

Institutions for private sector development and pro-poor growth: Evidence from Vietnam

Trung X. Hoang^{*,**}, Cong S. Pham^{***} and Mehmet A. Ulubaşođlu^{***}

* Department for Management of Science and Technology Development, Ton Duc Thang University, Ho Chi Minh City, Vietnam. Email: hoangxuantrung@tdtu.edu.vn

** Faculty of Business Administration, Ton Duc Thang University, Ho Chi Minh City, Vietnam. Email: hoangxuantrung@tdt.edu.vn

***Deakin University, Melbourne, Australia. Emails: cong.pham@deakin.edu.au; mehmet.ulubasoglu@deakin.edu.au

Abstract

Using the Vietnam Household Living Standards Survey 2008, we explore the differences in pro-poor growth performance in provinces in Vietnam according to the quality of the provinces' institutions that support private sector activity. We exploit the localised and varying effect of French colonial legacy across Vietnamese provinces to address the endogeneity of institutions. We find strong and robust evidence of a positive effect of good-quality institutions that support private sector activity on pro-poor growth and that enhanced working hours and hourly wage and extended income from nonfarm self-employment play critical roles in this outcome.

Key words: pro-poor growth; private sector development; French colonial legacy; Vietnam.

JEL Codes: J3, O1, O4

1. Introduction

The number of people in the world living on less than US\$2 per day has decreased over the past three decades. Using household survey data from 117 countries, Ravallion (2010) shows that about 1.2 billion people in the world joined the middle-class between 1990 and 2005, with about half of them located in China and 117 million located in India. However, the bad news is that many of the ex-poor are still positioned just above the poverty line and are still vulnerable to economic slowdowns. The extent to which economic growth has helped the poor, as well as the sustainability of this progress, has been the subject of extensive debate in the literature (e.g., Dollar and Kraay, 2002; Ravallion and Chen, 2003; Son, 2004; Gasparini et al., 2007).

The literature on pro-poor growth began with studies that utilised cross-country data (see Ravallion and Chen, 1997; Ravallion, 2001; Collier and Dollar, 2001; Adams Jr, 2004; Kalwij and Verschoor, 2007; Fosu, 2009; Ram, 2011). The cross-country setting is useful for gaining a broad view of pro-poor growth but is limited in its ability to reveal the sources and mechanisms of the phenomenon, as a consistent definition of those sources and mechanisms cannot be made in that framework. To address concerns related to cross-country data, another strand of research has used different jurisdictions within one country; see, notably, Datt and Ravallion (1998, 2002, 2011) and Ravallion and Datt (2002) for India, Ayala and Jurado (2011) for Spain, Kang and Imai (2012) and Imai, Gaiha and Kang (2011a, 2011b) for Vietnam. However, these studies focused mainly on whether or not pro-poor growth existed in those countries, as well as the heterogeneous experiences of different segments of the population, such as different ethnicities. On the methodological front, whereas the cross-country literature mainly estimated the poverty elasticities of growth, some later studies utilised household-level survey data to find microeconomic evidence of pro-poor growth. Recently, studies have also focused on the welfare of the vulnerable, who are defined as not

currently poor but who face a considerable risk of falling into poverty (Dang and Lanjouw, 2017; Magrini, Montalbano and Winters, 2018).

The primary objective of this paper is to examine the effect of institutional quality on pro-poor growth, using household-level data from Vietnam. We contribute to the debate on pro-poor growth by examining a specific mechanism, the quality of the institutions that support private sector activity. Our central motivation is the fact that although private sector activity is well known for its role in creating markets and generating both self-employment and wage-employment for the poor, many developing countries still lack strong institutions that support its development. There is little work in the literature that systematically examines the way in which institutions that support private sector activity could influence the welfare of the poor, or the mechanisms of this influence. In a general setting, these institutions include the rules and organs that provide incentives, protect property rights, ensure competition, settle disputes, assist entrepreneurship and promote the culture of doing business. The poor may benefit from some of these institutions directly (for instance, through self-employment in the nonfarm sector) and from others only indirectly if they are wage-employed by larger firms. We study how province-level institutional quality in Vietnam affects the key two income sources of the poor: farm vs nonfarm-hours worked, and hourly wages in the labour market.

This study focuses on Vietnam because Vietnamese provinces exhibit widespread heterogeneity, not only in measured poverty levels but also in the quality of institutions that support private sector activity and the market presence (Malesky and Taussig, 2009). This sizeable variation permits us significant empirical leverage to explore our research question. In addition, our within-country setting enables a more consistent definition of the factors that trigger pro-poor mechanisms and provides data that are comparable. To measure pro-poor growth, we use the detailed information on expenditure, poverty, wages and working hours of

individuals from the 2008 Vietnam Household Living Standards Survey (VHLSS). To measure the quality of the institutions that support the private sector, we use a component of the Vietnam Provincial Competitiveness Index (PCI), entitled ‘Private Sector Development Services’ (PSDS). This component rates the quality of support extended by provincial authorities to local private enterprises in six areas: provincial services for private sector trade promotion; provision of market information to businesses; export promotion and trade fairs; match-making between business partners; industrial zones; and technological services for business development.

However, a major econometric problem in our research question is the endogeneity of institutional quality due to potential omitted variables. For example, it may be the case that the provincial experience of collectivisation in Vietnam, which is an important, persistent determinant of poverty, varies from one province to another and correlates negatively with the institutions that support private sector activity. This is because provinces with the greatest levels of collectivisation in the past, and consequently the entrepreneurship drive and market experience were the most negatively affected, are likely to be the provinces that have taken longer to develop a private sector. If this is the case, then the ordinary least squares (OLS) estimate of the effect of institutions is likely to be biased downwards.

As a solution to this problem, we exploit a historical experiment, the French colonisation of Vietnam, in an instrumental variable estimation. Specifically, we instrument the quality of the provincial institutions that support private sector activity by the ratio of French citizens living in the province in 1943 to total population of the province in 1943. This approach exploits the variation between the institutional quality in provinces that were exposed to French colonisation (with varying intensities) and that in provinces with no such experience to identify the differences in pro-poor growth performance in those province groups. The key motivation behind this approach is that the French established markets and

private sector activity in Vietnam in the areas they occupied. Thus, by providing the foundations for markets and market-supporting institutions, the French made it possible for the poor of today to participate in the markets in provinces that were colonised, whereas the market space remains much narrower for the poor in other provinces. The effects of French colonisation in Vietnam have persisted and are still present today.

To illuminate our instrumental variable further, French colonial rule in Vietnam spanned a long period from 1887 to 1945 (or up to 1954 in some provinces/cities). The changes brought about by the French ‘civilisation’ of Vietnam were fundamental and unprecedented.¹ It is crucial to emphasise that the French presence during the colonial rule of Vietnam varied across provinces. To repress local resistance to colonisation, the French divided Vietnam into three ‘protectorates’, which they administered separately: Tonkin (North), Annam (Centre) and Cochinchina (South). Since the driving factor behind the French colonisation was profit, they developed institutions in Tonkin and especially in Cochinchina, where the French interests were strongest. Although French colonial rule in Vietnam was in general oppressive, it did create some form of market for rice, rubber, coal and other resources. The French also embedded a strong culture of private sector activity in the local community, including supporting small businesses, local shops, stores and other business opportunities for self-employment. These facts, supported by historical accounts and anecdotal evidence, enable us to argue, at least initially, that the French presence in a given province in 1943 could be a valid instrument for evaluating the effect of the institutions behind private sector activity. Indeed, our regressions showed that French presence in 1943 in a province could explain the institutional quality of private sector support in that province, but not other dimensions of institutional set-up, such as entry costs, time costs and state

¹ It is important to note that although Japan pressured the Vichy France to make important military concessions in French Indochina in 1941, in 1943 the French colonial administration in Vietnam was still intact.

sector bias, to which French presence was less relevant. This study utilised an array of controls to mitigate the threats to our identification that could arise through other channels.

Critically, our analysis also investigates the mechanisms that run from the institutions that support private sector activity to pro-poor growth. Given the prominent role of income and employment in poverty alleviation, the major channel for institutional quality to activate the distributional mechanisms is likely to be enhanced nonfarm participation and labour market opportunities. Therefore, we examine in detail the role of this particular institution type in the number of farm- vs nonfarm-hours worked and the hourly wages of individuals.² Our premise is that private sector activity that is supported by good institutions may generate higher nonfarm participation rates and higher employment and/or higher productivity, thus reducing poverty and boosting pro-poor growth.

Our findings reveal that individuals living in provinces with better private sector support are more likely to escape poverty and attain higher levels of expenditure in Vietnam. Our endogeneity-corrected estimates are economically meaningful and show that an increase in the quality of private sector support by one standard deviation in a province, measured by the PSDS score in 2006, reduces the poverty probability of individuals by about 8% and increased their expenditure per capita by more than 14% in 2008. These results are robust to controlling for nine other PCI components in IV regressions, an array of geographic and climatic controls that address possible exclusion restrictions violations, as well as the use of the 2012 VHLSS dataset instead of 2008. Moving on to the mechanism, our IV regressions suggest that the wages of the poor living in a province with a PSDS score that was one standard deviation higher in 2006, are 10.3% higher in 2008 than the wages of similar individuals in other provinces. Moreover, we show that better institutional support for the private sector increases the number of nonfarm hours worked and nonfarm income, while

² There are, of course, several other possible avenues for reforms to affect poverty, such as reduced prices of staple foods and increases in government transfers. However, it is largely agreed that improved employment opportunities and higher pay generally constitute the key components of poverty reduction.

also reducing the number of farm hours worked and farm income. Further, the vulnerable segment of the population, defined as per Dang and Lanjouw (2017), enjoy similar benefits from better institutions as do the poor. Overall, the key conclusion in this paper is that growth is more pro-poor in provinces with improved private sector support, and that enhanced working hours and hourly wages, and extended income from nonfarm self-employment play critical roles in these outcomes.

This study makes three important contributions to the literature on pro-poor growth. First, we investigate the role of quality of the institutions that support private sector activity in the welfare of the poor. Second, we study the labour market mechanism, in particular, wages and income from nonfarm self-employment, as a crucial channel that runs from institutional quality to pro-poor outcomes. Third, we contribute to the growing literature on the long-term consequences of French colonial legacy in former French colonies (for example, Dell et al., 2018). In contrast to the corpus of work that documents the adverse effects of colonisation, we find that French colonial rule had a positive effect on the institutions that support the private sector in Vietnam currently.

Section 2 provides the contextual background of this paper. Section 3 discusses the data, Section 4 describes the econometric approach and Section 5 discusses the empirical results. Section 6 discusses the mechanisms of influence and Section 7 concludes.

2. Contextual Background

2.1. Institutions for Private Sector Development and Pro-Poor Growth

The core argument in the debate regarding pro-poor growth is that for growth to be pro-poor, the poor must experience positive income growth. In a strong case of pro-poor growth, the growth rate of the income of the poor should exceed the average income growth rate. A more recent consideration in this debate is the degree to which the not-currently-poor are vulnerable to the risk of falling into poverty. The distribution of income growth across the

population is crucial because most variations in the success of alleviating poverty follow from variations in who benefits from economic growth (Kraay, 2006).

The main premise of our theoretical mechanism is that for the poor to engage in welfare-increasing economic activity, they must participate in markets; and for markets to deliver welfare to the poor, they must function well in informing about business opportunities and signalling commodity scarcity through pricing. In a general context, functioning markets are ensured by institutions that include rules and organs that provide incentives, enforce contracts, protect property rights, ensure competition, settle disputes, assist entrepreneurship and promote the culture of doing business. In addition, a strong market economy is typically accompanied by well-developed financial intermediaries, with finance-constrained investors borrowing to produce new goods and services and savers lending their savings.

The relevance of these institutions to the poor is varied and it can be direct or indirect. The poor need to receive information about business opportunities and relatively accurate price signals for goods they produce and trade. In this sense, entrepreneurship, incentives and the culture of doing business are more directly relevant to the scale of their activities than contract enforcement, competition and dispute settlement. The latter are clearly an essential part of good institutions in a market economy but are likely to be more relevant to firms and mercantile business of larger scale. A poor individual is less likely to go to court for dispute settlement, given the scale of activities in which s/he is involved. Nevertheless, institutions such as contract enforcement, competition and dispute settlement can be indirectly relevant to the poor if they are wage-employed by firms.

To delve further into institutions that directly support the private sector activity of the poor, usually, the poor in Vietnam run small businesses in their own stores, selling handicrafts and other tradable goods. Thus, pro-poor institutions need to provide incentives for small-scale microenterprise growth. The poor can grow out of poverty only if institutions

help to build trading networks and commercial infrastructure. Moreover, informal rules and the culture of doing business, with guild membership and tolerance of ethnic and religious diversity, are directly relevant to nonfarm activity and to contributing to the welfare of the poor and reducing poverty (Dorward et al., 2014). Further, the ability to borrow is essential for the poor to be able to bring goods to the market.

Other institutions for private sector development can be indirectly relevant to the poor if they are employed in the labour market by large businesses. In addition to contract enforcement, dispute settlement, trade regulations, competition, innovation and rewarding risk that are all important for larger businesses, property rights that protect mercantile businesses from confiscation and ensure financial safety nets in the case of failure are critical for firm survival. Moreover, financial regulations concerning starting a business, credit, bankruptcy and the cost of dealing with licences are key considerations for such businesses. Where such institutions exist, the poor can benefit from the resulting higher productivity and wages in the labour market.

In the Vietnamese context, the poor participate in nonfarm markets in two ways: self-employment and wage-employment. Most nonfarm employment is generated by manufacturing (i.e., food and beverages, wood processing, furniture, fur products and non-metal mineral products), construction and trading. In 2008, self-employment (including family businesses) comprised around 40% of nonfarm employment. Jobs that are often subject to self-employment include handicrafts, trading and family business. Wage-employment in the private sector (and to some extent, in the state-owned and FDI sectors) form another 53% of nonfarm employment. Nearly 90% of households in Vietnam are engaged in blue-collar work (Hoang, Pham and Ulubasoglu 2014).

Do the institutions for private sector reduce poverty in farm vs non-farm sectors to the same degree? Our data show that among nonfarm households, only 5 percent live in poverty

while this rate is 19.6 percent for farm households. This divide suggests that the channels through which the growth of the private sector can benefit the poor could be different for agricultural and non-agricultural households. Let us disentangle this nexus. First, the private sector can help agricultural households gain from general economic growth because it increases the demand for goods and services and expands the market space. Second, through match-making efforts, the private sector can improve supply networks between the farm and nonfarm sectors whereby the poor in rural areas can supply agricultural produce to stores, become incentivized to produce different agricultural goods, and benefit from economies of scale through urban areas' sourcing of agricultural goods from rural areas. Third, private sector development reduces transport costs, improves technology and trading opportunities, and assists industrial zones. This, in turn, decreases the general price level, which increases the real expenditure of the poor, ultimately leading to poverty reduction. On the whole, the impacts of private sector development on agricultural households are likely to be the net impacts, which indirectly come through increased activities for non-farm households and directly through more trading opportunities for farm households.

2.2. Poverty and Growth in Vietnam

Vietnam offers a major advantage for studying pro-poor growth because the massive economic and institutional reforms implemented during the past decade triggered a number of distributional mechanisms, owing to high economic growth and fast poverty reduction. For example, the poverty rate in Vietnam decreased dramatically from 58.1% in 1993 to 37.4% in 1998 (Glewwe et al., 2002). The 2000s saw further reduction of poverty, from 27.9% in 2002 to 14.2% in 2008. In the period 2002–2007, there was a concomitant increase in economic growth, at an annual average rate of 8.1%. While both urban and rural Vietnam recorded rapid poverty reduction in the 1990s, the poverty rate remained considerably higher in rural areas than in urban areas. In the 2000s, the rural poverty rate was six times higher than the

urban poverty rate for the whole period. Together with the sizeable variations observed in the extent to which different sectors have been affected by the reforms, the Vietnamese case provides a rich picture of the mechanisms of pro-poor growth.

The economic and institutional reforms in Vietnam included a myriad of steps towards fulfilling two key objectives: transitioning from a command economy to a market economy and integrating into global markets. Establishing a strong private sector was key to these efforts. For example, the promulgation of the Enterprise Law in 2000 signified fundamental changes in the country's economic activity. The law officially recognised the right to do business, eliminated more than 100 business licence requirements and simplified the registration procedures for new firms (Hoang et al., 2014). Consequently, there was a significant increase in the number of private enterprise registrations, from 14,457 in 2000 to around 36,000 in 2004 (Hakkala and Kokko 2007). Moreover, in 2001, all domestic enterprises in Vietnam were given the right to trade commodities freely (Decision 46/2001/QD-TTg). Further, the Law on Foreign Investment in 1996 and its amendment in 2000 generated significant employment. For example, employment in the FDI sector increased substantively, from 358,500 in 2000 to 1,694,400 in 2008 (General Statistics Office (GSO), 2012). Finally, in the first decade of the 2000s, the decentralisation trend precipitated in the 1990s was enhanced, as provincial authorities were given a greater role in poverty alleviation (Painter, 2008). According to the Ordinance on the Tasks and Authorities of People's Councils and People's Committees of 1996, these local governments were granted authority on a wide range of activities related to economic development, rural development, population, land use, culture, education and society.

Some notable studies on pro-poor growth have been conducted in the context of Vietnam. Glewwe and Dang (2011) documented that growth was pro-poor in Vietnam in the 1990s. They focused on methodological issues in pro-poor growth, such as measurement

error in survey data and intertemporal comparability of quintiles. Kang and Imai (2012) explored pro-poor growth, poverty and inequality in Vietnam between 2002 and 2006. However, their focus was exclusively on ethnicities and the way different ethnic groups fared in pro-poor growth in rural Vietnam.³ They found that the impacts of economic growth on poverty varied widely across ethnic groups. See also Imai, Gaiha and Kang (2011a, 2011b).

3. Data: Poverty, Expenditure and Institutional Quality

The 2008 VHLSS was implemented by the Vietnamese GSO (with assistance from the World Bank) and was funded by United Nations Development Programme. The survey covered 9,189 households.⁴ We consider only rural poverty in this study, because poverty is mostly a rural phenomenon in Vietnam.⁵

We use the World Bank poverty line of 2100 calories/day to calculate the number of households in poverty. There are a number of reasons for using this particular poverty line. First, it corresponds to the level of expenditure that satisfies the basic adult calorie requirement, and hence, helps distinguish the poor from the rest of population. Second, the World Bank uses the very dataset we use, the Vietnam Household Living Standards Survey, to calculate the poverty line. Third, poverty lines are adjusted for regional and temporal differences. The estimated poverty line is 3,358,000 VND per person per year at January 2008 prices. Individuals are categorised as poor when their consumption is below the poverty line, and our analysis considers whether better institutional quality helps people remain above the poverty line. In this study, the ‘head-count’ measure of poverty is used.

In this study, ‘growth’ refers to growth in consumption expenditure. The reasons for using consumption instead of income in measuring growth are two-fold. First, expenditure

³ Using the VHLSSs of 2002 and 2004, McCaig (2011) investigated the poverty consequences of increased access of Vietnamese exports to the US market following the 2001 US–Vietnam Bilateral Trade Agreement.

⁴ As the recall period is uniform for all variables in the VHLSSs, there is no mixed recall period problem.

⁵ About 75% of the Vietnamese population lives in rural areas. Focusing on only rural population could be a serious limitation as growth patterns should affect the composition of rural-to-urban population, which should also affect the question of how growth affects poverty. This would be a less serious concern with regard to absolute poverty, which we analyse in this paper.

data are likely to be more accurate than income data because it is often easier to answer questions on expenditure (for example, it is difficult for self-employed interviewees to answer questions relating to income) and some households are reluctant to reveal their true income. Second, income affects the living standards of households only if it is consumed, while past income (savings) or borrowing can be used for consumption purposes. Thus, expenditure can reflect a household's living standard levels more accurately than income.⁶ Expenditure is adjusted for regional and monthly inflation.⁷ Importantly, considering expenditure growth solely would reflect a change in overall living standards. We distinguish pro-poor growth by considering expenditure growth across three population groups; lower one-third (poor), middle-third (middle), and upper-third (rich) of the expenditure distribution.⁸

To measure the quality of institutional support for the private sector, we use the (PSDS component of the Vietnamese PCI, which was developed by the Vietnamese Chamber of Commerce and Industry and the USAID-funded Vietnam Competitiveness Initiative (<http://eng.pcivietnam.org/>). The PCI was initiated in 2005 to assess the institutional quality of 42 provincial governments. Since 2006, it has been expanded to cover all 64 provinces. The PCI elicits responses to survey questionnaires from private enterprises on the quality of services they receive from provincial authorities. It is noteworthy that the response rate for surveys increased after 2005. The PCI rates provinces on 10 sub-components: entry costs (business establishment costs); land access and security of tenure; transparency and access to information; time costs of regulatory compliance/inspections; informal charges; state sector

⁶ The expenditure variable includes food expenditure (expenses for purchasing food such as rice, pork, chicken, coffee, tea, milk, and sugar) and non-food expenditure (expenses for purchasing services, materials and substances that support life, such as electricity, drinking water, gas, coal, soap, education, health).

⁷ Expenditure per capita ignores the fact that adults consume more than children. In unreported regressions, using the real expenditure per equivalent adult as an additional measure of well-being provides similar results to those presented in this paper. In this exercise, children under 14 are given a weight of 0.65 and adults are given a weight of 1 (Litchfield and Justino, 2004).

⁸ One can argue that in the rural areas of developing countries households often consume their own produce. Anecdotally we are aware that the poor in rural Vietnam consume a sizeable amount of food they do not produce.

bias; proactivity of provincial leadership; legal institutions; labour training and PSDS. As indicated, the PSDS rates provinces according to their quality of local support in six areas: private sector trade promotion; market information; trade fairs; match-making; industrial zones; and technological services.⁹ Note that the support provided to private sector activities did not have a direct focus on low-income households, so our analysis does not run a risk of tautology. To be consistent with the VHLSS 2008, we use the 2006 PCI. Descriptive statistics of the key data are provided in Appendix 1 Table A1.¹⁰

The final question is how the PSDS is linked to our theoretical channels (i.e., wage- and self-employment). Whilst PSDS does not rate sub-components that could be directly linked to either self- or nonfarm wage-employment, it is evident that it measures the overall quality of private sector support in a province. Nonetheless, because we cannot distinguish the PSDS components conducive to wage- or self-employment, we assume that institutions that facilitate self- and/or wage-employment for the poor are highly correlated, which is a plausible assumption to make.

4. Econometric Framework

4.1. Pro-Poor Growth

We use the following model to examine the effects of institutional quality that support private sector activity on the poverty status and expenditure per capita of households in 2008:

$$Y_{jp} = \alpha_1 + \alpha_2 PSDS_p + \alpha_3 \mathbf{X}_{jp} + \varepsilon_{jp} \quad (1)$$

where j is subscript for household, p for province; Y_{jp} is the log of real expenditure per capita or binary poverty status of the household (which was equal to 1 if the household j is poor and

⁹ The surveys identify the share of firm responses that are “good” and “very good” for five support services in a province (in the case of trade fairs, the number of fairs in the province), and then averages the six scores for each province to arrive at a provincial PSDS rating of between 1 and 10. To provide a flavour about what the equivalence of a one-unit change in the institutions’ rating could mean, Hải Phòng (4.98) scores roughly at the mean, Hanoi (6.12) is rated roughly one-unit higher than the mean, Ho Chi Minh City (7.63) is rated roughly three units higher than the mean, while Đà Nẵng (9.62) scores the highest rating among all provinces (in parentheses are the provincial ratings in 2006).

¹⁰ Note that 85% of the population in Da Lat province was French in 1943. The French built this city because of its location, which is a good example of the modern private sector activity being rooted in French colonialism.

zero otherwise). $PSDS_p$ is the PSDS score of the province in 2006. \mathbf{X}_{jp} includes the characteristics of households (age of household head, age of household head squared, education of household head, education of the spouse of the household head, and dummies indicating the ethnicity of household head¹¹) and communes (dummies indicating whether the commune could be accessed by car, had an upper school, post office and market) in a province.¹² The model also controls for eight regional dummies (Red River Delta, North East, North West, South Central Coast, Central Highlands, South East and Mekong River Delta), to account for region-level geographic, climatic and historical differences within Vietnam.¹³ Standard errors are clustered at the province level.

We apply a least squares estimator to Equation 1 when Y_{jp} is the log of real expenditure per capita and a probit model when it is the binary poverty status indicator. The estimation is likely to suffer from omitted variables bias due to the endogeneity of institutional support for private sector development. In particular, unobservable factors at the province level, such as localised policies of the central government, provincial culture and history, could affect the province-level support for private sector development and the household-level expenditure or poverty status simultaneously.

The direction of the endogeneity bias could go either way. If provinces with better support for private sector development are also provinces with better institutions in general and thus, better local economic performance, then we would have $Cov(PSDS_p, \varepsilon_{ip}) > 0$. In this

¹¹ Dummy variable for the ethnicity of household head is equal to 1 if household head belongs to Kinh, 0 otherwise. Nguyen Viet and Imai (2017) show that the Chinese ethnic group has a positive economic effect on regional economic development in Vietnam. We test whether our estimation results are driven by the Chinese ethnic group in two ways. First, we generate a dummy variable for Chinese head (0.12% of the sample) and include this variable in our model. Second, we remove individuals living in two metropolitan cities, Hanoi and Ho Chi Minh City, where the Chinese primarily reside. In both cases, our key results remain unchanged.

¹² Household size and dependency ratio as additional controls do not make any meaningful change to our results.

¹³ For example, after the French occupation, the South of Vietnam had its own government that was under strong influence from the United States, and this country's liberal market economy lasted for almost 30 years. This period may have brought certain long-lasting changes to the culture and institutions in southern provinces, suggesting that our results may be biased by the US influence over the period 1948–1975. Controlling for eight regional dummy variables is likely to remove the differences between North and South Vietnam due this history.

case, the OLS estimates would be greater than the IV estimates. In contrast, we would have $\text{Cov}(\text{PSDS}_p, \varepsilon_{ip}) < 0$ if history is a setback to the creation of institutions that support private sector activity and to individual welfare outcomes. The communist experience of Vietnam between 1960 and 1989 is a major factor here. The collectivisation policy in this period destroyed the economic motivation of individuals, because they were paid based on the time they spent on collective works, rather than according to their productivity. Individuals in such provinces may still suffer from low productivity today. Collectivisation policies also restrained the development of the private sector and the institutions that support it. All northern provinces had been collectivised before 1975 and southern provinces following the Vietnam war in 1975, to varying degrees. Thus, if the omitted variable in our regression is the communist history of the province, it could lead to a negative correlation between the institutions that support private sector development and the error term. In this case, our OLS estimates would be lower than the IV estimates.

An alternative source of endogeneity is selection bias. If provinces that adopted better institutions to support private sector development are those with an already improved private sector, then a selection bias could arise, leading to $\text{Cov}(\text{PSDS}_p, \varepsilon_{ip}) > 0$. A final possible source of endogeneity is reverse causation. Provinces with higher income levels or lower poverty rates might have had greater incentives to improve institutions that support the private sector. The ultimate sign of $\text{Cov}(\text{PSDS}_p, \varepsilon_{ip})$ depends on which bias dominates the others.

One could also be concerned about migration patterns. Nguyen-Hoang and McPeak (2011), who used annual survey data on migration during the five years prior to the 2009 Census, documented that inter-provincial migration in Vietnam was driven primarily by moving costs, expected income differentials, disparity in the quality of public services offered by provinces and the demographic composition at destination and source. It is important to emphasise that while migration among Vietnamese provinces is significant, it is not in

contradiction with the underlying assumption that sector mobility has remained limited since the reforms. This is the *sine qua non* condition for our study of the effect of institutional quality on poverty at the provincial level.¹⁴

4.2. French Colonial Legacy in Vietnam

We address the possible endogeneity of institutional quality by using the log of ratio of French citizens living in the province in 1943 to the total provincial population as an instrumental variable. Taking the log of the ratio smoothens the highly skewed distribution of this ratio (see Appendix Table A3), and enables us to satisfy the normality assumptions required for our least squares and maximum likelihood-based estimations. Figure 1 displays the positive link between French presence in 1943 and the PSDS score at province level.¹⁵

The use of French presence in 1943 as an instrument for institutions that support private sector activity is consistent with the historical context of Vietnam. The arrival of French colonialists in 1857 marked the end of the Vietnamese feudalist system and paved the way for the development of capitalism. Economically, the French developed the mining sector and started industrial production in Vietnam. Paul Doumer, the Governor-General of French Indochina for the period 1897–1902, undertook a number of measures to turn Indochina into a market for French products and a source of profitable investment for French businesspeople. Under his administration, Vietnam first exported rice. Bridges, roads and especially railroads connecting the major cities were built. Electricity was brought to large cities. In addition, the French introduced ‘entrepreneurship’ to the Vietnamese people. Importantly, the French ‘civilisation’ of Vietnam was not limited to the economy but was also applied to language, religion and education. For example, the French also educated

¹⁴ Implicitly, this assumption means that the relevant labour market is a province, not a national industry.

¹⁵ We obtain the number of French people and total population at province level in 1943 from *Vietnam Statistical Data in the 20th Century* (GSO, 2004). We trace back the origin of contemporary provinces to 1943 and match the data on French presence. Although we cannot match perfectly the boundary of provinces of 1943 with that of present ones, our matching seems to capture the known densities of French people in each province.

young Vietnamese elites not only in French history, literature and law but also in mathematics, science and engineering. In summary, French colonisation resulted in unprecedented radical changes in Vietnam's feudal society.

There are two fundamental assumptions in our identification strategy: i) the effects of French colonial legacy in Vietnam are not the same from one province to another; and ii) any effects have persisted over time. That is, the French colonisation of Vietnam left long-lasting and localised effects on institutions that support private sector activity.¹⁶ These assumptions are important because our coefficient α_2 is identified based on the heterogeneity of provinces in terms of their capacities/resources to implement the institutional changes for the private sector in the 2000s.

Taken together, our identification strategy is that the French in Vietnam created a culture of private sector activity *in the provinces in which they lived* and that this culture has persisted over time following the end of the communist era, positively influencing the adoption of contemporary institutions that support private sector activity. This persistence is noted by Acemoglu et al. (2001), who found that colonial origins and past institutions could have long-lasting effects on current institutions.¹⁷

¹⁶ Note that the development of the private sector, which accompanies the creation of markets for rice, rubber, coal and other resource sectors, is likely to be specific to provinces/regions. For example, rice and rubber trees can be grown only in the provinces or regions that have suitable land quality, irrigation and weather conditions. Similarly, coal and other resources are available only in some provinces. To the extent that weather conditions and the land quality of provinces do not change much over time, there is good reason to expect that they have persistent localised effects on the development of the private sector at the provincial level.

¹⁷ Reinforcing the argument on persistence of institutions, Dell et al. (2018) found that different historical governance norms have resulted in variations in living standards in Vietnam today. Dell et al. (2018) use the boundary between the Dai Viet and Khmer regimes in 1698 to identify the effect of pre-colonial monarchies on today's living standards. According to Dell et al., the southernmost provinces and northern Vietnam are different in the de facto norms of local governance. The former was exposed to the influence of the Khmer Empire with much less institutionalized village government, whereas the latter was exposed to more local norms of government. The difference in institutionalized norms in the two groups of provinces has resulted in the North having better economic outcomes. The question for our purposes here is whether it is pre-French governance norms, rather than French colonization, that is driving the institutions' strength for private sector. To understand whether our results are driven by the difference between the north and the southernmost part of Vietnam today, we exclude Ho Chi Minh from the sample and run the regressions using this new sample. This is because the majority of provinces in our sample are those in the north and the centre, while only Ho Chi Minh is part of Cochichine (Table 3). Our results remain much the same with the new sample, suggesting that they are unlikely to be driven by the pre-colonial norms northern and southern Vietnam.

Given this background, we estimate Equation 1 with 2SLS. The first-stage regression of Equation 1 can be represented as follows:

$$\text{PSDS}_p = \delta_1 + \delta_2 F_{1943,p} + \delta_3 \mathbf{X}_{jp} + \mu_{jp} \quad (1')$$

where $F_{1943,p}$ is the log of ratio of French citizens in province p in 1943 to total population. As we have the data for 46 of the 64 current Vietnamese provinces, our instrumental variable estimation was able to utilise only those provinces.

Some other possible channels might have led the historical French presence in a province to affect poverty and expenditure per capita today. For example, the French might have preferred some provinces because of factors such as soil type and quality, land area and proximity to ports. Most of these characteristics are likely to be time-invariant, which we address through an exhaustive set of controls on the right-hand side. Further, we include quality of land, density of population and a dummy for plains at the commune level into the 2SLS regressions and our results remain robust (unreported). Another potential channel is infrastructure that was built by the French, which could lead to $\text{Cov}(F_{1943,p}, \varepsilon_{ip}) \neq 0$. Note that although the French built infrastructure (especially railroads) to connect cities, this infrastructure was not specific to provinces but to the whole of Vietnam.¹⁸ Other infrastructure was built to help the mining and other resource sectors, but these sectors are not of strong relevance to the Vietnamese economy today. Nevertheless, we utilise several commune-level infrastructure variables in our regressions to account for these factors. Note that removing these variables from the estimation does not change the magnitude of the coefficient of PSDS in the 2SLS regressions (unreported). The insignificance of the infrastructure channel could be because both the communist regime and contemporary

¹⁸ Under French rule, provincial autonomy in Vietnam was very weak, in that the French controlled the country centrally. Thus, the French only focused on the development of the whole Vietnam to exploit its resources, and provinces did not have any provision to make infrastructure investments. Note, however, this phenomenon is different than the development of local private sector institutions, which were driven by the French population living in that locality.

governments overlaid their own infrastructure on that built by the French. It also suggests that political regimes may invest in their own physical infrastructure, but the institutions that support private sector activity are likely to be inherited across generations.¹⁹

Another concern is that the historical French presence might correlate positively with the presence of large firms in Vietnam, because large firms might have colonial roots. In addition, these firms might affect economic growth, violating the exclusion restriction criterion in our setting. However, this violation is unlikely because the large companies that were created by the French in the mining and resource industries either were nationalised by the Vietnamese communists after 1954 or destroyed in the war in 1954. Currently, there are no large Vietnamese firms that have French roots and the largest companies are not in the mining or resources industries.²⁰

In addition, one might ask whether institutional support for private sector development is highly correlated with other institutional indicators such that we identify the effect of something else. Table A2 in Appendix 1 shows that the French presence in 1943 is insignificant in explaining entry costs (i.e., business establishment costs), access to land, time costs, informal charges, state sector bias, legal institutions and other sub-indices of the PCI. Mostly, these institutions are determined by the bureaucratic system of Vietnam. While the French presence in 1943 is statistically significant in explaining transparency and labour training, the F-statistic of the excluded instrument in these cases is lower than the rule-of-thumb 10. In contrast, the French presence in 1943 is highly significant in explaining the support for private sector activity and the F-test of the excluded instrument is 25.9 (see

¹⁹ Another infrastructure-related potential threat to our identification strategy was the American-Vietnam War between 1965 and 1975, which destroyed numerous factories, bridges, buildings, roads, hospitals and other infrastructure. This factor could have prevented the existence or the development of 'entrepreneurship'. We controlled for province-level bombing intensity in the 2SLS regressions for poverty and expenditure. The estimated coefficients were found to make little difference compared to when this factor was not controlled. This result implies that while bombing may ruin the physical infrastructure, it cannot destroy institutions in private sector development that have been inherited across generations. Data on the amount of bombing by the US Air Force and Navy between 1965 and 1975 were taken from Miguel and Roland (2011).

²⁰ An exception may be the state-owned company Petrovietnam, which is a large firm in the oil industry. However, it has Russian roots, rather than French origins.

Column 1, Table 1). These results lend credence to our instrumentation approach. Controlling for all other nine PCI indicators in our IV robustness checks does not change our results (see below).

4.3. Labour Markets and Nonfarm Activity

A number of studies have suggested that an increase in labour income is the most critical component of poverty reduction and increased expenditure (e.g., Ural 2012). Therefore, by employing data that cover 10,260 individuals in the 2008 VHLSS, we examine the impact of the quality of the institutions supporting private sector development on hourly wages and the number of working hours. In this analysis, we also consider three different groups: the poor, the middle, and the rich. Our assumption is that for the reforms to be pro-poor, the new policies would improve the wages and/or the number of working hours for those who are at the bottom end of the income distribution.

Also important, we analyse the effect on institutions in relation to the increasingly popular notion of vulnerability, whereby vulnerable population groups are defined as those that are currently not poor but may face a considerable risk of falling into poverty. We define vulnerable groups in two ways; first, in an approach suggested by the Vietnamese Government, the population group with annual expenditure per capita between the poverty line (3,358,000 VND) and 30% above this poverty line (4,365,400 VND), and second, as offered by Dang and Lanjouw (2017), the group with annual expenditure per capita between the poverty line (3,358,000 VND) and the level that corresponds to the vulnerability index of 10% (7,288,400 VND).²¹ Given this approach, we may compare and contrast expenditure growth for the poor, the vulnerable, and the rest of the population.

To proceed, we formulate the following Mincer-type equation:

$$Y_{ijp} = \beta_1 + \beta_2 \text{PSDS}_{p+} + \beta_3 \mathbf{X}_{ijp} + \beta_4 D_s + \varepsilon_{ijp} \quad (2)$$

²¹ 7,288,400 VND corresponds to the 74th percentile of the expenditure distribution in 2008.

where, Y_{ijp} is either the log of real wages per hour or the log of the number of working hours for an individual i in a household j living in province p . \mathbf{X}_{ijp} includes the characteristics of individuals (education, age, age squared and gender), households (age of household head, education of household head and ethnicity of household head) and communes (having a car way to the commune, having an upper school, a post office or a market). The model also controls for regional dummies (D_s), with standard errors clustered at the province level.

As in the preceding section, we instrument provincial institutions supporting private sector activity with French presence in the province in 1943. As the mechanisms that determine wages, expenditure per capita and poverty status are highly likely to be similar, our previous discussion on the reliability of the instrument applies here.

Initially, we consider only wage earners (i.e., those who reported their wage) in the sample and perform a least squares-based estimation.²² However, the sample of wage earners (2,516 observations) does not include those who are self-employed, the unemployed and those looking for a wage-earning job. This censoring of the hourly wage might create a sample selection problem. Therefore, in another estimation, we consider all of the individuals in the 2008 VHLSS aged between 18 and 60 (11,465 observations) and undertake a Tobit analysis for hourly wages (with and without IV). About 80% of the additional individuals in the VHLSS are involved with agriculture. Conversely, data on the number of working hours are available for a large sample of 10,260 individuals and show no evidence of censoring (they have a quasi-normal distribution). Thus, we use OLS and 2SLS when the dependent variable is the total number of hours worked. We examined both farm-based and nonfarm-based hours to elucidate the role of nonfarm activity in pro-poor growth.

With regard to the censored regressions on hourly wages, important studies, such as Carson and Sun (2007) and Martin and Pham (2008), have emphasised paying attention to the

²² For wage-earners, corresponding hourly wages were adjusted for regional and monthly inflation.

censoring point. Martin and Pham (2008) recommend the application of the Tobit estimator a la Eaton-Tamura (1994), in which the censoring point is estimated jointly with other Tobit coefficient estimates. Carson and Sun (2007) show that the Tobit model could yield inconsistent estimates when zero is chosen as the censoring point but the true censoring threshold is non-zero and unknown. They recommend the use of the Tobit estimator, with the smallest value of observations as the threshold point. However, in practice, the maximum likelihood estimation of the Tobit is difficult to converge when the threshold is unknown and needs to be estimated jointly, especially for samples characterised by a large percentage of censored observations.²³

These considerations regarding the Tobit estimator leave us with two possible censoring thresholds: zero and the minimum values of the hourly wage in the sample. To decide which one to use, we run Monte Carlo simulations, as presented in Table A3 of Appendix 2, which demonstrate that the Tobit estimation with censored point equal to the minimum value in the sample generated, on average, estimates higher than the true coefficients of the explanatory variables of interest. The Tobit estimation with zero being the censored point generates, on average, estimates closer to the true coefficients of the same variables.²⁴ Without loss of generality, we run Tobit estimations by setting the missing hourly wage observations to zero and treat zero as the censoring point.²⁵ However, we find that the OLS results are close to Tobit estimations with zero as censoring point. Therefore, to save the space we only report the results of OLS estimation.

²³ According to Martin and Pham (2008), this problem of convergence is very common to any maximum likelihood estimator (i.e., Tobit, Heckman and Poisson-Tobit estimators), especially when the dependent variable is in levels. We also applied the Eaton-Tamura Tobit estimator and the econometric implementation did not converge in most of the cases.

²⁴ Table 3A in Appendix 2 shows another advantage of the Tobit estimation with zero as the censored point. It generated estimates with smaller standard errors than the Tobit estimation with the minimum value being the censored point. While this advantage is likely to be less noticeable with very large samples, it was expected to be significant, given the sample size of our data.

²⁵ Because the wages and hours worked were in logs, zero as the censoring threshold meant that we assigned the value 1 to all missing observations of the dependent variable. Since the dependent variable was not a *ratio*, adding 1 was unlikely to influence the coefficient estimates substantially.

5. Empirical Results

5.1. Poverty Status and Expenditure per Capita

Table 1A presents the effect of PSDS 2006 on the poverty status and log real expenditure per capita of individuals in 2008. The simple-probit results in Column 2, using the full VHLSS sample, show that institutions that supported the private sector in 2006 are negatively related to the probability of being poor in 2008, with the estimated coefficient of 1.7%. To ensure that our IV results are robust to a different sample composition, Column 3 repeats the probit regression for the sample for which the data on province-level French citizens are available. Our coefficient estimate of interest is estimated to be strikingly similar, 1.7%, however the estimate is not statistically significant. By contrast, using IV-probit regressions (Column 4), the effect is estimated to be significant at the 1% level and the magnitude of the coefficient is much larger than before, standing at 8.1%. This estimate suggests that a one-point increase in the PSDS score, which was also close to an increase of one standard deviation in this score, reduces the poverty rate by 8.1%.²⁶

With regard to expenditure per capita, the OLS regressions in Columns 5 and 6 show that the PSDS is positively related to expenditure per capita in both the full VHLSS sample and the restricted sample for which province-level French presence data are available. Both regressions indicated a similar magnitude of effect: a one-point increase in PSDS is associated with a 3% higher expenditure per capita. However, the 2SLS estimation in Column 7 yields a much larger coefficient: 14.1%.²⁷ The higher IV coefficients in Table 1A are consistent with $\text{Cov}(\text{PSDS}_p, \varepsilon_{ip}) < 0$, suggesting that a provincial history of collectivisation and low productivity could bias the coefficients of the OLS and simple-probit downwards.

One concern is that this poverty elasticity might provide little indication of whether the effect is pro-poor. In general, if there are many people near the poverty line, the

²⁶ The Wald test of endogeneity shows that private sector development score was indeed endogenous (i.e., the p-value was less than the 5% level).

²⁷ The Wald test points to endogeneity that is statistically significant at the 1% level.

coefficient may be estimated to be high when most of the growth accrues to the rich. The use of poverty elasticity assumes stability in the distribution of income and in the fraction of the population near the poverty line. To address this issue, in Table 1B we experiment with the poverty line, shifting it upwards and downwards by 10%. The IV-probit results in Columns 2 and 4 indicate that the PSDS score is still negative and statistically significant in both cases. In addition, they are greater than the simple-probit coefficients in Columns 1 and 3. The magnitudes of the IV-probit coefficients are comparable to those obtained with the original poverty line in Table 1A.

We revisit the exclusion restrictions assumption in the IV estimation in several ways. First, one may question why the French presence only affected support for the private sector and hardly any other areas of competitiveness, which are arguably also indicators of institutional quality. Particularly considering we argue that the influence of the French presence is evident today in culture and education, there may not be a clear reason as to why other aspects of the PCI should not be correlated with the IV. To address this concern, we control for all other nine components of PCI in the IV model. This exercise also helps us verify that PSDS is a direct and appropriate measure of private business culture and practices, which then determines economic performance. Table 1C shows in columns 1 and 3 that the effect of PSDS on poverty and expenditure per capita is very similar. Among other PCI categories, entry costs, access to land, and transparency are estimated with statistically significant poverty-increasing and expenditure-reducing effects, while labour training has an expenditure-increasing effect.

Second, it is possible to argue that the French settled in more conducive areas from a geographic or climatic point of view. Vietnam differs significantly both geographically (the plains versus the mountains) and climatically (tropical versus more temperate climates), and the resulting differences in natural resources, transport networks, and access to trade routes

might have been critical for the growth of the nonfarm sector. Hence, in our IV regressions we consider additional geographic and climatic controls, including rainfall, quality of land, and remoteness to the sea. Using data on rainfall in the period 1989–2006, we construct the standard deviation of rainfall at the province level. Information on quality of land is available in the 2002 VHLSS at the commune level, which classifies annual planted land and aquacultural waterface into six classes and provides total area of annual planted land and aquacultural waterface for each class. We calculate the index of quality of land at province level using weights of area of land. Using the standard deviation of rainfall, the index of quality of land, dummies for communes located in coastal areas, inland delta, hills/midlands, and low mountains as control variables in IV regressions, we find that our IV results in columns 2 and 4 are robust. Thus, we rule out the possibility of geography working its way into our regressions through selective French colonial penetration in 1943.²⁸

As an additional robustness check, we use the 2012 dataset of VHLSS instead of 2008. This time we use poverty line based on 2300 cal/day, as is constructed by the World Bank for the VHLSS of 2012. Table 2 presents the results on the effects of PSDS in 2006 on poverty status and log real expenditure per capita in 2012. The results are analogous and robust for this alternative dataset. Because the first-stage F-statistic is lower than the rule of thumb 10, we use IV-LIML instead of IV-2SLS, given that the former is robust to the weak instruments problem.

5.2. Results for Hourly Wages

This section illuminates the channels through which the qualities of institutions that support private sector activity induce changes in expenditure per capita and poverty status. Table 3 reports the results on the relationship between the PSDS and hourly wages. Column 1 in Panel A, using OLS and the wage earners' sample, shows that a one-point increase in PSDS

²⁸ There are dimensions of the business environment that are not captured in the PCI. Consider, for instance, the control of corruption. Because no reliable metric is available, the influence of this variable might be captured in the error term of the main regression.

in 2006 is associated with 3.9% higher wage in 2008. Panels B and C report the IV results for the same sample, with and without industry dummies. Focusing on all individuals in the sample in Column 1, the coefficients on the PSDS are much higher for the 2SLS regressions than for the OLS regressions. Specifically, a one-point increase in PSDS increases hourly wages in 2008 by 9.2% to 10.8%, depending on whether or not the industry dummies are used. Considering the specific groups, the 2SLS results in Column 2 of Panels B and C show that a poor individual living in a province with a private sector development score that is one point higher in 2006 is associated with 10.3% and 10.1% higher hourly wages in 2008, respectively.²⁹ The result is also statistically significant for individuals belonging to middle-group when we control for industry dummies (Column 2 of Panel B). Concerning vulnerable groups, while we find no evidence of the impact of PSDS on wages using the Vietnamese Government's criterion of vulnerability, we estimate a significant effect using Dang and Lanjouw's (2017) vulnerability line, suggesting a higher wage rate of 6.2% to 10.2%.

5.3. Results for Working Hours

The regression results on PSDS and working hours are displayed in Table 4. Using the large sample of 10,260 individuals aged between 18 and 60, the OLS coefficients in Panel A are estimated to be mostly insignificant. However, the 2SLS coefficients in Panel B are mostly significant. Importantly, the 2SLS results identify a positive and statistically very strong effect of private sector support on the working hours of individuals across all groups. The coefficients imply that holding other personal characteristics fixed, an average individual living in a province with a PSDS score that is one point higher in 2006 work about 10% more hours in 2008. The effect of PSDS on working hours is similar for the poor, the middle-class, and the vulnerable groups (defined both ways) and lower, at 5.7%, for the rich.

²⁹ Note that in all IV estimations, the *F*-statistic on the excluded instrument was greater than 10, suggesting that our instrument was valid and strong.

6. Nonfarm Activity

An important question is the source of the change in working hours. Decomposing nonfarm and farm working hours could provide an insight into this question because the nonfarm sector in Vietnam offers rural households new opportunities given significant land constraints. Supporting this statement is the evidence found by Hoang, Pham and Ulubasoglu (2014), who show that every additional household member in rural Vietnam who is involved in the nonfarm sector reduces the probability of poverty by 7–12% over a two-year period.

Panel A in Table 5A, reporting the OLS results for nonfarm hours, show that PSDS is not statistically significant for nonfarm hours for all groups. Considering the IV results in Panel B, a one-point increase in PSDS in 2006 is associated with a 30.2% increase in nonfarm working hours in the sample of all individuals aged 18–60 in 2008 (Column 1). This increase seems to be driven by the middle expenditure group (Column 3), who exhibits an increase of 39.6%. The results are positive but not statistically significant for the poor or the rich (columns 2 and 4), while the vulnerable group, defined as per the Dang and Lanjouw (2017) vulnerability line, exhibits a similar positive and significant effect to that of the middle group (Column 6).

Table 5B reports the results on the impact of PSDS on farm working hours. We find that using OLS regressions, PSDS show no significant impact on farm working hours for the whole sample and for all groups: the poor, the middle, the rich, and the vulnerable (Columns 1-6 of Panel A). However, IV estimations in Panel B indicate that PSDS is statistically significant for the whole sample at the 5% level. In particular, a one-unit increase in PSDS decreases farm working hours by 28% (Column 1 of Panel B). This effect seems to be driven primarily by the vulnerable group defined as per Dang and Lanjouw (2017), as this group exhibits a similar decline of 24.8% (Column 6). We find no evidence on the effect of PSDS on farm working hours for all other groups (Columns 2–5 of Panel B).

The nonfarm- vs farm-sector dichotomy reveals important results and is worth exploring further. Did better private sector support affect the rural households' income from nonfarm self-employment, wage income or agricultural income? Table 6 reports the results for the rural households that reported their income sources. Focusing on the 2SLS results to save space, a one-point increase in PSDS increases the rural households income drawn from nonfarm self-employment by 41.3% and 35.3% for the poor and middle groups, respectively, and by 25–26% for vulnerable groups defined both ways (Columns 1, 2, 4 and 5). We find no significant impact of PSDS on income from nonfarm self-employment for the rich group. Regarding wage income, the findings show that PSDS is positively related to wage income for the middle and rich groups, as well as for the vulnerable group defined by the Dang and Lanjouw (2017) approach. The results are not statistically significant for the poor. Looking at agricultural income, we find that a one-unit increase in provincial PSDS reduces the agricultural income of rural households by 24.3% and 15.8% for the poor and rich groups, respectively. Similarly, the vulnerable, defined as per Dang and Lanjouw, also experience a 14.4% reduction in agricultural income. Taken together, the results indicate that better private sector support expands the income from nonfarm self-employment but reduces the agricultural income, for both the poor and the vulnerable. However, the positive effect of on the income from nonfarm self-employment is about twice as big in absolute value as the negative effect on agricultural income for both groups. This finding suggests that the key beneficiaries of the better private sector support are the poor and the vulnerable.

7. Conclusions

The extent to which economic growth helps the poor has been debated extensively. This paper investigates the sources and mechanisms of pro-poor growth across Vietnamese provinces, employing the VHLSS 2008. Several features of our study distinguish it from the existing literature on pro-poor growth. First, we focus explicitly on the role of provincial

institutions that support private sector activity in pro-poor growth. Second, we explore the labour market mechanism through which such institutions might have affected the poor. Specifically, we investigate in detail the role of reforms in hourly real wages and farm and nonfarm wages at the individual level. Third, and importantly, we identify the causal effect of the quality of institutions that support private sector activity on poverty and expenditure, using the number of French citizens living in Vietnam in 1943 as an instrumental variable.

The mechanisation of agriculture, ongoing industrialisation and a booming export/import industry in Vietnam during the 2000s meant rapid economic growth and increased opportunities for the poor, but each province has experienced these reforms to varying degrees. Exploiting these variations in econometric analysis, we document that a one-standard deviation increase in the quality of institutions that support the private sector increases expenditure per capita by 13.9% and decreases the probability of poverty by 8.1%.

With regard to the mechanisms at work, we find critical evidence that institutions that support private sector activity generate a higher labour income for the poor. We find that, holding other personal characteristics constant, a poor individual living in a province that had a PSDS score in 2006 one unit higher than other provinces earned 10.3% higher wages in 2008. Our estimates show that extended working hours for the poor, enhanced wage income, and extended income from nonfarm self-employment, facilitated by better institutional support for private sector activity, lie behind the successful pro-poor growth observed in Vietnam. Our study also shows that institutions that support private sector activity benefit the vulnerable similarly, that is, through an increase in income from nonfarm self-employment, wage income, and working hours.

Institutions that support private sector activity could be endogenous, owing to possible omitted variables. The collectivisation of the provinces by the communist regime in Vietnam was the most notable omitted variable here. We address this problem by using the

ratio of French citizens living in the province in 1943 as an instrumental variable for institutions that support private sector activity. Our identifying assumption is that in the process of colonising Vietnam, the French created a culture of private sector activity in the provinces in which they lived and this culture has persisted over time and positively influenced the adoption of institutions that support private sector development today. We find very strong empirical support for this channel in our first-stage regressions. The fact that our 2SLS estimates are greater than the OLS estimates attests to the expected negative correlation between the error term and the institutions that support private sector activity.

To the extent that wage income represents a key driver of consumption expenditure, the effects of reforms on hourly wages and to some degree, the number of working hours of lower education groups (usually the poor) illuminate the factors behind reduced poverty in rural Vietnam. Specifically, our results demonstrate that improved private sector development services at the province level play a significant role in boosting real wages. Our analysis highlights that the widespread availability of private sector development services, covering the provisions of market information, industrial zones, match-making between business partners and technological services for enterprises, is likely to be a promising factor for enhanced labour market opportunities. Given Vietnam's key position in the global production of crops such as rice, pepper, tea and coffee, as well as industrial crops such as rubber, these private sector development activities are likely to provide significant opportunities for not only the poor but also the other individuals on the expenditure spectrum.

From a policy advice viewpoint, it may be useful to look beyond the case of Vietnam and briefly discuss other former French colonies that could develop well economically because of this colonization. Morocco may be a suitable example. The French arrival in Morocco marked unprecedented changes in the country. Remaining a French colony until 1956, Morocco adopted French as its second national language after Arabic. The French also built

infrastructure, such as railways, roads and ports, and created schools that focus more on science than Morocco's traditional religion-based schools. French colonisation also imparted an influence on Morocco's laws and government. For example, Morocco's political system consists of parliament as the legislative body, a Supreme Court as the judicial body, and a prime minister leading the executive government. Today Morocco's GDP per capita is about 20% higher than that of Vietnam. All these suggest that certain aspects of the colonisation experiment are likely to have been beneficial for host countries in the long-term, especially if they had emulated the institutional fabric of the parent country. Our paper shows that, in this setting, institutions that support private sector activity have been one of the key building blocks of more nonfarm participation, enhanced working hours and hourly wage, and lower poverty in the host country.

References

- Acemoglu, D., Johnson, S. and Robinson, J. (2001). 'The origins of comparative development: an empirical investigation', *American Economic Review*, 91(5), pp. 1369–1401.
- Adams Jr., R.H. (2004). 'Economic growth, inequality and poverty: estimating the growth elasticity of poverty', *World Development*, 32 (12), pp. 1989–2014.
- Ayala, L. and Jurado, A. (2011). 'Pro-poor economic growth, inequality and fiscal policy: the case of Spanish Regions', *Regional Studies*, 45(1), pp. 103–121.
- Carson R.T. and Sun Y. (2007). 'The Tobit model with a non-zero threshold', *Econometrics Journal*, 10(3), pp. 488–502.
- Collier, P. and Dollar, D. (2001). 'Can the world cut poverty in half? How policy reform and effective aid can meet international development goals', *World Development*, 29 (11), pp. 1787–802.
- Dang, H.A. and Lanjouw, P. (2017). 'Welfare Dynamics Measurement: two definitions of a vulnerability line and their empirical application', *Review of Income and Wealth*, 63(4), pp. 633–660
- Datt, G. and Ravallion, M. (1998). 'Why have some Indian states done better than others at reducing rural poverty?' *Economica*, 65 (257), pp. 17–38.

- Datt, G. and Ravallion, M. (2002). 'Is India's economic growth leaving the poor behind?' *Journal of Economic Perspectives*, 16 (3), pp. 89–108.
- Datt, G. and Ravallion, M. (2011). 'Has India's economic growth become pro-poor in the wake of economic reforms?' *World Bank Economic Review*, 25 (2), pp. 157–189.
- Dell, M., Lane, N., and Querubin, P. (2018), 'State capacity, local governance, and economic development in Vietnam', *Econometrica*, Forthcoming.
- Dollar, D. and Kraay, A. (2002). 'Growth is good for the poor', *Journal of Economic Growth*, 7 (3), pp. 195–225.
- Dorward, A., Kydd, J., Morrisson, J. and Urey, I. (2004). 'A policy agenda for pro-poor agricultural growth', *World Development*, 32(1), pp. 73–89.
- Eaton, J. and Tamura, A. (1994). 'Bilateralism and regionalism in Japanese and US trade and direct foreign investment', *Journal of the Japanese and International Economies*, 8, pp. 478–510.
- Fosu, A.S. (2009). 'Inequality and the impact of growth on poverty: comparative evidence for Sub-Saharan Africa', *Journal of Development Studies*, 45(5), pp. 726–745.
- Gasparini, L., Gutiérrez, F. and Tornarolli, L. (2007). 'Growth and income poverty in Latin America and the Caribbean: evidence from household surveys', *Review of Income and Wealth*, 53 (2), pp. 209–245.
- Glewwe, P. and Dang, H.A.H. (2011). 'Was Vietnam's economic growth in the 1990s pro-poor? An analysis of panel data from Vietnam', *Economic Development and Cultural Change*, 59 (3), pp. 583–608.
- Glewwe, P., Gragnolati, M. and Zaman, H. (2002). 'Who gained from Vietnam's boom in the 1990s?' *Economic Development and Cultural Change*, 50(4), pp. 773–792.
- GSO (2012). http://www.gso.gov.vn/Default_en.aspx?tabid=491. Accessed in June 2016.
- Hakkala, K. and Kokko, A. (2007). 'The state and the private sector in Vietnam', EIJS Working Paper Series 236, Stockholm School of Economics, The European Institute of Japanese Studies..
- Hoang, T., Pham, C., Ulubasoglu, M.A. (2014). 'Nonfarm activity, household expenditure, and poverty reduction in rural Vietnam: 2002–2008', *World Development*, 64, pp. 554–568.
- Imai, K.S., Gaiha, R., and Kang, W. (2011a). 'Poverty, inequality and ethnic minorities in Vietnam', *International Review of Applied Economics*, 25 (3), pp. 249–282.
- Imai, K.S., Gaiha, R., and Kang, W. (2011b). 'Poverty dynamics and vulnerability in Vietnam', *Applied Economics*, 43 (25), pp. 3603–3618.

- Kalwij, A. and Verschoor, A. (2007). 'Not by growth alone: the role of the distribution of income in regional diversity in poverty reduction', *European Economic Review*, 51, pp. 805–829.
- Kang, W. and Imai, K.S. (2012). 'Pro-poor growth, poverty and inequality in Rural Vietnam', *Journal of Asian Economics*, 23, pp. 527–539.
- Kraay, A. (2006). 'When is growth pro-poor? Evidence from a panel of countries', *Journal of Development Economics*, 80, pp. 198–227.
- Litchfield, J. and Justino, P. (2004). 'Welfare in Vietnam during the 1990s', *Journal of the Asia Pacific Economy*, 9 (2), pp. 145–169.
- Magrini, E., Montalbano, P. and Winters, L.A. (2018). 'Households' vulnerability from trade in Vietnam', *World Development*, 112, pp. 46–58.
- Malesky, E. and Taussig, M. (2009). 'Out of the gray: the impact of provincial institutions on business formalization in Vietnam', *Journal of East Asian Studies*, 9, pp. 249–290.
- Martin, W. and Pham C.S. (2008). 'Estimating the gravity equation when zero trade flows are frequent'. Deakin University, Economics Working Paper Series 2008-03, Melbourne, Australia.
- McCaig, B. (2011). 'Exporting out of poverty: provincial poverty in Vietnam and U.S. market access', *Journal of International Economics*, 85 (1), pp. 102–113.
- Nguyen-Hoang P. and McPeak J.G (2010). 'Leaving or staying: inter-provincial migration in Vietnam', *Asian and Pacific Migration Journal*, 19(4), pp. 473–500.
- Nguyen-Viet, T.A. and Imai M. (2017). 'The effects of ethnic Chinese minority on Vietnam's regional economic development in the Post-Vietnam war period', *Journal of Development Studies*, pp. 1–18.
- Miguel, E and Roland, G. (2011). 'The long-run impact of bombing Vietnam', *Journal of Development Economics*, 96, pp. 1–15.
- North, D. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.
- Painter, M. (2008). 'From command economy to hollow state? Decentralisation in Vietnam and China', *Australian Journal of Public Administration*, 67(1), pp. 79–88.
- Ram, R. (2011). 'Growth elasticity of poverty: direct estimates from recent data', *Applied Economics*, 43, pp. 2433–2440.
- Ravallion, M. (2001). 'Growth, inequality and poverty: looking beyond averages', *World Development*, 29 (3), pp. 1803–15.

Ravallion, M. (2010). 'The developing world's bulging (but vulnerable) middle class', *World Development*, 38 (4), pp. 445–454.

Ravallion, M. and Chen, S. (1997). 'What can new survey data tell us about recent changes in distribution and poverty?' *World Bank Economic Review*, 11 (2), pp. 357–382.

Ravallion, M. and Chen, S. (2003). 'Measuring pro-poor growth', *Economics Letters*, 78 (1), pp. 93–99.

Ravallion, M. and Datt, G. (2002). 'Why has economic growth been more pro-poor in some states of India than others?' *Journal of Development Economics*, 68 (2), pp. 381–400.

Son, H.H. (2004). 'A note on pro-poor growth', *Economics Letters*, 82 (3), pp. 307–314.

Ural, B. (2012). 'Tariff pass-through and the distributional effects of trade liberalization', *Journal of Development Economics*, 99 (2), pp. 265–281.

Table 1A: Institutions for Private Sector Development, Poverty and Expenditure in 2008
(Vietnam Household Living Standards Survey of 2008)

VARIABLES	First stage	The dependent variable is 1 if a household is poor and 0 otherwise			Dependent variable: log of real expenditure per capita in 2008		
	(1)	Full VHLSS sample (Probit) (2)	Sample with province-level French population data available (Probit) (3)	Sample with province-level French population data available (IV-Probit) (4)	Full VHLSS sample (OLS) (5)	Sample with province-level French population data available (OLS) (6)	Sample with province-level French population data available (IV-2SLS) (7)
PSDS 2006		-0.017**	-0.017	-0.081***	0.031**	0.026	0.141***
Log of ratio of French citizens to total pop. in province in 1943	0.363***						
Observations		6,837	4,902	4,902	6,837	4,902	4,902
R-squared					0.309	0.335	0.299
F test of excluded instruments	25.87						

Notes: *, ** and *** denote 1%, 5% and 1% level of significance, respectively. Reported coefficients are marginal effects. PSDS: Private Sector Development Services score. All the regressions control for characteristics at the household level, dummies for the education of household head, age of household head, age of household head squared, ethnicity of household head; at the commune level, dummies for whether the commune has a car way, upper-school, post office, market. Standard errors are clustered at the province level.

Table 1B: Institutions for Private Sector Development and Different Poverty Lines in 2008
(Vietnam Household Living Standards Survey of 2008)

	Higher poverty line by 10 percent		Lower poverty line by 10 percent	
	Probit (1)	IV-Probit (2)	Probit (3)	IV-Probit (4)
PSDS 2006	-0.019	-0.086**	-0.012	-0.059**
Test for endogeneity (p-value)		0.023		0.045
Observations	4,902	4,902	4,902	4,902

See notes of Table 1A. Sample for which the province-level French population data are available.

Table 1C: Robustness to Other PCI Categories
(Vietnam Household Living Standards Survey of 2008)

	The dependent variable is 1 if a household is poor and 0 otherwise		Dependent variable: log of real expenditure per capita in 2008	
	IV-Probit (1)	IV-Probit (2)	IV-2SLS (3)	IV-2SLS (4)
Private sector support in 2006	-0.099***	-0.095***	0.152***	0.150***
Entry costs in 2006	0.041**	0.040**	-0.067**	-0.063**
Access to land in 2006	0.061***	0.056**	-0.101***	-0.108***
Transparency in 2006	0.044**	0.041**	-0.067**	-0.064**
Time costs in 2006	-0.002	-0.002	-0.028	-0.031
Informal charges in 2006	-0.036*	-0.036	0.063*	0.062
State sector bias in 2006	0.019	0.008	-0.009	-0.010
Labour training in 2006	-0.006	-0.013	0.040	0.043*
Legal institution in 2006	0.010	-0.003	0.003	0.002
Proactivity of provincial leadership in 2006		0.018	-0.039	-0.038
Log of std of rainfall in 1989-2016		0.001		-0.004
Quality of land		-0.003		-0.019
Dummy for coastal area		-0.096***		0.097*
Dummy for inland Delta		-0.074**		0.084
Dummy for hills/midlands		-0.053		0.020
Dummy for low mountains		-0.055***		0.064*
Constant			7.528***	7.654***
Observations	4,902	4,902	4,902	4,902
R-squared			0.337	0.340

See notes of Table 1A. Sample for which the province-level French population data are available

Table 2: Institutions for Private Sector Development, Poverty and Expenditure in 2012**(Vietnam Household Living Standards Survey of 2012)**

VARIABLES	First stage	The dependent variable is 1 if a household is poor and 0 otherwise			Dependent variable: log of real expenditure per capita in 2012		
		Full VHLSS sample (PROBIT)	Sample with province-level French population data available (PROBIT)	Sample with province-level French population data available (IVPROBIT)	Full VHLSS sample (OLS)	Sample with province-level French population data available (OLS)	Sample with province-level French population data available (IV-LIML)
	(1)	(2)	(3)	(4)	(5)	(6)	
PSDS 2006		-0.019*	-0.009	-0.095**	0.025*	0.011	0.157**
Log of ratio of French citizens to total pop. in province in 1943	.301**						
Observations		6,693	4,737	4,737	6,693	4,737	4,737
R-squared					0.316	0.367	0.306
F test of excluded instruments	6.66						

See notes of Table 1A.

Table 3: Institutions for Private Sector Development and Log Hourly Wages in 2008

VARIABLES	All	Poor	Middle	Rich	Vulnerable (VG)	Vulnerable (DL)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: OLS regressions, Wage earners only (controlling for industry dummies)						
PSDS 2006	0.039** (0.015)	0.022 (0.023)	0.010 (0.020)	0.047** (0.020)	0.017 (0.035)	0.020 (0.020)
Observations	2516	839	839	838	407	1389
R-squared	0.238	0.206	0.222	0.223	0.222	0.209
Panel B: IV-2SLS regressions, Wage earners only (controlling for industry dummies)						
PSDS 2006	0.093** (0.037)	0.103** (0.043)	0.035 (0.029)	0.053 (0.041)	-0.008 (0.051)	0.062** (0.028)
Observations	2516	839	839	838	407	1389
R-squared	0.231	0.188	0.220	0.223	0.220	0.203
First stage regressions						
Log of ratio of French citizens to total pop. in province in 1943	0.374*** (0.071)	0.286*** (0.069)	0.377*** (0.086)	0.364*** (0.074)	0.337*** (0.089)	0.373*** (0.077)
F-test of the excluded instrument	27.83	16.97	19.03	24.06	14.36	23.15

Panel C: IV-2SLS regressions, Wage earners only (without controlling for industry dummies)						
PSDS 2006	0.108*** (0.040)	0.101** (0.047)	0.098*** (0.033)	0.042 (0.038)	0.015 (0.057)	0.102*** (0.033)
Observations	2516	839	839	838	407	1389
R-squared	0.132	0.077	0.086	0.148	0.100	0.081
Log of ratio of French citizens to total pop. in province in 1943	0.371*** (0.070)	0.290*** (0.069)	0.388*** (0.085)	0.358*** (0.076)	0.343*** (0.080)	0.371*** (0.076)
F-test of the excluded instrument	27.92	17.43	20.82	22.16	18.40	23.66

Notes: (1) *, ** and *** denote 10%, 5% and 1% level of significance, respectively. The dependent variable is the log of hourly wage for the respective sample of workers at the individual level. Regressions includes the following control variables: at the individual level, indicators for education, age and age squared, gender; at the household level, dummies for the education of household head; at the commune level, dummies for whether the commune has a car way, upper-school, post office, market; plus seven regional dummies. The model also clusters for provinces.

(2) Sample for which the province-level French population data are available.

(3) Vulnerable group (VG) is defined as per Vietnam Government's suggestion to include those who are just above the poverty line up to the expenditure per capita level that is 30% greater than the poverty line (i.e., between 3,358,000 and 3,358,000*1.3 VND).

(4) Vulnerable group (DL) is defined as per Dang and Lanjouw's (2017) suggestion to include those whose expenditure per capita is between the poverty line and the expenditure per capita level that corresponds to the vulnerability index of 10% (i.e., between 3,358,000 and 7,288,400 VND).

Table 4: Institutions for Private Sector Development and Log Total Working Hours in 2008

Independent variables	All	Poor	Middle	Rich	Vulnerable (VG)	Vulnerable (DL)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: OLS regressions, All individuals between 18-60 (controlling for industry dummies)						
PSDS 2006	0.024 (0.019)	0.054* (0.028)	0.032 (0.022)	-0.001 (0.015)	0.044* (0.025)	0.031 (0.018)
Observations	10260	3421	3420	3419	1882	5414
R-squared	0.165	0.105	0.165	0.224	0.141	0.162
Panel B: IV-2SLS regressions, All individuals between 18-60 (controlling for industry dummies)						
PSDS 2006	0.087*** (0.032)	0.106* (0.056)	0.100** (0.042)	0.057** (0.024)	0.091* (0.047)	0.092** (0.037)
Observations	10260	3421	3420	3419	1882	5414
R-squared	0.155	0.098	0.155	0.215	0.136	0.153
Log of ratio of French citizens to total pop. in province in 1943	0.364*** (0.076)	0.331*** (0.115)	0.369*** (0.066)	0.378*** (0.076)	0.359*** (0.085)	0.382*** (0.074)
F-test of the excluded instrument	22.92	8.27	31.10	24.29	17.69	26.45

See the notes to Table 3.

Table 5A: Institutions for Private Sector Development and Log Nonfarm Hours in 2008

Independent variables	All	Poor	Middle	Rich	Vulnerable (VG)	Vulnerable (DL)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: OLS regressions, All individuals between 18-60 (controlling for industry dummies)						
PSDS 2006	0.060 (0.066)	-0.008 (0.055)	0.022 (0.075)	0.041 (0.091)	-0.081 (0.103)	0.015 (0.061)
Observations	11465	3823	3822	3820	2001	5990
R-squared	0.252	0.241	0.195	0.243	0.216	0.206
Panel B: IV-2SLS regressions, All individuals between 18-60 (controlling for industry dummies)						
PSDS 2006	0.302** (0.138)	0.099 (0.153)	0.396** (0.195)	0.186 (0.134)	0.107 (0.188)	0.330** (0.141)
Observations	11465	3823	3822	3820	2001	5990
R-squared	0.248	0.239	0.186	0.241	0.213	0.199
Log of ratio of French citizens to total pop. in province in 1943	0.365*** (0.075)	0.330*** (0.110)	0.376*** (0.068)	0.379*** (0.075)	0.363*** (0.081)	0.385*** (0.075)
F-test of the excluded instrument	23.63	8.99	30.50	25.18	20.07	26.04

Table 5B: Institutions for Private Sector Development and Log Farm Hours in 2008

Independent variables	All	Poor	Middle	Rich	Vulnerable (VG)	Vulnerable (DL)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: OLS regressions, All individuals between 18-60 (without controlling for industry dummies)						
PSDS 2006	-0.025 (0.071)	0.053 (0.075)	0.032 (0.077)	-0.036 (0.086)	0.066 (0.117)	0.023 (0.066)
Observations	11465	3823	3822	3820	2001	5990
R-squared	0.299	0.254	0.227	0.245	0.225	0.242
Panel B: IV-2SLS regressions, All individuals between 18-60 (without controlling for industry dummies)						
PSDS 2006	-0.280** (0.119)	-0.208 (0.247)	-0.157 (0.155)	-0.199 (0.128)	-0.194 (0.250)	-0.248** (0.118)
Observations	11465	3823	3822	3820	2001	5990
R-squared	0.294	0.247	0.225	0.243	0.220	0.237
Log of ratio of French citizens to total pop. in province in 1943	0.365*** (0.075)	0.330*** (0.110)	0.376*** (0.068)	0.379*** (0.075)	0.363*** (0.089)	0.385*** (0.075)
F-test of the excluded instrument	23.63	8.99	30.50	25.18	20.07	26.04

**Table 6: Institutions for Private Sector Development and Income Sources in 2008
(IV-2SLS Regressions)**

Variables	Poor (1)	Middle (2)	Rich (3)	Vulnerable (VG) (4)	Vulnerable (DL) (5)
Panel A: Dependent variable: Log of income from nonfarm self-employment					
PSDS 2006	0.413** (0.187)	0.353*** (0.110)	0.106 (0.074)	0.281* (0.148)	0.290*** (0.102)
Observations	519	518	518	233	831
Panel B: Dependent variable: Log of wage income					
PSDS 2006	0.109 (0.095)	0.283*** (0.107)	0.183** (0.092)	0.134 (0.095)	0.244*** (0.066)
Observations	930	930	930	517	1514
Panel C: Dependent variable: Log of agricultural income					
PSDS 2006	-0.243** (0.121)	-0.111 (0.075)	-0.158* (0.080)	-0.164 (0.102)	-0.144** (0.061)
Observations	1496	1496	1495	865	2446

See the notes to Table 3.

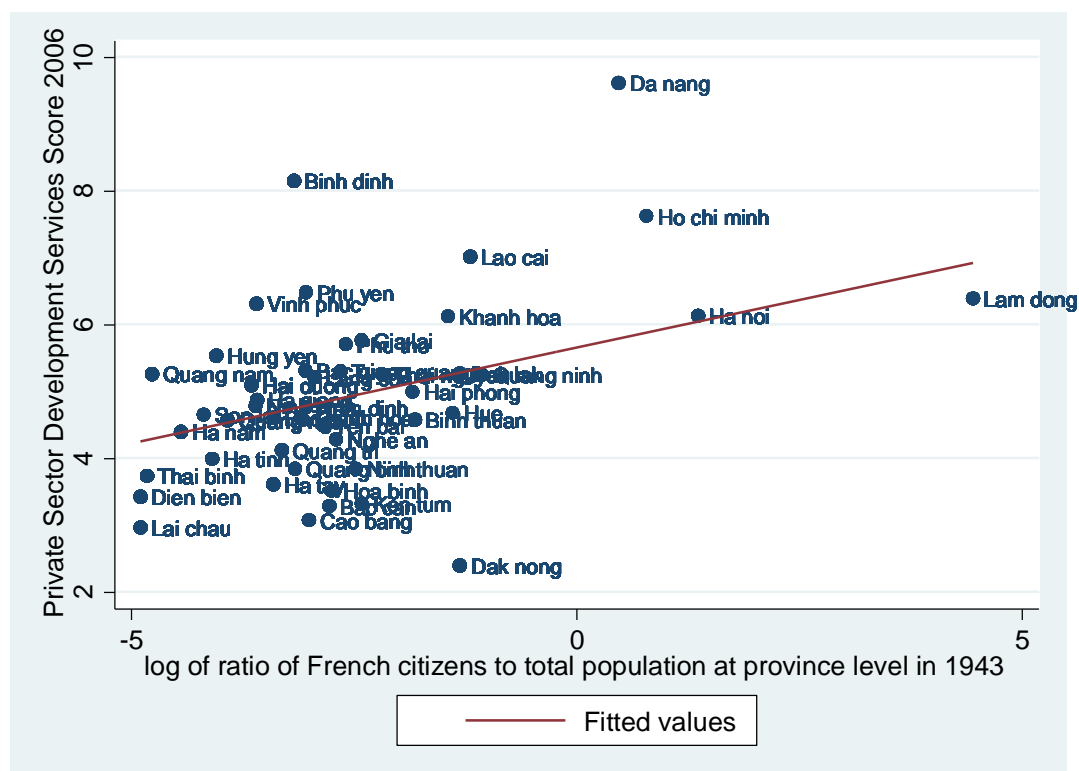


Figure 1. French Colonial Legacy and the Institutions for Private Sector Activity

APPENDIX 1

Table A1. Descriptive Statistics of Key Variables by Province

Variables	Obs	Mean	Std.Dev.	Min	Max
Private Sector Development Services score in 2006	46	4.826	1.14	2.4	9.62
Ratio of French citizens to total population in 1943 in province (%)	46	2.1	12.6	0.007	85.5

Table A2: French Presence and Province Competitiveness Index

	Log of ratio of French citizens to total pop. in province in 1943 (French Presence)	Observations	F-statistic on French Presence
Private sector support in 2006	0.366***	4,902	26.19
Entry costs in 2006	-0.034	4,902	0.24
Access to land in 2006	-0.037	4,902	0.13
Transparency in 2006	0.217**	4,902	4.87
Time costs in 2006	0.109	4,902	2.26
Informal charges in 2006	0.00016	4,902	0.0
State sector bias in 2006	-0.086	4,902	0.89
Labour training in 2006	0.175*	4,902	3.27
Legal institution in 2006	0.011	4,902	0.02
Proactivity of provincial leadership in 2006	.0046	4,902	0.0

Notes: *, ** and *** denote 10%, 5% and 1% level of significance, respectively. The regressions control for characteristics at the household level, dummies for the education of household head, age of household head, age of household head squared, ethnicity of household head; at the commune level, dummies for whether the commune has a car way, upper-school, post office, market. The model also clusters for provinces.

Table A3: Total Population and French Population in 1943

Province	Total population	French population
Ha Noi	119427	4642
Hai Phong	494008	782
Vinh Phuc	498282	136
Phu Tho	351666	263
Ha Tay	1175011	387
Hoa Binh	84413	54
Bac Ninh	543481	180
Bac Giang	311783	148
Hai Duong	843530	217
Hung Yen	533270	93

Ha Nam	596221	70
Nam Dinh	1233413	591
Ninh Binh	406165	110
Thai Binh	1139812	91
Ha Giang	109260	30
Tuyen Quang	83588	59
Cao Bang	230518	114
Lao Cai	69520	209
Yen Bai	107580	62
Bac Kan	69501	43
Thai Nguyen	153480	173
Lang Son	213108	112
Quang Ninh	297700	1025
Lai Chau	67311	5
Son La	118745	18
Thanh Hoa	1127209	510
Nghe An	1147943	773
Ha Tinh	582439	97
Quang Binh	255206	108
Quang Tri	192386	70
Thua Thien Hue	406997	1012
Da Nang	50915	816
Quang Nam	1001605	85
Quang Ngai	549926	109
Binh Dinh	780243	325
Phu Yen	282835	135
Khanh Hoa	146632	345
Kon Tum	157181	141
Gia Lai	157181	141
Dak Lak	81433	219
Lam Dong	5217	4461
Ho Chi Minh	861539	18935
Ninh Thuan	145921	122
Binh Thuan	145921	237

APPENDIX 2

Monte Carlo Simulations of the Tobit Estimator with Two Different Censored Points

For our Monte Carlo simulations we adopted the following data generating process (DGP):

$$(a) \quad y_i^* = \exp(x_i\beta) + \varepsilon_i - k = \exp(x_i\beta) \cdot \eta_i - k = \exp(\beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i}) \cdot \eta_i - 1$$

where y_i^* is the latent variable and $y_i = y_i^*$ if $y_i^* \geq 0$; $y_i = 0$ if $y_i^* < 0$. Note that in the specification above we have $\eta_i \equiv 1 + [\varepsilon_i / \exp(x_i\beta)]$ and x_{1i} is a binary dummy that equals 1 with probability 0.4; x_{2i} is a standard normal variable continuous explanatory variable and the data are randomly generated using $\beta_0=0$, $\beta_1= \beta_2 =1$. We assume that η_i is log-normally distributed with mean 1 and variance $\sigma_i^2=1$. The DGP above generates approximately 45% zero observations. We estimate (a) using the Tobit estimator with two censored points: zero and the minimum wage rate. For the censored point equal to zero we need to add 1 to the dependent variable so that $\ln(y_i)$ is defined. The simulation results are presented below.

Table A3: Results of the Monte Carlo Simulations

	Mean	Std. Dev.	Min	Max
Zero is the censored point				
β_1	0.9981	0.0379	0.8977	1.1086
β_2	0.9980	0.0642	0.8189	1.2164
Minimum wage is the censored point				
β_1	1.1349	0.0855	0.8773	1.5221
β_2	1.0882	0.1409	0.6779	1.5717

The results show that the Tobit with censored point equal to the minimum wage generates on average estimates that are higher than the true coefficients of β_1 and β_2 while the Tobit with zero being the censored point generates estimates lower than the true values of β_1 and β_2 . Yet, the Tobit with zero as the censored point on average performs better than its rival because it generate estimates closer to the true value of β_1 and β_2 than the Tobit with minimum value being the censored point.