi, Vietnam.

national policy are used to determine the eligibility of households for the poverty identity. The full list of control variables is provided in Appendix A1.

Indicators for the political connectedness of households are classified along four dimensions: (i) whether a household has political connections in general; (ii) the type of political connections: whether it is a family member, relative, or friend; (iii) the level of political connections: whether the household is connected with district level government, commune level government, or mass organizations; (iv) specific political connections: whether the household has a family member, relative, or friend working in district level government, commune level government, or mass organizations. The extent of social connections of households is captured by (i) an indicator variable for whether household members join social unions; (ii) the number of union memberships per household member; and (iii) the proportion of total income spent on social activities.

The baseline estimation for the impact of political connections on poverty identity is given by:

$$PI_{it} = \beta \mathbf{PC}_{it} + \gamma \mathbf{SC}_{it} + \phi \mathbf{VA}_{it} + \theta \mathbf{X}_{it} + \alpha_i + \tau_t + e_{it} \quad (7)$$

where PI_{it} is an indicator variable for whether household i is identified as poor in time period t ; \mathbf{PC}_{it} is a vector of indicator variables for whether the household has political connections; \mathbf{SC}_{it} is a vector of indicator variables for the extent of social connections of the household; \mathbf{VA}_{it} is a vector of variables capturing the vulnerability of the household, including indicators used by village leaders in assessing households (e.g. accommodation conditions, marital status of the household head, etc.) and criteria as mandated in national policies; \mathbf{X}_{it} is a vector of control variables capturing other time-varying household characteristics; α_i are household fixed effects; τ_t are time dummies; and e_{it} is a statistical noise term.

Table 1 summarizes the number of households classified as poor in our dataset in each province and illustrates some of the characteristics of poor and non-poor households. As shown, there is a clear link between ethnicity and poverty; the poverty rate is highest in provinces where the proportion of ethnic minorities is high. Table 1 also illustrates that the proportion of households classified as poor declines gradually from 2008 to 2010 but remains high in 2012 in some provinces. Of note (but not shown) is the fact that almost two-thirds of households identified as poor have income levels above the national poverty line.

Table 1: Comparison of means: households (HHs) identified as poor and non-poor

Variable	2008			2010			2012		
	Poor	Non-poor		Poor	Non-poor		Poor	Non-poor	
Political connections (PC) indicators									
General PC	0.200	0.320	***	0.264	0.343	**	0.157	0.270	**
PC: HH member	0.014	0.065	***	0.021	0.064	**	0.016	0.051	**
PC: relative	0.155	0.228	**	0.170	0.230	*	0.094	0.154	*
PC: friends	0.058	0.125	***	0.135	0.184	*	0.077	0.151	*
PC: district	0.043	0.121	***	0.035	0.112	***	0.019	0.070	***
PC: commune	0.145	0.223	***	0.215	0.259		0.135	0.199	
PC: village	0.043	0.071	*	0.056	0.066		0.047	0.0812	
PC: HH member + district	0.000	0.011	*	0.003	0.009		0.000	0.007	
PC: relative + district	0.034	0.079	**	0.021	0.067	**	0.011	0.038	**
PC: friend + district	0.012	0.051	***	0.014	0.058	**	0.008	0.035	**
PC: HH member + commune	0.010	0.032	*	0.000	0.034	**	0.011	0.030	**
PC: relative + commune	0.100	0.136	*	0.125	0.148		0.074	0.095	
PC: friend + commune	0.043	0.085	**	0.121	0.136		0.066	0.121	
PC: HH member + village	0.005	0.025	*	0.017	0.024		0.005	0.018	
PC: relative + village	0.027	0.032		0.028	0.030		0.016	0.032	
PC: friend + village	0.014	0.018		0.017	0.019		0.027	0.039	
Social connections indicators									
Social network	0.031	0.036		0.032	0.034		0.009	0.031	***
Membership per capita	0.251	0.256		0.290	0.283		0.312	0.305	
Women's union	0.336	0.362		0.319	0.425	***	0.284	0.379	***
Farmer's union	0.217	0.230		0.236	0.307	*	0.248	0.275	*
Veteran's union	0.063	0.121	***	0.056	0.135	***	0.058	0.116	***
Control variables for regressions									
Married_h	0.729	0.843	***	0.705	0.834	***	0.664	0.816	***
HH size	4.635	4.532		4.361	4.310		4.308	4.211	
Ill member (%)	0.123	0.081	***	0.199	0.109	***	0.197	0.115	***
Disabled member (%)	0.016	0.009	*	0.032	0.017	**	0.036	0.016	**
Alcoholism	0.249	0.283		0.240	0.318	**	0.121	0.145	**
Flush toilet	0.031	0.187	***	0.035	0.257	***	0.083	0.358	***
Clean water	0.075	0.131	**	0.080	0.161	***	0.088	0.182	***
Log net income	9.132	9.920	***	9.513	10.402	***	10.128	10.952	***
Log total saving	2.423	4.908	***	3.587	6.866	***	5.368	8.101	***
Log durable goods	6.438	8.624	***	6.527	9.020	***	7.500	9.661	***
Natural shocks	0.524	0.413	***	0.517	0.418	**	0.457	0.293	**
Gender_h	0.722	0.804	***	0.697	0.800	***	0.702	0.796	***
Age_h	51.36	51.72		54.92	52.78	***	56.14	54.33	**
Egrade_h	7.53	7.93	**	7.31	8.06	***	7.54	8.05	***
Memage	34.86	33.41	**	37.35	36.48		38.65	38.41	
Childn	1.37	0.94	***	1.13	0.85	***	1.12	0.72	***
Memedu	7.57	8.21	***	7.41	8.35	***	7.61	8.53	***
Committee	2.46	2.65		2.83	2.01	***	2.73	2.14	***
Pschool	1.69	2.11		1.79	1.54	**	1.97	1.77	
Ethnicity	0.401	0.160	***	0.413	0.169	***	0.457	0.146	***
Land	6379	8345	*	7583	7777		7612	7714	
Observations	414	1698		288	1824		363	1749	

Note: *** $P < 0.01$, ** $P < 0.05$, * $P < 0.10$. All variables are explained in Appendix A1.

Source: Authors' dataset and calculations.

The descriptive statistics also reveal that non-poor households have more connections with local government compared to poor households. Although non-poor households join more social unions, there is no significant difference in the number of union memberships per capita within the household between two groups. We also find no significant difference in the proportion of social expenditures to total income. In terms of the characteristics used to assess households for poverty identity under national guidelines, as expected, poor households are more likely to have a female household head, be in an ethnic minority group, and have more dependent members (elderly people, disabled people, and children under 15 years). In relation to the criteria used by local officials in the assessment of households (Mai and Lebailly 2013), the statistics show that

households identified as poor have poorer living conditions with fewer durable goods, are more likely to be split families, and are more vulnerable to natural shocks.

Of importance for our identification strategy is the extent of within-household variation in poverty identity and political and social connections over the time frame of our analysis. Between 2008 and 2010, 5 per cent of households in our sample obtain the poverty identity whereas 11 per cent move from having the poverty identity in 2008 to not having it in 2010. The corresponding proportions for the change between 2010 and 2012 are 9 and 5 per cent, respectively. For the variation in political connections, we find that 19 per cent of households become politically connected between 2008 and 2010 while 15 per cent lose their political connections. Between 2010 and 2012 the proportions are 13 and 21 per cent, respectively. This variation can be attributed to turnover in positions as a result of illness, death, or retirement/removal from positions and of the 2011 election in Vietnam which resulted in changes to the People's Council and People's Committee at a provincial level and to the Commune Survey Board. The main social networks variable is the proportion of total expenditure spent on social occasions, which has an average within-household standard deviation of 4 per cent of total expenditure for the period 2008–12.

Although the inclusion of household fixed effects and time-varying control variables eliminates many potential sources of endogeneity, our analysis is based on observational data and so we do not observe the counterfactual outcome; that is, whether politically connected households would be classified as poor if they did not have such connections. In addition, exploring the role of political connections does not easily lend itself to an experimental design. To further refine our identification strategy, for our second regression model we use propensity score matching to select a control group of households. These are households that are not politically connected but are identical in every other observable way to households that are.⁶ The treatment variable we use is whether the household gained a political connection in 2010 or 2012; in other words, we do not consider households that had a political connection in 2008 as a treated household for the purpose of selecting the matched sample. Using propensity score matching we find nearest neighbours to these connected households on the basis of a range of economic and social characteristics in 2008.⁷ Matching households on the basis of their characteristics prior to obtaining a political connection ensures that the variables used for matching are not themselves influenced by being politically connected. We choose variables that can simultaneously affect being politically connected and being classified as poor. These include household characteristics (household size, ratio of female to male members, number of dependent members, living conditions, etc.), income from specific sources (agriculture, wage work, common property resources, etc.), assets (durable goods, savings and loans), vulnerability to external shocks, and indicators of social capital. We use the nearest-neighbour algorithm and sample without replacement so that each control household is used only once in the matching.⁸ Using this approach all balancing tests are satisfied (see Appendix A2) and all treatment households are within the common support. The sample we use for this part of the

⁶ This approach requires that the conditional independence assumption holds in that all variables that simultaneously affect being politically connected and being classified as poor are observed. We cannot rule out the possibility that there is bias due to unobservables using this approach.

⁷ Given that we have a single binary treatment outcome we use a probit model to estimate the propensity scores. Using a logit model yields a similar matched sample (90 per cent of matches are the same) and leads to the same results in the second stage. Results are not presented but are available on request.

⁸ As a robustness check we apply a range of different tolerance levels on the maximum propensity score distance. We consider distances ranging from 0.1 to 0.001. The proportion of matches that are the same as when using the basic nearest-neighbour approach ranges from 89 to 72 per cent. Moreover, using these alternative samples leads to very similar results in the second stage. Results are not presented but are available on request.

analysis consists of 1106 households, 553 with political connections and 553 without. The full panel of matched households therefore consists of 3312 observations.

4 Results

Table 2 presents the results for the baseline model of poverty identity given in Equation (7) for the full sample of households. The model is estimated using household fixed effects and so the identification of the relationship between political and social connections and poverty identity comes from the within-household variation in poverty identity and connections over time, controlling for all time-invariant household characteristics and all time-variant observable characteristics. Results for the baseline specification, excluding political and social connections, and for the control variables are presented in Appendix A3. Although our interest lies specifically in the impact of political and social connections, it is important to highlight that the results for the control variables are as expected. They show that the living conditions of poor households are worse than those of other households; they tend to have fewer assets, have lower income levels, and are more vulnerable to natural shocks. It is also interesting to note that indicators that capture the criteria set out in national policy and factors that form part of the local assessment criteria for poverty identification are not found to be statistically significant.

Table 2: Poverty identity, political connections, and social connections—full sample

	(1)	(2)	(3)	(4)
Political connections (PC) indicators				
General PC	0.015 (0.010)			
PC: HH member		0.016 (0.020)		
PC: relative		0.018 (0.011)		
PC: friends		0.005 (0.011)		
PC: district			-0.011 (0.013)	
PC: commune			0.019* (0.012)	
PC: village			0.012 (0.015)	
PC: HH member + district				0.003 (0.030)
PC: relative + district				0.002 (0.017)
PC: friend + district				-0.020 (0.016)
PC: HH member + commune				0.007 (0.031)
PC: relative + commune				0.027* (0.014)
PC: friend + commune				0.011 (0.014)
PC: HH member + village				0.017 (0.025)
PC: relative + village				0.012 (0.023)
PC: friend + village				0.020 (0.026)
Social connections indicators				
Social network	0.030 (0.032)	0.030 (0.032)	0.031 (0.031)	0.031 (0.031)
Membership per capita	-0.029 (0.032)	-0.030 (0.032)	-0.030 (0.032)	-0.031 (0.032)
Women's union	0.012 (0.010)	0.011 (0.010)	0.011 (0.010)	0.011 (0.010)
Farmer's union	-0.005 (0.013)	-0.005 (0.013)	-0.005 (0.013)	-0.005 (0.013)
Veteran's union	0.015 (0.016)	0.015 (0.016)	0.015 (0.016)	0.015 (0.016)
Observations	6309	6309	6309	6309
R-squared	0.034	0.034	0.034	0.035
Number of HHs	2112	2112	2112	2112

Note: Robust standard errors clustered at the household level are presented in parenthesis. *** $P < 0.01$, ** $P < 0.05$, * $P < 0.10$. Each model includes time-varying household control variables and household fixed effects. All variables are explained in Appendix A1.

Source: Authors' dataset and calculations.

Turning to the main results presented in Table 2 we include a range of indicators of the extent of political connectedness of households. While we do not find any evidence that political connections in general, and with different relations, impact poverty identity (columns (1) and (2)), we find that households with political connections at the commune level are significantly more

likely to be classified as poor. More specifically, we find that households that have relatives holding positions in commune level government are more likely to have the poverty identity (column (4)). These results suggest that political connections may play an important role in the poverty classification process, specifically, political connections with relatives at the commune level. Our measures of social connections include the proportion of spending on social activities to total income and indicators for membership in social unions. None of these variables, however, are found to be well determined.

As discussed in Section 3, because our study does not lend itself to an experimental design, we use propensity score matching to select a more appropriate control group for comparing outcomes rather than using the sample as a whole. A detailed description of how the sample was matched is provided in Section 3. The results of the main specifications using the matched sample are presented in Table 3.⁹

Table 3: Poverty identity, political connections, and social connections—matched sample

	(1)	(2)	(3)	(4)
Political connections (PC) indicators				
General PC	0.024 (0.016)			
PC: HH member		-0.003 (0.038)		
PC: relative		0.048** (0.019)		
PC: friends		-0.005 (0.019)		
PC: district			-0.009 (0.024)	
PC: commune			0.039** (0.018)	
PC: village			-0.011 (0.026)	
PC: HH member + district				-0.081 (0.138)
PC: relative + district				0.047 (0.033)
PC: friend + district				-0.045 (0.028)
PC: HH member + commune				-0.022 (0.065)
PC: relative + commune				0.065*** (0.023)
PC: friend + commune				0.004 (0.023)
PC: HH member + village				0.028 (0.045)
PC: relative + village				-0.012 (0.037)
PC: friend + village				-0.002 (0.039)
Social connections indicators				
Social network	0.006 (0.056)	0.008 (0.057)	0.004 (0.056)	0.006 (0.056)
Membership per capita	-0.013 (0.040)	-0.013 (0.041)	-0.012 (0.040)	-0.013 (0.040)
Women's union	0.001 (0.015)	0.000 (0.015)	0.000 (0.015)	-0.001 (0.015)
Farmer's union	0.004 (0.017)	0.004 (0.017)	0.004 (0.017)	0.004 (0.017)
Veteran's union	0.015 (0.022)	0.016 (0.022)	0.014 (0.022)	0.016 (0.022)
Observations	3312	3312	3312	3312
R-squared	0.031	0.032	0.032	0.034
Number of HHs	1106	1106	1106	1106

Note: Same as for Table 2.

Source: Authors' dataset and calculations.

Having relatives working in local government and having political connections at the commune level are significant in determining poverty identity; specifically, whether the household has relatives working in commune level government are positive and well determined. These corroborate our findings from Table 2 and show that even when we condition on similar households, political connections play a vital role in the poverty identification process. In

⁹ Results for the control variables are not presented but are available on request. They are very similar to those found for the baseline model.

particular, having relatives working in commune level government is the main driving force behind the relationship between political connections and poverty identity.¹⁰

These results are consistent with the conceptual framework, set out in Section 2, which suggests that there is scope for political corruption in decentralized systems for allocating public transfers. The mechanism we propose is that where households are politically connected, in particular where connections are through close ties, the probability of detection where ineligible households are classified as poor is low. Moreover, connections are more likely to play a role at the level of government where local officials have the power to make important decisions; that is, in this case, at the commune level where the final decisions on the identification of poor households are made.

Our model also suggests that social connections may play a role in this process by reducing the probability of detection. We do not find any statistically significant effect of our social connections indicators on poverty identity (see Table 3). The mechanism that we propose in our model is that social expenditures reduce the probability of members of the local community objecting to or reporting an ineligible household being given the poverty identity. Given that the list of households classified as poor is published at the village level to ensure fairness and reliability of the process, it pays for households to be well connected socially to ensure that there are no such objections. If this is the case we would expect social expenditures to be important for politically connected households that obtain the poverty identity. To explore this possibility we re-estimate the baseline model including an interaction term between social expenditures and the indicators for political connections that are found to be of importance. The results are presented in Table 4.¹¹

In all cases, the interaction terms are positive and well determined. This suggests that the impact of political connections on poverty identity increases with the level of social spending of households and that the mechanism through which social spending impacts the poverty identification process is by reducing the probability of a politically connected household that receives the poverty identity being reported by neighbours. These results also rule out the possibility of social connections having an effect through some other mechanism (such as, for example, being used to influence the vote at the selection meeting or through the provision of information), given that the level effect of social connections does not have an independent effect on poverty identity.

¹⁰ We also compare near-poor households below the national poverty line but not classified as poor with households below and above the poverty line identified as poor. We find that political connections are statistically significant in this reduced sample. Results are not shown but are available on request.

¹¹ Results are based on a comparison of households classified as poor with matched counterparts using the full sample to select control households. The results for the full sample are similar and lead to the same conclusions. Results are not shown but are available on request.

Table 4: Poverty identity, political connections, and social connections interactions—matched sample

	(1)	(2)	(3)	(4)
Interaction term	Social network × PC general	Social network × PC relative	Social network × PC commune	Social network × PC relative + commune
Interaction	0.266** (0.131)	0.397** (0.183)	0.263* (0.140)	0.439** (0.197)
Political connections (PC) indicators				
General PC	0.017 (0.016)			
PC: HH member		0.000 (0.038)		
PC: relative		0.041** (0.019)		
PC: friends		-0.007 (0.019)		
PC: district			-0.005 (0.024)	
PC: commune			0.030 (0.019)	
PC: village			-0.010 (0.026)	
PC: HH member + district				-0.078 (0.137)
PC: relative + district				0.048 (0.033)
PC: friend + district				-0.043 (0.028)
PC: HH member + commune				-0.018 (0.066)
PC: relative + commune				0.056** (0.023)
PC: friend + commune				0.002 (0.023)
PC: HH member + village				0.029 (0.045)
PC: relative + village				-0.011 (0.037)
PC: friend + village				0.000 (0.039)
Social connections indicators				
Social network	-0.018 (0.055)	-0.009 (0.054)	-0.018 (0.055)	-0.008 (0.054)
Membership per capita	-0.017 (0.041)	-0.017 (0.041)	-0.016 (0.041)	-0.014 (0.041)
Women's union	0.002 (0.015)	0.001 (0.015)	0.002 (0.015)	0.000 (0.015)
Farmer's union	0.003 (0.017)	0.002 (0.017)	0.003 (0.017)	0.003 (0.017)
Veteran's union	0.013 (0.021)	0.014 (0.021)	0.013 (0.021)	0.014 (0.021)
Observations	3312	3312	3312	3312
R-squared	0.033	0.035	0.034	0.036
Number of HHS	1106	1106	1106	1106
F-statistic ¹	4.81	5.82	4.62	6.50
P-value	0.028	0.016	0.032	0.011

Note: Same as for Table 2. ¹ F-test of joint significance of political connections variables and interaction with social network.

Source: Authors' dataset and calculations.

In the final part of our analysis, we consider how households use their political connections. There are two possible underlying mechanisms. First, bureaucrats could provide households with information on the classification process that allows them to manipulate it. Second, a more direct corruption route would be one whereby bureaucrats attempt to influence the selection process by, for example, attempting to influence the vote at the selection meeting. The former is more likely to be the mechanism in the case of Vietnam. If a bureaucrat simply provides information to connected households his/her actions are less likely to be detected and are less punishable. Moreover, attempting to influence the voting process at the selection meeting is difficult for a bureaucrat given the make-up of the participants in the vote and the fact that ultimately the selection must be validated on the basis of the household survey data.

There is no way for us to observe how bureaucrats vote at the village meeting. We can, however, investigate whether there is evidence for the information channel using data on the ways in which households access information. The VARHS asks households about the main way in which they get information on government policy changes allowing them to select from a list of possible sources including relatives, friends, and neighbours; other social networks; official channels; and mass media. In our model, we include an indicator variable that measures whether households report relatives, friends, and neighbours as the main source of information on policy changes and interaction terms between this variable and the indicators of political connections. If the link

between political connections and poverty identity is driven by the information channel we expect this interaction term to be positive and well determined.

The results are presented in Table 5. We focus on the interaction between political connections in general, connections with relatives, connections with others in the commune, and connections with relatives within the commune, as these are the main types of political connections identified as being important in our analysis. In all cases, the interaction terms are positive and statistically significant and in most cases render the political connections variables insignificant. This suggests that the main mechanism through which political corruption impacts the poverty identification process is through the provision of information to relatives. We find no evidence of a significant interaction between political connections and the provision of information through other channels, nor do we find that the interaction between the provision of information through relatives/friends and political connections at other levels of governance matters in the poverty identification process. The results also hold when we include the interaction term between social expenditures and the political connections variables.¹² This is an important result from a policy perspective as it suggests that to improve transparency the use of political connections in the poverty identification process could be eliminated through the provision of detailed information on the process of poverty identification to all households. This is a very simple and easily implementable policy that could improve the effectiveness of poverty targeting and is an approach that has proven to be successful in other settings.¹³

Table 5: Poverty identity, political connections, and social connections—information channel and interactions—matched sample

	(1)	(2)	(3)	(4)
	PC general	PC relative	PC commune	PC relative + commune
Information	-0.040 (0.025)	-0.038 (0.023)	-0.035 (0.024)	-0.031 (0.022)
Information x PC variable	0.137*** (0.051)	0.167*** (0.056)	0.146** (0.061)	0.193*** (0.069)
Political connections (PC) indicators				
General PC	0.010 (0.016)			
PC: relative		0.029 (0.020)		
PC: commune			0.023 (0.019)	
PC: relative + commune				0.044* (0.023)
Social connections indicators				
Social network	0.004 (0.056)	0.006 (0.057)	0.002 (0.056)	0.005 (0.056)
Observations	3312	3312	3312	3312
R-squared	0.034	0.036	0.035	0.037
Number of HHs	1106	1106	1106	1106
F-statistic ¹	8.97	13.18	8.36	12.82
P-value	0.003	0.000	0.004	0.000

Note: Same as for Table 2. ¹ F-test of joint significance of political connections variables and interaction with information.

Source: Authors' dataset and calculations.

As a robustness check on all of our findings, we estimate all models using the full (unmatched) sample of data and find that all results hold. A potential threat to our identification strategy is that there may be an endogenous relationship between being identified as poor and political connections. It could be, for example, that through the classification process households become politically connected because of an increased level of contact with authorities. We explore this

¹² Results are available on request.

¹³ Reinikka and Svensson (2005) find evidence for a reduction in corruption in the allocation of public funds to schools in Uganda through a newspaper campaign that provided schools and parents with information to monitor the handling by local officials of grants for education programmes.

possibility by examining whether having the poverty identity has a lagged effect on political connections. The results are presented in Table 6 and show no significant positive correlation between being identified as poor and political connections in the subsequent period. This suggests that being classified as poor does not lead to households having closer ties with the local government.

5 Conclusion

In this paper, we investigated the potential for bureaucratic corruption in decentralized poverty-targeting programmes. We also considered the role of social connections in the poverty identification process, in particular as a means of avoiding detection and retribution at the local level. Our model is motivated by the decentralized system of identifying poor households for receipt of state benefits in Vietnam. We presented a conceptual framework that builds on standard models of bureaucratic corruption by considering how political and social connections might influence the targeting of poor households.

Using a rich panel dataset that allowed us to control for time-invariant household characteristics through the use of household fixed effects we found that political connections play a vital role in the poverty classification process. This result holds when households identified as poor are compared against the full sample and also when politically connected households are matched to nearest neighbours on the basis of observable household characteristics. Political connections with relatives in positions in commune level government are particularly important. In terms of social connections, we found that expenditures on improving social relationships are important for politically connected households that receive the poverty identity.

Our results are consistent with our proposed conceptual framework which suggests that decentralized systems for allocating benefits are open to corruption and that the extent of corruption is greater where important decisions are made and where the probability of detection is lowest. In the case of Vietnam, this is at the commune level—the most decentralized level of government—and where connections are with relatives. Our empirical analysis identified the provision of information as the main mechanism through which households use political connections to obtain the poverty identity. This suggests that an information campaign at the grassroots level which provides all households with detailed information on the conditions for poverty identification and on the process involved could be effective in eliminating corruption in poverty-targeting programmes.

Table 6: Political connections and lagged poverty status

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	PC	PC: HH member	PC: relative	PC: friends	PC: district	PC: commune	PC: village	PC: HH member + district
L.dpoor	0.000 (0.049)	0.012 (0.017)	-0.087** (0.040)	0.029 (0.041)	0.029 (0.028)	-0.006 (0.044)	-0.012 (0.028)	-0.006 (0.005)
Observations	2212	2212	2212	2212	2212	2212	2212	2212
R-squared	0.000	0.000	0.004	0.000	0.001	0.000	0.000	0.001
Number of HHs	1106	1106	1106	1106	1106	1106	1106	1106
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	PC: relative + district	PC: friend + district	PC: HH member + commune	PC: relative + commune	PC: friend + commune	PC: HH member + village	PC: relative + village	PC: friend + village
L.dpoor	0.000 (0.022)	0.035* (0.020)	0.012 (0.011)	-0.058* (0.033)	0.017 (0.037)	0.006 (0.012)	-0.017 (0.019)	0.000 (0.020)
Observations	2212	2212	2212	2212	2212	2212	2212	2212
R-squared	0.000	0.003	0.001	0.003	0.000	0.000	0.001	0.000
Number of HHs	1106	1106	1106	1106	1106	1106	1106	1106

Note: Robust standard errors clustered at the household level are presented in parenthesis. *** $P < 0.01$, ** $P < 0.05$, * $P < 0.10$.

Source: Authors' dataset and calculations.

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Appendices

Appendix A1 Definition of variables used for estimation and matching

Variable name	Definition
Political connections (PC) indicators	
General PC	Whether the household has political connections in general
PC: HH member	Whether the household has members holding positions in local government
PC: relative	Whether the household has relatives holding positions in local government
PC: friends	Whether the household has friends holding positions in local government
PC: district	Whether the household has connection with district level government
PC: commune	Whether the household has connection with commune level government
PC: village	Whether the household has connection with village level government (mass organizations)
PC: HH member + district	Whether the household has members holding positions in district level government
PC: relative + district	Whether the household has relatives holding positions in district level government
PC: friend + district	Whether the household has friends holding positions in district level government
PC: HH member + commune	Whether the household has members holding positions in commune level government
PC: relative + commune	Whether the household has relatives holding positions in commune level government
PC: friend + commune	Whether the household has friends holding positions in commune level government
PC: HH member + village	Whether the household has members holding positions in mass organizations
PC: relative + village	Whether the household has relatives holding positions in mass organizations
PC: friend + village	Whether the household has friends holding positions in mass organizations
Social connections indicators	
Social network	Proportion of social expenditures to total income
Membership per capita	Average number of memberships in social unions per capita
Women's union	Whether the household has members join the women's union
Farmer's union	Whether the household has members join the farmer's union
Veteran's union	Whether the household has members join the veteran's union
Control variables for regressions	
Married_h	Whether the household head is married or not
HH size	Size of the household
Ill member (%)	Proportion of ill household members
Disabled member (%)	Share of disabled household members
Alcoholism	Whether the household has member involved in alcoholism
Flush toilet	Whether the household has flush toilet (with septic tank or sewage pipes)
Clean water	Whether the main source of water is clean tap water
Log net income	Natural logarithm of net income in the last 12 months
Log total saving	Natural logarithm of total savings
Log durable goods	Natural logarithm of the value of all durable goods
Natural shocks	Whether the household suffered from natural shocks in the last two years
Gender_h	Gender of household head
Age_h	Age of household head
Egrade_h	Educational level of household head
Mmage	Average age of all household members
Childn	Number of children under 15 years
Memedu	Average education level of household members
Committee	Distance from household to People's Committee Office
Pschool	Distance from household to primary school
Ethnicity	Whether the household is of Kinh ethnicity
Land	Total area of land the household has the right to manage
Additional variables for propensity score matching	
lwage	Natural logarithm of wage income
lagri	Natural logarithm of agriculture income
lproperty	Natural logarithm of income from common property resources
larent	Natural logarithm of rental income
lasale	Natural logarithm of income from sales of assets
Inonfarm	Natural logarithm of non-farm and non-wage income
lprtrans	Natural logarithm of income from private transfers
lotherin	Natural logarithm of other income
lfoodexp	Natural logarithm of food expenditure in the last four weeks

Source: Authors' dataset and calculations.

Appendix A2

Balancing tests

Table A1: Propensity score matching of politically connected (treated) households

Variable	Unmatched			Matched		
	Treatment	Control	Significance	Treatment	Control	Significance
Social connections indicators						
Social network	0.032	0.032		0.032	0.030	
Membership per capita	0.236	0.255		0.236	0.233	
Women's union	0.354	0.334		0.354	0.383	
Farmer's union	0.262	0.190	***	0.262	0.255	
Veteran's union	0.146	0.071	***	0.146	0.110	*
Control variables for regressions						
Married_h	0.853	0.794	***	0.853	0.850	
HH size	4.658	4.437	**	4.658	4.642	
Ill member (%)	0.100	0.087		0.100	0.085	
Disabled member (%)	0.011	0.010		0.011	0.010	
Alcoholism	0.293	0.368		0.293	0.278	
Flush toilet	0.137	0.137		0.137	0.141	
Clean water	0.121	0.118		0.121	0.136	
Log net income	9.844	9.634	***	9.844	9.810	
Log total saving	4.494	3.977	**	4.494	4.383	
Log durable goods	8.378	7.732	***	8.378	8.283	
Natural shocks	0.472	0.379	***	0.472	0.459	
Gender_h	0.814	0.767	**	0.814	0.810	
Age_h	51.361	51.415		51.361	50.584	
Egrade_h	7.948	7.581	**	7.948	8.094	
Mamage	34.411	34.766		34.411	33.557	
Childn	1.018	1.065		1.018	1.081	
Memedu	8.171	7.824	***	8.171	8.231	
Committee	2.313	2.251		2.313	2.340	
Pschool	1.548	1.610		1.548	1.561	
Ethnicity	0.244	0.216		0.244	0.226	
Land	9226	6792	***	9226	7969	
Additional variables for propensity score matching						
lwage	4.660	4.896	***	4.660	4.741	
lagri	8.208	7.827	***	8.208	8.202	
lproperty	2.068	2.291		2.068	2.132	
larent	0.032	0.023		0.032	0.036	
lasale	0.471	0.426		0.471	0.540	
Inonfarm	2.403	2.586		2.403	2.526	
lprtrans	2.202	2.495		2.202	2.062	
lotherin	0.374	0.280		0.374	0.305	
lfoodexp	6.021	5.824	***	6.021	6.020	
Observations	576	1536		553	553	
LR test of joint insignificance of all regressors	LR χ^2 : 104.32; <i>P</i> -value: 0.000; reject null			LR χ^2 : 15.43; <i>P</i> -value: 0.998; do not reject null		

Note: *** $P < 0.01$, ** $P < 0.05$, * $P < 0.10$.

Source: Authors' dataset and calculations.

Appendix A3

Baseline specification and control variable results

Table A2: Poverty identity and household characteristics—full sample

	(1)	(2)	(3)	(4)	(5)
	Baseline	General PC	PC_type	PC_level	Specific PC
Control variables for regressions					
Married_h	-0.036 (0.029)	-0.041 (0.029)	-0.042 (0.029)	-0.040 (0.029)	-0.041 (0.029)
HH size	-0.002 (0.008)	-0.002 (0.008)	-0.002 (0.008)	-0.002 (0.008)	-0.002 (0.008)
Ill member (%)	0.016 (0.027)	0.013 (0.027)	0.013 (0.027)	0.013 (0.027)	0.013 (0.027)
Disabled member (%)	0.079 (0.061)	0.079 (0.061)	0.080 (0.061)	0.079 (0.061)	0.079 (0.061)
Alcoholism	0.001 (0.011)	0.001 (0.011)	0.001 (0.011)	0.001 (0.011)	0.000 (0.011)
Flush toilet	-0.037*** (0.010)	-0.039*** (0.010)	-0.039*** (0.010)	-0.038*** (0.010)	-0.038*** (0.010)
Clean water	-0.033** (0.014)	-0.031** (0.014)	-0.031** (0.014)	-0.032** (0.014)	-0.031** (0.014)
Log net income	-0.017*** (0.006)	-0.021*** (0.007)	-0.021*** (0.007)	-0.021*** (0.007)	-0.021*** (0.007)
Log total saving	-0.003** (0.001)	-0.003** (0.001)	-0.003** (0.001)	-0.003** (0.001)	-0.003** (0.001)
Log durable goods	-0.014*** (0.005)	-0.015*** (0.005)	-0.015*** (0.005)	-0.015*** (0.005)	-0.014*** (0.005)
Natural shocks	0.031*** (0.010)	0.031*** (0.010)	0.031*** (0.010)	0.031*** (0.010)	0.031*** (0.010)
Gender_h	-0.010 (0.036)	-0.009 (0.036)	-0.008 (0.036)	-0.010 (0.036)	-0.010 (0.036)
Age_h	0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)	0.000 (0.001)
Egrade_h	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)
Memage	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Childn	0.005 (0.011)	0.004 (0.011)	0.004 (0.011)	0.005 (0.011)	0.005 (0.011)
Memedu	-0.008* (0.005)	-0.008* (0.005)	-0.008* (0.005)	-0.008* (0.005)	-0.008* (0.005)
Committee	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)
Pschool	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)
Ethnicity	0.041 (0.074)	0.043 (0.074)	0.041 (0.074)	0.041 (0.074)	0.038 (0.074)
Land	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Year 2010	-0.033*** (0.010)	-0.032*** (0.010)	-0.032*** (0.010)	-0.032*** (0.010)	-0.032*** (0.010)
Year 2012	0.032** (0.013)	0.038*** (0.014)	0.039*** (0.014)	0.037*** (0.014)	0.038*** (0.014)
Constant	0.579*** (0.118)	0.616*** (0.125)	0.615*** (0.125)	0.613*** (0.125)	0.616*** (0.125)

Note: Robust standard errors clustered at the household level are presented in parenthesis. *** $P < 0.01$, ** $P < 0.05$, * $P < 0.10$. Each model includes household fixed effects.

Source: Authors' dataset and calculations.