The Roles of Grassroots Government and Associations Versus Internet Access in Households' Income in Vietnam

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Abstract. This paper investigates the roles played by government and associations at grassroots level and internet access in households' welfare in Vietnam. We employ the random walk Metropolis-Hastings Markov chain Monte Carlo method with data from the Vietnam Household Living Standards Survey in 2018. It seems that internet usage has made a powerful impact on people's well-being, increasing a typical household's income per capita by 34.1%. In contrast, it does no good to participate in local associations which even marginally reduce their members' income. Unfair communes that do not give subsidies to poor households as mandated by national policies harm not only poor but also non-poor families living in these communes. Local governments should be enforced to follow national laws and policies, and to help the poor.

1 Introduction

It has been widely accepted that local government and associations have exerted a significant influence on economic growth and poverty reduction in developing countries. Local governance is expected to improve the functioning of markets; public policies help address market failures and facilitate social transformation (Khan, 2007). The performance of local government is effectively monitored and enhanced by local associations. Greater cooperation of households in a commune tends to increase the effectiveness of not only publicly provided services but also common property management (Narayan and Pritchett, 1999). In addition, both local government and associations speed up the diffusion of information, about the availability and the proper use of seeds, fertilizer, and chemicals in farming practices, as well as of important innovations in non-farming activities.

Many indicators and sub-indicators have been developed and revised from different data sources to measure the quality of governance (Kaufmann, Kraay, and Zoido-Lobaton, 2002; Kaufmann, Kraay, and Mastruzzi, 2009). In Vietnam, two well-known aggregate measures are Vietnam Provincial Governance and

Public Administration Performance Index (PAPI) and Provincial Competitiveness Index (PCI). The PAPI surveys have been conducted annually since 2011 by the United Nations Development Program, the Vietnam Fatherland Front, and the Center for Community Support Development Studies to document citizens' assessment of governance and public administration in their localities. Meanwhile, PCI has been a yearly business survey since 2005 in a joint collaboration between the Vietnam Chamber of Commerce and Industry and the U.S. Agency for International Development to evaluate and rank the performance, capacity and willingness of provincial governments in creating a favorable environment for private sector development.

A large number of empirical researches have used these two indicators to examine the poverty-reducing effect of the quality of local government in Vietnam (Tran et al., 2019; Nguyen et al., 2021). However, both PAPI and PCI are measures of governance at the province level. They fail to account for heterogeneity at lower-level units such as districts or communes, which are believed to have an immediate impact on households' livelihood and income. This is especially true in Vietnam where traditionally 'the monarch's law loses to a village's norms' ['phép vua thua l? láng' (in Vietnamese)].

Moreover, dissemination of information has become faster with the proliferation of the internet. The adoption of information and communications technologies (ICT) allows households to reduce transaction costs, increase market participation (Tadesse and Bahiigwa, 2015), apply new technologies (Fu and Akter, 2016), and promote farming efficiency and productivity (Ogutu, Okello, and Otieno, 2014). Internet has served as a substitute for local associations and, to some extent, for local government in fostering economic development in the new era.

This paper is to investigate how government and associations at grassroots level and internet use/access affect households' income in Vietnam. Our data are from the Vietnam Household Living Standards Survey (VHLSS) conducted in 2018 by the General Statistics Office (GSO) of Vietnam. It was a nationwide sample with 46,995 households in 3,133 communes/wards which were representative at national, regional, urban, rural and provincial levels. We find that internet has a strikingly important impact than local associations on households' economic well-being. Having access to internet increases a typical household's income per capita by 34.1% while being a member of local associations causes a marginal loss of 0.2%, holding other things constant. Additionally, unfair commune governments which do not give subsidies to poor households as mandated by national policies tend to reduce welfare of people living in those communes by 2.2%.

The paper is structured as follows. Section 2 gives a brief overview of the literature on the influences of local governance, associations, and internet on households' income. Section 3 shows the econometric model. Section 4 presents the data set, descriptive statistics, and empirical findings. Conclusions follow in Sect. 5.

2   Literature Review

Governance is generally considered one of the critical factors determining socio-economic performance across developing countries. The Organization for Economic Cooperation and Development (OECD) (2006) affirmed that 'good public governance helps to strengthen democracy and human rights, promote economic prosperity and social cohesion, reduce poverty, enhance environmental protection and the sustainable use of natural resources, and deepen confidence in government and public administration.'

Khan (2007) claimed that there are two different economic approaches to governance, namely, 'market-enhancing' and 'growth-enhancing' governance. The former postulates that if governments can sustain efficient markets, especially by enforcing stable property rights, a good rule of law, curbing corruption, to minimize unproductive rent-seeking activities and the crowding out of productive ones, then private sector will foster economic development. This approach is advocated by institutionalists Krueger (1974) and North (1995) and international development and financial agencies. The 'growth-enhancing' governance argued that markets in developing countries are intrinsically inefficient. Even the strongest political commitment cannot push underdeveloped markets to stimulate efficient resource allocation. Successful development in developing countries therefore requires competent governance of states to accelerate the transfer of assets and resources to more productive sectors and to endorse the absorption of new technologies. They would ensure productivity growth in both the private and public sectors. The East Asian Miracle, which is attributed to a large extent to these governments' industrial policies, has been used as an evidence in support of this argument (World Bank, 1993).

The relationship between governance, public administration and economic growth has attracted a lot of attention in researches on developing countries, though they vary significantly in scope and focus. Most large-scale studies use national-level data and concentrate on different aspects of governance. Democratic institutions are more susceptible to the demands of the poor, which leads to expansion of their access to education and decreasing income inequality, but at the expense of physical capital accumulation (Tavares and Wacziarg, 2001). Better informed citizens are more likely to vote and monitor governments' policies, public services, and administration, making public officials more accountable (Lassen, 2005). Clear tax policies and transparent legal frameworks make economies and markets perform more efficiently (Stiglitz, 2002). Since corruption lowers private domestic and foreign direct investment, increases public investment but reduces its productivity, causes more damage to new and small firms than to larger ones, creates incentives for talented persons to engage in rent-seeking activities, and raises poverty and income inequality, good governance that reduces corruption boosts economic growth (Mauro, 1995; Tanzi and Davoodi, 2000; Gupta et al., 2002).

An element of governance that has formed a fundamental building block of development and national cohesion is civil society. It fills the space untouched by the public and private sectors. Civil society includes organizations that are not

associated with government. Small agricultural producers in developing countries face considerable challenges due to changed procurement systems in which supermarkets have been increasingly dominating and to new quality and safety standards set by developed countries. Stringent requirements such as Global GAP and larger supply volumes ordered by supermarket chains have limited their participation. In addition, as developing countries have signed more free trade agreements, smallholder farmers are compelled to compete not only with their local peers and firms, but also with farmers and agribusinesses from other countries. Joining farmer cooperatives or producer organizations would enable smallholders to gain necessary market information and access to new technologies, and to enter high-value markets (Markelova et al., 2009). Local associations also defend citizen rights and interests, monitor the performance of government in its provision of public services, and stimulate effective building and management of common property. Moreover, they offer informal insurance that protects poor households from weather shocks, and encourages them to adopt innovations that are high-return but often considered high-risk (Narayan and Pritchett, 1999).

Many studies have tried to measure the quality of overall governance by aggregate indices based on a large number of sub-indicators. Campos and Nugent (1999) identified four critical institutional components: (1) the executive, (2) civil society, (3) the bureaucracy, and (4) the rule of law. In the Worldwide Governance Indicators research project, Kaufmann, Kraay, and Mastruzzi (2009) evaluated six dimensions of governance: "Voice and Accountability," "Political Stability and Absence of Violence/Terrorism," "Government Effectiveness," "Regulatory Quality," "Rule of Law," and "Control of Corruption." To develop these indicators, they used more than 400 individual variables from 35 separate data sources constructed by 33 different organizations throughout the world. Using this cross-country data set, Rodrik et al. (2004) suggested a positive impact of good institutional quality on economic growth. Campos and Nugent (1999) found that the prominent institution improving economic growth is the quality of bureaucracy for East Asia, but the effectiveness of rule of law for Latin America.

The governance diversity exists across countries and within countries. Several studies have examined the possible effects of governance on households' well-being at the provincial level. United Nations Development Programme (2011) implied that there is a positive association between PAPI and Human Development Index (HDI) in Vietnam. Tran et al. (2019) showed that good provincial governance does not on average affect household per capita income, but brings greater benefits for richer households. Nguyen et al. (2021) found an opposite result where the very poor gain the most from good governance and public administration as it boosts income growth and reduces inequality. However, there have been no studies so far that consider the quality of governance at lower-level units such as districts or communes. It is believed that their behavior is heterogeneous and has an immediate impact on households' livelihood and income.

An alternative and increasingly powerful tool that is able to provide timely, relevant, and workable information to its users at dramatically lower cost than any traditional service is the information and communications technology (ICT). Internet-using farmers can apply new farming practices (Fu and Akter, 2016), and are more likely to switch to a pesticide that is more efficacious against pests and less harmful to humans (Cole and Fernando, 2012). They can save time and costs required to verify price information from multiple sources, thus reducing price dispersion across markets and seasons. Better knowledge of products and prices that prevail in markets enables farmers to make good choice of what crops, when, how to grow, and where to sell them profitably (Jensen, 2007). Farmers participate more in markets (Tadesse and Bahiigwa, 2015) and enhance their farming efficiency and productivity (Ogutu, Okello, and Otieno, 2014). ICT also encourages rural laborers to engage in off-farm employment, diversifying their income sources. This is particularly beneficial to rural households in developing countries because it diminishes income volatility due to external shocks in agricultural production (Leng et al., 2020). Furthermore, internet has simplified e-banking, money transfers, and payment processing that offer access to financial products and services to previously financially excluded people (Lenka and Barik, 2018). Therefore, internet has served as a substitute for local associations and, to some extent, for local government in promoting economic development in the new era.

3   Estimation Method

So far no indices have been built to measure the quality of governance at grassroots level. A comprehensive evaluation requires a lot of data on many criteria that are not available. Though, Munda (2017) claimed that fairness in the policy process is very important because it accounts for a majority of social values, interests and desires, perspectives, distributional issues in a coherent and transparent manner. For communal governments, fairness involves more in policy implementation than in formulation. In this paper, we consider a commune 'unfair' if it fails to give subsidies to households residing in that commune who are officially labeled 'poor', thus are eligible to receive grants under the national policies.

Apart from grassroots-level government fairness, membership in local associations and access to internet, household per capita income is supposed to depend on demographic characteristics of household heads, comprising gender, ethnicity, educational attainment, age, and marital status. Other determinants are characteristics of the household such as urban/rural residence, poverty status, household size, cultivated land use rights[1], the number of working adults who are self-employed or are working in farming and non-farming sectors, access to credit, and amount of subsidies received. The regression model is

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[1] In Vietnam, land (including agricultural land) is owned by the state. Organizations and individuals only hold and acquire rights to use land.

$$\ln \quad (Income\,per\,capita) = \beta_0 + \beta_1 Male + \beta_2 Ethnic\,minority + \beta_3 Educ + \beta_4 Age$$
$$+ \beta_5 Age^2 + \beta_6 Marital\,status + \beta_7 Urban + \beta_8 Poverty + \beta_9 Hhsize$$
$$+ \beta_{10} Land\,area + \beta_{11} Farmers + \beta_{12} Non\text{-}farmers + \beta_{13} Self\text{-}employed$$
$$+ \beta_{14} Credit + \beta_{15} Subsidy + \beta_{16} Associations + \beta_{17} Internet$$
$$+ \beta_{18} Unfair\,commune + \delta Region\,dummies + \varepsilon, \tag{1}$$

where *Male*, *Ethnic minority*, *Marital status*, *Urban*, *Poverty*, *Credit*, *Associations*, *Internet*, *Unfair commune* are dummy variables. *Male* is 1 if the household head is male, *Ethnic minority* is 1 if he/she is not Vietnamese or Chinese, *Marital status* is 1 if the household head is currently living with his/her spouse, *Urban* is 1 if the household resides in urban area, *Poverty* is 1 if the household was labeled 'poor' by its commune in the previous year, *Credit* is 1 if the household gets a loan from a formal financial institution, *Associations* is 1 if the household head is a member of local associations, *Internet* is 1 if the household head uses internet. *Educ* is the number of the head's schooling years. A quadratic term Age^2 is added to represent the typical pattern of increasing then decreasing income over the life. *Hhsize* is the number of members in the household. *Land area* is the area of cultivated land that the household has the right to use. *Farmers*, *Non-farmers*, and *Self-employed* are the numbers of adults who work in farming sectors, non-farming sectors, and are self-employed, respectively. To take into account heterogeneity at provincial and regional levels in geography, culture, social norms, governance, etc., households are grouped into seven regions, namely, Northern Uplands, Red River Delta, North Coast, Central Coast, Central Highlands, South East, and Mekong Delta. Six regional dummies are included in Eq. (1).

4   Data Description and Empirical Results

Our data are compiled from the Vietnam Household Living Standards Survey (VHLSS) which was conducted nationwide in 2018 by the General Statistics Office (GSO) of Vietnam. It consists of 46,995 households in 3,133 communes/wards which are representative at national, regional, provincial, urban, and rural levels. Information was collected during four periods in four quarters (one period per quarter) through face-to-face interviews with household heads, members and key commune officials. Data on households and individuals cover demography, education, health, employment and income, housing, fixed assets and durable goods, and participation of households in poverty alleviation programs[2]. Due to missing data, a sample of 43,093 households is ready for analysis.

Table 1 shows that a typical household whose head is a member of local associations has an average income per capita of VND 82.68 million, lower than the one which is not (VND 98.02 million). But access to internet signifies a remarkable difference in people's welfare. Residents in a household that uses internet enjoy an average income per capita of VND 135.42 million, more than double VND 63.73 million in a household that does not. This stereotype holds

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[2] A sub-sample of 9,399 households were asked about consumption expenditures.

Table 1. Average Annual Income Per Capita by Association Membership and Internet Access

			Internet access	
			No	Yes
			VND 63.73 mil	VND 135.42 mil
Association	No	VND 98.02 mil	VND 67.27 mil	VND 143.21 mil
Membership	Yes	VND 82.68 mil	VND 59.48 mil	VND 124.06 mil

Notes: On Dec 28, 2018, \$1 = VND 23,180 or VND 1 mil = \$43.14.

consistently when association membership and internet access are considered jointly. The cross-tabulation in Table 1 indicates that income per capita is the lowest in households which join local associations but do not use internet, and is the highest in those which are non-members and use internet.

Obviously, internet usage cannot take the whole credit for income increase. It is highly correlated with other important determinants of household earnings. Panel a in Table 2 implies that household heads that use internet are nearly ten years younger and more educated than those who do not. It makes sense since young people are more willing to embrace new technology and better educated people are able to absorb new knowledge more rapidly, thus having higher demand for internet usage. In Panel b, households living in urban areas have easier access to internet than their rural counterparts. Probably economies of scale due to big customer base in towns makes internet service to be supplied faster and more conveniently to urban residents. Their proportion of internet usage is 56.99%, almost double that among rural dwellers. Since ethnic minority groups are generally less educated and live in remote areas where basic infrastructure is not well developed, their internet connectivity is rather limited. Therefore,

Table 2. Internet-Correlated Characteristics

Panel a	Internet access	
Household head's	No	Yes
Average age	56.6	46.7
Average number of schooling years	6.4	10.1
Panel b	% Households using internet	
Urban areas	56.99	
Rural areas	30.65	
Vietnamese or Chinese	42.59	
Ethnic minority	18.92	
Non-poverty status in 2017	41.82	
Poverty status in 2017	9.14	

Table 3. Descriptive Statistics of the Sample

Variable	Mean	Std Dev	Min	Max
Income per capita (VND mil)	91.33	173.90	1.89	18705.34
Male	0.74	0.44	0	1
Ethnic minority	0.17	0.38	0	1
Number of schooling years	7.83	4.19	0	22
Age	52.79	13.71	13	113
Marital Status	0.79	0.41	0	1
Urban areas	0.30	0.46	0	1
Poverty status in 2017	0.10	0.30	0	1
Household size	3.72	1.63	1	17
Cultivated land area (thousand m^2)	5.79	24.77	0	2824
Number of farming workers	1.20	1.24	0	11
Number of non-farming workers	1.08	1.02	0	7
Number of self-employed	0.48	0.80	0	8
Formal credit	0.17	0.38	0	1
Subsidies for poor households (VND mil)	5.07	9.38	0	161.19
Subsidies for non-poor households (VND mil)	0.59	5.08	0	602.82
Local association membership	0.44	0.50	0	1
Internet access	0.38	0.49	0	1
Unfair commune	0.05	0.23	0	1

the divide in internet connection between the Vietnamese or Chinese (42.59%) and ethnic minority groups (18.92%) is even larger. However, the largest gap is amongst non-poor households (41.82%) and poor households (9.14%).

Table 3 provides descriptive statistics of our sample. The average income per capita is VND 91.33 million (or equivalently $3940) per annum. But the income inequality is quite large, with the highest income being 205 times as much as the average level. Seventy four percent of households are headed by male, and 17.3% of them belong to ethnic minority groups. A typical household head spent roughly 8 years in school and is 53 years old. More than six percent of family heads are uneducated, 149 of them have master's degrees, and 28 doctoral degrees. Two heads are orphans, just 13 and 16 years old. Seventy nine percent of heads are living with their spouses, 44% are members of local associations, and 38% are using internet. Thirty percent of households reside in urban areas, and 17% could borrow money from formal financial institutions. Households have rights to use on average 5,789 m^2 of cultivated land, most of which is in rural areas. They have a mean number of 3.7 members, 2.8 of whom are income-earners, specifically, 1.2 in farming sectors, 1.08 in non-farming sectors, and 0.48 self-employed. Ten percent of households were officially classified 'poor' in 2017

Table 4. Bayesian Estimation Results of Eq. (1)

	Mean	Std Dev	MCSE	Median	Equal-tailed [95% Cred.	Interval]
Male	−0.0290	0.0011	0.0003	−0.0290	−0.0310	−0.0269
Ethnic minority	−0.2712	0.0009	0.0002	−0.2712	−0.2731	−0.2693
Number of schooling years	0.0379	0.0006	0.0000	0.0379	0.0366	0.0391
Age	0.0304	0.0003	0.0000	0.0304	0.0298	0.0309
Age^2	−0.0003	3.9×10^{-6}	3×10^{-7}	−0.0003	−0.0003	−0.0003
Marital Status	0.0494	0.0013	0.0004	0.0497	0.0470	0.0515
Urban areas	0.1872	0.0008	0.0002	0.1871	0.1859	0.1886
Poverty status in 2017	−0.5578	0.0053	0.0015	−0.5598	−0.5653	−0.5491
Household size	−0.0935	0.0004	0.0000	−0.0935	−0.0943	−0.0927
Cultivated land area (thousand m^2)	0.0023	0.0001	5.3×10^{-6}	0.0023	0.0020	0.0025
Number of farming workers	−0.0581	0.0004	0.0001	−0.0580	−0.0588	−0.0574
Number of non-farming workers	0.2084	0.0013	0.0003	0.2083	0.2061	0.2112
Number of self-employed	0.3371	0.0007	0.0001	0.3372	0.3359	0.3382
Formal credit	0.0153	0.0008	0.0001	0.0152	0.0139	0.0168
Subsidies for poor (VND mil)	0.0061	0.0007	0.0001	0.0061	0.0047	0.0075
Subsidies for non-poor (VND mil)	0.0002	0.0005	0.0001	0.0001	−0.0006	0.0009
Local association membership	−0.0023	0.0008	0.0002	−0.0023	−0.0037	−0.0010
Internet access	0.2938	0.0004	0.0000	0.2938	0.2930	0.2945
Unfair commune	−0.0223	0.0022	0.0007	−0.0228	−0.0260	−0.0186
σ^2	0.3158	0.0021	0.0000	0.3158	0.3117	0.3201
Acceptance rate	0.3043					
Number of observations	43,093					

Notes: Coefficients for regional dummies and the constant are not reported.

under the national criteria. They receive an average subsidy of VND 5.07 million, 8.6 times as much as that of VND 586,314 for non-poor households. Even though poor families are eligible for such grants, some in 171 communes do not get them.

We estimate Eq. (1) by the Bayesian approach, i.e., the random walk Metropolis-Hastings (MH) Markov chain Monte Carlo (MCMC) method. It employs the normal priors with 0 mean and variance of 10,000 for the regression coefficients. The first 2,500 burn-in iterations are discarded and the subsequent 10,000 MCMC iterations are used to produce the results that are presented in Table 4. The first column shows the posterior mean estimate, the second column the estimated posterior standard deviation, the third column the Monte Carlo standard error (MCSE) measuring the accuracy of simulation results, the fourth column the posterior median estimate, and the last two columns the 95% equal-tailed credible interval.

Other things held constant, income per capita in a male-headed household is 2.9% lower than that in a female-headed one. An ethnic minority family has income per person equal to 76% of that in a Vietnamese or Chinese family. Each additional year spent in school by head would increase his/her household's welfare by 3.9%. This average rate of return to education fits in the range estimated by McGuinness et al. (2021) for Vietnam. Income per capita would increase by

5.1% if the head is living with his/her spouse, and by 20.6% if the household dwells in urban areas. Earnings tend to exhibit an inverted U-shaped motif, rising with age, reaching their peak when heads are 56 years old, then dropping slightly as heads enter retirement. As the number of persons in a household rises by one, their income per capita decreases by 8.9%.

Over the past three decades, Vietnam has experienced one of the most rapid structural transformations among low-income agricultural countries. Massive expansion of the non-farming sectors induced by urbanization and industrialization has created numerous job opportunities with better salaries, and moved millions of young workers out of farming (McCaig and Pavcnik, 2017). Even though larger arable land area is associated with a higher likelihood to use mechanization and to receive credit, its value has become rather low. Table 4 shows that another thousand square meters of cultivated land would raise income per capita marginally by 0.2%, other things being fixed. The relative decline of agriculture in Vietnam is also reflected in the impacts of the numbers of workers on households' well-being. While an extra self-employed or non-farming employee would increase income per capita by 33.7 or 20.8%, an extra farming employee would decrease it by 5.8%.

Being able to borrow money from a formal financial institution gives borrowers a clear advantage because the interest rates are either lower or controlled, loan term length is usually longer than informal credit. Borrowing households can make necessary investments to reallocate their productive resources into more efficient uses. Their income per capita is unsurprisingly 1.5% higher. However, formal credit normally requires collateral that many poor households lack. This and other inherent weaknesses deprive people in households that were labeled 'poor' in the previous year of 42.8% of what they would have if they live in non-poor households. Therefore, government subsidies are a considerable support for them. Additional VND 1 million of grants would augment income per capita in poor households by 0.6%, and not affect non-poor households. The contradicting impacts justify bigger subsidies for the poor and a firm assurance that this policy should be implemented properly. Unfair communes that fail to achieve complete implementation would reduce income per capita of both poor and non-poor households by 2.2%.

Estimation results confirm our preliminary notice in Table 1. Membership of local associations would decrease income per capita slightly by 0.2% whereas internet access would increase it by 34.1%. The emergingly strong influence of internet is seemingly attributed to widespread introduction of high speed connection and increasingly rich information in Vietnamese available on internet. The government should consider ways to upgrade the capabilities of local associations which are expected to play an important part in helping small agricultural producers overcome challenging barriers to participate in global supply chains.

5   Conclusion

This paper examines the roles of associations and government at grassroots level and internet access in households' income in Vietnam. We use the random walk

Metropolis-Hastings Markov chain Monte Carlo method with data from the Vietnam Household Living Standards Survey in 2018. It seems that internet usage has made a profound impact on people's well-being. In contrast, it does no good to participate in local associations which even marginally reduce their members' income per capita. Unfair communes that do not give subsidies to poor households harm not only poor but also non-poor families living in these communes. Therefore, the government should facilitate internet access and post more instructive videos in Vietnamese language online. In addition, comprehensive evaluation indicators on the performance of grassroots-level governments should be constructed in order to enforce them to follow national laws and policies, and to improve their efficiency.

Conflict of interest

The authors declare that they have no conflict of interest.

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