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Efficiency And Equity Impacts Of The Rental Market For Cropland In Vietnam And Sources Of Transaction Costs Impeding The Market

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SUMMARY

This research investigates the efficiency and equity impacts of the cropland rental market in rural Vietnam and attempts to identify the determinants and importance of transaction costs impeding this market. A generalised ordered logit model with shifting thresholds accounting for effects of transaction costs associated with market participation was specified and estimated using pooled data extracted from the Vietnam Household Living Standards Surveys of 2004 and 2008. The findings show that the cropland rental market reduced imbalances in factor endowments, transferring cropland to those households more willing and able to farm. Equity advantages were also revealed as cropland transferred from relatively land-rich to relatively land-poor households, allowing young farmers to 'scale the agricultural ladder'. However, the market is constrained by transaction costs that effect lessors and lessees differently. It is recommended that the Vietnamese government should complete its land registration programme and consider relaxing restrictions on the use of wetlands to grow crops other than rice. It should also focus on improving access to all-weather roads as this encourages participation on both sides of the rental market whereas better access to communications infrastructure was found to promote only the supply side.

Key words: Vietnam, 2003 land law, rental market, transaction costs

INTRODUCTION

Vietnam recorded impressive economic growth and poverty reduction during the 1990's in response to market-oriented policy reforms (World Bank, 2006a), including ambitious land reforms in 1988, 1993 and 2003. However, there are concerns that the reforms have not produced institutions strong enough to support efficient markets in all sectors of the economy, and that growth has slowed – particularly in the agricultural sector (Gaiha and Thapa, 2007; Hansen and Diaz, 2008). Vietnam remains one of the 40 lowest-income countries in the world (World Bank, 2009).

More than 80 per cent of the poor are located in rural Vietnam, where their livelihoods depend primarily on agriculture (VASS, 2007). The average area of cropland operated by farmers in Vietnam is only 0.63 hectares (VASS, 2007). Not only are the farms amongst the world's smallest (Eastwood et al, 2010), they are also highly fragmented. Some 75 million cropland parcels are owned by almost 12 million rural households (Hung et al, 2007; Kerkvliet, 2006) resulting in land fragmentation and land losses between plots (Phuong, 2009). There is considerable evidence that farms are cost inefficient (Hung et al, 2007; Kompas, 2004; Rios and Shively, 2005; Vu, 2006). As a result, farm incomes are tightly constrained by very small farm sizes, highly fragmented cropland holdings and cost inefficiency.

In theory, an efficient land market should help to resolve these problems by providing aspiring farmers with opportunities to consolidate land and to expand their operations. Vietnam's 2003 Land Law still imposes strict ceilings on land ownership (3 hectares) so that opportunities to consolidate and expand farming operations through the land sale market are very limited. Vietnam therefore requires an efficient land rental market to promote growth in agriculture and to raise rural incomes. Previous studies of cropland markets in Vietnam (Deininger and Jin, 2008; Do and Iyer, 2008; Ravallion and van de Walle, 2003) were conducted in the context of Vietnam's 1993 Land Law. The 2003 Land Law strengthened tenure security by broadening the bundle of land rights assigned to landholders. In theory, this should have enhanced the efficiency of rental markets for cropland and strengthened farming household incentives to invest in agriculture.

Given the very small areas operated by farmers and their persistently low incomes, it is reasonable to ask if rental markets for cropland in Vietnam are efficient or not. This paper presents part of a broader study undertaken by the first author with guidance from the other authors (Huy, 2013). It is hypothesised that rental markets for cropland remain inefficient in many parts of rural Vietnam, preventing farmers from consolidating cropland parcels, growing their farm enterprises, adopting new technology, and increasing both their incomes and those of non-farming rural households. This paper examines factors that motivate farm household decisions to participate in the rental market for cropland in rural Vietnam, the efficiency and equity impacts of these transactions, and the efficiency of the market itself. A generalised ordered logit model with shifting thresholds accounting for effects of transaction costs associated with market participation is postulated and estimated using pooled data (for the sub-sample of rural households that farm, or that have farmland) extracted from the Vietnam Household Living Standards Surveys (VHLSS) of 2004 and 2008. These surveys were conducted by the General Statistics Office of Vietnam with technical support from the World Bank.

LITERATURE REVIEW

Existing literature suggests that voluntary land rental transactions have both efficiency and equity advantages (Crookes and Lyne, 2003). Allocative efficiency improves because the market imposes an opportunity cost on idle and underutilised cropland, which creates incentives for voluntary transactions that transfer this land to more effective farmers, i.e. farmers willing and able to make more profitable use of the land (Lyne and Nieuwoudt, 1991). Cost efficiency improves because the rental market allows farmers to exchange and consolidate cropland parcels (Norton, 2004). Perhaps more important than these static efficiency gains, the rental market allows effective farmers to grow the scale of their farming operations over time, making investments in knowledge and new technology more profitable; larger farms increase the revenue that can be gained from new technology while reducing the unit costs of adoption (Kille and Lyne, 1993). These efficiency gains may further translate into higher levels of output and better employment opportunities on farms and in service industries (Deininger and Jin, 2005; Vranken and Swinnen, 2006). In addition, efficient cropland rental markets help overcome imperfections in markets for credit, insurance, management, draught power and machinery through interlinked contracts (Bardhan, 1989; Otsuka et al, 1992; Sadoulet et al, 2001).

Viewed from an equity perspective, a rental market offers these efficiency gains without the threat of distress sales and a 'landless class' problem as it entails only a temporary transfer of certain use rights (Crookes and Lyne, 2003; Deininger and Jin, 2005). Lessors and lessees would not transact voluntarily unless the rental transaction creates greater utility for both parties than the costs it imposes on them. Furthermore, land rental markets allow prospective farmers to 'scale the agricultural ladder' while also providing lessors with an opportunity to gain experience in non-farm occupations (Crookes and Lyne, 2003; Deininger 2003).

Agricultural land scarcity is the basis for the economic value of land and for the emergence of agricultural land markets (Binswanger et al, 1995; Feder et al, 1988). However, land markets will not develop in the absence of secure land tenure and low transaction costs (Lyne and Thomson, 1998). Security of land tenure defined by Place et al (1994) involves three components: breadth, duration, and assurance of land rights. The breadth or robustness of land rights refers to the quantity (or bundle) of rights, such as rights of access, use, exclusion and transfer, under a legal or customary framework assigned to an individual or organisation. Duration of rights means the length of time during which the validity of a specified right or set of rights is legally protected. Assurance of land rights signifies the certainty with which rights and duration are exercised.

This definition signals an inverse relationship between security of tenure and transaction costs in land rental markets (Lyne 2009; Lyne et al, 1997). In the case of inadequate breadth of rights, for example, a potential lessee may be faced with prohibitively high transaction costs of discovering the owner of a land parcel and establishing a contract if there are many legitimate claimants with inclusive rights to the parcel. Risks that arise from inadequate assurance of land rights can also be viewed as a source of transaction costs (Lyne et al, 1997). Examples of risks stemming from inadequate assurance of rights include uncertainty about institutions to resolve disputes, complex and costly

procedures to establish or defend contracts, or unpredictable judgements (Lyne et al, 1997). All of these reduce land tenure security and raise transaction costs.

Transaction costs can be usefully divided into *ex ante* and *ex post* components (Williamson, 1985). *Ex ante* transaction costs are mainly fixed costs associated with costs of searching for markets and partners, drafting, negotiating and safeguarding contracts. Hence, *ex ante* transaction costs tend to rise when physical infrastructure is poor (specifically roads and telecommunications) (Lyne, 2009); accessing necessary documents or securing approval from local officials is time-wasting and costly; or the legal fees of notary and registration of land transfer are high (de Janvry et al, 2001b). *Ex post* transaction costs are largely variable costs associated with monitoring, renegotiating and enforcing contracts, and losses or risk of losses arising from the opportunistic behaviour of lessees and lessors (Skoufias, 1995).

Transaction costs effectively drive a wedge between potential lessees and lessors; these costs tend to lower the price offered by the potential lessee while raising the potential lessor's reserve price, creating a 'price band' in land rental markets and excluding those within the band who find it unprofitable to participate (Crookes and Lyne, 2003; Key et al, 2000). When land is highly fragmented, as in Vietnam, potential market participants will face pronounced unit *ex ante* transaction costs. In the case of prohibitively high *ex ante* fixed transaction costs, the costs preclude contracting and are therefore unobservable (Crookes and Lyne, 2003). An increase in *ex post* transaction costs tends to reduce the quantity of land transacted as they are largely variable costs. It follows that insecure tenure and high transaction costs prevent land rental markets from functioning efficiently.

Vietnam initiated ambitious and comprehensive land reforms in 1988. The Land Law of 1988 mandated the break-up of collective farms and allocation of exclusive use rights to individuals. By 2007, more than 80 per cent of the agricultural land had been registered with Land Use Certificates that conferred a relatively broad bundle of use and transfer rights on landholders (Phuong, 2008). It was anticipated that enhanced tenure security would motivate farming households to invest more labour and capital in land. The 2003 Land Law intended to strengthen these incentives and promote allocative efficiency by allowing subletting and by removing earlier limitations imposed on lease duration (less than or equal to three years in the 1993 Land Law). Furthermore, the extended use of Land Use Certificates (LUCs) as a mortgage, guarantee or capital share was expected to increase the supply credit to farming households.

Despite the impressive success of its land reforms, there is evidence of widespread inadequacy in the breadth of rights to cropland in Vietnam. Possession of a LUC does not prevent local authorities from zoning wetland for rice production. Markussen et al. (2009) found that, at plot level, about 36 per cent of sampled plots 'must grow rice in all seasons' despite the user's preference for other crops. The duration and assurance of land rights are also constrained. According to the 2003 Land Law, the right to land cultivated with annual crops expires after 20 years, and the limit for land growing perennial crops is 50 years. Although LUCs may be renewed at the end of the period (the first certificates expire in 2013), renewal is conditional on an official's assessment that the farmer has and will continue use the land for its certified purpose. When making its assessment, local government can (and may have a political incentive to) adjust rights (Kerkvliet, 2006). Huyen and Ha (2009) provide evidence of land disputes

that government has been slow to resolve, and of local governments expropriating land 'in the public interest' without offering fair compensation. These deficiencies in tenure security raise transaction costs. High transaction costs have also been attributed to cumbersome and costly bureaucratic procedures for transferring farmland use rights (Phuong, 2008; World Bank, 2002) and to poor physical infrastructure, particularly rural roads and telecommunications (Joint-Donors, 2009).

Huy (2013, pp 77-84) presents descriptive statistics computed from 2004 and 2008 VHLSS data suggesting an improvement in the efficiency of the rental market over his study period; The proportion of farm households making use of the rental market increased from 16.9 per cent in 2004 to 18.4 per cent in 2008. The average area operated by farming households was not significantly higher in 2008 than it was in 2004 but the data revealed a consolidation of parcels, indicated by a reduction in the average number of plots operated. Despite these gains, it is apparent that the rental market is not efficient. More than 80 per cent of the sample households did not participate in the market. This is high compared to corresponding estimates of 54 per cent for India, 46 per cent for Eritrea and 37 per cent for rural Bangladesh. In addition, approximately five per cent of sample households left cropland idle, supporting the view that transaction costs are high - fixed *ex ante* transaction costs in particular.

THE EMPIRICAL MODEL AND ITS RESULTS

The purpose of the analysis presented in this section is to investigate the efficiency and equity impacts of the cropland rental market in rural Vietnam, and to identify the determinants of transaction costs in order to understand their existence and significance. To achieve these goals, a generalised ordered logit model with shifting thresholds accounting for the effects of transaction costs associated with market participation was specified and estimated, using the pooled data from the VHLSS04 and VHLSS08 for the sub-sample of rural households that farm or have farmland. No attempt is made to measure the absolute size of transaction costs as transaction costs are often unobserved (Goetz, 1992; Key et al, 2000). The econometric model is explained in detail by Huy (2013, pp 122-131). Due to space constraints this paper emphasises the results of the model and their implications for policy.

In the absence of transaction costs, the market rent is determined by the intersection of the supply of available cropland to the market and the demand for cropland for agricultural production. The demand for cropland, in turn, derives from the value of the marginal product of cropland, which is the value of the agricultural production that can be attributed to the next unit of cropland (implicit land rent). The value of the marginal product of cropland, which can be derived from the production function, is the product of the marginal productivity of cropland for the production of certain crops and their market prices. Hence, a lessee is willing to pay rent based only on the result of the agricultural production process because he or she receives only the benefits derived from using the land as a productive factor (Trivelli, 1997; Binswanger et al, 1995). For this study, the value of the marginal product of cropland is defined as the net return to land, accounting for the income remaining after paying for all productive factors and inputs (except land) involved in the agricultural production process. Let $e(\bullet)$ be a well-behaved net income function with $\acute{e}(\bullet)$ being the first derivative with respect to cropland, and let $\acute{S}_h$ denote the potential value of the marginal product of cropland for household h in cropland autarky. Then $\acute{S}_h$ can be written as a linear expression of $\acute{e}(\bullet)$ as:

$$\dot{S}_h = \acute{e}(X_h) = \alpha + \beta + \varepsilon_h \quad (1)$$

where $\dot{S}_h$ is assumed to be continuous and take values from -∞ to +∞; α is the intercept; X_h is a (K×1) vector of explanatory variables with $ß$ being a (K×1) vector of associated parameters; and ε_h is the random error term.

In the presence of transaction costs associated with cropland rental market participation, the costs cause a gap between rented-in and rented-out prices, creating a 'price band' (Crookes and Lyne, 2003; Key et al, 2000). For convenience, let $r_h(TRC^i)$ denote the effective rent paid by household h written as a function of transaction costs, which equals the market rent plus transaction costs associated with renting in land; and $r_h(TRC^o)$ denote the effective rent received by household h written as a function of transaction costs, which equals the market rent minus transaction costs associated with renting out land. Accordingly, the 'price band' implies that $r_h(TRC^i)-r_h(TRC^o)>0$ and this gap is an indicator of the size of transaction costs when using the market. For this study, it is assumed that a household cannot simultaneously be both a lessee and a lessor, given the existence of transaction costs. The assumption is reasonable in the Vietnam context where there only about 0.4 per cent of households in the sample participate in both sides of the cropland rental market.

With the existence of transaction costs, a rural household's decision on market participation is based on its potential value of marginal product of cropland under land autarky and transaction costs associated with market participation. The household is assumed to become a lessor if its potential value of marginal product of cropland is lower than the effective rent received, i.e. $\dot{S}_h<r_h(TRC^o)$. In contrast, the household becomes a lessee if its potential value of marginal product of cropland is higher than the effective rent paid, i.e. $\dot{S}_h>r_h(TRC^i)$. Finally, the household does not participate in the market if its potential value of marginal product of cropland lies between the effective rent received and the effective rent paid, i.e., $r_h(TRC^o) \leq \dot{S}_h \leq r_h(TRC^i)$. In other words, no land adjustment occurs inside the 'price band'.

Being an abstract construct, the potential value of the marginal product of cropland for household h in cropland autarky, $\dot{S}_h$ is an underlying continuous but latent process. However, the outcome of the household's decision on market status (i.e. being a lessor, non-participant, or lessee) can be observed. The discussion in the preceding paragraph suggests that there are only three mutually exclusive and collectively exhaustive regimes of the cropland rental market that can be ranked in order of the latent value of land's marginal productivity, $\dot{S}_h$, for farming household h. Accordingly, the observed market participation regime for farming household h can be tied to the latent variable $\dot{S}_h$ by a non-linear probability model of ordinal outcomes in a form:

$$R_h \begin{cases} = 1 \text{ for the lessor regime} & \text{if } -\infty < \dot{S}_h \leq \mu_1 \\ = 2 \text{ for the autarkic regime} & \text{if } \mu_1 < \dot{S}_h \leq \mu_2 \\ = 3 \text{ for the lessee regime} & \text{if } \mu_2 < \dot{S}_h \leq +\infty \end{cases} \quad (2)$$

where R_h is an index taking on values of 1, 2 and 3 in ascending order and $\mu_1=r_h(TRC^o)$ and $\mu_2=r_h(TRC^i)$ are thresholds.

A generalised ordered logit model was used to estimate order response probabilities for the regimes in equation 2, to overcome the limitations of a parallel-lines model (Williams, 2006) and to allow the thresholds (cut points) to depend on a number of proxy variables for transaction costs. In other words, transaction costs - and hence the market regime of a household, which is tied to the household's latent productivity of cropland - are household specific. In this study the threshold equations were expressed as linear functions of variables measuring observed sources of transaction costs, such as the share of a household's cropland registered with LUCs and the presence of an all-weather road in the commune.

Tables 1 and 2 present and define the variables used to explain market participation and the thresholds respectively. Most of the variables in table 1 are self explanatory. To capture the land quality that is assumed to systematically differ across four topologies in which households located, dummy variables were introduced for three topologies, i.e. DELTA, MIDLAND and MOUNTAIN. The coastal topology served as the default and was omitted from the model. As the value of the marginal product of cropland and hence market participation is also affected by output market prices, a regional consumer price index, REGIONCPI (the value in January 2004 prices with the rural area of the Red River Delta as the base region), was used to control for differences in levels of output market prices across regions. Regional dummy variables for seven Vietnam regions, REGION2 to REGION8 (Red River Delta served as the default region), were also included to control for differences in rural infrastructure, weather and other unobserved factors that vary systematically across regions.

The drivers of transaction costs, including tenure insecurity, presented in table 2 warrant further explanation. The variable ENDOWTITLED, defined as the share of endowed cropland registered with land use certificates, was included in the model to capture the effect of titling on transaction costs and hence participation in the cropland rental market. Whether or not the registration of land use certificates has promoted the cropland rental market in rural Vietnam remains an empirical question as titling programmes and their outcomes tend to be context specific

RICEZONING, measured as the ratio of rice sown area to total sown area, was intended to capture transaction costs incurred by market participants due to the limited breadth and assurance of land rights attributed to the actions of local authorities that frequently prevent farmers from converting rice land to other more profitable crops. The dummy variable LANDDISPUTE, scoring one for communes with land conflicts and disputes and zero otherwise, was included to capture risks at the commune level, which arise from both inadequate assurance and inadequate breadth of land rights. Like zoning, LANDDISPUTE is expected to impact negatively on market participation. Ownership of a telephone, OWNPHONE, and a motorised vehicle, OWNVEHICLE, were viewed as proxy variables for fixed transaction costs associated with market participation. Households that own these assets are expected to face lower transaction costs when participating in the cropland rental market. Commune specific proxy variables for fixed transaction costs were also included in the model as measures of access to physical infrastructure. Transaction costs were expected to be lower, and rental market participation higher, in communes that have radio broadcast systems (RADIOSTATION) to disseminate local news and information, roads with permanent surfaces that can be negotiated by cars (CMNROAD) and a local market serving as a forum for the exchange of information and social interaction (CMNMARKET).

Table 1: Summary Statistics of Variables Explaining Rental Market Participation

Variables	Description	Lessors (n=820)	Non-participants (n=9514)	Lessees (1,096)
MKTREGIME	Cropland rental market regimes	1	2	3
ENDOWAREA	Cropland endowment (ha)	0.51	0.70	0.40
ENDOWPLOT	No. of endowed cropland plots	3.50	3.70	3.50
DELTA	Delta commune (1 if yes, 0 otherwise)	0.71	0.48	0.61
MIDLAND	Midland commune (1 if yes, 0 otherwise)	0.06	0.07	0.06
MOUNTAIN	Mountainous commune (1 if yes, 0 otherwise)	0.19	0.40	0.28
HHLDSIZE	Adult equivalent household size (persons)[1]	2.54	3.20	3.08
CHILDDEPCY	Child dependency ratio	0.15	0.24	0.30
WIDOW	Widow-headed household (1 if yes, 0	0.24	0.11	0.09
HEADAGE	Age of the head (years)	57.84	48.80	43.89
HEADAGE2	Square of head age	3,603	2,562	2,058
HHLDEDU	Education of the household (yrs)	8.57	9.08	9.31
EXPERIENCE	Farming experience of the household (yrs)	15.56	21.66	20.60
SELFFARM	Self-employed farmer (1 yes, 0 otherwise)	0.35	0.61	0.60
EXTENSION	Visits by extension officers to commune	9.58	8.79	8.35
FARMWAGE	Commune average farm wage (1000VND/hr)	3.82	3.54	3.70
FARMASSET	Value of farm assets (1000VND)[2]	4,238	4,660	5,147
REMITTANCE	Annual Income from remittances (1000VND)	3,017	1,728	1,548
LOANVALUE	Total loan amount (1000VND)	6,542	4,489	5,572
REGIONCPI	Regional CPI (Rural Red River Delta=1)	1.02	1.03	1.02
REGION2	North East (1 if yes, 0 otherwise)	0.10	0.18	0.15
REGION3	North West (1 if yes, 0 otherwise)	0.02	0.07	0.03
REGION4	North Central Coast (1 if yes, 0 otherwise)	0.11	0.13	0.16
REGION5	South Central Coast (1 if yes, 0 otherwise)	0.09	0.09	0.09
REGION6	Central Highlands (1 if yes, 0 otherwise)	0.02	0.07	0.05
REGION7	South East (1 if yes, 0 otherwise)	0.07	0.07	0.06
REGION8	Mekong River Delta (1 if yes, 0 otherwise)	0.20	0.18	0.13
YEAR	Time dummy (1 if 2008, 0 if 2004)	0.57	0.49	0.47

[1] The measure of adult equivalent assigns a value of 1 to the working-age adults, 0.7 to each aged member and 0.5 to each child

[2] Excludes the value of land

Source: Computed from VHLSS04 and VHLSS08

The dummy variable, ETHNICITY - scoring one if the commune has more than one ethnic group, and zero otherwise - accounts for language barriers and lower mutual trust that may serve to raise transaction costs. Similarly, the dummy variable RELIGION, scoring one if the commune has more than one religious group and zero otherwise, is introduced to capture diversity in belief and norms that could discourage people from exchanging information.

Table 2: Summary Statistics of Variables Driving Transaction Costs

Variables	Description	Mean (n=11,430)	S.D.
ENDOWTITLED	Share of endowed cropland area with LUC (%)	76.5	38.8
RICEZONING	Rice zoning index (ratio of rice sown area to total	0.54	0.38
LANDDISPUTE	Commune has land conflicts and disputes (1 if yes, 0	0.37	0.48
OWNPHONE	Household owns a telephone (1 if yes, 0 otherwise)	0.31	0.46
RADIOSTATION	Commune has a radio relay station (1 if yes, 0	0.77	0.42
OWNVEHICLE	Household owns a motorised vehicle (1 if yes, 0	0.56	0.50
CMNROAD	Commune has all-weather roads (1 if yes, 0	0.62	0.49
CMNMARKET	Commune has a local market (1 if yes, 0 otherwise)	0.61	0.49
ETHNICITY	Commune has diverse ethnic groups (1 if yes, 0	0.55	0.50
RELIGION	Commune has diverse religions (1 if yes, 0 otherwise)	0.57	0.50

Source: Computed from VHLSS04 and VHLSS08

The parameters of the generalised ordered logit model, including those of the threshold equations, were estimated using the maximum likelihood method with Stata11.2SE software. Initially, a global test of the parallel-lines assumption was conducted using both Brant and Likelihood Ratio tests. The test results rejected the standard ordered logit model and favoured the generalised ordered logit model at the one per cent level of probability. All of the variables used to estimate the model had variance inflation factors less than ten. This suggests that the estimated model is free of any serious multicollinearity (Belsley et al, 2004). Individual parameter estimates are presented in table 3 (variables explaining rental market participation) and table 4 (drivers of transaction costs explaining rental market participation).

When interpreting the estimates in table 3 it is important to remember that market regimes were coded in ascending order, i.e. 1 for lessors, 2 for non-participants, and 3 for lessees, where these scores are tied to the latent value of the marginal product of cropland. A positive coefficient estimated for an explanatory variable therefore indicates that an increase in the explanatory variable implicitly leads to higher marginal product of cropland. This, in turn, makes it more likely that the household would shift to a higher category of market regimes than its current one, given the prevailing market rental and associated transaction costs, when using the market. By contrast, negative coefficients indicate that higher values of the explanatory variable increase the likelihood of being in the current or a lower market regime. Given this interpretation the estimated results are, with one exception, consistent with *a priori* expectations.

Among the traditional factors of agricultural production, the coefficients estimated for endowments of cropland (ENDOWAREA) and plots (ENDOWPLOT) are negative, while the estimated coefficients of family labour (HHLDSIZE) and farm capital (FARMASSET) are positive. All of these estimated coefficients are statistically significant at the one per cent level of probability. The implication is that the rental market transfers cropland from relatively land-abundant but labour- and capital-poor rural households to those with relatively less cropland endowment but more family labour and farm assets. This is in line with findings in KwaZulu (Crookes and Lyne, 2003; Lyne, 2009), China (Jin and Deininger, 2009) and Ethiopia (Holden et al, 2011). This evidence supports the view that the cropland rental market promotes efficient land use and reduces imbalances in factor endowments at household level, leading to greater

equalisation of the shadow prices for cropland, family labour and farm capital across rural households.

Table 3: Motives for Market Participation and Outcomes of the Cropland Rental Market

Variables	Description	Estimates
ENDOWAREA	Cropland endowment (ha)	- 0.13**
ENDOWPLOT	No. of endowed cropland plots	- 0.15**
DELTA	Delta commune (dummy)	- 0.22
MIDLAND	Midland commune (dummy)	- 0.21
MOUNTAIN	Mountainous commune (dummy)	- 0.18
HHLDSIZE	Adult equivalent household size	0.093**
CHILDDEPCY	Child dependency ratio	0.84**
WIDOW	Widow headed household (dummy)	- 0.067
HEADAGE	Age of the head (years)	- 0.042**
lnHEADAGE2	Ln[1] Square of head age	0.24
HHLDEDU	Education of the household (yrs)	0.026*
EXPERIENCE	Farming experience of the household (yrs)	0.018**
SELFFARM	Self-employed farmer (dummy)	0.30**
EXTENSION	Visits by extension officers to commune	- 0.0054*
FARMWAGE	Commune average farm wage (1000VND/hr)	0.091**
lnFARMASSET	Ln Value of farm assets (1000VND)	0.086**
lnREMITTANCE	Ln Annual Income from remittances (1000VND)	- 0.015
lnLOANVALUE	Ln Total loan amount (1000VND)	0.020**
REGIONCPI	Regional CPI (Rural Red River Delta =1)	- 1.37
REGION2	North East (dummy)	0.18
REGION3	North West (dummy)	- 0.17
REGION4	North Central Coast (dummy)	0.20*
REGION5	South Central Coast (dummy)	0.17
REGION6	Central Highlands (dummy)	0.47*
REGION7	South East (dummy)	0.46*
REGION8	Mekong River Delta (dummy)	0.35**
YEAR	Time dummy (1 if 2008, 0 otherwise)	- 0.17
	Observations	11,430
	Log likelihood	- 5,653
	Wald chi2(47)	1,548
	Prob > chi2	0.000

[1] Ln is the natural logarithm
*, ** Significantly different from zero at the 5% and 1% level of probability, respectively
Source: Computed from VHLSS04 and VHLSS08

Specialisation effects are also evident. It is interesting to observe that the estimated coefficient of the household head's age (HEADAGE) is negative and statistically significant, while the estimated coefficients of the household's education (HHLDEDU), farming experience (EXPERIENCE), commitment to farming (SELFFARM) and access to cash (LOANVALUE) are positive and statistically significant. These estimates suggest that the rental market transfers cropland to younger, full-time farmers and households that have more farming experience, better education and greater access to

credit. In short, the market transfers cropland to more effective farmers, i.e. to those who are more willing and able to farm.

Equity impacts of the cropland rental market are also evident. For instance, the negative coefficient estimated for ENDOWAREA suggests that rental transactions tend to equalise farm sizes, with cropland transferred from land-rich to land-poor households. Interestingly, the negative coefficient of the household head's age seems to support the hypothesis that the rental market allows young prospective farmers to 'scale the agricultural ladder'. Similarly, the results show that households with more dependent children (CHILDDEPCY) rent in extra cropland – presumably to help meet their higher subsistence needs. The coefficients estimated for WIDOW and REMITTANCE are not statistically significant but both have negative signs. A negative coefficient for WIDOW is consistent with the view that the rental market allows widows, who have few means of generating farm income, to earn rental income or a crop share by renting out their land. Likewise, a negative coefficient for REMITTANCE is consistent with the argument that the market provides lessors with opportunities to earn rental income while gaining experience in non-farm occupations.

The coefficient estimated for FARMWAGE is statistically significant and positive. If differences in farm wages between communes reflect differences in the quality of farm labour, this finding supports the view that farmers in communes with higher quality labour are more likely to hire additional cropland. Alternatively, it could indicate that wages are higher because renting increases profits and the demand for farm labour. The coefficient estimated for EXTENSION is statistically significant but its sign, contrary to expectations, is negative suggesting that extension services are targeted at communes where the marginal productivity of land is relatively low.

Table 4 presents both unstandardised and partially standardised parameters estimated for the threshold equations. The partially standardised coefficients "provide the rank ordering of the strengths of the relationships of the predictors to the outcome, but cannot otherwise be interpreted or used in the same way as standardised coefficients in multiple regression" (Menard, 2011, p1416). Importantly, table 4 points to the difference in the effect of individual sources of transaction costs between the lessor and the lessee, highlighting the asymmetries in transaction costs faced by market participants.

On the supply side of the rental market, the rice zoning index (RICEZONING) appears to be the most important source of transaction costs that discourage prospective lessors from supplying cropland to the market. Transaction costs stemming from ethnic diversity (ETHNICITY) come second in the rank ordering and also have a negative effect on market participation. In contrast, improvements in physical infrastructure reduce transaction costs and encourage participation by prospective lessors. However, as suggested by the rank ordering, the influence of physical infrastructure on market participation is weaker than the influence of restrictions on land use and of ethnic diversity in the commune. In particular, sources of transaction costs stemming from access to telephones (OWNPHONE), the presence of a local radio station (RADIOSTATION) and all-weather roads in the commune (CMNROAD) are ranked third, fourth and sixth respectively. Registration of land use right certificates (ENDOWTITLED), which also encourages participation by prospective lessors, is the fifth most important of the significant sources of transaction costs affecting the supply side of the land rental market.

Table 4: The Relative Importance of Sources of Transaction Costs

Variables	Renting-out threshold			Renting-in threshold		
	Estimates	Partially standardised estimates	Rank	Estimates	Partially standardised estimates	Rank
Land tenure security						
ENDOWTITLED	-0.0032**	-0.125	5	- 0.0058**	-0.223	3
RICEZONING	2.14**	0.801	1	0.71**	0.267	2
LANDDISPUTE	0.027	0.013	10	- 0.14	-0.066	6
Other sources of transaction costs						
OWNPHONE	- 0.51**	-0.237	3	0.0095	0.004	10
RADIOSTATION	- 0.50**	-0.231	4	- 0.031	-0.013	9
OWNVEHICLE	0.071	0.035	9	- 0.16*	-0.080	5
CMNROAD	- 0.21*	-0.103	6	0.17*	0.083	4
CMNMARKET	- 0.079	-0.039	8	0.085	0.041	7
ETHNICITY	0.80**	0.299	2	- 0.56**	-0.278	1
RELIGION	- 0.15	-0.073	7	0.080	0.040	8

*, ** Significantly different from zero at the 5% and 1% level of probability, respectively
Source: Computed from VHLSS04 and VHLSS08

Turning to the demand side of the market, ethnic diversity (ETHNICITY) has the highest rank ordering but impacts negatively on prospective lessees. Sources of transaction costs stemming from land tenure insecurity also appear to be relatively important. The rice zoning index (RICEZONING) ranks second followed by the registration of land use right certificates (ENDOWTITLED). Whereas zoning encourages farmers to hire additional cropland (presumably land that is not zoned for rice production), registration of land use rights has the opposite effect. A possible explanation is that improved land tenure security has encouraged emerging farmers, at least as a first step, to invest in fixed improvements and land-saving technology instead of renting in more cropland. The non-significance of land disputes (LANDDISPUTES) suggests that the registration of land use rights has indeed served to promote tenure security in rural Vietnam. The presence of all-weather roads in the commune (CMNROAD) and vehicle ownership (OWNVEHICLE) represent the fourth and fifth most important of the significant sources of transaction costs affecting the demand side of the rental market. Whereas good quality roads encourage prospective lessees to participate in the land rental market, ownership of a motorised vehicle has the opposite effect, presumably because it encourages farmers to participate in the off-farm job market.

CONCLUSIONS

This paper set out to examine factors that motivate farm household decisions to participate in the rental market for cropland in rural Vietnam, the efficiency and equity impacts of these transactions, and the efficiency of the market itself. Overall, the findings show that the land rental market reduced imbalances in factor endowments at the household level by transferring cropland to more effective users, i.e. to those more willing and able to farm. The evidence points to an emerging class of commercial

farmers who are using the rental market to consolidate and extend their farming operations to benefit from size economies that make investments in knowledge and new technology more profitable. Equity advantages were also revealed as cropland transferred from relatively land-rich to relatively land-poor households, allowing young prospective farmers to 'scale the agricultural ladder'. There is also some evidence that the rental market enabled widows - who have few means of generating farm income - to earn rental income or a crop share by renting out their land, and allowed rural households to engage in non-farm occupations without losing their land or leaving it idle.

However, the findings also reveal significant transaction costs that prevent the cropland rental market from functioning effectively. Importantly, the results highlight sources of transaction costs that effect lessors and lessees differently, and signal the relative importance of their impacts. Drawing on these findings it is recommended that the Vietnamese government should complete its very successful land registration programme and consider relaxing restrictions on the use of wetlands to grow crops other than rice. It should also focus on improving access to all-weather roads as this encourages participation on both sides of the rental market whereas better access to communications infrastructure was found to promote only the supply side of the market.

Ethnic diversity appears to be a very important source of transaction costs in the land rental market. Unfortunately the survey data used in this study did not provide sufficient information to explore the reasons underlying this finding. Clearly there is scope for more in-depth research into the roles played by social capital and cultural norms. Readers are also cautioned that conclusions drawn in this study may have little relevance to developing countries where customary tenure institutions constrain the rental market as land registration programmes based on imperfect knowledge of existing rights tend to aggravate the problem of insecure tenure. In such cases, adaptive strategies involving small incremental changes to customary tenure arrangements may be a better approach.

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