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How does joint evolution of social trust and land administration shape economic outcomes?

Evidence from Vietnam

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Abstract: This paper examines how the interaction of social trust and institutions, such as land administration, affects household economic decisions in Vietnam. Using a panel dataset of rural households from 2008 to 2014, we show that negative consequences of the duration of land administration on credit access, agricultural investment, and land use rights have been mitigated in communes with higher level of trust. These results support the view that trust complements formal institutions.

Keywords: Trust, land administration, agricultural investment, Vietnam

JEL classification: Z13, O13, K4, O53

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1 Introduction

A large body of empirical evidence shows that formal institutions, such as those underpinning property right protections or the legal system, play important roles in determining economic outcomes (Acemoglu et al., 2001; LaPorta et al., 1998). Another strand of literature emphasizes the aggregate effects of culture, such as trust or social capital (Glaeser et al., 2007; Tabellini, 2008). While much progress has been made in isolating the importance of trust and institutions, we do not know much about how they jointly affect development (Alesina and Giuliano, 2015). Depending on the economic environment and initial conditions, trust and institutions might complement each other, or might act as substitutes, contrasting each other and limiting their combined ability to promote economic growth (Bisin and Verdier, 2017).

Recently, Miguel et al. (2015) investigated the joint interaction of political institutions and social trust in determining the provision of public goods in Chinese villages. The authors argue that elections in Chinese villages are more effective at choosing politicians who provide more public goods in villages where generalized trust is high relative to personalized trust. The main result is that elections have very little effect in villages with low social trust and a big effect in villages with high social trust.

The primary objective of this paper is to complement recent studies that try to understand the joint effects of trust and institution on economic outcomes in a developing country. Viet Nam offers an attractive setting to study these effects. Unlike many other developing countries, Viet Nam has experienced exceptional per capita income growth in the last three decades, accompanied by fundamental but gradual social changes without large-scale social or political upheavals. However, the rate of this economic growth cannot be explained by the quality of formal institutions as Viet Nam ranks poorly on international tables such as Polity IV and the Governance Indicator. One explanation is that weak formal institutions are likely to be supplemented by strong informal institutions (Dang, 2012). For instance, the World Value Surveys show that the Vietnamese national level of social trust is higher than some other East Asian nations at the same stage of economic development (Dalton and Ong, 2005).

We examine the hypothesis that social trust complements the effectiveness of land administration, which is considered as one of the main factors affecting agricultural investment decisions and access to credit by rural households. To test this hypothesis, we use panel data from the Viet Nam Access to Resources Household Survey in 2008–14 to investigate whether trust and land administrative procedures have joint effects on household economic outcomes.

There are difficulties in empirically determining whether land administration and social trust are complements or substitutes. Trust is correlated with other factors that could influence how land administration can affect household decisions. To address this, we document the correlates of land administration (such as political connections) and directly control for the interaction of each correlate and land administration in the baseline specification. We also provide a large set of robustness tests to rule out the potentially confounding influence from other factors such as households head characteristics, income and the demographic composition of communes.

The results reveal that for households with high trust, the effects of land administration have less negative impacts on their investment in agricultural land, especially soil investment, compared to those with lower trust. Higher-trust households tend to invest more on agricultural land compared to low-trust households where household head are male. The joint effects of social trust and quality of land administration also have positive effects on land-use right certification and access to

informal loans. The results also confirm the hypothesis that social capital such as trust and institutions such as land administration are complementary. They provide strong and novel empirical evidence that culture can play an important role in determining the success of improvements in formal institutions.

This study makes several contributions to the literature. To the best of our knowledge, this paper is one of the few studies that provide rigorous empirical evidence on the interaction effect of trust and formal institutions. This study complements the findings from recent studies that have shown the joint effects of culture and institutions on economic development (such as Guiso and Pinotti, 2012; Nannicini et al., 2010; Miguel et al., 2015). Our study contributes to the existing evidence by directly examining land administration and its effect on household outcomes. We also add to studies that find generalized trust to be an important determinant of economic outcomes (for example, Aghion et al., 2010; Alesina and La Ferrara, 2002; Algan and Cahuc, 2010).

The paper is organized as follows. We begin in section 2 by describing the characteristics of trust and land administration in Viet Nam. Section 3 illustrates the conceptual framework. Section 4 discusses our data, along with descriptive analyses of trends in trust and land administration variables. In section 5, we present the empirical strategy. Section 6 presents estimation results. Section 7 summarizes the key findings and concludes.

2 Characteristics of trust and land administration in rural Viet Nam

2.1 Land administration in Viet Nam

There have been many changes in land policy over the last 30 years. Resolution 10 of the Party in 1988 is a milestone policy of the agriculture reform which expanded the implementation of the "package-contract" scheme in which all means of production (land and equipment) were handed back to farmers instead of cooperatives. The land law enacted in 1993 enables farmers to entitle to long-term agricultural land assignment (20 years) through the issuance of land use certificates (LUCs). This law allowed farmers to not only cultivate on their assigned land but also trade, transfer, rent or inherit the land use right. In 2003, the land law was revised another time with its focus on regulating land area limits and land use terms of farmer households and setting the government land price frame. Most recently, in 2013 this law was amended to increase area limits of land trading and land use terms per household. Therefore, land rights, including the right to sell, rent, mortgage, exchange, and bequest a plot of land, were guaranteed through LUCs and have been gradually reinforced and refined through various amendments to the Land Law. These developments are often recognized as an important determinant of rural economic growth in Viet Nam (Pingali and Xuan, 1992; Rozelle and Swinnen, 2004; Deininger and Jin, 2008; Do and Iyer, 2008; Kompas et al., 2012, Newman et al., 2015).

Although many legislation reforms have been implemented, some studies show that households cannot fulfil all their land property rights and the rights are not always well protected (Markussen, 2017). For example, Markussen et al. (2011) show that many households face some restrictions on crop choice, and more specifically Giesecke et al. (2013) document the fact that rice households who cannot change their land use purpose to other crops because of food security reasons reduce their production productivity. Khai et al. (2013) also indicate that while the efficiency of land market transactions has been improved they are still immature in many regions of Viet Nam.

The government system in Viet Nam consists of both the central government based in Ha Noi and local governments, which comprise of three levels: provincial, district and communal.

Accompanying legislation reform, the power of land management has been decentralized to lower levels of government. This has classified clearer power and mandates at different government levels, helping local governments to better manage land. Specifically, the land use designation (*lap quy hoach*) and planning (*lap ke hoach*) is prepared at three levels: national, provincial, and district. Land use plans, developed every 5 years for national and provincial level and every year for district level, are issued by the Ministry of Natural Resources and Environment (MONRE) after the approval of the Government and the National Assembly based on a 10-year land use designation, 5-year socio-economic development plan, the land demand of different sectors, and the performance of the land use plan implementation in the previous term. Following the approval of land-use planning and plans, the communal People's Committees decide limits for land allocation, leasing and reclamation and to issue a land price frame in accordance with general regulations by the central governments (Le et al. 2015). As the lowest level of the administrative system, communes are responsible to manage, use and exploit public lands, and to update and store information relating to any changes in their territory. Land users can exploit their land by their own decision but are not allowed to change the land use purpose/land use categories regulated in land use plans without the approval of MONRE and provincial authorities who are responsible for the monitoring and evaluation of the land use plan implementation in practice.

As such, commune governments play a crucial role in the security of property rights. This is most evident in their role in the State issuance of LURCs. While the process of issuing LURCs to millions of land users progressed with impressive speed and without obvious signs of widespread abuse by local authorities in the 1990s, current management of LURC issuance is widely perceived to be highly affected by corruption (World Bank, 2009; Anderson and Davidsen, 2011). Land administration in Viet Nam found that incomplete and unclear information about administrative procedures was made available to the public. It also noted that the processes for issuing property rights and certificates were complicated and expensive. Therefore, as Markussen and Tarp (2014) point out there is a risk of land reclamation by local government and household's land investment depends on their informal relationship with local government officials.

2.2 Social trust in Viet Nam

Trust is an important factor in both individual and household social capital. For example, trust can enable people's engagement in potentially profitable business with (trusted) strangers. Trust within a community may facilitate economic cooperation with their partners that benefits all in the long term. Individuals that live in societies with a high level of trust are more likely to divert fewer resources to purchasing protection such as paying bribes (Knack and Keefer, 1997). In countries that may lack formal institutions, generalized trust could substitute for such institutions as a second-best solution.

Dalton and Ong (2005) show that Vietnamese levels of social trust are higher than some other East Asian nations at the same stage of economic development. Dang (2012) shows that rural households in Viet Nam living in a high-risk environment have evolved a series of institutions which serve to reduce individual insecurity. This is accomplished by spreading risk-taking over a group larger than the nuclear family, such as the extended family and the corporate community. By choosing to cooperate with other members, trust amongst village members increases.

3 Conceptual framework

There are several potential mechanisms through which land administration and trust might influence land market development, investment in agriculture, and access to credit by rural households.

First, transaction costs play an important role in land market development. High transaction costs in land markets originate from insecure land rights and low levels of trust. Formal land laws and regulations may be an important factor in reducing the cost of transactions. Where land regulations are insufficient, trust also helps reduce transaction costs in land markets as the costs of acquiring information, and negotiating and enforcing contracts tend to be much lower. In these cases, high trust may complement weak land administration.

Second, better land administration might make investors feel more secure in investing in agricultural land. Longer processing time and slower issuance of land use rights may exacerbate household fears of expropriation or loss of control of land on which investments would be made, potentially deterring such investment.

Third, access to credit might be hindered if land use rights are not sufficiently defined for land to serve as collateral for loans. At the same time, although the legal system can enforce financial contracts, without trust it would be costly to involve courts in financial transactions. Trust can complement land use rights as a form of collateral that helps households access to credit.

4 Data sources and description

This study exploits a four-wave household panel dataset that was collected in the Vietnam Access to Resources Household Survey (VARHS) from 2008 to 2014. The VARHS is a panel survey, conducted in the rural areas of 12 provinces in Viet Nam every second year. The VARHS re-interviewed rural households sampled for the income and expenditure modules of the 2004 Vietnam Household Living Standards Survey (VHLSS). The VARHS collects a broad range of detailed information about economic and social aspects of the lives of households in rural areas, such as rural employment, on- and off-farm income generating activities, rural enterprises, property rights, savings, investment, insurance, participation in formal and informal social networks, and land investment.

The VARHS also includes a commune questionnaire that asks information on the general situation of the commune and demographic information. The commune questionnaire includes one module that asks about administrative procedures related to land use rights.

Attrition in the VARHS is fairly low with an overall attrition rate from 2008 to 2014 of seven per cent. A common reason for attrition is migration. Based on the responses from local authorities, two third of migrating households are believed to have migrants permanently, whereas one third is believed to have migrated temporarily.

Trust variables

The survey asks two standard questions about self-reported trust. The exact wording of the question is as follows: 'Please tell me whether in general you agree or disagree with the following statements: Most people are generally honest and can be trusted, and: In this commune one has to be careful, there are people you cannot trust?' Respondents could either agree or disagree. Since

respondents' answers to the trust questions are binary, we construct a measure of trust that takes on the binary value of 0 and 1, where 0 corresponds to the response 'Disagree' and 1 to the response 'Agree'. As shown in Table 2, there is a negative link between two trust scores.

In general, the level of trust in other people in the community of households decreased over time in the surveyed sample. The distributions of responses for each question are reported in Table 1. Based on the data in Table 1, in 2008, 92 per cent of the interviewed households agreed that most people are generally honest and can be trusted; however this fell to 87 per cent by 2014, a decrease of five percentage points since 2008. Even though people were becoming less confident in others, only 51 per cent of households in 2014 agreed that there are some people who cannot be trusted. This ratio was significantly lower than the level of 67 per cent in 2008.

Table 1. Descriptive statistics

VARIABLES	2008	2010	2012	2014
Days for land administration at commune levels	13.41	13.47	12.63	11.05
Most people can be trust:=1; w/o:=0	0.92	0.91	0.90	0.87
There are people you cannot trust:=1; w/o:=0	0.67	0.61	0.52	0.51
Log of total land investment	1.59	1.12	1.15	0.79
Log of investment in soil and irrigation investment	1.49	1.63	1.57	2.03
Log of investment in aquaculture	0.71	0.64	0.70	0.27
Log of investment in permanent structures	6.41	0.00	1.22	0.54
Share of commune land with land use rights	0.51	0.70	0.32	0.38
Share of household land with land use rights	0.67	0.60	0.69	0.70
Share of borrowing households with informal credit	0.25	0.24	0.28	0.29
Log of household income	10.58	11.12	10.88	10.97

Note: Prices are adjusted for inflation.

Source: Author's calculation from VARHS 2008–14.

Table 2. Pairwise correlation among main variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. Log of land investment	1										
2. Share of commune land with LUR	-0.01	1									
3. Share of HH land with LUR	-0.04*	0.25*	1								
4. Whether HHs have informal loans	-0.04*	-0.04*	-0.03*	1							
5. Days for land administration	0.004	-0.04*	-0.002	0.05*	1						
6. Most people can trust	-0.02	-0.004	-0.03*	-0.007	-0.01	1					
7. People cannot be trusted	-0.006	0.04*	0.01	0.05*	-0.03*	-0.21*	1				
8. Log of HH income	0.04*	0.11*	0.13*	-0.04*	-0.03*	-0.02*	0.14*	1			
9. HH members hold positions	0.06*	0.00	-0.01	-0.08*	0.00	0.01	0.09*	0.11*	1		
10. HH relatives hold positions	0.04*	0.02*	0.03*	0.00	-0.02*	0.01	0.05*	0.09*	0.11*	1	
11. HH friends hold positions	0.03*	-0.03*	0.03*	-0.03	-0.02	-0.01	0.05*	0.15*	0.21*	0.26*	1

Source: Authos' calculation from VARHS 2008–14.

Land administrative procedures

We use the number of days that the Commune Government takes to process an application for land transactions in the commune, such as sale, rental, exchange, or other type of transaction of land-use rights as a measure of quality of land administrative procedures. Table 1 indicates that the days for land administration have been shortened, decreasing from 13.4 days in 2008 to 11.05 days in 2014.

Agricultural land investment

Table 1 presents a summary on total value of cash investment in household agricultural land and three different types of land-related investment, including investments in soil and water conservation, structures for aquaculture (mainly ponds) and other structures, such as farm buildings, fences and animal sheds. The figures indicate that on average total investment in agricultural land in 2014 has declined and is lower than the past years mainly due to lower levels of investment in permanent structure. However, the soil investment shows an improvement in 2014 compared to those in the past years.

Table 1 also reveals that 26 per cent of households had an outstanding informal loan in 2008 and the proportion increases to 29 per cent in 2014. 70 per cent of rural households have land use right certificates in 2014, which is 3 percentage points higher than the proportion in 2008.

5 Empirical strategies

Our empirical strategy can be summarized by the following equation:

$$y_{ijt} = \alpha_1 Trust_{ijt} + \alpha_2 Land\_ad_{jt} + \alpha_3 (Trust_{ijt} \times Land\_ad_{jt}) + \beta\left(Land\_ad_{jt} \times X_{ijt}\right) + \tau_{ijt} + \delta_i + \rho_t + \varepsilon_{ijt} \quad (1)$$

where y_{ijt} is the level of outcome variables of household *i* in commune *j* during year *t* (which are agricultural land investment, land registration and access to credit). $Trust_{ijt}$ is the generalized trust by household *i* in commune *j* during year *t*. $Land\_ad_{jt}$ *is* the time for land administrative procedures in commune *j* at time *t*. $Trust_{ijt} \times Land\_ad_{jt}$ is the interaction effect of a dummy variable for trust at household levels, $Trust_{ijt}$, and the time for land administrative procedures at commune levels, $Land\_ad_{jt}$. X_{ijt} are household's political connections. τ_{ijt} are household and commune characteristics. δ_i, ρ_t are household and year fixed effects, respectively. Standard errors are clustered by commune.

α_2 captures the effect of land administration procedures for households with low trust, $Trust_{ijt}$ = 0, which is expected to have negative impacts on household outcomes ($\alpha_2 < 0$). $\alpha_2 + \alpha_3$ captures the effect of land administration procedures for households with high trust, $Trust_{ijt}$ = 1. We expect that trust and institutions, which are proxied by time for land administration procedures, are complementary, then the interaction effect will be positive, $\alpha_3 > 0$.

The challenge in estimating the Equation (1) is that there is potential endogeneity between outcomes variables and the interaction between trust and land administration. The source of this endogeneity could be due to omitted variable bias. It is possible that unobserved characteristics of the household or communes which are correlated with trust and land administration may affect household decisions. Using household-level fixed effects eliminates the potential for any time-invariant characteristics of households and communes to act as confounding factors in our analysis. Moreover, we also introduce the interaction of land administration variable with a vector of other social connections such as political connections, X_{ijt}. By controlling for the interaction of these potential correlates with land administration, we mitigate the possibility that the coefficient of interest is contaminated by the influence that these other correlates may have on the effect of the land administration. It is nevertheless possible that some omitted variable bias remains due to

unobserved time-varying household characteristics and so some caution should be exercised in interpreting the results as causal.

6 Results

Land investment

We now turn to estimating the joint effects of trust and land administration on agricultural land investment. Table 3 presents estimates of equation (1). To implement the log-linear version of equation (1) without dropping observations with zero-values on the dependent variables, we use ln(Land investment + 1) as our dependent variable. The values of investment are inflation-adjusted to reflect changes in prices over time. A number of unobservable household characteristics, such as entrepreneurial spirit, cognitive abilities and risk preferences are likely to affect both investment decisions and the trust and therefore may be a source of endogeneity bias. Household fixed effects account for these factors, to the extent that they are time-invariant. To check the potential effects of omitted varying variables, a number of control variables are included. In column (1), we include a few characteristics of the household head, namely age, gender, schooling and household incomes as controls. In column (2), we control for a larger set of variables. Table 2 shows that political connections are related to household land investment. We expect the level of land-related investment to depend on land administration. Therefore, we include both political connections and interaction of political connection and land administration in the regression in column (2). At the same time, households with better connections with officials may be more confident with investing (Markussen and Tarp, 2014). We also control for other commune characteristics such as number of households and number of poor households in communes. Moreover, year-fixed effects are included to take account of changes over time in the economic environment. The control variables are not presented for ease of exposition. Models in columns (3) and (4) have characteristics identical to columns (1) and (2), respectively, except that social trust is measured as an alternative indicator of trust.

Table 3. Effects of trust and land administration on household's land investment

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Log(Land investment+1)			
Trust X Days for land administration	0.019**	0.011		
	(0.008)	(0.008)		
Most people can be trust:=1; w/o=0	-0.676***	-0.596***		
	(0.174)	(0.172)		
Careful X Days for land administration			-0.013**	-0.013**
			(0.005)	(0.006)
There are people you cannot trust:=1; w/o=0			0.291**	0.297**
			(0.118)	(0.119)
Days for land administration	-0.017**	-0.008	0.011*	0.013**
	(0.008)	(0.009)	(0.006)	(0.006)
Observations	8,685	8,685	7,675	7,675
R-squared	0.019	0.020	0.019	0.021
Number of HH	2,708	2,708	2,697	2,697
Other controls	Yes	Yes	Yes	Yes
Other interacts	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes

Note: Standard errors, clustered at commune level, in parentheses. Other control variables are age of household head, gender, year of schooling, log of household income, an indicator for household has a relative who holds a position of public or bureaucratic responsibility, an indicator for household has a relative who holds a public position, an indicator for household has a member who holds a public position, an indicator for household has a friend who holds a public position, number of households in communes, number of poor households in communes. Other interacts includes interaction of time for land administration and indicator for household has a friend who holds a public position, interaction of time for land administration and indicator for household has a member who holds a public position, interaction of time for land administration and indicator for household has a relative who holds a public position. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation from VARHS 2008–14.

Models in columns (1) and (2) show strong and positive effects of trust and land administration on land-related investment. However, only the estimation in column (1) is statistically significant. They are consistent with the hypothesis that trust is complementary to land administration. The result in column (2) is not statistically significant but the magnitude of coefficient is almost identical to the one in column (1). The effects are also similar with the second measures of self-reported trust in columns (3) and (4). For the magnitude of the coefficients, holding other variables constant, compared to low trust households, a one-day increase in land administration results in high trust households increasing land investment by 0.13 per cent[1]. The magnitude of the coefficient also has a meaningful effect. Given that the average days of land administration is around 12.6, reducing 10 per cent of land administration results in an average of 1.6 per cent increase in land investment of high-trust people compared to low-trust ones.[2]

Along with examining the joint effect of social trust and land administration on land investment, we also investigate its impact on household's decision to invest. The results are reported in Table 4. Rather than the amount of land investment, the dependent variable is now a dummy variable,

[1] Given low variation of the first measure of social trust over time, we rely on the second measure of trust to evaluate the impacts of trust and quality of land administration on household outcomes.

[2] The magnitude is calculated as 1.26*0.013*100=1.26%

which takes value of 1 if households invest and 0 otherwise. Similar to the findings in Table 3, the key variables in columns (1) to (4) show that households with high trust have a higher probability to invest than ones with lower trust, although the estimates are only statistically significant in columns (2) and (4).

Table 4. Effects of trust and land administration on household's land investment

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Whether household has land investment			
Trust X Days for land administration	0.002	0.003*		
	(0.002)	(0.001)		
Most people can be trust:=1; w/o=0	-0.122***	-0.129***		
	(0.031)	(0.028)		
Careful X Days for land administration			-0.002	-0.002*
			(0.001)	(0.001)
There are people you cannot trust:=1; w/o=0			0.074***	0.076***
			(0.024)	(0.024)
Days for land administration	-0.000	-0.001	0.003***	0.003**
	(0.002)	(0.001)	(0.001)	(0.001)
Observations	8,685	8,685	7,675	7,675
R-squared	0.145	0.146	0.152	0.153
Number of HH	2,708	2,708	2,697	2,697
Other controls	Yes	Yes	Yes	Yes
Other interacts	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes

Note: Standard errors, clustered at commune level, in parentheses. Other control variables are age of household head, gender, year of schooling, log of household income, an indicator for household has a relative who holds a position of public or bureaucratic responsibility, an indicator for household has a relative who holds a public position, an indicator for household has a member who holds a public position, an indicator for household has a friend who holds a public position, number of households in communes, number of poor households in communes. Other interacts includes interaction of time for land administration and indicator for household has a friend who holds a public position, interaction of time for land administration and indicator for household has a member who holds a public position, interaction of time for land administration and indicator for household has a relative who holds a public position. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation from VARHS 2008–14.

Table 5 presents the effect of trust and land administration on household's land investment by gender. The main coefficients in all models have expected signs but are only statistically significant in column (4). The estimate in the last column shows that male household heads with higher trust tend to invest more than those with lower trust.

Table 5. Effects of trust and land administration on household's land investment by household head's gender

VARIABLES	(1)	(2)	(3)	(4)
	Dependent variable: Log (Land investment+1)			
	Female	Male	Female	Male
Trust X Days for land administration	0.018	0.013		
	(0.014)	(0.009)		
Most people can be trust:=1; w/o=0	-0.392	-0.689***		
	(0.280)	(0.188)		
Careful X Days for land administration			-0.004	-0.009*
			(0.012)	(0.005)
There are people you cannot trust:=1; w/o=0			0.006	0.200
			(0.173)	(0.132)
Days for land administration	-0.005	-0.011	0.008	0.009*
	(0.015)	(0.009)	(0.011)	(0.005)
Observations	1,578	7,107	1,413	6,262
R-squared	0.037	0.037	0.032	0.038
Number of HH	571	2,307	562	2,287
Other controls	Yes	Yes	Yes	Yes
Other interacts	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes

Note: Standard errors, clustered at commune level, in parentheses. Other control variables are age of household head, gender, year of schooling, log of household income, an indicator for household has a relative who holds a position of public or bureaucratic responsibility, an indicator for household has a relative who holds a public position, an indicator for household has a member who holds a public position, an indicator for household has a friend who holds a public position, number of households in communes, number of poor households in communes. Other interacts includes interaction of time for land administration and indicator for household has a friend who holds a public position, interaction of time for land administration and indicator for household has a member who holds a public position, interaction of time for land administration and indicator for household has a relative who holds a public position. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation from VARHS 2008–14.

We now turn to the examination of how interaction of trust and land administration affects land investment by different ethnic groups[3]. The estimates are reported in Table 6. According to estimates from column (1), ethnic households with higher trust invest more than lower trust ones for the first measure of trust. However, the result in column (4) shows that among Kinh households, higher trust households invest more on agricultural land than lower trust ones.

[3] The ethnicity group accounts for 38 per cent of our sample.

Table 6. Effects of trust and land administration on household's land investment by ethnicity

	(1)	(2)	(3)	(4)
	Dependent variable: Log (Land investment+1)			
VARIABLES	Ethnicity	Kinh	Ethnicity	Kinh
Trust X Days for land administration	0.023***	0.010		
	(0.007)	(0.012)		
Most people can be trust:=1; w/o=0	-0.993***	-0.514***		
	(0.286)	(0.195)		
Careful X Days for land administration			0.002	-0.021**
			(0.007)	(0.009)
There are people you cannot trust:=1; w/o=0			-0.169	0.324**
			(0.186)	(0.137)
Days for land administration	-0.022***	0.003	-0.001	0.023**
	(0.007)	(0.012)	(0.007)	(0.009)
Observations	2,986	5,699	2,618	5,057
R-squared	0.042	0.051	0.038	0.055
Number of HH	1,034	1,710	1,023	1,707
Other controls	Yes	Yes	Yes	Yes
Other interacts	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes

Note: Standard errors, clustered at commune level, in parentheses. Other control variables are age of household head, gender, year of schooling, log of household income, an indicator for household has a relative who holds a position of public or bureaucratic responsibility, an indicator for household has a relative who holds a public position, an indicator for household has a member who holds a public position, an indicator for household has a friend who holds a public position, number of households in communes, number of poor households in communes. Other interacts includes interaction of time for land administration and indicator for household has a friend who holds a public position, interaction of time for land administration and indicator for household has a member who holds a public position, interaction of time for land administration and indicator for household has a relative who holds a public position. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation from VARHS 2008–14.

We next turn to a closer examination of the impact of joint effects of trust and land administration on different types of agricultural land investment. The estimates are reported in Table 7. As shown in columns (1) and (4), the effects of joint trust and land administration are mainly attributed to investment in soil and irrigation systems. These results are not surprising because crop production still plays an important role in the majority of households in rural Viet Nam.

Table 7. Effects of trust and land administration on types of household's land investment

VARIABLES	(1) Log(1+Soil investment)	(2) Log (1+Aqua investment	(3) Log (1+ Permanent investment)	(4) Log(1+Soil investment)	(5) Log (1+Aqua investment	(6) Log (1+ Permanent investment)
Trust X Days for land administration	0.020**	0.005	0.085			
	(0.009)	(0.008)	(0.069)			
Most people can be trust:=1; w/o=0	-1.138***	0.256	-1.402			
	(0.301)	(0.203)	(1.038)			
Careful X Days for land administration				-0.011*	-0.002	0.008
				(0.006)	(0.005)	(0.044)
There are people you cannot trust:=1; w/o=0				0.176	-0.133	1.220
				(0.178)	(0.165)	(0.743)
Days for land administration	-0.019**	-0.003	-0.102	0.011*	0.004	-0.023
	(0.009)	(0.008)	(0.069)	(0.006)	(0.004)	(0.035)
Observations	3,663	3,663	1,364	3,209	3,209	1,173
R-squared	0.055	0.007	0.460	0.054	0.007	0.504
Number of HH	2,018	2,018	1,157	1,902	1,902	1,015
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Other interacts	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Standard errors, clustered at commune level, in parentheses. Other control variables are age of household head, gender, year of schooling, log of household income, an indicator for household has a relative who holds a position of public or bureaucratic responsibility, an indicator for household has a relative who holds a public position, an indicator for household has a member who holds a public position, an indicator for household has a friend who holds a public position, number of households in communes, number of poor households in communes. Other interacts includes interaction of time for land administration and indicator for household has a friend who holds a public position, interaction of time for land administration and indicator for household has a member who holds a public position, interaction of time for land administration and indicator for household has a relative who holds a public position. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation from VARHS 2008–14.

Land property rights

A key channel through which land administration and trust may affect investment is through property rights. Table 8 presents regressions for two different measures of land rights. First, we consider the share of a household's farm land with a land use right certificate. Second, the share of commune land with land-use right. Land-use right certificates (LURCs) endow holders with a number of rights, and land administration may take time in the process of issuing LURCs. In general, land plots with LURC have received more investment than plots without LURC (VARHS, 2014). The control variables in Table 8 are generally the same as in Table 3. We present results both with a limited set of exogenous characteristics of household heads, and with a larger set of controls.

Table 8. Effects of trust and land administration on household's land-use right certificates

VARIABLES	Share of households' land with LURCs		Share of commune land with LURCs	
Trust X Days for land administration	0.002**	0.003**	0.002***	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Most people can be trust:=1; w/o=0	-0.001	-0.001	-0.003***	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Days for land administration	-0.015	-0.018	-0.026	-0.018
	(0.016)	(0.016)	(0.016)	(0.016)
Observations	8,594	8,594	8,680	8,680
R-squared	0.051	0.051	0.434	0.435
Number of HH	2,692	2,692	2,708	2,708
Other controls	Yes	Yes	Yes	Yes
Other interacts	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes

Note: Standard errors, clustered at commune level, in parentheses. Other control variables are age of household head, gender, year of schooling, log of household income, an indicator for household has a relative who holds a position of public or bureaucratic responsibility, an indicator for household has a relative who holds a public position, an indicator for household has a member who holds a public position, an indicator for household has a friend who holds a public position, number of households in communes, number of poor households in communes. Other interacts includes interaction of time for land administration and indicator for household has a friend who holds a public position, interaction of time for land administration and indicator for household has a member who holds a public position, interaction of time for land administration and indicator for household has a relative who holds a public position. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation from VARHS 2008–14.

The results show that land administration has an insignificant effect on the share of land held with a LURC by rural households. However, the main coefficients in Table 8 are positive and statistically significant in all estimations. Having high trust is associated with a sizeable increase in having LURC compared to low trust. The results in Table 9 for second measure of trust provide the similar effects. Low trust households tend to have a lower chance to own land-use certificates.

Table 9. Effects of trust and land administration on household's land-use right certificates

VARIABLES	Share of households' land with LURCs		Share of commune land with LURCs	
Days for land administration	0.004**	0.004***	-0.002**	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
There are people you cannot trust:=1; w/o=0	0.004	0.005	-0.024	-0.023
	(0.018)	(0.018)	(0.015)	(0.015)
Careful X (Days for land administration)	-0.003**	-0.003**	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Observations	7,595	7,595	7,673	7,673
R-squared	0.054	0.055	0.430	0.433
Number of HH	2,680	2,680	2,697	2,697
Other controls	Yes	Yes	Yes	Yes
Other interacts	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes

Note: Standard errors, clustered at commune level, in parentheses. Other control variables are age of household head, gender, year of schooling, log of household income, an indicator for household has a relative who holds a position of public or bureaucratic responsibility, an indicator for household has a relative who holds a public position, an indicator for household has a member who holds a public position, an indicator for household has a friend who holds a public position, number of households in communes, number of poor households in communes. Other interacts includes interaction of time for land administration and indicator for household has a friend who holds a public position, interaction of time for land administration and indicator for household has a member who holds a public position, interaction of time for land administration and indicator for household has a relative who holds a public position. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation from VARHS 2008–2014.

Informal credit access

Another possible explanation for the joint effects of trust and land administration is variation in access to credit. Land administration and LURC play an important role in the allocation of loans from lending institution. Shorter land administration makes land transaction faster. LURC is the main collateral that may improve access to both formal and informal loans. Therefore, we expect that the longer time for land administration processing, the lower probability that households can get a loan. At the same time, social trust plays an important role in informal financial markets, where it helps to reduce the risks of asymmetric information. If trust is a complement to land administration, we expect that households with high trust may have higher chances to access informal loans.

Table 10 presents regressions for whether households have taken loans from informal lenders. The set of control variables is similar to the set used in Table 3. Again, we present results both with a limited set of exogenous characteristics of the household head, and a set of controls which are the interaction of days of land administration with political connections and commune characteristics. Linear models for informal borrowing are presented. Results are quantitatively similar if a fixed-effect logit model is used (as shown in Appendix). We restrict the sample only to households who access to credit. Therefore, the number of observations is significantly lower than the previous regressions because not all rural household have borrowed.

Table 10. Effects of trust and land administration on household's informal borrowing

VARIABLES	Dependent variables: Households have informal borrowing			
Trust X Days for land administration	0.004*	0.005**		
	(0.002)	(0.002)		
Most people can be trust:=1; w/o=0	-0.051	-0.060		
	(0.042)	(0.042)		
Careful X Days for land administration			-0.002	-0.002
			(0.002)	(0.002)
There are people you cannot trust:=1; w/o=0			0.053*	0.054*
			(0.029)	(0.029)
Days for land administration	-0.001	-0.003	0.003	0.003
	(0.001)	(0.002)	(0.002)	(0.002)
Observations	3,745	3,745	3,271	3,271
R-squared	0.014	0.016	0.013	0.014
Number of HH	1,985	1,985	1,847	1,847
Other controls	Yes	Yes	Yes	Yes
Other interacts	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes

Note: Standard errors, clustered at commune level, in parentheses. Other control variables are age of household head, gender, year of schooling, log of household income, an indicator for household has a relative who holds a position of public or bureaucratic responsibility, an indicator for household has a relative who holds a public position, an indicator for household has a member who holds a public position, an indicator for household has a friend who holds a public position, number of households in communes, number of poor households in communes. Other interacts includes interaction of time for land administration and indicator for household has a friend who holds a public position, interaction of time for land administration and indicator for household has a member who holds a public position, interaction of time for land administration and indicator for household has a relative who holds a public position. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation from VARHS 2008–14.

The results in columns (1) and (2) represent the differential effects of land administration on households with high generalized trust relative to households with low levels of social trust for the first measure of self-reported trust. The estimation shows positive and statistically significant effect of the interaction of trust and land administration. These results suggest that access to credit, especially from informal lenders, is improved for rural households with high trust when facing the burden from land administration. This may contribute to explaining why high-trust households invest more in their land than other households. The results in columns (3) and (4) for the second measure of trust show similar results but they are not statistically significant.

7 Conclusion

In this study, we examine the combined effects of trust and land administrative procedures on investment in agricultural land, land-use right certificates and informal borrowings in rural communities in Viet Nam. The findings suggest that households with higher trust to others tend to increase their levels of land-related investment, especially soil investment, compared to those with lower trust. Higher-trust households tend to invest more on agricultural land compared to low-trust households where household head are male. We also find that high-trust households strengthen de facto land property rights and improve access to informal credit when facing obstacles from land administration. These results highlight the economic importance of complementarity between trust and institutions, particularly in environments where property rights

institutions and markets for credit are not fully developed. On the broader sense, the results also provide evidence showing why effects of institutional changes on economic development are more profound in one region but not in the others, which depend on different cultural traits of people in the regions.

The findings also indicate that faster economic development may be promoted if land administrative procedures can be simplified, which enhances investment and access to finance of households who have stronger trust on others. This would help increase agricultural investment and the agricultural sector, which are good for improved food security in developing countries, especially in rural areas, where poverty is more pronounced.

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Appendix: Logistic estimation

Table A1. Effects of trust and land administration on household's informal borrowing

VARIABLES	Dependent variables: Households have informal borrowing			
Trust X Days for land administration	0.052**	0.054**		
	(0.025)	(0.024)		
Most people can be trust:=1; w/o=0	-0.593*	-0.619**		
	(0.315)	(0.313)		
Careful X Days for land administration			-0.013	-0.014
			(0.010)	(0.011)
There are people you cannot trust:=1; w/o=0			0.380*	0.396**
			(0.197)	(0.202)
Days for land administration	-0.039	-0.041*	0.019**	0.020**
	(0.024)	(0.024)	(0.009)	(0.009)
Observations	1,189	1,189	938	938
Number of HH	439	439	361	361
Other controls	Yes	Yes	Yes	Yes
Other interacts	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes

Note: Standard errors, clustered at commune level, in parentheses. Other control variables are age of household head, gender, year of schooling, log of household income, an indicator for household has a relative who holds a position of public or bureaucratic responsibility, an indicator for household has a relative who holds a public position, an indicator for household has a member who holds a public position, an indicator for household has a friend who holds a public position, number of households in communes, number of poor households in communes. Other interacts includes interaction of time for land administration and indicator for household has a friend who holds a public position, interaction of time for land administration and indicator for household has a member who holds a public position, interaction of time for land administration and indicator for household has a relative who holds a public position. *** p<0.01, ** p<0.05, * p<0.1

Source: Author's calculation from VARHS 2008–14.