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DO GOOD GOVERNANCE AND PUBLIC ADMINISTRATION IMPROVE ECONOMIC GROWTH AND POVERTY REDUCTION? THE CASE OF VIETNAM

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ABSTRACT: *In this study, we examine how governance and public administration quality can affect per capita income, income inequality, and poverty using provincial-level data in Vietnam. Governance and public administration quality are measured by the Vietnam Governance and Public Administration Performance Index (PAPI) surveys, which collect data on citizens' experiences with and perception of provincial performance in governance and public. Using province fixed-effect regressions, we find a positive and nonlinear association between governance and public administration and per capita income. Better performance of governance and public administration also appears to improve income distribution and reduces poverty. The association between governance quality and poverty severity is larger than the association between governance quality and poverty headcount. This finding implies that, within a province, better governance and public administration are most beneficial for the poorest of the poor.*

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INTRODUCTION

The relationship between governance, economic growth, and poverty reduction has received a great deal of attention from researchers and policymakers. Although many influential scholars view good governance as a key factor in spurring development (e.g., Kaufmann, Kraay, and Zoido-Lobaton 1999; Gupta, Hamid, and Rosa 2002; Grindle 2004; Rodrik, Subramanian, and Trebbi 2004; Khan 2009), there is disagreement about the channels of causation, and empirical findings of the effects of governance on economic growth and poverty reduction are not consistent. A major point of contention exists between analysts who favor an orthodox policy agenda to improve the functioning of markets, and others who emphasize policy's ability to enhance state capacity to address market failure and facilitate social transformation (Khan 2007). Regarding empirical findings, a number of studies find a positive association between good governance and economic growth, yet other studies do not reveal such a correlation (e.g., Gerring et al. 2005; Dellepiane-Avellaneda 2010; Earle and Scott 2010).

One of the difficulties in measuring the effect of governance on economic growth and poverty reduction is the lack of consistent and comparable data (e.g., Glaeser et al. 2004; Bardhan 2005; Dellepiane-Avellaneda 2010). Governance is a broad concept (Rhodes 1996; Kaufmann et al. 1999), and attempts to construct and measure the quality of governance across countries demand a great deal of data. A few studies, such as Rodrik et al. (2004), Kaufmann et al. (1999), and Kaufmann, Kraay, and Mastruzzi (2009), construct aggregate measures of governance through a large number of sub-indicators from different data sources throughout the world. Although this approach provides a useful data source, the comparability of the data across countries is questionable. Measurement errors and nonrandom missing data can lead to bias in estimating the effect of governance on economic growth and other outcomes. Data limitations also stem from a lack of understanding of the mechanisms through which good governance affects economic growth and poverty reduction (Helpman 2004; Dellepiane-Avellaneda 2010); it's not yet clear which measures are relevant to these outcomes.

In this study, we set aside divisions over the nature of the governance-prosperity relationship, and instead seek only to empirically test for the presence of a governance effect on livelihoods and poverty in Vietnam. We exploit high-quality Vietnam Governance and Public Administration Performance Index (PAPI) surveys to explore the relationship between governance, poverty, and income inequality within Vietnam. Since 2011, the PAPI surveys have been conducted annually by the United Nations Development Program, the Vietnam Fatherland Front, and the Center for Community Support and Development Studies, in order to document citizens' experiences with governance and public administration as performed by local governments and relevant stakeholders at the local level (CECODES, VFF-CRT and UNDP 2015). Based on the collected data, provincial performance in governance and public administration is measured and constructed into six dimensions: (1) citizen participation at local levels; (2) transparency in local policymaking and planning; (3) vertical accountability; (4) control of corruption in the public

sector; (5) public administrative procedures; and (6) public service delivery. PAPI results offer comparable data on these aspects of governance and public administration for each of Vietnam's 63 provinces. In addition, we also draw data from the Vietnam Household Living Standard Surveys, which measure income, inequality, and poverty.

Using provincial-level panel data during the 2012 to 2014 period and province fixed-effect regressions, we find evidence of a possible poverty-reducing effect of the quality of governance and public administration in Vietnam. Interestingly, we find that the effect of good performance in governance and public administration on poverty is higher for poorer provinces. In other words, poorer provinces tend to benefit more from improving governance and public administration performance than richer provinces.

The observed poverty reduction can be explained as the combination of two mechanisms: an income-increasing effect and an inequality-decreasing effect. First, improving the performance of governance and public administration, especially in the dimensions of "public administrative procedures" and "public service delivery," helps provinces increase their mean income. (This effect occurs, however, at a decreasing rate: lower-income provinces are more likely to benefit from the improvement in quality of governance and public administration than higher-income provinces.) One possible channel for this income growth is an increase in labor productivity through improved human capital. Provinces with better governance and public administration have a higher share of employed workers and a lower share of unskilled workers. Second, better governance and public administration, primarily through improving "transparency in local policymaking and planning," "vertical accountability," and "control of corruption in the public sector," help provinces to reduce income inequality. This effect may result from more effective democratic procedures and reduced corruption, making public investment and income-redistribution programs more efficient and more beneficial for the poor.

This study makes several contributions to the literature on the effect of governance on growth and poverty. First, we provide empirical evidence to support a positive effect of good governance on poverty reduction. Many previous studies discuss the role of governance in economic growth (e.g., Hall and Jones 1999; Aron 2000; Gupta et al. 2002; Grindle 2004); few, however, test the effect of governance and public administration on poverty reduction, particularly at the subnational level. Our study is one of the first attempts to examine empirically the relationship between governance and poverty within a country. Second, using comparable data on different indicators of governance and household welfare, we are able to observe several basic channels through which governance and public administration affect poverty reduction. We show that better governance and public administration improve not only income growth, but also income distribution.

Although we are seeking evidence of a causal connection between governance and economic outcomes, we are acutely aware of the difficulties in estimating causal effects in this field, and are therefore cautious in interpreting our findings.

Our use of province fixed-effects regression may still provide biased estimates of the impact of governance and public administration if its underlying assumption does not hold.

Vietnam provides an interesting case study for examining the effect of governance on poverty. The country has been very successful in achieving economic growth and poverty reduction during the past decade. However, this success is currently challenged by the recent global economic slowdown. Although the government has implemented several public administration reform programs, Vietnam still has high levels of corruption (World Bank 2010). Good governance and public administration are increasingly recognized within Vietnam as important factors for economic growth and human development (CECODES, FR, CPP and UNDP 2012; Acuña-Alfaro et al. 2015; Giang, Nguyen, and Tran 2017). Increasingly, Vietnamese citizens are demanding transparent and efficient governance (CECODES, FR, CPP and UNDP 2012). This study provides support for this strategy of promoting good governance as a means to improve household welfare and reduce poverty, and suggests that stronger reforms in governance and public administration will move Vietnam further toward its economic goals.

Following this introduction, the article is organized into five additional sections. The second section presents a brief overview of the literature on governance, growth, inequality, and poverty. The third section introduces the data sets and descriptive statistics. The fourth section presents the econometric method used in this study. The fifth section discusses empirical findings of the impact of governance and public administration on per capita income, income inequality, and poverty of provinces. Finally, the sixth section presents conclusions and policy implications.

THEORY AND LITERATURE REVIEW

The effect of governance on poverty is complex; governance is a broad concept and can affect income and wealth through many social-economic channels. A common approach to the question is to examine the channels of income growth and income inequality. The current literature indicates a broad consensus that economic growth is a pre-condition for sustainable poverty reduction. Numerous empirical studies find a very strong relationship between economic growth and poverty reduction (e.g., Demery and Squire 1995; Ravallion and Chen 1997; Dollar and Kraay 2002; Ravallion 2001; Bourguignon 2003, 2004; Adams 2004; Ram 2007). Scholars differ, however, on their conclusions regarding the channels of causation and the strength of the relationship (Khan 2007).

Although economic growth is important for poverty reduction, the extent of the effect depends on income distribution (Bourguignon 2004). The relationship is primarily arithmetic: income inequality blunts the poverty-reducing impact of growth. Several studies, such as Ravallion and Chen (1997) and Fosu (2009, 2011), find supportive evidence from cross-country distributional data that higher initial income inequality is associated with a lower absolute elasticity of poverty to

growth in average incomes. Other growth arguments contend that lower inequality can have direct positive effects on economic growth (see Bourguignon 2004 for a review).

The measurement of governance is itself a subject of controversy.[1] Studies of the effects of governance vary widely in focus and scope. Economists have long been interested in the relationship between democratic governance and economic growth (Tavares and Wacziarg 2001; Gerring et al. 2005). Democracy facilitates citizen participation in elections and monitoring of the government, which lead to greater information transparency with regard to governments' policies, public services, and administration, as well as greater accountability for officials (Tavares and Wacziarg 2001; Strömberg 2004; Lassen 2005). Under clear tax policies and transparent legal frameworks, economies and markets operate more efficiently (Stiglitz 2002). Democracy can improve income distribution, since poor people are more informed about authorities and more public goods are produced under democratic governments (e.g., Li, Squire, and Zou 1998; Sen 1999; Lundberg and Squire 2003; Deacon 2009). However, democracy is not always viewed as a linear determinant of economic growth. According to Barro (1999), growth initially increases as electoral rights are introduced, but after achieving a peak, growth decreases with advancing democratic reforms. High levels of democracy lead to high levels of social programs, which reduce resources for investment and production. As a whole, the empirical evidence on the effect of democracy on economic growth, development, and poverty reduction is mixed (Gerring et al. 2005; Earle and Scott 2010).

Another important aspect of good governance is effective control of corruption. Good governance implies low corruption, and there is a positive correlation between control of corruption and economic growth (e.g., Mauro 1995; Tanzi and Davoodi 2000; Gupta et al. 2002). Corruption distorts markets and discourages private and foreign direct investment. Reducing corruption also prevents inequality of factor ownership and income. Without corruption, public investment is more efficient and more likely to satisfy citizen's demands. Gupta et al. (2002) show that a one-standard-deviation increase in corruption raises income inequality by about 11 percentage points, and reduces income growth of the poor by about 5% per year. However, Rock and Bennett (2004) show that in large, newly industrializing economies such as China, Indonesia, Korea, and Thailand, corruption level is positively correlated with economic growth. They hypothesize that high growth, and high corruption, "reflects monopoly control of corruption networks by strong over centralized states" in these countries. Governments have a close relation with big businesses and investors, and they maintain economic growth to achieve long-term corruption from bribes and kickbacks.

Good governance also results in better public investment and improved public services, especially education and health. This improvement in human capital plays an important role in economic growth (e.g., Barro 1991; Mankiw, Romer, and Weil 1992; Schultz 1997, 2002). Efficient public administration can reduce the transaction costs of obtaining public services, leading to local benefits that can boost economic activity (e.g., Krueger 1974; North 1994).

Some heterodox economists (e.g., Khan 2007, 2009) have questioned these standard orthodox arguments, offering alternative explanations for the links between improved governance and livelihoods. Within these arguments, the importance of state capability in addressing market failure and facilitation of both structural change and social transformation is emphasized (Khan 2007). Other analyses have pointed to the importance of political economy and the interaction between more capable states and better policy environments as keys to growth (Rodrik et al. 2004).

Several empirical studies examine the quality of overall governance (e.g., Rodrik et al. 2004; Kaufmann et al. 1999, 2009; Fayissa and Nsiah 2013). These studies measure governance by an aggregate index constructed from a large number of sub-indicators. For example, Kaufmann et al. (2009) measure governance quality within six dimensions: "Voice and Accountability," "Political Stability and Absence of Violence/Terrorism," "Government Effectiveness," "Regulatory Quality," "Rule of Law," and "Control of Corruption." To construct these aggregate indices, they assembled data on more than 400 indicators from 35 different sources throughout the world. Using this cross-country data, Kaufmann et al. (1999), and later Rodrik et al. (2004), find a positive association between good governance and economic growth.

The diversity of findings on the relationships between different aspects of governance and poverty demonstrate that more research is needed to understand better the governance-prosperity dynamic. There is currently little evidence concerning the effect of governance on income inequality. Additionally, most studies use cross-country data, which may not be fully comparable. To our knowledge, no previous studies have focused on the relationship between governance, economic growth, and poverty within one country. With respect to Vietnam, the Human Development Index (HDI) has been found to positively correlate with the PAPI (United Nations Development Programmes (UNDP) 2011; CECODES, FR, CPP and UNDP 2012). However, no evidence has been found concerning the relationship between governance and economic growth in Vietnam. In this study, we aim to provide new empirical evidence on these relationships.

DATA SOURCES AND DESCRIPTIVE ANALYSIS

Data Sources

We use data from two sources. The first is the PAPI, described earlier in this .[2] In 2010, the survey was conducted in 30 provinces, covering a randomly selected population of 5,560 citizens. Since 2011, the PAPI surveys have been conducted annually with respondents sampled in all 63 provinces of the country. Sample size each year is nearly 14,000 citizens. In the 57 provinces with populations below 2 million, 240 citizens are randomly selected from 12 villages in six communes in three districts within each province. In provinces with a population between 2 and 4 million, 480 citizens are selected for the surveys from 24 villages in 12 communes in six districts within each province. For Hanoi and Ho Chi Minh City, six

districts, 12 communes, and 24 villages are also sampled, but the sample size is 720 citizens. PAPI data are aggregated at the provincial level and can be used to predict national trends over time.

The second data source is the Vietnam Household Living Standard Survey (VHLSS) of 2012 and 2014. The VHLSS was conducted by the General Statistics Office of Vietnam (GSO) with technical assistance from the World Bank. Each VHLSS covers approximately 45,000 households. The VHLSS is representative at the provincial level. Data on households and individuals include basic demography, employment and labor force participation, education, health, income, housing, fixed assets and durable goods, and participation of households in poverty alleviation programs. For a sub-sample of the VHLSS participants, data on consumption expenditures are available. However, this sub-sample covers only 9,400 households, and is not representative at the provincial level.

Descriptive Analysis

Poverty in Vietnam is often measured using either income or expenditure. The Ministry of Labor, Invalid and Social Affairs (MOLISA) measures poverty using a per capita income poverty line calculated as 400 to 500 thousand VND per person per month for the period from 2011 through 2015. Using this income threshold, estimated poverty rates from VHLSS 2012 and 2014 are very low at around 5%. The second poverty line, estimated by the General Statistics Office (GSO) of Vietnam and the World Bank, is based on expenditure. For the 2012 VHLSS, the corresponding expenditure poverty rate in the 2012 VHLSS is 17.2%. In this study, we use the VHLSS to compute the per capita income index and income poverty index at the provincial level.[3] Because MOLISA's official poverty line is so low, we select a higher income threshold. Using the poverty percentage derived from the expenditure-based calculations, we define an income poverty line below which 17.2% of Vietnamese citizens fall. This income poverty line is 746.7 thousand VND in 2012. For the 2014 VHLSS, we deflate income data to match January 2012 using the monthly consumer price index; then, as with 2012, use 746.7 thousand VND as the poverty line to calculate the poverty rate for 2014.

Table 1 shows that per capita income increased from 1,916.7 to around 2,155.8 thousand VND/person/month from 2012 to 2014 (an annual growth rate of approximately 6%). The poverty rate decreased from 17.2% in 2012 to 13.8% in 2014. Poverty was higher in rural areas, especially in the Northern Mountain and Central Highland regions. Compared with Kinh and Hoa, ethnic minorities had a substantially higher poverty rate.[4]

To measure the quality of governance and public administration in Vietnam, we use the PAPI surveys and their operationalization of the concepts of governance, public administration, and performance (CECODES, VFF-CRT and UNDP 2015). The PAPI surveys contain detailed information on citizen experiences with and assessments of provincial performance in governance and public administration. Using the information collected from citizens, an aggregate PAPI score is constructed from six dimensions: (1) citizen participation at local levels; (2)

TABLE 1
Per Capita Income and Poverty Rate

Groups	Per capita income (million VND)		Income poverty rate (%)	
	2012	2014	2012	2014
Rural/urban				
Rural	1,613.3	1,814.2	22.1	18.2
Urban	2,713.3	3,017.5	4.5	3.0
Regions				
Red River Delta	2,345.8	2,562.5	5.7	5.0
Northern Mountain	1,359.2	1,597.5	40.7	32.6
Central Coast	1,670.8	1,863.3	19.0	16.1
Central Highlands	1,910.0	1,896.7	23.1	24.8
South East	2,421.7	2,830.0	6.3	3.1
Mekong River Delta	1,860.8	2,185.8	15.1	9.3
Kinh/Hoa and ethnic minorities				
Kinh and Hoa	2,105.8	2,365.8	9.7	7.2
Ethnic minorities	938.3	1,063.3	56.0	48.3
Total	1,916.7	2,155.8	17.2	13.8

Note: Income is measured in January 2012 prices.
Source: Estimations from the 2012 and 2014 VHLSSs.

transparency in local policymaking and planning; (3) vertical accountability; (4) control of corruption in the public sector; (5) public administrative procedures; and (6) public service delivery. PAPI is a multidimensional metric system that reflects the quality of local governance and public administration.

Each of six dimensions has several sub-dimensions, which are in turn constructed from several indicators estimated from collected data. Table A1 in the Appendix presents the list of all the indicators used in constructing the PAPI. These indicators, as well as aggregate dimensional and sub-dimensional scores, are standardized from one (worst) to 10 (best) to measure performance of a province. The aggregate PAPI is the sum of the score of six dimensions. Thus, it ranges from 6 (the minimum level) to 60 (the maximum level). More detailed discussion of the construction of the PAPI can be found in CECODES, FR, and UNDP (2010) and CECODES, VFF-CRT, and UNDP (2015).

There are two aggregate PAPI scores: weighted and unweighted. The unweighted composite score is the sum of the scores of the six dimensions, while the weighted PAPI score applies weights computed from a regression analysis of citizens' satisfaction (for detailed discussion, see CECODES, VFF-CRT, and UNDP 2015). In this study, we used both weighted and unweighted PAPI scores, and the estimation results were similar. For interpretation, we will use the weighted PAPI score in this paper. Figure 1 presents the provincial maps of the rank of the weighted PAPI scores and per capita income in 2012 and 2014, respectively.
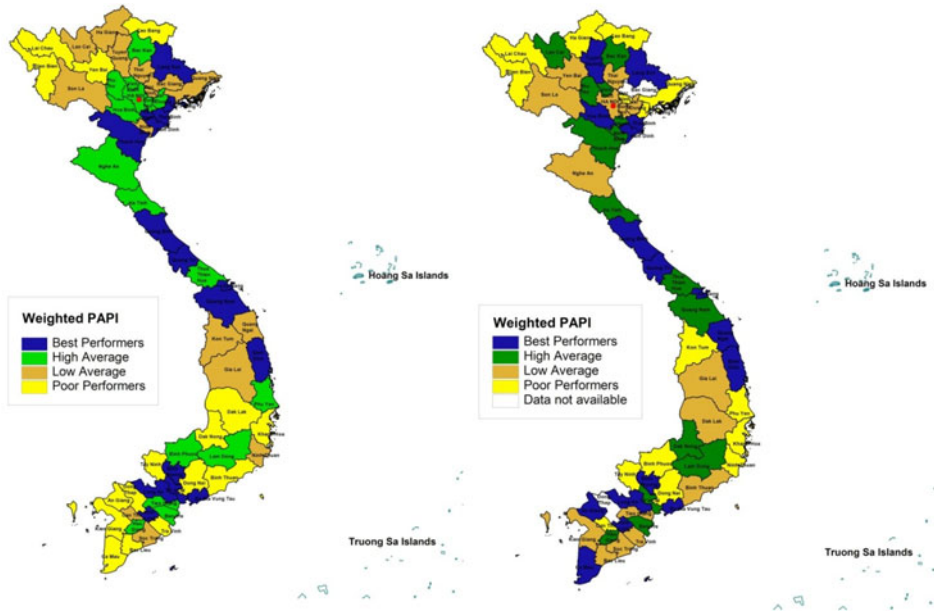
Figure 1. Provincial maps by PAPI.
Source: Authors' estimation from PAPI data.

We measure income inequality using the Gini index (see Appendix A for the formula). The Gini coefficient is the most common measure of income distribution. It ranges from zero (everyone has the same income) to one (one person has the whole income of the population). The higher the Gini coefficient value, the more unequal the income distribution. In this article, we multiply the Gini coefficient by 100, so that our measure of income inequality ranges from 0 to 100.

Figure 2 presents the correlation between governance, per capita mean income, income inequality, and poverty rate. There is a slight positive correlation between mean income and governance level. This correlation pattern is very similar in 2012 and 2014. The pattern shows a negative association between income inequality and the quality of governance and public administration. The association is higher in 2014 than in 2012. There is also a negative association between poverty and the quality of governance and public administration.

ESTIMATION METHOD

The descriptive analysis shows a positive association between governance and income, and a negative association between governance and income inequality, and between governance and poverty indices. To examine the effect of governance and public administration on economic growth, we estimate the following equations:

$$\ln(Y_{i,t}) = \alpha + \beta \ln(Governance_{i,t-1}) + \delta Year2014_t + X_{i,t}\pi + u_i + v_{i,t}, \qquad (1)$$
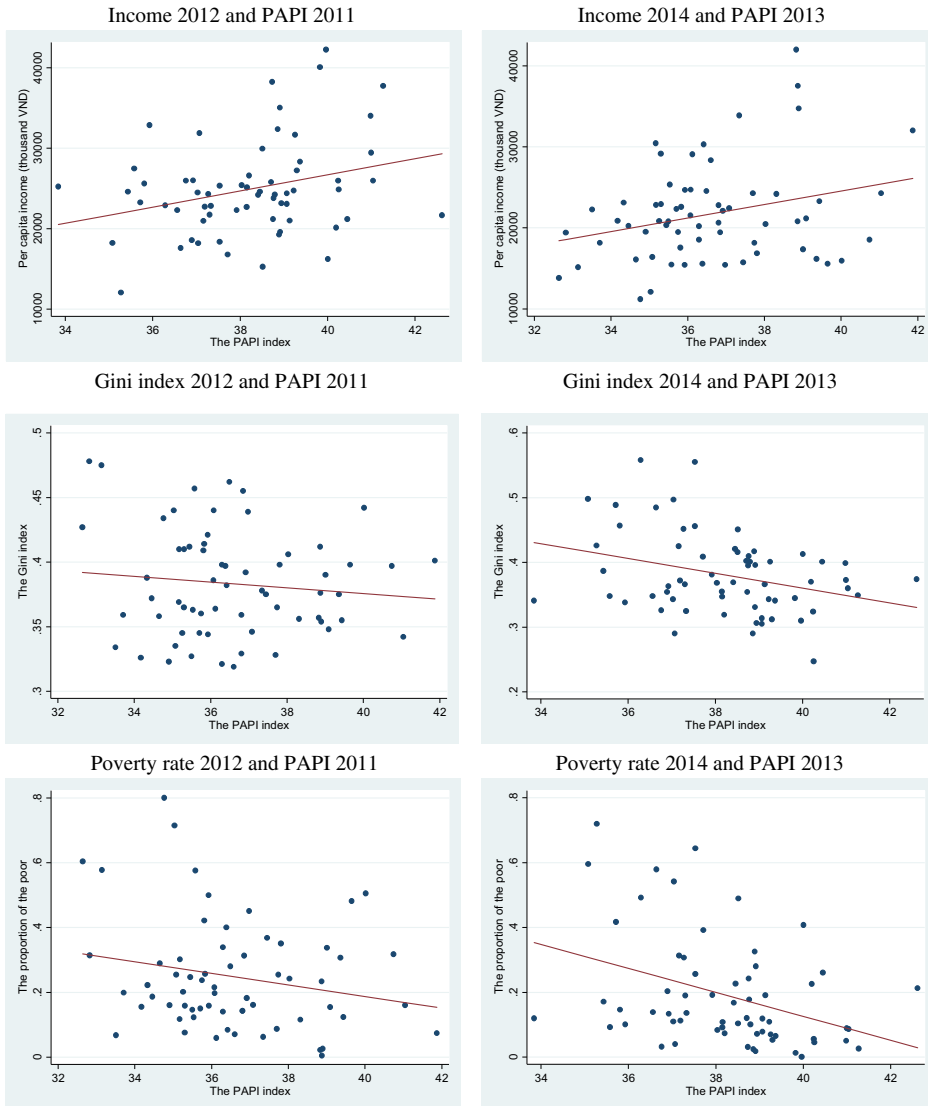
Figure 2. Mean per capita income and PAPI of provinces.
Source: Authors' estimation from PAPI and VHLSS data.

where $Y_{i,t}$ is an outcome of interest of province i in the year t (years 2012 and 2014). In this study, we have five outcome variables: (1) per capita income; (2) Gini index; (3) poverty rate; (4) poverty gap index; and (5) poverty severity index. We use similar model specifications for different outcomes. *Governance*$_{i,t-1}$ is an indicator index of lagged governance and public administration measured for province i. This variable is measured by the weighted PAPI score of provinces.

Year 2014$_t$ is a dummy year which is equal to one for 2014 and zero for 2012. $X_{i,t}$ is the vector of exogenous control variables. Unobserved variables are decomposed into time-invariant component u_i and time-variant component $v_{i,t}$. We will use the panel data of provinces in 2012 and 2014 to estimate model 1.

We use the lagged PAPI score instead of the current PAPI score for two reasons. First, the PAPI surveys are often conducted between June and December, whereas the VHLSS is conducted between March and December. Using the dependent and independent variables in the same years can lead to reverse causality. Using lagged independent variables avoids this problem and mitigates the endogeneity bias. Second, the 2014 PAPI is missing data for two provinces, and using the 2014 PAPI data can reduce the number of observations in our analysis. Since we use one year-lagged independent variable, the effect of governance and public administration should be interpreted as the short-term effect. We do not have a longer panel data set. Hence, we are not able to estimate the long-term effect of governance and public administration.

The main challenge with our regression models is the endogeneity of the independent variables. For example, governance can be correlated with omitted variables in the equation of mean income. Randomization of governance quality is not possible in this study. Another econometric method to solve endogeneity bias is instrumental variable regression. This method requires an instrument that affects governance quality but is not correlated to unobserved variables in the equation of mean income. For this study, we are unable to find a convincing instrument for governance. Instead, we use fixed-effects regression to mitigate the endogeneity bias. This method also eliminates the time-invariant error, u_i.

Although we use fixed-effects regression along with lagged governance and public administration measures, this approach is still not fully able to eliminate the risk of endogeneity bias and bi-directional causation (or reverse causality). Firstly, there can be omitted variables that affect both governance and economic growth. Secondly, economic growth can also affect the governance. In addition, PAPI index is constructed based on citizens' perception of governance and public administration, which can be affected by the economic level. These risks remain a concern, given the known linkages between improved economic performance (and income equality) and governance.[5] We expect the bias to be small once we control for the observed variables and time-invariant unobserved variables. Thirdly, as mentioned, we do not have a long panel data set to estimate the long-term effect of the quality of governance and public administration. The short-term data set might be more likely to capture association instead of causality. Thus, we remain cognizant of these concerns in interpreting our findings and drawing conclusions.

Several studies (e.g., Li et al. 1998; Dollar and Kraay 2002) show a heterogeneous impact of governance across levels of development. To test whether the effect of governance and public administration quality differs for provinces with varying levels of growth and poverty, we use quantile regression with province fixed-effects. A challenge with fixed-effects quantile regression is that the traditional fixed-effects regression (either using dummies of provinces or transforming

data) cannot be applied. In this study, we apply Canay's (2011) method to estimate fixed-effects quantile regression. First, we estimate model 1 using fixed-effects regression or OLS with the provincial dummies, then estimate the provincial dummy effect; i.e., $\widehat{u}_i$. Second, a new dependent variable is computed as the difference between the original dependent variable and the fixed-effects:

$$ln\widehat{(Y_{i,t})} = \ln(Y_{i,t}) - \widehat{u}_i. \tag{2}$$

Third, quantile regressions are applied to the new dependent variable as follows:

$$Quantile\left[ln\widehat{(Y_{i,t})}\right]_\theta = \alpha_\theta + \beta_\theta \ln(Governance_{i,t-1}) + \delta_\theta Year2014_t + X_{i,t}\pi_\theta, \tag{3}$$

where θ denotes the corresponding quantiles of dependent variables. The standard errors are estimated using bootstrap techniques. Under certain assumptions discussed in Canay (2011), this estimator is asymptotically consistent.

EMPIRICAL FINDINGS

Impact of Governance and Public Administration

This section presents regressions of per capita income, the Gini index, and poverty indices on the lagged PAPI score. The control variables include log of population density, the share of urban population, the share of ethnic minority population, public spending on investment of provinces, public spending on education and health services, and other public spending, and log of the number of passengers within provinces during the last 12 months. The summary statistics of the control variables and regression results are presented in Tables A2 and A3 in Appendix B.

Results from regressions without control variables are similar to those from regressions with control variables. In this study, we use the results from province fixed-effects regression with control variables for interpretation.

In Table 2, we start with a linear model, which shows a positive association between governance and public administration and per capita income. However, the association is not statistically significant at the conventional level. Next, we apply a quadratic model, in which both the log of lagged PAPI and the squared log of lagged PAPI are statistically significant. There is an inverted-U shape relationship between per capita income and the quality of governance and public administration. Per capita income initially increases as the PAPI score rises. When the log of the lagged PAPI score is at 3.67 (which is equal to $12.18/(2 \times 1.66)$), the effect of the PAPI score on the per capita income is equal to zero. The range of the log of the lagged PAPI score is from 3.48 to 3.75, and approximately 95% of provinces have a score below 3.64. This observation indicates that the effect of governance and public administration on per capita income of provinces is positive, but decreases with the level of per capita income.

The last two columns of Table 2 present the province fixed-effect quantile regression of model 3. We estimate regression at only two quantiles—the 25th and

TABLE 2

Fixed-Effects Regression of Per Capita Income and Gini Index on the Government Index

Explanatory variables	Fixed-effects	Fixed-effects	25th quantiles	75th quantiles
Log of lagged PAPI	0.162	12.178*	0.173**	0.104
	(0.183)	(5.723)	(0.083)	(0.072)
Squared log of lagged PAPI		−1.660*		
		(0.815)		
Log of population density	−0.140	−0.125	−0.003	−0.001
	(0.093)	(0.097)	(0.005)	(0.006)
Share of urban population	−0.225*	−0.218	−0.029	0.035
	(0.111)	(0.113)	(0.033)	(0.029)
Share of ethnic minor-ity population	−0.863**	−0.888**	−0.035	0.028
	(0.309)	(0.313)	(0.024)	(0.026)
Log of government spend-ing on investment	−0.036	−0.035	−0.007	−0.001
	(0.020)	(0.019)	(0.008)	(0.008)
Log of government spend-ing on health and education	0.021	0.021	0.006	−0.004
	(0.014)	(0.015)	(0.009)	(0.011)
Log of government spend-ing on other items	0.027	0.027	0.008	0.006
	(0.015)	(0.014)	(0.011)	(0.016)
Log of the number of passengers	0.354	0.356	−0.001	−0.001
	(0.247)	(0.250)	(0.008)	(0.007)
Dummy year 2014	0.087**	0.088**	0.141***	0.142***
	(0.024)	(0.025)	(0.010)	(0.009)
Constant	7.545***	−14.076	9.153***	9.514***
	(1.675)	(11.257)	(0.363)	(0.318)
Observations	126	126	126	126
R-squared	0.81	0.81	0.93	0.91

Robust standard errors in parentheses.
*significant at 10%.
**significant at 5%.
***significant at 1%.
Source: Authors' estimation from PAPI and VHLSS data.

75th quantiles—since we do not have a large number of observations. Governance and public administration have a positive and significant effect on per capita income at the 25th quantile but an insignificant effect at the 75th quantile of per capita income. The elasticity of per capita income with respect to the quality of governance and public administration is 0.17 at the 25th quantile and 0.1 at the 75th quantile. This finding indicates that governance and public administration are more important for income growth in low-income provinces than in high-income provinces. Our findings are similar to those of Li et al. (1998) and Dollar and Kraay (2002), who also find that income of countries in the lower quantiles is

more responsive to a change in the government variable. In other words, with respect to income, poor countries are more likely to benefit from improvement in governance than rich countries.

We examine the effect of governance and public administration on income inequality as measured by the Gini index and other poverty indices (Table 3). In addition to the poverty rate, we use the poverty gap and severity indices, which take into account not only the number of poor citizens (poverty rate) but also the gap between the poverty line and the poor's income (formulas are presented in Appendix A). The Gini index and the poverty rates are multiplied by 100, and the dependent variables are the logs of the Gini and the poverty indices.

We attempted to include both the log of lagged PAPI and the squared log of lagged PAPI in all of the regressions. However, except in the regression of income, neither log is significant. Therefore, the linear model fits the data better than the quadratic model. We also ran both linear and quantile regressions. Quantile regression shows a differential impact of governance at different quantiles. Accordingly, we use results from quantile regression for interpretation in this section. The results from linear regression are presented in Appendix B.

Table 3 illustrates that good governance and public administration help to reduce income inequality. The effect is large at the higher quantiles. Specifically, a 1% increase in the PAPI score is associated with a 0.35% decrease in the Gini coefficient at the 25th quantile of inequality, and a 0.39% decrease at the 75th quantile. This finding indicates that better governance and public administration provide more of an income-increasing benefit to the poorer households within a province than to the richer households within that province, and this benefit is greater in provinces in which income distribution is more unequal. The negative correlation between governance and inequality has also been found in other studies using cross-country data, such as Li et al. (1998), Lundberg and Squire (2003), and Chong and Gradstein (2004).

As a result of the income-increasing effect and the inequality-reducing effect of better governance, poverty decreased significantly. Our results indicate that poverty is highly sensitive to governance and public administration. Moreover, the elasticity of poverty to governance and public administration is larger at higher quantiles of poverty; i.e., the poorer provinces. A 1% increase in the PAPI score is associated with a 1.3% decrease in the poverty rate at the 25th quantile of provinces (those with the lowest poverty rates) and a 1.8% decrease at the 75th quantile of provinces (those with the highest poverty rates). The effect of governance and public administration is greater on the poverty gap index and the poverty severity index than on the poverty rate. This finding indicates that, within a province, the very poor benefit most from good governance and public administration in terms of poverty reduction.

Impact of Dimensions of Governance and Public Administration

To understand the mechanisms through which the quality of governance and public administration affects income growth and poverty reduction, we run

TABLE 3

Fixed-Effects Simultaneous Quantile Regression of the Gini and Poverty Indices

Explanatory variables	Log of Gini index		Log of poverty rate		Log of poverty gap index		Log of poverty severity index	
	25th quantile	75th quantile	25th quantile	75th quantile	25th quantile	75th quantile	25th quantile	75th quantile
Log of lagged PAPI	−0.354***	−0.390***	−1.313***	−1.780***	−2.626***	−3.017***	−3.358***	−3.932***
	(0.116)	(0.121)	(0.423)	(0.390)	(0.458)	(0.482)	(0.618)	(0.664)
Log of population density	−0.004	0.003	−0.027	0.023	−0.019	0.014	0.030	−0.066
	(0.009)	(0.007)	(0.036)	(0.033)	(0.043)	(0.038)	(0.051)	(0.052)
Share of urban population	−0.029	0.007	−0.205	0.106	−0.119	0.217	−0.021	0.090
	(0.049)	(0.036)	(0.143)	(0.160)	(0.209)	(0.208)	(0.258)	(0.249)
Share of ethnic minority population	−0.019	0.012	−0.154	0.185	−0.127	0.244	−0.036	0.029
	(0.032)	(0.039)	(0.118)	(0.130)	(0.141)	(0.163)	(0.216)	(0.221)
Log of government spending on investment	−0.002	−0.022	0.006	−0.036	0.017	−0.032	0.015	−0.039
	(0.014)	(0.014)	(0.056)	(0.045)	(0.054)	(0.071)	(0.088)	(0.094)
Log of government spending on health and education	0.010	0.003	0.057	−0.026	0.052	−0.051	0.011	−0.056
	(0.015)	(0.013)	(0.057)	(0.052)	(0.082)	(0.068)	(0.095)	(0.079)
Log of government spending on other items	−0.013	0.014	−0.054	−0.008	−0.128	0.003	−0.088	0.003
	(0.018)	(0.018)	(0.076)	(0.065)	(0.103)	(0.077)	(0.135)	(0.099)
Log of the number of passengers	0.003	0.008	0.012	0.039	−0.010	0.036	−0.045	0.088*
	(0.008)	(0.008)	(0.031)	(0.029)	(0.032)	(0.044)	(0.040)	(0.052)
Dummy year 2014	0.002	0.006	−0.385***	−0.336***	−0.318***	−0.338***	−0.285***	−0.273***

TABLE 3
Continued

Explanatory variables	Log of Gini index		Log of poverty rate		Log of poverty gap index		Log of poverty severity index	
	25th quantile	75th quantile	25th quantile	75th quantile	25th quantile	75th quantile	25th quantile	75th quantile
Constant	4.984***	5.037***	7.614***	10.046***	12.262***	13.456***	13.891***	16.195***
	(0.013)	(0.013)	(0.057)	(0.046)	(0.060)	(0.066)	(0.065)	(0.081)
	(0.405)	(0.496)	(1.611)	(1.666)	(1.769)	(1.732)	(2.634)	(2.498)
Pseudo R2	0.8887	0.8808	0.9587	0.9648	0.9469	0.9575	0.9328	0.9498
Observations	126	126	126	126	126	126	126	126

Robust standard errors in parentheses.
*significant at 10%.
**significant at 5%; Robust standard errors in parentheses.
The poverty rate, poverty gap index, and poverty severity index are measured in percent.
Source: Authors' estimation from PAPI and VHLSS data. Significant at 1%.

regressions of these variables on the scores of the PAPI survey's six dimensions of governance and public administration. These explanatory variables are the lagged log of the score of the six dimensions. Since these dimensions are highly correlated, we run each regression on each dimension separately to avoid multicollinearity. The control variables are also the same as the previous regressions. Table 4 presents the coefficients of quantile regression of the dependent variables on each of the six dimensions. Two dimensions, "Public administrative procedures" and "Public service delivery," have a positive association with per capita income. Other dimensions are not significantly associated with income.

Regarding income inequality, improvement in "Transparency," "Vertical accountability," and "Control of corruption" are associated with n reduction in income inequality. One possible explanation is that improvement in these dimensions can increase efficiency of public investments and provide the poor with more information and better access to public services. As corruption, by its nature, benefits the powerful, reducing corruption also decreases the gap between the rich and the poor.

Table 4 also presents regressions of poverty indices. The three dimensions of "Public service delivery," "Vertical accountability," and "Transparency" are negatively associated with poverty rates. "Public service delivery" has the largest association: a 1% increase in the score of this dimension is associated with a 0.54% reduction in the poverty rate of provinces at the 25th quantile (richer provinces) and a 0.45% reduction in the poverty rate at the 75th quantile (poorer provinces). The beneficial effect of public service delivery on the poorest households within a province is considerably higher. A 1% increase in the score of this dimension is associated with a 4.9% decrease in the poverty severity index at the 25th quantile (richer provinces) and a 3.8% decrease at the 75th quantile (poorer provinces). Based on these findings, improving transparency in local policymaking and planning, and increasing access to public services, are effective means to reduce poverty and to help the poor improve their living standards.

Impact of Governance and Public Administration on Labor Productivity and Human Capital

To understand further the mechanisms of the impact of governance and public administration on growth and poverty reduction, we regress the employment and human capital variables on the PAPI score. Table 5 shows that there is a small and insignificant association between governance and education. However, better governance and public administration help high-quantile (more unskilled workers) provinces decrease the share of unskilled workers. A 1% increase in the PAPI score is associated with a 0.2% decrease in the proportion of unskilled workers at the 25th province quantile.

Better governance and public administration help to create more employment for local residents, although the effect is small. The elasticity of the percentage of working people to the PAPI score is 0.028 for provinces at the 25th quantile of employment rates and 0.041 for provinces at the 75th quantile.

TABLE 4

Fixed-Effects Simultaneous Quantile Regression on Sub-Dimensions of Governance and Public Administration

	Log of per capita income		Log of Gini index		Log of poverty rate		Log of poverty gap index		Log of poverty severity index	
	25th quantile	75th quantile	25th quantile	75th quantile	25th quantile	75th quantile	25th quantile	75th quantile	25th quantile	75th quantile
Log of lagged score of "Citizen participation at local levels"	0.037 (0.047)	0.049 (0.054)	−0.027 (0.057)	−0.010 (0.094)	0.436** (0.216)	−0.119 (0.097)	0.350 (0.302)	−0.447** (0.205)	−0.071 (0.362)	−0.314 (0.347)
Log of lagged score of "Transparency in local policymaking and planning"	0.008 (0.045)	−0.043 (0.041)	−0.232*** (0.043)	−0.317*** (0.056)	−0.589*** (0.163)	−1.005*** (0.176)	−1.054*** (0.198)	−1.473*** (0.303)	−1.717*** (0.407)	−1.829*** (0.341)
Log of lagged score of "Vertical accountability"	−0.043 (0.038)	−0.055 (0.054)	−0.334*** (0.035)	−0.421*** (0.070)	−0.878*** (0.150)	−1.345*** (0.194)	−0.799*** (0.303)	−1.692*** (0.253)	−1.024*** (0.330)	−1.544*** (0.323)
Log of lagged score of "Control of corruption"	0.017 (0.040)	−0.029 (0.030)	−0.152** (0.059)	−0.169*** (0.050)	−0.242 (0.176)	−0.248 (0.169)	−0.599** (0.257)	−0.670*** (0.237)	−0.750** (0.323)	−0.454 (0.340)
Log of lagged score of "Public administrative procedures"	0.413*** (0.119)	0.278*** (0.065)	0.475*** (0.108)	0.475*** (0.088)	0.974** (0.463)	0.597 (0.409)	0.211 (0.612)	−0.098 (0.521)	0.038 (0.676)	−0.074 (0.683)
Log of lagged score of "Public service delivery"	0.500*** (0.081)	0.326*** (0.065)	0.029 (0.101)	0.032 (0.082)	−1.508*** (0.352)	−1.386*** (0.400)	−2.341*** (0.491)	−2.760*** (0.510)	−3.193*** (0.578)	−3.171*** (0.905)

Robust standard errors in parentheses.
*significant at 10%.
**significant at 5%.
***significant at 1%.
The poverty rate, poverty gap index, and poverty severity index are measured in percent.
Source: Authors' estimation from PAPI and VHLSS data.

TABLE 5

Fixed-Effects Simultaneous Quantile Regression of Human Capital

Explanatory variables	Log of the number of schooling years		Log of percentage of completion of university		Log of the percentage of unskilled workers		Log of the employment rate		Log of productivity	
	25th quantiles	75th quantiles	25th quantiles	75th quantiles	25th quantiles	75th quantiles	25th quantiles	75th quantiles	25th quantiles	75th quantiles
Log of lagged PAPI	−0.003	0.029	−0.089	−0.207	−0.195*	−0.039	0.028	0.041*	0.189**	0.003
	(0.036)	(0.041)	(0.270)	(0.306)	(0.098)	(0.200)	(0.020)	(0.024)	(0.090)	(0.099)
Log of population density	0.000	−0.000	−0.020	0.003	0.002	0.002	0.001	−0.001	−0.002	−0.000
	(0.002)	(0.002)	(0.016)	(0.016)	(0.013)	(0.012)	(0.001)	(0.001)	(0.006)	(0.007)
Share of urban population	−0.014	0.014	0.025	−0.070	−0.115	0.099	−0.000	0.001	−0.022	0.020
	(0.012)	(0.011)	(0.068)	(0.072)	(0.136)	(0.109)	(0.008)	(0.009)	(0.043)	(0.044)
Share of ethnic minority population	−0.015*	0.007	−0.169**	0.116*	0.012	−0.006	0.005	−0.004	−0.038	0.018
	(0.009)	(0.010)	(0.074)	(0.065)	(0.041)	(0.038)	(0.006)	(0.006)	(0.029)	(0.035)
Log of government spending on investment	−0.002	0.001	0.023	−0.018	−0.004	0.006	−0.000	−0.002	−0.003	−0.003
	(0.003)	(0.003)	(0.025)	(0.023)	(0.014)	(0.017)	(0.002)	(0.002)	(0.008)	(0.010)
Log of government spending on health and education	0.002	0.002	−0.012	0.019	0.014	−0.017	−0.001	−0.002	0.010	−0.011
	(0.003)	(0.002)	(0.025)	(0.022)	(0.029)	(0.022)	(0.002)	(0.002)	(0.009)	(0.011)

(continued)

TABLE 5
Continued

Explanatory variables	Log of the number of schooling years		Log of percentage of completion of university		Log of the percentage of unskilled workers		Log of the employment rate		Log of productivity	
	25th quantiles	75th quantiles	25th quantiles	75th quantiles	25th quantiles	75th quantiles	25th quantiles	75th quantiles	25th quantiles	75th quantiles
Log of government spending on other items	−0.001 (0.003)	0.002 (0.004)	0.027 (0.030)	0.002 (0.040)	−0.014 (0.029)	0.002 (0.024)	0.000 (0.002)	0.004 (0.003)	−0.001 (0.012)	0.022 (0.016)
Log of the number of passengers	0.002 (0.002)	−0.003 (0.002)	−0.032 (0.021)	0.018 (0.017)	−0.006 (0.016)	0.009 (0.014)	0.000 (0.002)	0.000 (0.002)	0.001 (0.010)	−0.006 (0.008)
Dummy year 2014	0.022*** (0.004)	0.023*** (0.004)	0.259*** (0.029)	0.253*** (0.026)	−0.027 (0.019)	−0.029** (0.014)	−0.004 (0.002)	−0.005** (0.002)	0.126*** (0.011)	0.134*** (0.012)
Constant	2.093*** (0.137)	1.939*** (0.154)	1.779* (0.964)	2.353** (1.097)	4.488*** (0.860)	3.938*** (0.888)	4.408*** (0.077)	4.360*** (0.094)	9.348*** (0.380)	10.022*** (0.385)
Pseudo R2	−0.003	0.029	−0.089	−0.207	−0.195	−0.039	0.028	0.041*	0.189**	0.003
Observations	126	126	126	126	126	126	126	126	126	126

Robust standard errors in parentheses.
*significant at 10%.
**significant at 5%.
***significant at 1%.
The poverty rate, poverty gap index, and poverty severity index are measured in percent.
Source: Authors' estimation from PAPI and VHLSS data.

Finally, we regress the labor productivity, which is computed by total income of provinces divided by the number of working people aged from 15 to 65, on the PAPI score. This analysis shows that the effect of governance on productivity is consistent with the effect on per capita income. A 1% increase in the PAPI score is associated with a 0.19% increase in the labor productivity of provinces at the 25th quantile of labor productivity. The association between governance quality and labor productivity is very small and not significant at the 75th quantile.

Improving governance and public administration thus appears to have some role in helping provinces to increase human capital by increasing education levels, increasing population and, to a lesser extent, increasing employment and productivity. The diminishing positive effect of governance and public administration on labor productivity might be due to decreasing physical capital returns to human capital. In the short term, physical capital increases at a lower rate than human capital.

CONCLUSIONS

In this study, we examine the association between the quality of governance and public administration and different provinces' outcomes, including income mean, income distribution, and poverty, using provincial-level data from Vietnam in 2012 and 2014. We measure the quality of governance and public administration using Vietnam's Public Administration Performance Index (PAPI) data.

Using fixed-effect regressions, we find a positive but nonlinear association between the quality of governance and public administration and per capita income. The association between the quality of governance and public administration and economic level is stronger for provinces with a lower level of income. This finding indicates that governance and public administration are more important for income growth for low-income provinces than high-income provinces. The quality of governance and public administration is also associated with income distribution. An increase in the PAPI score corresponds to a reduction in the Gini coefficient of provinces. The income-increasing effect and the inequality-reducing effect together reduced poverty significantly. Moreover, the effects of improved governance and public administration on the poverty gap index and the poverty severity index are higher than on the poverty rate, indicating that, within a province, good governance tends to provide the most benefit to the very poor.

While remaining aware of the difficulties of definitively establishing causation between governance and economic growth, the strength of our findings is supportive of a link. The established literature cites numerous channels through which governance and public administration can affect poverty levels. In this study, we find that one potential channel is via improved human capital. Provinces with better governance and public administration have a higher rate of employment and a lower share of unskilled workers. Improved human capital helps provinces to increase labor productivity, thereby raising per capita income and reducing

poverty. The effect is weaker for provinces with high income and low poverty, likely due to diminishing returns to human capital. Improvement in government transparency, vertical accountability, and control of corruption also help provinces to reduce poverty and income inequality.

The findings from this study have several policy implications. First, improving the quality of governance and public administration is likely to be important for economic growth, income equality, and poverty reduction. Second, the role of good governance and public administration appears to be more important for provinces with lower income and lower quality of governance. Improving the quality of governance and public administration should therefore be a goal for all provinces, but especially for poor provinces and those with a low quality of governance. Third, improving the quality of public administrative services and creating better access to these services are important for economic growth, while enhancing transparency, vertical accountability, and control of corruption can help reduce income inequality. Intervention measures to improve governance and public administration should be tailored to fit different provinces' levels of income and inequality.

NOTES

1. For instance, UNDP (1997) defines governance as the exercise of economic, political, and administrative authority to manage a country's affairs at all levels. Governance comprises mechanisms, processes, and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences. Kaufmann et al. (1999) refer to governance as the traditions and institutions by which authority in a country is exercised for the common good. This definition includes the process by which those in authority are selected, monitored, and replaced, and the capacity of the government to effectively manage its resources and implement sound policies. Different definitions result in various measures of governance, with differing variables of interest, such as rule of law and anti-corruption, political stability, voice and accountability, and absence of violence.
2. For detailed information about the data source, see www.papi.vn/en
3. We cannot estimate the per capita expenditure index and the expenditure poverty index at the provincial level, since the samples of VHLSS containing expenditure data are not representative at the provincial level.
4. Kinh is Vietnamese and Hoa is Chinese. Only a small number of residents are Hoa, but they generally enjoy a high socioeconomic status and live primarily in urban areas. For these reasons, Hoa are often grouped with Kinh in poverty analyses.
5. See Acemoglu, Johnson, and Robinson (2001) for a discussion of the issues and efforts to control for bi-directional causation.

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APPENDIX A

Measurement of Poverty and Inequality

We measure poverty using three Foster-Greer-Thorbecke poverty indexes, which are estimated using the following formula (Foster, Greer, and Thorbecke 1984):

$$P_\alpha = \frac{1}{n} \sum_{i=1}^{q} \left[\frac{z - Y_i}{z} \right]^\alpha \tag{A.1}$$

where Y_i is income of person i, z is the poverty line, n is the number of people in the sample population, q is the number of poor people, and α is interpreted as a measure of inequality aversion. When $\alpha = 0$, Equation (A.1) estimates the head-count index H, which is the proportion of people below the poverty line. When $\alpha = 1$, we have the poverty gap index, which measures the depth of poverty. When $\alpha = 2$, we have the squared poverty gap index (also called the poverty severity index), which measures the severity of poverty.

To measure inequality, we use the common measure of inequality, the Gini coefficient, which can be calculated from the individual incomes in the population as follows (Deaton 1997):

$$G = \frac{1}{2n(n-1)\mu} \sum_{i=1}^{n} \sum_{j=1}^{n} |Y_i - Y_j| \tag{A.2}$$

where Y_i is the income of the ith person, and n is the total number of people in the population. The Gini coefficient ranges from 0, when everyone has the same income, to 1, when one person has the whole income of the population. The higher value of the Gini coefficient means a more unequal income distribution.

APPENDIX B

Tables

TABLE A1
List of Indicators Used to Construct the Aggregate PAPI

Dimensions and indicators

Dimension 1: Citizen participation at local levels
- Correct knowledge of village head term limit (%)
- Knowledge of which local offices are electable (0 to 4)
- Voted in last Commune People's Council Election (%)
- Voted in last Village Head Election (%)
- Voted in last National Assembly Election (%)
- Aware of Grassroots Democracy Decree (%)
- Aware of slogan "People Know, Discuss, Do, Verify" (%)

TABLE A1
Continued

Dimensions and indicators

- In my village, the chief is selected by an election (%)
- Election has more than one candidate (%)
- Respondent was invited to participate (%)
- Paper ballot was used (%)
- Votes counted publicly (%)
- Candidate was suggested by authorities (%)
- Respondent voted for winner (%)
- Respondent made voluntary contribution (%)
- Voluntary contributions monitored by community board (%)

Dimension 2: Transparency in local policymaking and planning
- Poor households receive support (% agree)
- Poverty list published in last 12 months (% agree)
- Households are missing from poverty list (%)
- Non-poor included on poverty list (%)
- Budget is made available (% agree)
- Respondent read communal budget if available (%)
- If respondent read, they believe it has adequate information (%)
- Respondent is aware of communal land use plan (%)
- Respondent provided comment on plan (%)
- If provided, land use plan acknowledges concerns (% agree)
- Respondent DID NOT lose land as a result of new plan (%)
- Compensation for lost land is close to market value (% agree)
- Respondent knows where to go to get land information (%)
- Impact of land plan on family (1 Hurt; 2 Nothing; 3 Benefit)

Dimension 3: Vertical accountability
- Contact village head to sort out personal/community issues (%)
- Contact commune officials to sort out personal/community problems (%)
- Meeting with village head was useful (%)
- Meeting with commune official was useful (%)
- Made proposal to local authorities (%)
- Making proposal was useful (%)
- Respondent is aware of village PIB (%)
- PIB selected by vote (% of those aware)
- PIB is effective at its job (% of those aware)
- Respondent is aware of commune investment supervision board (%)
- Commune investment supervision board is effective at its job (% of those aware)

Dimension 4: Control of corruption in the public sector
- Officials divert state funds for personal use (% disagree)
- Bribes are necessary to obtain land title (% disagree)

TABLE A1
Continued

Dimensions and indicators

- Bribes are necessary to obtain construction permit (% disagree)
- Individuals paying informal charges at notary (%)
- Bribes are necessary at hospital (% disagree)
- Parents at communal primary school give bribes to teachers for favoritism (% disagree)
- Parents bribe teachers in school (from experience) (% disagree)
- Teachers favor students who attend after-school study sessions (% disagree)
- Corruption has no effect on you or family (%)
- Individuals paying informal charges at hospital (%)
- Bribes are necessary for public employment (% disagree)
- Number of government positions for which relationships are NOT necessary (1 to 5)
- Respondent is aware of Anti-Corruption Law (%)
- Province is serious about fighting corruption when it occurs (%)
- Respondent was a victim of a corruption, but chose not to denounce (%)
- How high a bribe would need to be paid to a police officer?
- How high a bribe would need to be paid to a People's Committee Official?

Dimension 5: Public administrative procedures

- Respondent used notary service (%)
- Total notary quality score
- Total construction application quality score (sum of eight items)
- If he/she applied for construction permit, respondent did not go to more than one window (%)
- Percentage of respondents who applied for new LURC in last three years (%)
- Total LURC application process quality (sum of eight items)
- If he/she applied for LURC, respondent did not go to more than one window (%)
- LURC application process has been simplified in past three years (% agree)

Dimension 6: Public service delivery

- Total quality of public primary education (sum of eight items)
- Distance from home to nearest primary school (km)
- Total quality of hospitals (sum of seven items)
- Respondents with health insurance (%)
- Do poor households receive subsidized health insurance? (% Yes)
- Are medical checks for children under 6 free? (% Yes)
- Households with electricity (%)
- Quality of road nearest to house (1 Dirt; 2 Gravel; 3 Concrete; 4 Paved)
- Frequency of garbage pick-up (0 Never to 5 Every Day)
- Tap water in home as primary drinking water (%)
- Respondents drinking rain or river water as primary source (%)
- Crimes experienced in last year by respondents
- Assessment of safety in village (0 Very Unsafe; 3 Very Safe)
- Safety improvement in past three years (% Agree)

Source: CECODES, FR, and UNDP (2010).

TABLE A2
Summary Statistics of Variables

Variables	Year 2012		Year 2014	
	Mean	Std. Dev.	Mean	Std. Dev.
Dependent variables				
Per capita income (thousand VND)	20,570.2	5,879.8	23,567.4	6,023.7
Gini index	38.32	4.11	38.07	6.21
Poverty rate (%)	24.82	17.07	19.16	17.12
Poverty gap index (in percent)	8.00	6.64	6.14	6.44
Poverty severity index (in percent)	3.46	3.14	2.79	3.04
Productivity (thousand VND per worker)	25,937.7	8,564.4	29,398.5	8,862.0
Percentage of working people (15–65)	91.30	4.77	91.00	4.77
Percentage of unskilled workers	47.08	22.53	45.80	21.74
Number of schooling years	8.17	1.46	8.38	1.45
Percentage of completed college/university	6.55	3.59	8.24	4.10
Explanatory variables				
PAPI index	36.58	2.02	38.22	1.72
Share of ethnic minority population	22.96	29.65	21.95	29.27
Population density (people per km^2)	467.5	540.7	480.5	589.7
Share of urban population	25.31	15.66	27.45	17.40
Provincial government spending on investment (billion VND)	2,871	3,598	2,953	4,416
Provincial government spending on regular (billion VND)	5,588	5,596	6,382	5,107
Provincial government spending on other items (billion VND)	13,300	11,100	15,000	12,800
Passenger (million km)	1,329	1,914	1,518	2,351

Source: Authors' estimation from PAPI and VHLSS data.

TABLE A3
Fixed-Effects Regression of Gini and Poverty Indexes

Explanatory variables	Log of Gini index	Log of poverty rate	Log of poverty gap index	Log of poverty severity index
Log of lagged PAPI	−0.514*	−2.226**	−3.593**	−4.470**
	(0.214)	(0.631)	(1.122)	(1.518)
Log of population density	−0.163	−0.668	−0.701	−0.914
	(0.102)	(0.669)	(0.748)	(0.938)
Share of urban population	−0.116	−0.315	0.665	1.754
	(0.179)	(0.650)	(0.694)	(0.899)
Share of ethnic minority population	−0.099	2.720	3.394**	4.702**
	(0.352)	(1.568)	(1.100)	(1.241)
Log of government spending on investment	−0.081***	−0.182	−0.210**	−0.263**
	(0.019)	(0.094)	(0.078)	(0.080)
Log of government spending on health and education	−0.010	−0.122***	−0.193***	−0.230***
	(0.009)	(0.015)	(0.019)	(0.024)
Log of government spending on other items	−0.032	−0.091	−0.129	−0.113
	(0.017)	(0.048)	(0.067)	(0.085)
Log of the number of passengers	−0.149	−2.405*	−1.817**	−1.585**
	(0.244)	(1.061)	(0.557)	(0.562)
Dummy year 2014	0.028*	−0.032	−0.066	−0.042
	(0.013)	(0.070)	(0.057)	(0.076)
Constant	9.299***	36.105***	37.774***	40.166***
	(1.272)	(7.187)	(2.683)	(3.557)
Observations	126	126	126	126
R-squared	0.261	0.715	0.731	0.638

Robust standard errors in parentheses.
*significant at 10%.
**significant at 5%.
***significant at 1%.
The poverty rate, poverty gap index, and poverty severity index are measured in percent.
Source: Authors' estimation from PAPI and VHLSS data.